RFB NO. 319018

CONSTRUCTION DOCUMENTS
PROJECT MANUAL

DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY AND TRANSPORTATION

PUBLIC WORKS ENGINEERING DIVISION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

REQUEST FOR BIDS NO. 319018
I.T. NETWORK UPGRADES
DEPARTMENT OF HUMAN SERVICES–NORTHPORT OFFICE
1202 NORTHPORT DRIVE
MADISON, WISCONSIN

Due Date / Time: **TUESDAY, June 16, 2020 / 2:00 P.M.**

Location: **PUBLIC WORKS OFFICE**

Performance / Payment Bond: **100% OF CONTRACT AMOUNT**

Bid Deposit: **5% OF BID AMOUNT**

FOR INFORMATION ON THIS REQUEST FOR BIDS, PLEASE CONTACT:

RYAN SHORE, PROJECT MANAGER
TELEPHONE NO.: 608/266-4475
FAX NO.: 608/267-1533
E-MAIL: SHORE@COUNTYOFDANE.COM

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INVITATION TO BID

LEGAL NOTICE

INVITATION TO BID

Dane County Dept. of Public Works, Hwy & Transp., 1919 Alliant Energy Center Way, Madison, WI 53713, will receive sealed Bids until:

2:00 P.M., TUESDAY, JUNE 16, 2020

RFB NO. 319018

I.T. NETWORK UPGRADES

DEPARTMENT OF HUMAN SERVICES–NORTHPORT OFFICE

1202 NORTHPORT DRIVE, MADISON, WI

Dane County is inviting Bids for construction services for I.T. network upgrades at the Department of Human Services Northport Office. This project involves removing existing network cabling and providing updated cabling, remodeling and construction of data closets. Request for Bids document may be obtained after **2:00 p.m. on April 28, 2020** by downloading it from bids-pwht.countyofdane.com. Please call Ryan Shore, Project Mgr, at 608/266-4475, or our office at 608/266-4018, for any questions or additional information.

All Bidders must be pre-qualified as a Best Value Contractor at time of bid. Complete Pre-qualification Application for Contractors at countyofdane.com/pwht/BVC_Application.aspx or obtain one by calling 608/267-0119.

A pre-bid facility tour will be held Friday, May 29, 2020 at 10 a.m. at the Northport Office starting in the lobby. Bidders are strongly encouraged to attend this tour.

PUBLISH: APRIL 28 & MAY 5 - WISCONSIN STATE JOURNAL

APRIL 29 & MAY 6 - THE DAILY REPORTER

END OF SECTION

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INSTRUCTIONS TO BIDDERS

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1. GENERAL

A. Before submitting Bid, bidder shall thoroughly examine all Construction Documents. Successful Bidder shall be required to provide all the Work that is shown on Drawings, set forth in Specifications, or reasonably implied as necessary to complete Contract for this project.

B. Bidder shall visit site to become acquainted with adjacent areas, means of approach to site, conditions of actual site and facilities for delivering, storing, placing, and handling of materials and equipment.

C. Pre-bid meeting is scheduled on May 29, 2020 at 10 a.m. at the Human Services Northport Office. Attendance by all bidders is optional, however bidders and subcontractors are strongly encouraged to attend.

D. Failure to visit site or failure to examine any and all Construction Documents will in no way relieve successful Bidder from necessity of furnishing any necessary materials or equipment, or performing any work, that may be required to complete the Work in accordance with Drawings and Specifications. Neglect of above requirements will not be accepted as reason for delay in the Work or additional compensation.

2. DRAWINGS AND SPECIFICATIONS

A. Drawings and Specifications that form part of this Contract, as stated in Article 1 of General Conditions of Contact, are enumerated in Document Index of these Construction Documents.

B. Complete sets of Drawings and Specifications for all trades will be available to all Bidders, irrespective of category of work to be bid on, in order that all Bidders may be familiar with work of other trades as they affect their bid.

3. INTERPRETATION

A. No verbal explanation or instructions will be given in regard to meaning of Drawings or Specifications before Bid Due Date. Bidders shall bring inadequacies, omissions or conflicts to Owner or Architect / Engineer's attention at least ten (10) calendar days before Bid Due Date. Prompt clarification will be available to all bidders by Addendum.

B. Failure to so request clarification or interpretation of Drawings and Specifications will not relieve successful Bidder of responsibility. Signing of Contract will be considered as implicitly denoting that Contractor has thorough understanding of scope of the Work and comprehension of Construction Documents.

C. Owner or Architect / Engineer will not be responsible for verbal instructions.

4. QUALIFICATIONS OF BIDDER (CONTRACTOR AND SUBCONTRACTOR)

A. Before award of Contract can be approved, Owner shall be satisfied that Bidder involved meets following requirements:

1. Has completed at least one (1) project of at least fifty percent (50%) of size or value of Division of work being bid and type of work completed is similar to that being bid. If greater magnitude of experience is deemed necessary, other than size or value of work, such requirements will be described in appropriate section of Specifications.

2. Maintains permanent place of business.

3. Can be bonded for terms of proposed Contract.

4. Has record of satisfactorily completing past projects.. Criteria which will be considered in determining satisfactory completion of projects by bidder will include:

    a. Completed contracts in accordance with drawings and specifications.
    b. Diligently pursued execution of work and completed contracts according to established time schedule unless Owner grants extensions.
    c. Fulfilled guarantee requirements of construction documents.
    d. Is not presently on ineligible list maintained by County's Department of Administration for noncompliance with equal employment opportunities and affirmative action requirements.
    e. Authorized to conduct business in Wisconsin. By submitting Bid, bidder warrants that it has: complied with all necessary requirements to do business in State of Wisconsin; that persons executing contract on its behalf are authorized to do so; and, if corporation, that name and address of bidder's registered agent are as set forth in Contract. Bidder shall notify Owner immediately, in writing, of any change in its registered agent, their address, and bidder's legal status. For partnership, term "registered agent" shall mean general partner.

B. County's Public Works Project Manager will make such investigations as are deemed necessary to determine ability of bidder to perform the Work, and bidder shall furnish to County's Public Works Project Manager or designee all such information and data for this purpose as County's Public Works Project Manager may request. Owner reserves right to

reject Bid if evidence submitted by, or investigation of, bidder fails to satisfy Owner that bidder is responsible and qualified to carry out obligations of Contract and to complete the Work contemplated therein.

5. BID GUARANTEE

A. Bank certified check, cashier's check or Bid Bond, payable to County in amount not less than five percent (5%) of maximum bid, shall accompany each Bid as guarantee that if Bid is accepted, Bidder will execute and return proposed Contract and Performance and Payment Bonds within ten (10) business days after being notified of acceptance of Bid. Company issuing bonds must be licensed to do business in Wisconsin.

B. Any bid, which is not accompanied by bid guarantee, will be considered "No Bid" and will not be read at Bid Due Date.

C. If successful Bidder so delivers Contract, Certificate of Insurance, and Performance and Payment Bonds, check will be returned to Bidder. In case Bidder fails to deliver such Contract, insurance, and bond, amount of bid guarantee will be forfeited to County as liquidated damages.

D. All checks tendered as bid guarantee, except those of three (3) lowest qualified, responsible bidders, will be returned to their makers within three (3) business days after Bid Due Date. All such retained checks will be returned immediately upon signing of Contract and Performance and Payment Bonds by successful Bidder.

6. WITHDRAWAL OF BIDS

A. Bids may be withdrawn by written request received from bidder or authorized representative thereof prior to time fixed for Bid Due Date, without prejudice to right of bidder to file new Bid. Withdrawn Bids will be returned unopened. Negligence on part of bidder in preparing their Bid confers no right for withdrawal of Bid after it has been opened.

B. No Bid may be withdrawn for period of sixty (60) calendar days after Bid Due Date.

C. If Bid contains error, omission or mistake, bidder may limit liability to amount of bidder's guarantee by giving written Notice of Intent not to execute Contract to Owner within seventy-two (72) hours of Bid Due Date.

7. CONTRACT FORM

A. Sample copy of contract that successful Bidder will be required to enter into is included in these Construction Documents and bidders are required to familiarize themselves with all conditions contained therein.

8. CONTRACT INTERESTS BY COUNTY PUBLIC OFFICIALS

A. In accordance with Wisconsin Statute 946.13, county official may not bid for or enter into any contract involving receipts or disbursements of more than $15,000.00 in a year, in which they have private pecuniary interest, direct or indirect if at same time they are authorized to take official action with respect to making of this Contract. Any contract entered into in violation of this Statute is void and County incurs no liability thereon. This subsection does not affect application and enforcement of Wisconsin Statute 946.13 by state prosecutors in criminal courts of this state.

9. EMERGING SMALL BUSINESS PROVISIONS

A. **Emerging Small Business Definition.** For purposes of this provision, ESB is defined as:

1. Independent business concern that has been in business minimum of one year;

2. Business located in State of Wisconsin;

3. Business comprised of less than twenty-five (25) employees;

4. Business must not have gross sales in excess of three million dollars ($3,000,000.00) over past three years; and

5. Business does not have history of failing to complete projects.

B. **Emerging Small Business (ESB) Involvement.** Bidder shall make good faith effort to award minimum of ten percent (10%) of the Work to ESBs. Bidder shall submit report to Dane County Contract Compliance Specialist within ten (10) business days of Bid Due Date demonstrating such efforts. Good faith efforts means significant contact with ESBs for purposes of soliciting bids from them. Failure to make or demonstrate good faith efforts will be grounds for disqualification.

C. **Emerging Small Business Report.** Emerging Small Business Enterprise Report is to be submitted by Bidder in separate envelope marked "Emerging Small Business Report". This report is due by 2:00 p.m. following specified ten (10) business days after Bid Due Date. Bidder who fails to submit Emerging Small Business Report shall be deemed not responsive.

D. **ESB Goal.** Goal of this project is ten percent (10%) ESB participation. ESB utilizations are shown as percentage of total Bid. If Bidder meets or exceeds specified goal, Bidder is only required to submit Form A - Certification, and Form B - Involvement. Goal shall be met if Bidder qualifies as ESB.

E. **Report Contents.** Following award of Contract, Bidder shall submit copies of executed contracts for all Emerging Small Businesses. Emerging Small Business Report shall consist of these:

1. Form A - Certification;

2. Form B - Involvement;

3. Form C - Contacts;

4. Form D - Certification Statement (if appropriate); and

5. Supportive documentation (i.e., copies of correspondence, telephone logs, copies of advertisements).

F. ESB Listing. Bidders may solicit bids from this ESB listing: pdf.countyofdane.com/commissions/2013-2015_Targeted_Business_Directory.pdf.

G. **ESB Certification.** All contractors, subcontractors and suppliers seeking ESB certification must complete and submit Emerging Small Business Report to Dane County Contract Compliance Program.

H. **Certification Statement.** If ESB firm has not been certified by County as ESB prior to submittal of this Bid, ESB Report cannot be used to fulfill ESB goal for this project unless

firm provides “Form D - Certification Statement”. Certification statement must be completed and signed by ESB firm.

I. **Questions.** Questions concerning Emerging Small Business provisions shall be directed to:

Dane County Contract Compliance Specialist
City-County Building, Room 356
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703
608/266-4192

J. **Substituting ESBs.** In event of any significant changes in subcontract arrangements or if need arises to substitute ESBs, Bidder shall report such proposed changes to Contract Compliance Specialist to making any official changes and request authorization to substitute ESB firm. Bidder further agrees to make every possible effort to replace ESB firm with another qualified ESB firm.

K. **Good Faith Efforts.** Good faith efforts can be demonstrated by meeting all of these obligations:

1. Selecting portions of the Work to be performed by ESBs in order to increase likelihood of meeting ESB goal including, where appropriate, breaking down Contract into smaller units to facilitate ESB participation.

2. Advertising in general circulation, trade associations and women / minority focus media concerning subcontracting opportunities.

3. Providing written notices to reasonable number of specific ESBs that their interest in Contract was being solicited in sufficient time to allow ESBs to participate effectively.

4. Following up on initial solicitations of interest by contacting ESBs within five (5) business days prior to Bid Due Date to determine with certainty whether ESB were interested, to allow ESBs to prepare bids.

5. Providing interested ESB with adequate information about Drawings, Specifications and requirements of Contract.

6. Using services of available minority, women and small business organizations and other organizations that provide assistance in recruitment of MBEs / WBEs / ESBs.

7. Negotiating in good faith with interested ESBs, not rejecting ESBs as unqualified without sound reason based on thorough investigation of their capabilities.

8. Submitting required project reports and accompanying documents to County’s Contract Compliance Specialist within twenty-four (24) hours after Bid Due Date.

L. **Appeals Disqualification of Bid.** Bidder who is disqualified may appeal to Public Works & Transportation Committee and Equal Opportunity Commission.

10. METHOD OF AWARD - RESERVATIONS

A. Following will be basis of award of Contract, providing cost does not exceed amount of funds then estimated by County as available to finance Contract(s):

1. Lowest dollar amount submitted by qualified responsible bidder on Base Bid for all work comprising project, combined with such additive Owner accepted alternates.

2. Owner reserves right to reject all bids or any bid, to waive any informality in any bid, and to accept any bid that will best serve interests of County.

3. Unit Prices and Informational Bids will not be considered in establishing low bidder.

11. SECURITY FOR PERFORMANCE AND PAYMENTS

A. Simultaneous with delivery of signed Contract, Bidder shall be required to furnish Performance and Payment Bonds as specified in Article 29 of General Conditions of Contract, "Contract Security". Surety Company shall be licensed to do business in Wisconsin. Performance and Payment Bonds must be dated same date or subsequent to date of Contract. Performance and Payment Bonds must emulate information in Sample Performance and Payment Bonds in Construction Documents.

B. Provide certified copy of power of attorney from Surety Company showing that agent who signs Bond has power of attorney to sign for Surety Company. Secretary or Assistant Secretary of company must sign this certification, not attorney-in-fact. Certification must bear same or later date as Bond. Power of Attorney must emulate model power of attorney information detailed in Sample Performance and Payment Bonds.

C. If Bidder is partnership or joint venture, State certified list, providing names of individuals constituting partnership or joint venture must be furnished. Contract itself may be signed by one partner of partnership, or one partner of each firm comprising joint venture, but Performance and Payment Bonds must be signed by all partners.

D. If Bidder is corporation, it is necessary that current certified copy of resolution or other official act of directors of corporation be submitted showing that person who signs Contract is authorized to sign contracts for corporation. It is also necessary that corporate seal be affixed to resolution, contract, and performance and payment bonds. If your corporation has no seal, it is required that above documents include statement or notation to effect that corporation has no seal.

12. TAXES

A. Wisconsin Statute 77.54 (9m) allows building materials that become part of local unit government facilities to be exempt from sales & use tax. Vendors & materials suppliers may not charge Bidders sales & use tax on these purchases. This does not include highways, streets or roads. Any other Sales, Consumer, Use & other similar taxes or fees required by law shall be included in Bid.

B. In accordance with Wisconsin Statute 71.80(16)(a),successful nonresident bidder, whether incorporated or not, and not otherwise regularly engaged in business in this state, shall file surety bond with State of Wisconsin Department of Revenue payable to Department of Revenue, to guarantee payment of income taxes, required unemployment compensation contributions, sales and use taxes and income taxes withheld from wages of employees, together with any penalties and interest thereon. Amount of bond shall be three percent (3%) of Contract or subcontract price on all contracts of $50,000 or more.

13. SUBMISSION OF BIDS

A. All Bids shall be submitted on standard Bid Form bound herein and only Bids that are made on this Bid Form will be considered. Entire Bid Form and other supporting documents, if any, shall be removed or copied from Construction Documents, filled out, and submitted in manner specified hereinafter. Submit completed Bid Bond with Bid as well.

B. No bids for any subdivision or any sub-classification of this Work, except as indicated, will be accepted. Any conditional Bid, amendment to Bid Form or appended item thereto, or inclusion of any correspondence, written or printed matter, or details of any nature other than that specifically called for, which would alter any essential provision of Construction Documents, or require consideration of unsolicited material or data in determining award of Contract, will disqualify Bid. Telecommunication alterations to Bid will not be accepted.

C. Bidders must submit single Bid for all the Work.

D. Bid amounts shall be inserted in words and in figures in spaces provided on Bid Form; in case of conflict, written word amounts will govern.

E. Addenda issued after Bid Letting shall become part of Construction Documents. Bidders shall acknowledge receipt of such addenda in appropriate space provided on Bid Form. Bid may be rejected if receipt of any particular addendum applicable to award of Contract has not been acknowledged on Bid Form.

F. Bids shall be signed, placed in envelope, sealed and delivered before due time to place designated in Invitation to Bid, and identified with project name, bid number, location, category of work being bid upon, Bid Due Date, name and address of bidder.

G. Bidder shall be responsible for sealed Bid being delivered to place designated for Bid Due Date on or before date and time specified. Bids received after time of closing will be rejected and returned to bidder unopened.

H. Bid will be considered invalid and will be rejected if bidder has not signed it.

I. Faxed or emailed Bids will not be accepted.

J. Bidder's organization shall submit completed with Bid, Fair Labor Practices Certification form, included in these Construction Documents.

14. SUBCONTRACTOR LISTING

A. Bidders shall be required to submit list of major subcontractors for General Construction, Plumbing, HVAC, and Electrical work proposed for this project to include committed prices for each subcontractor. List shall be placed in separate sealed envelope that must be clearly identified as "Major Subcontractor List", for named project and name of Bidder submitting it. County must receive envelope no later than date by which successful Bidder is required to submit his or her signed Contract, as established in Construction Documents.

15. ALTERNATE BIDS

A. Not Applicable.

16. INFORMATIONAL BIDS

A. Not Applicable. .

17. UNIT PRICES

A. Not Applicable.

18. COMMENCEMENT AND COMPLETION

A. Successful Bidder shall commence work when schedule and weather permit, but no later than stated in Bid Form. Contractor shall pursue the Work regularly and continuously at reasonable rate to insure completion of the Work within time stated in Bid.

B. Should it be found impossible to complete the Work on or before time specified for completion, written request may be submitted for extension of time setting forth reasons believed to justify granting of such request. Refer to Article 20 of General Conditions of Contract, titled “Time for Completion”..

19. WORK BY OWNER

A. Not Applicable.

20. SPECIAL HAZARDS COVERAGE

A. Not Applicable.

FORM A

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION

In accordance with General Conditions of Contract, submit this Emerging Small Business Report within ten (10) days after Bid Due Date.

PROJECT NAME: _____

_____

BID NO.: _____ BID DUE DATE: _____

BIDDER INFORMATION

COMPANY NAME: _____

ADDRESS: _____

_____

TELEPHONE NO.: _____

CONTACT PERSON: _____

EMAIL ADDRESS: _____

FORM B

DANE COUNTY
(Copy this Form as necessary to provide complete information)
EMERGING SMALL BUSINESS REPORT - INVOLVEMENT

COMPANY NAME: _____

PROJECT NAME: _____

BID NO.: _____ BID DUE DATE: _____

ESB NAME: _____

CONTACT PERSON: _____

ADDRESS: _____

_____

PHONE NO & EMAIL.: _____

_____

Indicate percentage of financial commitment to this ESB: _____% Amount: $_____

ESB NAME: _____

CONTACT PERSON: _____

ADDRESS: _____

_____

PHONE NO & EMAIL.: _____

_____

Indicate percentage of financial commitment to this ESB: _____% Amount: $_____

FORM C

DANE COUNTY
(Copy this Form as necessary to provide complete information)
EMERGING SMALL BUSINESS REPORT - CONTACTS

COMPANY NAME: _____

PROJECT NAME: _____

BID NO.: _____ BID DUE DATE: _____

	ESB FIRM NAME CONTACTED	DATE	PERSON CONTACTED	DID ESB BID?	ACC-EPT BID?	REASON FOR REJECTION
1)						
2)						
3)						
4)						
5)						
6)						
7)						
8)						

FORM D

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION STATEMENT

I, _____ , _____ of
Name Title

_____ certify to best of my knowledge and
Company

belief that this business meets Emerging Small Business definition as indicated in Article 9 and that information contained in this Emerging Small Business Report is true and correct.

_____ _____
Bidder's Signature Date

Name of Bidding Firm: _____

SECTION 00 41 13

BID FORM

BID NO. 319018
PROJECT: I.T. NETWORK UPGRADES
HUMAN SERVICES – NORHTPORT OFFICE

TO: DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY & TRANSPORTATION PROJECT MANAGER
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

NOTE: WISCONSIN STATUTE 77.54 (9M) ALLOWS FOR NO SALES & USE TAX ON THE PURCHASE OF MATERIALS FOR COUNTY PUBLIC WORKS PROJECTS.

BASE BID - LUMP SUM:
Dane County is inviting Bids for construction services for I.T. network upgrades at the Human Services - Northport Office. The scope of this project involves removing existing cabling, providing updated cabling and construction and remodeling of data closets. The undersigned, having examined the site where the Work is to be executed and having become familiar with local conditions affecting the cost of the Work and having carefully examined the Drawings and Specifications, all other Construction Documents and Addenda thereto prepared by Dane County Department of Public Works, Highway & Transportation hereby agrees to provide all labor, materials, equipment and services necessary for the complete and satisfactory execution of the entire Work, as specified in the Construction Documents, for the Base Bid stipulated sum of:

_____ and __ /100 Dollars
Written Price

$_____
Numeric Price

Receipt of the following addenda and inclusion of their provisions in this Bid is hereby acknowledged:

Addendum No(s). _____ through _____

Dated _____

Dane County Department of Human Services must have this project completed by January 29, 2021. Assuming this Work can be started by August 10, 2020, what dates can you commence and complete this job?

Commencement Date: _____ Completion Date: _____
(final, not substantial)

I hereby certify that all statements herein are made on behalf of:

_____
(Name of Corporation, Partnership or Person submitting Bid)

Select one of the following:
1. A corporation organized and existing under the laws of the State of _____, or

2. A partnership consisting of _____, or

3. A person conducting business as _____;

Of the City, Village, or Town of _____ of the State of _____.

I have examined and carefully prepared this Bid from the associated Construction Documents and have checked the same in detail before submitting this Bid; that I have full authority to make such statements and submit this Bid in (its) (their) (my) behalf; and that the said statements are true and correct. In signing this Bid, we also certify that we have not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or firm to submit or not to submit a Bid; that this Bid has been independently arrived at without collusion with any other bidder, competitor, or potential competitor; that this Bid has not been knowingly disclosed prior to the Bids Due Date to another bidder or competitor; that the above statement is accurate under penalty of perjury.

The undersigned agrees to be qualified as a Best Value Contractor or will have proven their exemption before the award of this contract.

The undersigned further agrees to honor the Base Bid and the Alternate Bid(s) for sixty (60) calendar days from date of Award of Contract.

SIGNATURE: _____
(Bid is invalid without signature)

Print Name: _____ Date: _____

Title: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

Contact Person: _____

THIS PAGE IS FOR BIDDERS' REFERENCE AND NEED NOT BE SUBMITTED WITH BID FORM.

BID CHECK LIST:
These items **must** be included with Bid:
☐ Bid Form ☐ Bid Bond ☐ Fair Labor Practices Certification

DANE COUNTY BEST VALUE CONTRACTING PRE-QUALIFICATION

General Contractors & all Subcontractors must be pre-qualified as a Best Value Contractor with the Dane County Public Works Engineering Division at the time of bid. Qualification & listing is not permanent & must be renewed every 24 months. Obtain a *Best Value Contracting Application* by calling 608/266-4018 or complete one online at:
countyofdane.com/pwht/BVC_Application.aspx

DANE COUNTY VENDOR REGISTRATION PROGRAM

All bidders are strongly encouraged to be a registered vendor with Dane County. Registering allows vendors an opportunity to receive notifications for RFBs & RFPs issued by the County and provides the County with up-to-date company contact information. Complete a new form or renewal online at:
danepurchasing.com/Account/Login?

COUNTY OF DANE

PUBLIC WORKS CONSTRUCTION CONTRACT

Contract No. _____ Bid No. 319018

Authority: 2020 RES -_____

THIS CONTRACT, made and entered into as of the date by which authorized representatives of both parties have affixed their signatures, by and between the County of Dane (hereafter referred to as "COUNTY") and _____ (hereafter, "CONTRACTOR"), and

W I T N E S S E T H :

WHEREAS, COUNTY, whose address is c/o Assistant Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide construction services for I.T. network upgrades at the Department of Human Services - Northport Office, at 1202 Northport Drive, Madison, Wisconsin ("the Project"); and

WHEREAS, CONTRACTOR, whose address is _____ _____ is able and willing to construct the Project, in accordance with the Construction Documents;

NOW, THEREFORE, in consideration of the above premises and the mutual covenants of the parties hereinafter set forth, the receipt and sufficiency of which is acknowledged by each party for itself, COUNTY and CONTRACTOR do agree as follows:

1. CONTRACTOR agrees to construct, for the price of $_____ the Project and at the CONTRACTOR'S own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence labor, insurance, and other accessories and services necessary to complete the Project in accordance with the conditions and prices stated in the Bid Form, General Conditions of Contract, the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the specifications therefore as prepared by Graef-USA (hereinafter referred to as "the Architect / Engineer"), and as enumerated in the Project Manual Table of Contents, all of which are made a part hereof and collectively evidence and constitute the Contract.

2. COUNTY agrees to pay the CONTRACTOR in current funds for the performance of the Contract subject to additions and deductions, as provided in the General Conditions of Contract, and to make payments on account thereof as provided in Article entitled, "Payments to Contractor" of the General Conditions of Contract.

3. During the term of this Contract, CONTRACTOR agrees to take affirmative action to ensure equal employment opportunities. The CONTRACTOR agrees in accordance with Wisconsin Statute 111.321 and Chapter 19 of the Dane County Code of Ordinances not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs.

Such equal opportunity shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation. CONTRACTOR agrees to post in conspicuous places, available to all employees and applicants for employment, notices setting forth the provisions of this paragraph.

4. CONTRACTOR shall file an Affirmative Action Plan with the Dane County Contract Compliance Specialist in accord with Chapter 19 of the Dane County Code of Ordinances. CONTRACTOR must file such plan within fifteen (15) business days of the effective date of this Contract. During the term of this Contract CONTRACTOR shall also provide copies of all announcements of employment opportunities to COUNTY'S Office of Equity & Inclusion, and shall report annually the number of persons, by race, ethnicity, gender, and disability status, which apply for employment and, similarly classified, the number hired and number rejected.

5. During the term of this Contract, all solicitations for employment placed on CONTRACTOR'S behalf shall include a statement to the effect that CONTRACTOR is an "Equal Opportunity Employer".

6. CONTRACTOR agrees to furnish all information and reports required by COUNTY'S Contract Compliance Specialist as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and the provisions of this Contract.

7. This Contract is intended to be a Contract solely between the parties hereto and for their benefit only. No part of this Contract shall be construed to add to, supplement, amend, abridge or repeal existing rights, benefits or privileges of any third party or parties including, but not limited to, employees of either of the parties.

8. The entire agreement of the parties is contained herein and this Contract supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that the express terms of this Contract shall not be amended in any fashion except in writing, executed by both parties.

9. CONTRACTOR and subcontractors must be qualified as, or apply to be a Best Value Contractor with Dane County Public Works Engineering Division before Bid Due Date. All contractors must be qualified as a Best Value Contractor to perform any work under this Contract.

IN WITNESS WHEREOF, COUNTY and CONTRACTOR, by their respective authorized agents, have caused this Contract and its Schedules to be executed, effective as of the date by which all parties hereto have affixed their respective signatures, as indicated below.

* * * * * * *

FOR CONTRACTOR:

Signature Date

Printed or Typed Name and Title

Signature Date

Printed or Typed Name and Title

NOTE: If CONTRACTOR is a corporation, Secretary should attest. In accordance with IRS Regulations, unincorporated entities are required to provide either their Social Security or Employer Number in order to receive payment for services rendered.

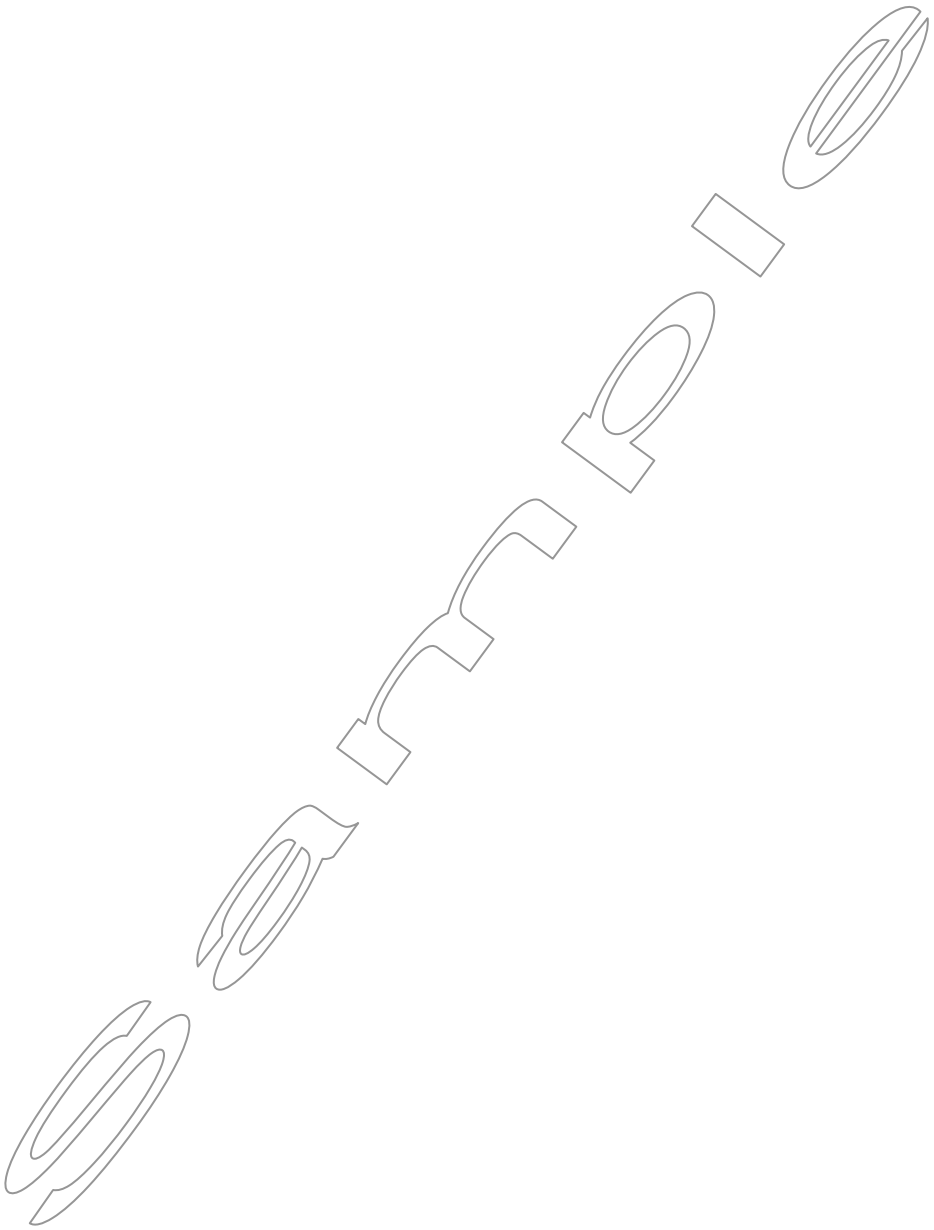
* * * * * * *

This Contract is not valid or effectual for any purpose until approved by the appropriate authority designated below, and no work is authorized until the CONTRACTOR has been given notice to proceed by COUNTY'S Deputy Public Works Director.

FOR COUNTY:

Joseph T. Parisi, County Executive Date

Scott McDonell, County Clerk Date



AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

BOND AMOUNT:

PROJECT:
(Name, location or address, and Project number, if any)

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of

(Witness)	*(Contractor as Principal)* *(Seal)*
	(Title)
(Witness)	*(Surety)* *(Seal)*
	(Title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

Init.
/

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	Name	Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	Name	Name and Title:	

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)
AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- **.1** the name of the Claimant;
- **.2** the name of the person for whom the labor was done, or materials or equipment furnished;
- **.3** a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- **.4** a brief description of the labor, materials or equipment furnished;
- **.5** the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- **.6** the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- **.7** the total amount of previous payments received by the Claimant; and
- **.8** the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

SECTION 00 72 12

GENERAL CONDITIONS OF CONTRACT

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1. CONSTRUCTION DOCUMENTS

A. Construction Documents, listed in Table of Contents of this Specification volume shall form part of this Contract and provisions of Construction Documents shall be as binding upon parties as if they were fully set forth in Contract itself.

B. These shall also be considered as part of Construction Documents: Addenda, including additions and modifications incorporated in such addenda before execution of Contract; requests for information; construction bulletins; change orders; and written interpretations by Architect / Engineer or Public Works Project Manager that are made after execution of Contract.

C. Construction Documents are complementary, and what is required by one shall be as binding as if required by all. Intent of Construction Documents is to include all labor, materials and equipment necessary for proper execution of the Work.

2. DEFINITIONS

A. These terms as used in this Contract are respectively defined as follows:
   1. All uses of term "County" in Construction Documents shall mean Dane County.
   2. All uses of term "Department" in Construction Documents shall mean Department of Public Works, Highway & Transportation, which is a unit of Dane County government. Department is County agency overseeing Contract with Contractor.
   3. Public Works Project Manager is appointed by and responsible to Department. Public Works Project Manager has authority to act on behalf of Department and will sign change orders, payment requests and other administrative matters related to projects.
   4. Public Works Project Manager is responsible for supervision, administration and management of field operations involved in construction phase of this Work.
   5. Term "Work" includes all labor, equipment and materials necessary to produce project required by Construction Documents.
   6. Term "Substantial Completion" is date when project or specified area of project is certified by Architect / Engineer that construction is sufficiently completed, in accordance with Construction Documents, and as modified by any subsequent changes agreed to by parties, so that County may occupy project or specified area of project for use for which it was intended subject to permit approval for occupancy.
   7. Contractor is person, firm, or corporation with whom County makes Contract. Though multiple contracts may be involved, Construction Documents treat them throughout as if each were of singular number.

3. ADDITIONAL INSTRUCTIONS AND DRAWINGS

A. Contractor may be furnished additional instructions and detail drawings as necessary to carry out the Work included in Contract. Additional drawings and instructions thus supplied to Contractor will coordinate with Construction Documents and will be so prepared that they can be reasonably interpreted as part thereof. Contractor shall carry out the Work in accordance with additional detail drawings and instructions.

4. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Unless otherwise specified, Contractor shall submit three (3) copies of all Shop Drawings for each submission, until receiving final approval. After final approval, provide five (5) additional copies for distribution and such other copies as may be required.

B. Contractor shall submit, on an on-going basis and as directed, Product Data such as brochures that shall contain catalog cuts and specifications of all furnished mechanical and electrical equipment. After Architect / Engineer's approval, one (1) copy shall remain in Architect / Engineer's file, one (1) kept at Department's office and one (1) kept at job site by Contractor for reference purposes.

C. Samples shall consist of physical examples furnished by Contractor in sufficient size and quantity to illustrate materials, equipment or workmanship, and to establish standards to compare the Work.
   1. Submit Samples in sufficient quantity (minimum of two (2)) to permit Architect / Engineer to make all necessary tests and of adequate size showing quality, type, color range, finish, and texture. Label each Sample stating material, type, color, thickness, size, project name, and Contractor's name.
   2. Submit transmittal letter requesting approval, and prepay transportation charges to Architect / Engineer's office on samples forwarded.
   3. Materials installed shall match approved Samples.

D. Contractor shall review Shop Drawings and place their dated stamp thereon to evidence their review and approval and shall submit with reasonable promptness and in orderly sequence to cause no delay in the Work or in work of any other contractor. At time of submission, Contractor shall inform Architect / Engineer in writing of any deviation in Shop Drawings or Samples from requirements of Construction Documents. Architect / Engineer will not consider partial lists.

E. Architect / Engineer will review and approve or reject Shop Drawings with reasonable promptness to cause no delay. Architect / Engineer's approval shall not relieve Contractor from responsibility for errors or omissions in Shop Drawings.

F. Contractor shall not commence any work requiring Shop Drawing, Product Data or Sample submission until Architect / Engineer has approved submission. All such work shall be in accordance with approved Shop Drawings, Product Data and Samples.

G. Contractor shall keep on site of the Work, approved or conformed copy of Shop Drawings and shall at all times give Department access thereto.

H. By stamping and submitting Shop Drawings, Product Data and Samples, Contractor thereby represents that he or she has or will determine and verify all field measurements, field construction criteria, materials, catalog numbers, and similar data and that he or she has checked and coordinated each Shop Drawing, Product Data and Sample with requirements of the Work and of Construction Documents. Architect / Engineer shall return without examination, Shop Drawings, Product Data and Samples not so noted.

I. All Shop Drawings from any one Contractor should be numbered consecutively and on cover sheet shall bear name and location of project, name of Contractor, date of submittal and date of each correction or revision and associated Specification section and page number.

5. CUTTING AND PATCHING

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

B. Contractor shall not damage or endanger portion of the Work or fully or partially completed construction of County or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. Contractor shall not cut or otherwise alter such construction by County or separate contractor except with written consent of County and of such separate contractor; such consent shall not be unreasonably withheld. Contractor shall not withhold unreasonably from County or separate contractor, Contractor's consent to cutting or otherwise altering the Work.

6. CLEANING UP

A. Contractor shall keep premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under Contract. Contractor shall remove from and about the Work waste materials, rubbish, Contractor's tools, construction equipment, machinery, and surplus materials at completion of the Work. Contractor shall maintain streets and sidewalks around the Work site in clean condition. Contractor shall remove all spillage and prevent tracking of spillage arising from performance of the Work, into, out of, and within the Work site. Contractor shall establish regular maintenance program of sweeping, vacuuming and / or hosing to minimize accumulation of dirt and dust upon such areas.

B. If Contractor fails to clean up as directed in Construction Documents, County may do so and shall charge Contractor cost thereof.

C. Contractor shall be responsible for broken windows and glass, and at completion of the Work shall replace such damaged or broken windows and glass. After replacing damaged or broken windows and glass, Contractor shall remove all labels, wash and polish both sides of all windows and glass.

D. In addition to general cleaning (sweeping, vacuuming and / or hosing, as is appropriate to work surface), Contractor shall perform following final cleaning for all trades at completion of the Work:
   1. Remove temporary protections;
   2. Remove marks, stains, fingerprints and other soil or dirt from painted, decorated and finished woodwork and wall surfaces;
   3. Remove spots, plaster, soil and paint from ceramic tile, marble and other finished materials, and wash or wipe clean;
   4. Clean fixtures, cabinet work and equipment, removing stains, paint, dirt and dust, and leave same in undamaged, new condition;
   5. Clean aluminum in accordance with recommendations of manufacturer; and
   6. Clean resilient floors thoroughly with well-rinsed mop containing only enough moisture to clean off any surface dirt or dust and buff dry by machine to bring surfaces to sheen.

7. USE OF SITE

A. Contractor shall provide County and Architect / Engineer access to the Work under all circumstances.

B. Contractor shall confine operations at site to areas permitted by County, law, ordinance, permits and Construction Documents and shall not unreasonably encumber site with materials or equipment. Contractor shall assure free, convenient, unencumbered, direct and safe access to all properties adjacent to the Work for County, its employees, invitees and guests.

8. MATERIALS AND WORKMANSHIP

A. Contractor shall perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, necessary to complete the Work required by this Contract, within time specified, in accordance with provisions of Construction Documents.

B. All equipment and materials incorporated in the Work covered by this Contract are to be new; use recycled and / or recovered materials to extent that such use is technically and economically feasible. Recovered materials are products recovered from solid waste in form identical to original form for use that is same as, or similar to original use. Recycled materials are products manufactured from solid waste.

C. If requested, Contractor shall furnish satisfactory evidence as to kind and quality of construction materials proposed or used. Contractor shall furnish to Architect / Engineer, for approval, manufacturer name and model, performance capacities and other pertinent information of machinery, mechanical, electrical or other types of equipment, which Contractor plans to install.

D. If not otherwise provided, materials and labor called for in this Contract shall be provided and performed in accordance with established practice and standards recognized by Architects, Engineers, Department, and construction industry.

E. Reference to "Standard" specifications of any association or manufacturer, or codes of County authorities, intends most recent printed edition or catalog in effect on date that corresponds with date of Construction Documents.

F. Whenever reference is made in Specifications that work shall be "performed", "applied", in accordance with "manufacturer's directions or instructions", Contractor to whom those instructions are directed shall furnish three (3) printed copies of such instructions to Architect / Engineer before execution of the Work.

9. CONTRACTOR'S TITLE TO MATERIALS

A. Contractor or any subcontractor shall not purchase materials or supplies for the Work subject to any chattel mortgage or under conditional sale contract or other agreement by which seller retains interest. Contractor warrants that all materials and supplies used in the Work are free from all liens, claims or encumbrances and Contractor has good title to them.

10. "OR EQUAL" CLAUSE

A. Whenever equipment or materials are identified on Drawings or in Specifications by reference to manufacturer's or vendor's name, trade name, catalog number, and other identifying information, it is intended to establish standards; and any equipment or material of other manufacturers and vendors which will perform adequately duties imposed by general design will be considered equally accepted provided equipment or material so proposed is, in opinion of Architect / Engineer, of equal substance and function. Architect / Engineer and Department shall provide written approval before Contractor may purchase or install it.

B. Equipment or materials of manufacturers, other than those named, may be used only upon following conditions:
   1. That, in opinion of Architect / Engineer and Department, proposed material or equipment item is fully equal or superior (in design, materials, construction, workmanship, performance, finish, etc.) to named item. No compromise in quality level, however small, is acceptable.
   2. That, in substituting materials or equipment, Contractor assumes responsibility for any changes in system or for modifications required in adjacent or related work to accommodate such substitution despite Architect / Engineer's and Department's approval, and all costs growing out of approval of "or equal" items shall be responsibility of Contractor. No extra costs resulting from such approval shall become responsibility of Department, Architect / Engineer or any other separate Contractor.
   3. It shall be understood that use of materials or equipment other than those specified, or approved equal by Architect / Engineer and Department, shall constitute violation of Contract, and that Architect / Engineer and Department shall have right to require removal of such materials or equipment and their replacement with specified materials or equipment at Contractor's expense.
   4. Product and manufacturer named first in Specifications or on information shown on Drawings is basis of selection of manufactured items and equipment, particularly mechanical equipment. In using other than first named products or manufacturers, including those specified as additionally approved or acceptable, Contractor assumes responsibility for any changes in system and for modifications in any work required to accommodate them. Architect / Engineer's approval of such additionally acceptable products or manufacturers, either in Specifications or in Addendum, does not relieve Contractor from obligation to coordinate such optional products with other Contractors, whose work may be affected by them, and to pay all additional costs resulting from their inclusion into the Work. Contractor's liability shall include payment of Architect / Engineer's fees for any additional services made necessary by or directly connected to such product changes. No extra costs resulting from such changes shall become responsibility of Department, Architect / Engineer or any other separate Contractor.

C. No request for approval of "or equal" materials will be entertained except from Contractor. Identify any request for substitution as substitution on Contractor's letter of transmittal and give reasons for substitution. Department may in its sole discretion allow substitutions of materials.

11. PATENTS AND ROYALTIES

A. If Contractor uses any design, device or material covered by letters, patent or copyright, it is mutually agreed and understood, that, without exception, contract prices shall include all royalties or costs arising from use of such design, device or materials, in any way involved in the Work.

B. Contractor shall indemnify and save harmless County from any and all claims for infringement by reason of use of such patent or copyright in connection with the Work agreed to be performed under this Contract, and shall indemnify County for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during prosecution of the Work or after completion of the Work.

12. SURVEYS, PERMITS, REGULATIONS AND TAXES

A. Department will furnish to Contractor all site, topography and property surveys necessary for execution of the Work.

B. Contractor shall procure all permits, licenses and approvals necessary for execution of this Contract.

C. Contractor shall give all notices and comply with all State of Wisconsin, Federal and local laws, codes, rules and regulations relating to performance of the Work, protection of adjacent property, and maintenance of passageways, guard fences or other protective facilities.

D. Contractor does not need to pay State and local sales & use taxes. See Wisconsin Statute 77.54 (9m).

E. Contractor shall promptly notify Architect / Engineer of any variances of Drawings or Specifications with that of any State of Wisconsin, federal or local law, code, rule or regulation. Upon such notification, Architect / Engineer will require correction of variance to comply with applicable law, code, rule or regulation at no additional cost to Contractor.

F. Work under this Contract shall comply with all applicable State of Wisconsin, Federal and local laws, codes and regulations.

G. Contractor shall pay charges for water, sewer and other utility connections made by municipalities where required by Specifications.

13. CONTRACTOR'S OBLIGATIONS AND SUPERINTENDENCE

A. Contractor shall provide and pay for all materials, labor, tools, equipment, transportation and superintendence necessary to execute, complete and deliver the Work within specified time. Contractor agrees to secure at their own expense all personnel necessary to carry out the Work. Such personnel shall not be deemed County employees nor shall they have or be deemed to have any direct contractual relationship with County.

B. Performance of any work necessary after regular working hours, on Sundays or Legal Holidays shall be without additional expense to County. Performance of any work at site at other than normal working hours must be coordinated with Public Works Project Manager.

C. Contractor shall furnish, erect, maintain and remove such temporary works as may be required.

D. Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of Construction Documents.

E. At the Work site, Contractor shall give personal superintendence to the Work or shall employ construction superintendent or foreman, experienced in character of work covered by Contract, who shall have full authority to act for Contractor. Understand that such superintendent or foreman shall be acceptable to Architect / Engineer and Department.

F. Remove from project or take other corrective action upon notice from Architect / Engineer or Department for Contractor's employees whose work is considered by Architect / Engineer or Department to be unsatisfactory, careless, incompetent, unskilled or otherwise objectionable.

G. Contractor and subcontractors shall be required to conform to Labor Laws of State of Wisconsin and various acts amendatory and supplementary thereto and to other laws, ordinances and legal requirements applicable to the Work.

H. Presence and observation of the Work by Architect / Engineer or Public Works Project Manager shall not relieve Contractor of any obligations.

14. WEATHER CONDITIONS

A. In event of temporary suspension of work, or during inclement weather, or whenever Architect / Engineer shall direct, Contractor shall, and shall cause subcontractors to protect carefully all work and materials against damage or injury from weather. If, in opinion of Architect / Engineer or Department, any work or materials that have been damaged or injured due to failure on part of Contractor or any subcontractors so to protect the Work, such materials shall be removed and replaced at expense of Contractor.

15. PROTECTION OF WORK AND PROPERTY

A. Contractor shall at all times safely guard County's property from injury or loss in connection with this Contract. Contractor shall at all times safely guard and protect the Work, and adjacent property, from damage. Contractor shall replace or make good any such damage, loss or injury unless such is caused directly by errors contained in Contract, or by County, or County's duly authorized representative.

B. Contractor may act diligently, without previous instructions from Architect / Engineer and / or Department, in emergency that threatens loss or injury of property, or safety of life. Contractor shall notify Architect / Engineer and / or Department immediately thereafter. Promptly submit any claim for compensation by Contractor due to such extra work to Architect / Engineer and / or Department for approval as provided for in Article 18 herein.

16. INSPECTION AND TESTING OF MATERIALS

A. Authorized representatives and agents of County government shall have access at all times to the Work wherever it is in preparation or progress and Contractor shall provide facilities for such access and for inspection.

B. Should it be considered necessary or advisable at any time before final acceptance of the Work to make examination of work already completed, by removing or tearing out same, Contractor shall upon request, promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any aspect, due to fault of Contractor or subcontractors thereof, Contractor shall assume all expenses of such examination and of satisfactory reconstruction. Contractor will be reimbursed for such examination and replacement in accordance with Article 18 - A.3., of these General Conditions of Contract if such work is found to meet requirements of Contract.

C. If Specifications, Architect / Engineer's, or Public Works Project Manager's instructions require any work to be specially tested or approved, Contractor shall give Architect / Engineer and Public Works Project Manager timely notice of its readiness for testing or inspection. Test all materials and equipment requiring testing in accordance with accepted or specified standards, as applicable. Architect / Engineer shall recommend laboratory or inspection agency and Department will select and pay for all initial laboratory inspection

services. Should retesting be required, due to failure of initial testing, cost of such retesting shall be borne by Contractor.

D. Cost of any testing performed by manufacturers or Contractor for substantiating acceptability of proposed substitution of materials and equipment, or necessary conformance testing in conjunction with manufacturing processes or factory assemblage, shall be borne by Contractor or manufacturer responsible.

17. REPORTS, RECORDS AND DATA

A. Contractor shall submit to Architect / Engineer and Public Works Project Manager such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, invoices, records and other data as either may request concerning work performed or to be performed under this Contract.

18. CHANGES IN THE WORK

A. Make no changes, except in cases of emergency, in the Work covered by approved Construction Documents without having prior written approval of Department. Charges or credits for the Work covered by approved change shall be determined by one of these methods:
   1. Unit bid prices previously approved.
   2. Agreed lump sum based on actual cost of:
      a) Labor, including foremen, and all fringe benefits that are associated with their wages.
      b) Materials entering permanently into the Work.
      c) Ownership or rental cost of construction tools and equipment during time of use on extra work.
      d) Power and consumable supplies for operation of power equipment.
      e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
      f) Social Security and old age and unemployment contributions.
      g) Add to cost under (2), fixed fee to be agreed upon, but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force. Fee shall be compensation to cover cost of supervision, overhead, bond, profit and any other general expense.
      h) On that portion of the Work under (2) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit and any other general expense.
      i) Department may require correct amount of costs with supporting vouchers; Contractor shall keep and present in such form as directed.
   3. Cost-plus work, with not-to-exceed dollar limit, based on actual cost of:
      a) Labor, including foremen, and all fringe benefits that are associated with their wages.
      b) Materials entering permanently into the Work.
      c) Ownership or rental cost of construction tools and equipment during time of use on extra work. Rental cost cannot exceed fifty percent (50%) replacement value of rented equipment.
      d) Power and consumable supplies for operation of power equipment.
      e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
      f) Social Security and old age and unemployment contributions.
      g) To cost under (3), there shall be added fixed fee to be agreed upon but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force.

Fee shall be compensation to cover cost of supervision, overhead, bond, profit, and any other general expense.

h) On that portion of the Work under (3) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit, and any other general expense.

i) Contractor shall keep and present, in such form as directed, correct amount of cost together with such supporting vouchers as may be required by Department.

B. If Contractor claims that by any instructions given by Architect / Engineer, Department, by drawings or otherwise, regarding performance of the Work or furnishing of material under Contract, involves extra cost, Contractor shall give Department written notice of cost thereof within two (2) weeks after receipt of such instructions and in any event before proceeding to execute work, unless delay in executing work would endanger life or property.

C. No claim for extra work or cost shall be allowed unless it was done in pursuance of written Change Order from Architect / Engineer and approved by Department, as previously mentioned, and claim presented with payment request submitted after changed or extra work is completed.

D. Negotiation of cost for change in the Work shall not be cause for Contractor to delay prosecution of the Work if Contractor has been authorized in writing by Public Works Project Manager to proceed.

19. EXTRAS

A. Without invalidating Contract, Department may order extra work or make changes by altering, adding to or deducting from the Work, contract sum being adjusted in accordance with Article 18 herein.

20. TIME FOR COMPLETION

A. Contractor agrees that the Work shall be prosecuted regularly and diligently and complete the Work as stated in Construction Documents.

21. CORRECTION OF WORK

A. All work, all materials whether incorporated in the Work or not, and all processes of manufacture shall at all times and places be subject to inspection of Architect / Engineer and Public Works Project Manager who shall be judge of quality and suitability of the Work, materials, and processes of manufacture for purposes for which they are used. Should they fail to meet Architect / Engineer's and Public Works Project Manager's approval they shall be reconstructed, made good, replaced or corrected, by Contractor at Contractor's expense. Immediately remove all rejected material from site.

B. If Contractor defaults or neglects to carry out the Work in accordance with Construction Documents or fails to perform any provision of Contract, Department may, after ten (10) business days' written notice to Contractor and without prejudice to any other remedy County may have, make good such deficiencies. In such case, appropriate Change Order shall be issued deducting from Contractor's payments then or thereafter, cost of correcting such deficiencies, including cost of Architect / Engineer's additional services made necessary by such default, neglect or failure.

22. SUBSURFACE CONDITIONS FOUND DIFFERENT

A. If Contractor encounters subsurface or latent conditions at site materially differing from those shown on Drawings or indicated in Specifications, Contractor shall immediately give notice to Architect / Engineer and Public Works Project Manager of such conditions before they are disturbed. Architect / Engineer will thereupon promptly investigate conditions, and if Architect / Engineer finds that they materially differ from those shown on Drawings or indicated in Specifications, Architect / Engineer will at once make such changes as necessary, any increase or decrease of cost resulting from such changes to be adjusted in manner provided in above Article 18 entitled "Changes in the Work".

23. RIGHT OF DEPARTMENT TO TERMINATE CONTRACT

A. In event that any provisions of this Contract are violated by Contractor or by any subcontractors, County may serve written notice upon Contractor and Surety of its intention to terminate Contract, such notice to contain reasons for such intention to terminate Contract, and unless within ten (10) business days after serving of such notice upon Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, Contract shall, upon expiration of said ten (10) business days, cease and terminate.

B. In event of any such termination, County shall immediately serve notice thereof upon Surety and Contractor, and Surety shall have right to take over and perform Contract subject to County's approval; provided, however, that if Surety does not commence performance thereof within ten (10) business days from date of mailing to such Surety of notice of termination, County may take over the Work and prosecute same to completion by contract, or by force account, at expense of Contractor; Contractor and Surety shall be liable to County for any excess cost occasioned County thereby, and in such event County may take possession of and utilize in completing the Work, such materials and equipment as may be on the Work site and therefore necessary.

24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

A. Contractor shall be responsible for Construction Schedule and coordination. Immediately after execution and delivery of Contract and before making first payment, Contractor shall notify all subcontractors to furnish all required information to develop Construction Schedule. Contractor and all subcontractors associated with the Work shall furnish following information from each Division of Specifications:
   1. List of construction activities;
   2. Start, finish and time required for completion of each activity;
   3. Sequential relationships between activities;
   4. Identify all long lead-time items, key events, meetings or activities such as required submittals, fabrication and delivery, procurement of materials, installation and testing;
   5. Weekly definition of extent of work and areas of activity for each trade or Subcontract; and
   6. Other information as determined by Public Works Project Manager.

B. In addition to above requested items, Contractor shall request delivery dates for all County-furnished equipment, materials or labor. This shall include any work handled by Department under separate contracts such as asbestos abatement, air and water balancing, etc. Indicate on Construction Schedule these associated delivery and installation dates.

C. Progress Reporting:

1. Contractor shall update and publish Construction Schedule on monthly basis. Revisions to Schedule shall be by Contractor and made in same detail as original Schedule and accompanied by explanation of reasons for revision; and shall be subject to approval by Department.
2. Failure of Contractor to keep Schedule in updated format shall result in County hiring firm specializing in construction schedule development and deducting those costs associated with updating process from payments due Contractor.
3. Contractor shall submit show actual percentage of each activity completed, estimated future progress, and anticipated completion time.

D. Responsibility for timely completion requires:
   1. Contractor and subcontractors understand that performance of each is interdependent upon performance of others.
   2. Whenever it becomes apparent from current schedule, that phasing or progress completion dates will not be met, Contractor must take some or all following actions at no additional cost to County:
      a) Increase construction labor in such quantities and crafts as will eliminate backlog of work.
      b) Increase number of working hours per shift, shifts per working day, working days per week, amount of construction equipment, or any combination of foregoing to eliminate backlog of work.
      c) Reschedule work (yet remain in conformance with Drawings and Specifications).
   3. Prior to proceeding with any of above actions, Contractor shall notify Public Works Project Manager.

E. Maintain current Construction Schedule at all times. Revise Construction Schedule in same detail as original and accompany with explanation of reasons for revision. Schedule shall be subject to approval by Architect / Engineer and Public Works Project Manager.

25. PAYMENTS TO CONTRACTOR

A. Contractor shall provide:
   1. Detailed estimate giving complete breakdown of contract price by Specification Division; and
   2. Periodic itemized estimates of work done for purpose of making partial payments thereon.

B. Submit these estimates for approval first to Architect / Engineer, then to Public Works Project Manager. Costs employed in making up any of these schedules are for determining basis of partial payments and not considered as fixing basis for additions to or deductions from Contract price.

C. County will make partial payments to Contractor for value, proportionate to amount of Contract, of all labor and material incorporated in the Work during preceding calendar month upon receipt of Application and Certificate for Payment form from Architect / Engineer and approval of Department.

D. Contractor shall submit for approval first to Architect / Engineer, and then to Public Works Project Manager all Application and Certificate for Payment forms. If requested, Application and Certificate for Payment shall be supported by such additional evidence as may be required, showing Contractor's right to payment claimed.

E. Application and Certificate for Payment for preparatory work and materials delivered and suitably stored at site to be incorporated into the Work at some future period, will be given due consideration. Requesting payment for materials stored off site, may be rejected, however, if deemed essential for reasons of job progress, protection, or other sufficient cause, requests will be considered, conditional upon submission by Contractor of bills of sale, photographs and such other procedures as will adequately protect County's interest such as storage in bonded warehouse with adequate coverage. If there is any error in payment, Contractor is obligated to notify Department immediately, but no longer than ten (10) business days from receipt of payment.

F. Payments by County will be due within forty-five (45) business days after receipt by Department of Application and Certificate for Payment.

G. County will retain five percent (5%) of each Application and Certificate for Payment until final completion and acceptance of all the Work covered by Contract. However, anytime after fifty percent (50%) of the Work has been furnished and installed at site, County will make remaining payments in full if Architect / Engineer and Public Works Project Manager find that progress of the Work corresponds with Construction Schedule. If Architect / Engineer and Public Works Project Manager find that progress of the Work does not correspond with Construction Schedule, County may retain up to ten percent (10%) of each Application and Certificate for Payment for the Work completed.

H. All material and work covered by partial payments made shall become sole property of County, but this provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made, or restoration of any damaged work, or as waiver of right of County to require fulfillment of all of terms of Contract.

I. County will make final payment within sixty (60) calendar days after final completion of the Work, and will constitute acceptance thereof. Submit Equal Benefits Compliance Payment Certification with final pay request. Payment may be denied if Certification is not included.

J. County may make payment in full, including retained percentages and less authorized deductions, upon completion and acceptance of each Division where price is stated separately in Contract.

K. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, affidavit(s) as required to prove that all debts and claims against this Work are paid in full or otherwise satisfied, and give final evidence of release of all liens against the Work and County.

26. WITHHOLDING OF PAYMENTS

A. County, after having served written notice on said Contractor, may either pay directly any unpaid bills of which Department has written notice, or withhold from Contractor's unpaid compensation sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged; whereupon, payment to Contractor shall be resumed in accordance with terms of this Contract, but in no event shall these provisions be construed to impose any obligations upon County to either Contractor or Contractor's Surety.

B. In paying any unpaid bills of Contractor, County shall be deemed agent of Contractor, and any payment so made by County, shall be considered as payment made under Contract by County to Contractor and County shall not be liable to Contractor for any such payment made in good faith.

C. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from all claims growing out of lawful demands of subcontractors, laborers, workers, mechanics, material men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in performance of this Contract.

D. At Department's request, Contractor shall furnish satisfactory evidence that all obligations of nature designated above have been paid, discharged or waived.

27. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

A. Making of final payment shall constitute waiver of all claims by County except those arising from:
   1. Unsettled lien;
   2. Faulty or defective work appearing after substantial completion;
   3. Failure of the Work to comply with requirements of Construction Documents; or
   4. Terms of any special guarantees required by Construction Documents.

B. Acceptance of final payment shall constitute waiver of all claims by Contractor.

28. PAYMENTS BY CONTRACTOR

A. Contractor shall pay following not later than fifth (5^{th}) business day following each payment received from County:
   1. All transportation and utility services rendered;
   2. All materials, tools, and other expendable equipment that have been delivered at site of the Work to extent of ninety percent (90%) of cost thereof, and balance of cost thereof when said balance is paid to Contractor; and
   3. Each subcontractor, respective amount allowed Contractor because of work performed by subcontractor to extent of subcontractor's interest therein.

29. CONTRACT SECURITY

A. Contractor shall furnish Performance and Payment Bonds in amount at least equal to one hundred percent (100%) of Contract price as security for faithful performance of this Contract and payment of all persons performing labor on project under this Contract and furnishing materials in connection with this Contract.

B. Sample Performance and Payment Bonds that Contractor will be required to execute is bound into these Construction Documents. Before construction Contract is consummated, completed Performance and Payment Bonds must be approved by Department.

30. ASSIGNMENTS

A. Contractor shall not assign whole or any part of this Contract or any moneys due or to become due hereunder without written consent of Department. In case Contractor assigns all or any part of any moneys due or to become due under this Contract, instrument of

assignment shall contain clause substantially to effect that it is agreed that right of assignee in and to any moneys due or to become due to Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for performance of the Work called for in this Contract.

31. MUTUAL RESPONSIBILITY OF CONTRACTORS

A. If, through acts of neglect on part of Contractor or any subcontractor shall suffer loss or damage on the Work, Contractor agrees to settle with such subcontractor by agreement or arbitration if such other subcontractor will so settle. If such subcontractor shall assert any claim against County on account of any damage alleged to have been sustained, Department shall notify Contractor, who shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives against any such claim.

32. SEPARATE CONTRACTS

A. Department may award other contracts for the Work and all Contractors shall fully cooperate with each other and carefully adjust their work to that provided under other contracts as may be directed by Department. No Contractor shall commit or permit any act that will interfere with performance of the Work by any other Contractor.

B. Contractor shall coordinate the Work with those of other Contractors. Cooperation will be required in arrangement for storage of materials and in detailed execution of the Work. Contractor, including subcontractors, shall keep informed of progress and detail work of others and shall notify Architect / Engineer or Department immediately of lack of progress or defective workmanship on part of others. Failure of Contractor to keep informed of the Work progressing on site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by Contractor of status of the Work as being satisfactory for proper coordination with Contractor's own work.

33. SUBCONTRACTS

A. Contractor may use services of specialty subcontractors on those parts of the Work that, under normal contracting practices, are performed by specialty subcontractors.

B. Contractor shall not award any work to any subcontractor without prior approval of Department. Qualifications of subcontractors shall be same as qualifications of Contractor. Request for subcontractor approval shall be submitted to Department fifteen (15) business days before start of subcontractor's work. If subcontractors are changed or added, Contractor shall notify Department in writing.

C. Contractor shall be as fully responsible to County for acts and omissions of subcontractors, and of persons either directly or indirectly employed by them, as Contractor is for acts and omissions of persons directly employed by Contractor.

D. Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to Contractor by terms of General Conditions of Contract and other Construction Documents insofar as applicable to work of subcontractors and to give Contractor same power as regards terminating any subcontract that Department may exercise over Contractor under any provision of Construction Documents.

E. Nothing contained in this Contract shall create any contractual relation between any subcontractor and County.

F. Contractor shall insert in all subcontracts, Articles 26, 33, 43 and 45, respectively entitled: "Withholding of Payments", "Subcontracts", "Affirmative Action Provision and Minority / Women / Disadvantaged Business Enterprises", and "Minimum Wages", and shall further require all subcontractors to incorporate physically these same Articles in all subcontracts.

34. PROJECT MANAGER'S AUTHORITY

A. Public Works Project Manager shall:
   1. Administer and ensure compliance with Construction Documents;
   2. Provide responsible on-site observations of construction and have authority to request work and to stop work whenever necessary to insure proper enforcement of Construction Documents;
   3. Convene and chair project meetings and foreman's coordination meetings when necessary to coordinate resolution of conflicts between Contractors, Architects, Engineers, Consultants, and Department; and
   4. Check and inspect material, equipment and installation procedures of all trades for proper workmanship and for compliance with Drawings, Specifications and Shop Drawings, permit no material on project site that is not satisfactory and reject work not in compliance with Construction Documents.

35. CONSULTANT'S AUTHORITY

A. Architect / Engineer is retained by, and is responsible to Department acting for County.

B. Architect / Engineer shall determine amount, quality, acceptability, and fitness of several kinds of work and materials that are provided under this Contract and shall decide all questions that may arise in relation to said work and construction thereof.

C. Architect / Engineer shall decide meaning and intent of any portion of Specifications and of any Drawings where they may be found obscure or be in dispute.

D. Architect / Engineer shall provide responsible observation of construction. Architect / Engineer has authority to stop the Work whenever such stoppage may be necessary to insure proper execution of Construction Documents.

E. Architect / Engineer shall be interpreter of conditions of Construction Documents and judge of its performance.

F. Within reasonable time, Architect / Engineer shall make decisions on all matters relating to progress of the Work or interpretation of Construction Documents.

G. Architect / Engineer's decisions are subject to review by Public Works Project Manager.

36. STATED ALLOWANCES

A. Stated allowances enumerated in Instructions to Bidders shall cover net cost of materials or equipment, and all applicable taxes. Contractor's cost of delivery and unloading at site, handling costs on site, labor, installation costs, overhead, profit and any other incidental costs shall be included in Contractor's bid, but not as part of cash allowance.

B. Department will solicit at least two (2) bids on materials or equipment for which allowance is stated and select on basis of lowest qualified responsible bid. Contractor will then be instructed to purchase "Allowed Materials". If actual price for purchasing "Allowed Materials", including taxes, is more or less than "Cash Allowance", Contract price shall be adjusted accordingly. Adjustment in Contract price shall not contain any cost items excluded from cash allowance.

37. ESTIMATES OF QUANTITIES

A. Whenever estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of Construction Documents, they are given for use in comparing bids and right is especially reserved to increase or diminish them as they may be deemed reasonably necessary or desirable by Department to complete the Work included in this Contract, and cost for such increase or diminution shall be adjusted in manner provided for in General Conditions of Contract Article 18 entitled "Changes in the Work".

38. LANDS AND RIGHTS-OF-WAY

A. Prior to start of construction, County shall furnish all land and rights-of-way necessary for carrying out and completion of the Work to be performed under this Contract.

39. GENERAL GUARANTEE

A. Neither final certificate of payment nor any provision in Construction Documents nor partial or entire occupancy of premises by County shall constitute acceptance of work not done in accordance with Construction Documents or relieve Contractor of liability in respect to any expressed warranties or responsibility for faulty materials or workmanship.
   1. In no event shall making of any payment required by Contract constitute or be construed as waiver by County of any breach of covenants of Contract or waiver of any default of Contractor and making of any such payment by County while any such default or breach shall exist shall in no way impair or prejudice right of County with respect to recovery of damages or other remedy as result of such breach or default.

B. Contractor shall remedy and make good all defective workmanship and materials and pay for any damage to other work resulting there from, which appear within period of one (1) year from date of substantial completion, providing such defects are not clearly due to abuse or misuse by County. Department will give notice of observed defects with reasonable promptness.

C. Guarantee on work executed after certified date of substantial completion will begin on date when such work is inspected and approved by Architect / Engineer and Public Works Project Manager.

D. Where guarantees or warrantees are required in sections of Specifications for periods in excess of one (1) year, such longer terms shall apply; however, Contractor's Performance and Payment Bonds shall not apply to any guarantee or warranty period in excess of one (1) year.

40. CONFLICTING CONDITIONS

A. Any provision in any of Construction Documents which may be in conflict or inconsistent with any Articles in these General Conditions of Contract or Supplementary Conditions shall be void to extent of such conflict or inconsistency.

B. In case of ambiguity or conflict between Drawings and Specifications, Specifications shall govern.

C. Printed dimensions shall be followed in preference to measurements by scale. Large-scale drawings take precedence over small-scale drawings. Dimensions on Drawings and details are subject to field measurements of adjacent work.

41. NOTICE AND SERVICE THEREOF

A. Any notice to Contractor from Department relative to any part of this Contract shall be in writing and considered delivered and service thereof completed, when said notice is posted, by certified or registered mail, to Contractor at Contractor's last given address, or delivered in person to said Contractor, or Contractor's authorized representative on the Work.

42. PROTECTION OF LIVES AND HEALTH

A. In order to protect lives and health of Contractor's employees under Contract, Contractor shall comply with all pertinent provisions of Wisconsin Administrative Code, Rules of Department of Commerce, relating to Safety and Health.

B. Contractor alone shall be responsible for safety, efficiency and adequacy of Contractor's tools, equipment and methods, and for any damage that may result from their failure or their improper construction, maintenance or operation.

43. AFFIRMATIVE ACTION PROVISION AND MINORITY / WOMEN / DISADVANTAGED BUSINESS ENTERPRISES

A. Affirmative Action Provisions.
   1. During term of their Contract, Contractor agrees not to discriminate on basis of race, religion, color, sex, handicap, age, sexual preference, marital status, physical appearance, or national origin against any person, whether recipient of services (actual or potential), employee, or applicant for employment. Such equal opportunity shall include but not be limited to following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). Contractor agrees to post in conspicuous places, these affirmative action standards so as to be visible to all employees, service recipients and applicants for this paragraph. Listing of prohibited bases for discrimination shall no be construed to amend in any fashion state or federal law setting forth additional bases and exceptions shall be permitted only to extent allowable in state or federal law.
   2. Contractor is subject to this Article only if Contractor has ten (10) or more employees and receives $10,000.00 or more in annual aggregate contracts with County. Contractor shall file and Affirmative Action Plan with Dane County Contract Compliance Officer in accord with Chapter 19 of Dane County Code of Ordinances. Such plan must be filed within fifteen (15) business days of effective date of this Contract and failure to do so by said date shall constitute ground for immediate termination of Contract by County. Contractor shall also, during term of this Contract, provide copies of all announcements

of employment opportunities to County's Contract Compliance Office, and shall report annually number of persons, by race, sex and handicap status, who apply for employment, and, similarly classified, number hired and number rejected.

3. Contact Dane County Contract Compliance Officer at Dane County Contract Compliance Office, 210 Martin Luther King, Jr. Blvd., Room 421, Madison, WI 53703, 608/266-4114.
4. In all solicitations for employment placed on Contractor's behalf during term of this Contract, Contractor shall include statement to affect Contractor is "Equal Opportunity Employer". Contractor agrees to furnish all information and reports required by County's Contract Compliance Officer as same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and provision of this Contract.

B. Minority / Women / Disadvantaged / Emerging Small Business Enterprises.
   1. Chapter 19.508 of Dane County Code of Ordinances is official policy of Dane County regarding utilization of, to fullest extent of, Minority Business Enterprises (MBEs), Women Business Enterprises (WBEs) Disadvantage Business Enterprises (DBEs) and Emerging Small Business Enterprises (ESBEs).
   2. Contractor may utilize MBEs / WBEs / DBEs / ESBEs as subcontractors or suppliers. List of subcontractors will be required of low bidder as stated in this Contract. List shall indicate which are MBEs / WBEs / DBEs / ESBEs and percentage of subcontract awarded, shown as percentage of total dollar amount of bid.

44. COMPLIANCE WITH FAIR LABOR STANDARDS

A. During term of this Contract, Contractor shall report to County Contract Compliance Officer, within ten (10) business days, any allegations to, or findings by National Labor Relations Board (NLRB) or Wisconsin Employment Relations Commission (WERC) that Contractor has violated statute or regulation regarding labor standards or relations. If investigation by Contract Compliance Officer results in final determination that matter adversely affects Contractor's responsibilities under this Contract, and which recommends termination, suspension or cancellation of this Contract, County may take such action.

B. Contractor may appeal any adverse finding by Contract Compliance Officer as set forth in Dane County Ordinance 25.015(11)(c) through (e).

C. Contractor shall post this statement in prominent place visible to employees: "As condition of receiving and maintaining contract with Dane County, this employer shall comply with federal, state and all other applicable laws prohibiting retaliation or union organizing."

45. DOMESTIC PARTNERSHIP BENEFITS

A. Not Used.

46. USE AND OCCUPANCY PRIOR TO ACCEPTANCE

A. Contractor agrees to use and occupancy of portion or unit of the Work before formal acceptance by Department, provided Department:
   1. Secures written consent of Contractor; except when in opinion of Public Works Project Manager, Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other Contract requirements.

2. Secures endorsement from insurance carrier and consent of Surety permitting occupancy of building or use of the Work during remaining period of construction, or, secures consent of Surety.
3. Assumes all costs and maintenance of heat, electricity and water.
4. Accepts all work completed within that portion or unit of the Work to be occupied, at time of occupancy.

47. MINIMUM WAGES

A. Contractor shall post, at appropriate conspicuous point on site of project, schedule showing all determined minimum wage rates for various classes of laborers and mechanics to be engaged in the Work under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by laborers and mechanics so engaged.

B. Supplementary Conditions section in Construction Documents lists wage determinations required by State Law.

C. If, after award of Contract, it becomes necessary to employ any person in trade or occupation not classified in wage determinations, such person shall be paid at not less than such rate as shall be determined by Wisconsin Department of Workforce Development. Such approved minimum rate shall be retroactive to time of initial employment of such person in such trade or occupation. Contractor shall notify Department of Contractor's intention to employ persons in trades or occupations not so classified in sufficient time for Department to obtain approved rates for such trades or occupations.

D. Specified wage rates are minimum rates only, and Department will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of applicable rate contained in this Contract. Contractor shall adjust any disputes in regard to payment of wages in excess of those specified in this Contract.

48. CLAIMS

A. No claim may be made until Department's Deputy Public Works Director has reviewed Architect / Engineer's decision as provided for in Article 35 of General Conditions of Contract. If any claim remains unresolved after such review by Department's Deputy Public Works Director the claim may be filed under Wisconsin Statute 893.80. Work shall progress during period of any dispute or claim. Unless specifically agreed between parties, venue will be in Dane County, Wisconsin.

49. ANTITRUST AGREEMENT

A. Contractor and County recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by County. Therefore, Contractor hereby assigns to County any and all claims for such overcharges as to goods and materials purchased in connection with this Contract, except as to overcharges which result from antitrust violations commencing after price is established under this Contract and any change order thereto.

50. INSURANCE

A. Contractor Carried Insurance:
   1. Contractor shall not commence work under this Contract until Contractor has obtained all insurance required under this Article and has provided evidence of such insurance to Risk

Manager, 425 City-County Building, 210 Martin Luther King Jr. Blvd., Madison, WI 53703. Contractor shall not allow any subcontractor to commence work until insurance required of subcontractor has been so obtained and approved. Company providing insurance must be licensed to do business in Wisconsin.

2. Worker's Compensation Insurance:
   a) Contractor shall procure and shall maintain during life of this Contract, Worker's Compensation Insurance as required by statute for all of Contractor's employees engaged in work at site of project under this Contract and, in case of any such work sublet, Contractor shall require subcontractor similarly to provide Worker's Compensation Insurance for all of latter's employees to be engaged in such work unless such employees are covered by protection afforded by Contractor's Worker's Compensation Insurance.
   b) If any claim of employees engaged in hazardous work on project under this Contract is not protected under Worker's Compensation Statute, Contractor shall provide and shall cause each subcontractor to provide adequate Employer's Liability Insurance for protection of such of Contractor's employees as are not otherwise protected.
3. Contractor's Public Liability and Property Damage Insurance:
   a) Contractor shall procure and maintain during life of this Contract, Contractor's Public Liability Insurance and Contractor's Property Damage Insurance in amount not less than $1,000,000 bodily injury, including accidental death, to any one person, and subject to same limit for each person, in amount not less than $1,000,000 on account of one accident, and Contractor's Property Damage Insurance in amount not less then $1,000,000 or combined single limit of at least $1,000,000 with excess coverage over and above general liability in amount not less than $5,000,000. Contractor shall add "Dane County" as additional insured for each project.
   b) Contractor's Public Liability and Property Damage Insurance shall include Products, Completed Operation, and Contractual Liability under Insurance Contract. "Contractor shall in all instances save, defend, indemnify and hold harmless County and Architect / Engineer against all claims, demands, liabilities, damages or any other costs which may accrue in prosecution of the Work and that Contractor will save, defend, indemnify and hold harmless County and Architect / Engineer from all damages caused by or as result of Contractor's operations" and each shall be listed as additional insured on Contractor's and subcontractors' insurance policies.
   c) Obligations of Contractor under Article 50.A.2.b) shall not extend to liability of Architect / Engineer, agents or employees thereof, arising out of:
      1) Preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications; or
      2) Giving of or failure to give directions or instructions by Architect / Engineer, agents or employees thereof provided such giving or failure to give is primary cause of injury or damage.
   d) Contractor shall procure and shall maintain during life of this Contract, Comprehensive Automobile Liability Insurance covering owned, non-owned and hired automobiles for limits of not less than $1,000,000 each accident single limit, bodily injury and property damage combined with excess coverage over and above general liability in amount not less than $5,000,000.
   e) Contractor shall either:
      1) Require each subcontractor to procure and to maintain during life of subcontract, subcontractor's Public Liability Property Damage Insurance, and Comprehensive Automobile Liability Insurance of type and in same amount specified in preceding paragraphs; or
      2) Insure activities of subcontractors in Contractor's own policy.
4. Scope of Insurance and Special Hazards: Insurance required under Article 50.A.2 & 50.A.3. hereof shall provide adequate protection for Contractor and subcontractors, respectively, against damage claims which may arise from operations under this Contract,

whether such operation be by insured or by anyone directly or indirectly employed by insured and also against any of special hazards which may be encountered in performance of this Contract as enumerated in Supplementary Conditions.

5. Proof of Carriage of Insurance: Contractor shall furnish Risk Manager with certificates showing type, amount, class of operations covered, effective dates, dates of expiration of policies and "Dane County" listed as additional insured. Such certificates shall also contain (substantially) following statement: "Insurance covered by this certificate will not be canceled or materially altered, except after ten (10) business days written notice has been received by Risk Manager."

B. Builder's Risk:

1. County shall provide Builder's Risk insurance coverage for its insurable interests in construction or renovation projects with completed value of $1,000,000 or less. Therefore, if project completed value is more than $1,000,000, Contractor shall obtain and maintain in force, at its own expense, Builder's Risk Insurance on all risks for amount equal to full completed value of covered structure or replacement value of alterations or additions. Any deductible shall not exceed $25,000 for each loss. Policy shall include occupancy clause and list Dane County as loss payee.

C. Indemnification / Hold Harmless:

1. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, and is caused in whole or in part by any act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by part indemnified hereunder.
2. In any and all claims against Dane County, its boards, commissions, agencies, officers, employees and representatives or by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, indemnification obligation under this Contract shall not be limited in any way by any limitation on amount or type of damages, compensation or benefits payable by or for Contractor or any subcontractor under worker's compensation acts, disability benefits or other employee benefit acts.
3. Obligations of Contractor under this Contract shall not extend to liability of Architect / Engineer, its agents or employees arising out of:
   a) Preparation or approval of maps, drawings, opinion, reports, surveys, change orders, designs or specifications; or
   b) Giving of or failure to give directions or instruction by Architect / Engineer, its agents or employees provided such giving or failure to give is primary cause of injury or damage.
4. Dane County shall not be liable to Contractor for damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties.

51. WISCONSIN LAW CONTROLLING

A. It is expressly understood and agreed to by parties hereto that in event of any disagreement or controversy between parties, Wisconsin law shall be controlling.

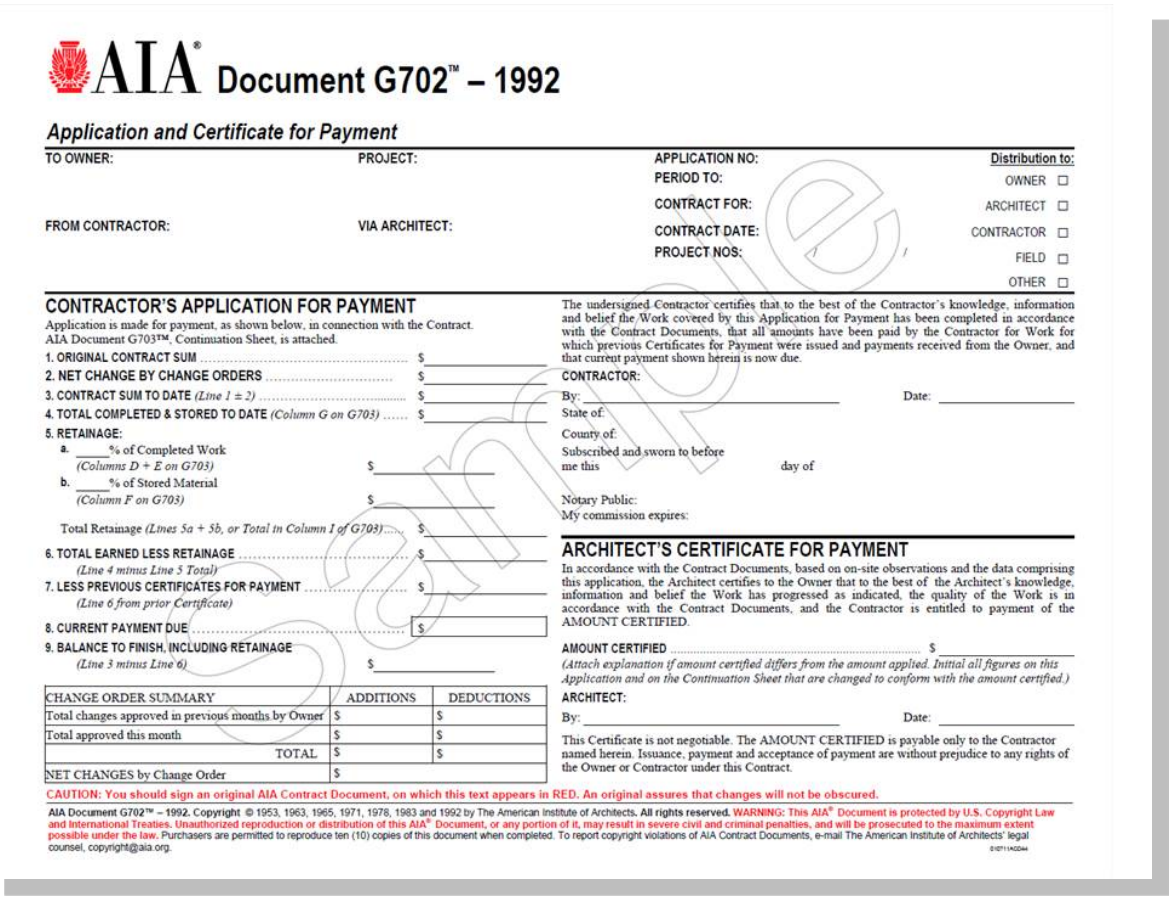
END OF SECTION

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

1. APPLICATION & CERTIFICATE FOR PAYMENT

A. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit partial and final Application & Certificate for Payment for work under said contract. Form shall provide similar information as shown on AIA G702™ and G703™ forms (samples shown below). Forms shall be submitted to project Public Works Project Manager for approval.



AIA® Document G702™ – 1992

Application and Certificate for Payment

TO OWNER: PROJECT: APPLICATION NO: Distribution to:
PERIOD TO: OWNER ☐
CONTRACT FOR: ARCHITECT ☐
FROM CONTRACTOR: VIA ARCHITECT: CONTRACT DATE: CONTRACTOR ☐
PROJECT NOS: / / FIELD ☐
OTHER ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703™, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM ..... $
2. NET CHANGE BY CHANGE ORDERS ..... $
3. CONTRACT SUM TO DATE *(Line 1 ± 2)* ..... $
4. TOTAL COMPLETED & STORED TO DATE *(Column G on G703)* ..... $
5. RETAINAGE:
   a. ____% of Completed Work *(Columns D + E on G703)* $
   b. ____% of Stored Material *(Column F on G703)* $
   Total Retainage *(Lines 5a + 5b, or Total in Column I of G703)* ..... $
6. TOTAL EARNED LESS RETAINAGE ..... $ *(Line 4 minus Line 5 Total)*
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ..... $ *(Line 6 from prior Certificate)*
8. CURRENT PAYMENT DUE ..... $
9. BALANCE TO FINISH, INCLUDING RETAINAGE *(Line 3 minus Line 6)* $

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this month	$	$
TOTAL	$	$
NET CHANGES by Change Order	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:
By: Date:
State of:
County of:
Subscribed and sworn to before me this day of
Notary Public:
My commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)
ARCHITECT:
By: Date:

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA® Document G703™ – 1992

Continuation Sheet

AIA Document G702™–1992, Application and Certificate for Payment, or G732™–2009, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
In tabulations below, amounts are in US dollars.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED: FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED: THIS PERIOD	MATERIALS PRESENTLY STORED (Not in D or E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C – G)	RETAINAGE (If variable rate)
	GRAND TOTAL								

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

END OF SECTION

Department of Public Works, Highway & Transportation
Public Works Engineering Division
608/266-4018

Gerald J. Mandli, P.E.
Commissioner / Director

Joseph T. Parisi
County Executive

Deputy Director
Todd Draper

1919 Alliant Energy Center Way
Madison, Wisconsin 53713
Fax: 608/267-1533
www.countyofdane.com/pwht/public_works.aspx

BEST VALUE CONTRACTING APPLICATION

CONTRACTORS / LICENSURE APPLICANTS

The Dane County Department of Public Works requires all contractors & subcontractors to be a best value contractor before being hired. Application documents are due to the County prior to Bid Due Date. Approval or rejection shall be within five (5) days of Bid Due Date. This document shall be completed, properly executed, along with the necessary attachments and additional information that the County requires for the protection and welfare of the public in the performance of a County contract.

Contractors or subcontractors of any tier who attain qualification status will retain that status for a period of two (2) years from the date of qualification. Contractors shall notify the Dane County Department of Public Works, Highway & Transportation within fifteen (15) days of any changes to its business or operations that are relevant to the application. Failure to do so could result in suspension, revocation of the contractor's qualification, debarment from County contracts for up to three (3) years and / or other sanctions available under the law.

No contracts will be awarded for construction work performed on Dane County projects unless the contractor is currently approved as a Wisconsin Trade Trainer or has applied for approval as an Apprenticeship Trade Trainer to the Wisconsin Department of Workforce Development and agrees to an acceptable apprenticeship program. If you are not currently approved as a Wisconsin Trade Trainer, or have not applied for approval as an Apprenticeship Trade Trainer, please contact the Department of Workforce Development - Bureau of Apprenticeship Standards at 608/266-3133 or visit their web site at: https://dwd.wisconsin.gov/apprenticeship/.

EXEMPTIONS

- Contractors who employ less than five (5) apprenticeable trade workers are not required to qualify.
- Contractors performing work that does not apply to an apprenticeable trade, as outlined in Appendix A.
- The contractor / subcontractor provides sufficient documentation to demonstrate one or more of the following:
  - apprentices are not available in a specific geographic area;
  - the applicable apprenticeship program is unsuitable or unavailable; or
  - there is a documented depression of the local construction market which prevents compliance.

SEC.	PROOF OF RESPONSIBILITY	CHECK IF APPLICABLE
1	Does your firm possesses all technical qualifications and resources, including equipment, personnel and financial resources, necessary to perform the work required for any project or obtain the same through the use of responsible, qualified subcontractors?	Yes: ☐ No: ☐
2	Will your firm possess all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, which are necessary for the type of work to be performed including, but not limited to, those for any type of trade work or specialty work?	Yes: ☐ No: ☐
3	Will your firm meet all bonding requirements as required by applicable law or contract specifications?	Yes: ☐ No: ☐
4	Will your firm meet all insurance requirements as required by applicable law or specifications, including general liability insurance, workers compensation insurance and unemployment insurance requirements?	Yes: ☐ No: ☐
5	Will your firm maintain a substance abuse policy for employees hired for public works contracts that comply with Wis. Stats. Sec. 103.503?	Yes: ☐ No: ☐
6	Will your firm fully abide by the equal opportunity and affirmative action requirements of all applicable laws, including County ordinances?	Yes: ☐ No: ☐
7	In the past three (3) years, has your firm had control or has another corporation, partnership or other business entity operating in the construction industry controlled it? If so, please attach a statement explaining the nature of the firm relationship?	Yes: ☐ No: ☐ If Yes, attach details.
8	In the past three (3) years, has your firm had any type of business, contracting or trade license, certification or registration revoked or suspended?	Yes: ☐ No: ☐ If Yes, attach details.
9	In the past three (3) years, has your firm been debarred by any federal, state or local government agency?	Yes: ☐ No: ☐ If Yes, attach details.
10	In the past three (3) years, has your firm defaulted or failed to complete any contract?	Yes: ☐ No: ☐ If Yes, attach details.
11	In the past three (3) years, has your firm committed a willful violation of federal, state or local government safety laws as determined by a final decision of a court or government agency authority.	Yes: ☐ No: ☐ If Yes, attach details.
12	In the past three (3) years, has your firm been in violation of any law relating to your contracting business where the penalty for such violation resulted in the imposition of a penalty greater than $10,000?	Yes: ☐ No: ☐ If Yes, attach details.
13	Is your firm an active Wisconsin Trade Trainer as determined by the Wisconsin Bureau of Apprenticeship Standards?	Yes: ☐ No: ☐
14	Is your firm exempt from being qualified with Dane County?	Yes: ☐ No: ☐ If Yes, attach reason for exemption.
15	Does your firm acknowledge that in doing work under any County Public Works Contract, it will be required to use as subcontractors only those contractors that are also qualified with the County or become so within five (5) days after the Bid Due Date?	Yes: ☐ No: ☐
16	Contractor has been in business less than one year?	Yes: ☐ No: ☐
17	Is your firm a first time Contractor requesting a one time exemption, but, intend to comply on all future contracts and are taking steps typical of a “good faith” effort?	Yes: ☐ No: ☐

SIGNATURE SECTION

Your firm's Officer, or the individual who would sign a bid and / or contract documents must sign this document.

I do hereby certify that all statements herein contained are true and correct to the best of my knowledge:

Signature: _____

(Application is invalid without signature)

Print Name: _____ Date: _____

Title: _____

NAME AND ADDRESS OF CONTRACTOR	
Name of Firm:	
Address:	
City, State, Zip:	
Phone Number:	
Fax Number:	
E-mail Address:	

REMEMBER!

RETURN ALL TO FORMS AND ATTACHMENTS, OR QUESTIONS TO:

TODD DRAPER
EMAIL: DRAPER@COUNTYOFDANE.COM
OFFICE: (608) 267-0119, FAX: (608) 267-1533

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HGHWAY & TRANSPORTATION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WI 53713

APPENDIX A

APPRENTICEABLE TRADES:

- Bricklayer
- Carpenter
- Cement Mason (Concrete Finisher)
- Cement Mason (Heavy Highway)
- Construction Craft Laborer
- Data Communications Installer
- Electrician
- Elevator Mechanic / Technician
- Environmental Systems Technician / HVAC Service Technician / HVAC Install & Service
- Glazier
- Heavy Equipment Operator / Operating Engineer
- Insulation Worker (Heat & Frost)
- Iron Worker (Assembler, Metal Buildings)
- Painter / Decorator
- Plasterer
- Plumber
- Roofer / Waterproofer
- Sheet Metal Worker
- Sprinkler Fitter
- Steamfitter (Service & Refrigeration)
- Taper & Finisher
- Telecommunications (Voice, Data & Video) Installer / Technician
- Tile Setter

END OF SECTION

SECTION 00 73 11

FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has a submitted a bid, application or proposal for a contract or agreement with the county of Dane.

B. That BIDDER, APPLICANT or PROPOSER has (check one):

_____ not been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ _____

Officer or Authorized Agent Signature Date

_____

Printed or Typed Name and Title

_____

Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlrb.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.09 is as follows:

(1) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The Controller shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder's responsibility to perform the contract.

If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.

Include this completed Certification with your bid, application or proposal.

END OF SECTION

SECTION 01 00 00

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Summary
2. Summary of the Work
3. Contractor Use of Premises
4. Applications for Payment
5. Change Procedures
6. Alternates
7. Lump Sum Allowances for Work
8. Coordination
9. Cutting and Patching
10. Conferences
11. Progress Meetings
12. Job Site Administration
13. Submittal Procedures
14. Proposed Products List
15. Shop Drawings
16. Product Data
17. Samples
18. Manufacturers' Instructions
19. Manufacturers' Certificates
20. Quality Assurance / Quality Control of Installation
21. References
22. Interior Enclosures
23. Protection of Installed Work
24. Parking
25. Staging Areas
26. Occupancy During Construction and Conduct of Work
27. Protection
28. Progress Cleaning
29. Products
30. Transportation, Handling, Storage and Protection
31. Product Options
32. Substitutions
33. Starting Systems
34. Demonstration and Instructions
35. Contract Closeout Procedures
36. Final Cleaning
37. Adjusting
38. Operation and Maintenance Data
39. Spare Parts and Maintenance Materials

40. As-Built and Record Drawings and Specifications

1.2 SUMMARY OF THE WORK

A. Project Description: Perform the Work as specified and detailed in Construction Documents package. Contractor to provide construction services for I.T. network upgrades at the Department of Human Services - Northport Office. The scope of this project involves removing existing cabling and providing building with updated cabling, and updating data closets by removing and replacing outdated wiring, racks, and equipment as described in the construction documents.

B. Work by Owner: Not applicable.

C. Permits: Prior to commencement of the Work, Contractor to secure any and all necessary permits for completion of the Work and facility occupancy. Provide Public Works Project Manager with copies of all permits.

D. Diggers Hotline:
1. It is General Contractor's responsibility to contact Diggers Hotline to have all utility locations marked prior to excavation and planning excavation so as not to delay the Work.
2. Diggers Hotline shall also be used to obtain information on safe working clearances from overhead lines.
3. Completely comply with all requirements of each affected utility company.
4. It is General Contractor's responsibility to contact & hire private utility locating services if necessary.

1.3 CONTRACTOR USE OF PREMISES

A. Limit use of premises to allow work by Contractors or Subcontractors and access by Owner.

B. Coordinate utility outages and shutdowns with Owner.

1.4 APPLICATIONS FOR PAYMENT

A. Submit one (1) original copies with "wet" signatures of each application on AIA G702™ and G703™ forms or approved contractors invoice form.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Payment Period: Monthly.

D. Submit Applications for Payment to Public Works Project Manager for approval & processing for payment.

1.5 CHANGE PROCEDURES

A. Contractor's costs for Products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from contingency allowance.

1.6 ALTERNATES

A. Alternates quoted on Bid Form shall be reviewed and accepted or rejected at Owner's option.

B. Coordinate related work and modify surrounding work as required.

C. Schedule of Alternates: there are no alternates proposed for this project.

1.7 LUMP SUM ALLOWANCES FOR WORK

A. Not Used.

1.8 COORDINATION

A. Coordinate scheduling, submittals, and work of various sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.

C. Coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings.

D. Refer to Drawings for recommended work sequence and duration.

E. Contractor shall provide [Public Works Project Manager with work plan that ensures the Work will be completed within required time of completion.

F. Public Works Project Manager may choose to photograph or videotape site or workers as the Work progresses.

1.9 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching new work; restore work with new Products.

B. Submit written request in advance of cutting or altering structural or building enclosure elements.

C. Fit work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

D. Refinish surfaces to match adjacent finishes.

1.10 CONFERENCES

A. Project shall have pre-bid conference; see Instructions to Bidders.

B. Owner will schedule preconstruction conference after Award of Contract for all affected parties.

C. Contractor shall submit Construction Schedule at pre-construction meeting.

D. When required in individual Specification section, convene pre-installation conference at project site prior to commencing work of Section.

1.11 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at minimum of one (1) per week, at time to be determined with Public Works Project Manager].

B. Preside at meetings, record minutes, and distribute copies within two (2) business days to those affected by decisions made.

C. Attendance at progress meetings by General Contractor, subcontractors, or their authorized representative, is mandatory.

D. Contractors shall give verbal reports of progress on the Work, discuss schedule for upcoming period and present all conflicts, discrepancies or other difficulties for resolution.

E. Day & time of progress meetings to be determined at pre-construction meeting.

1.12 JOB SITE ADMINISTRATION

A. Contractor shall have project superintendent on site minimum of four (4) hours per day during progress of the Work.

B. Contractor shall not change their project superintendent or project manager for duration of the Work without written permission of Public Works Project Manager.

C. Architect / Engineer shall have representative on site regularly, during progress of the Work.

1.13 SUBMITTAL PROCEDURES

A. Submittal form to identify Project, Contractor, Subcontractor or supplier; and pertinent Construction Documents references.

B. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of

information is in accordance with requirements of the Work and Construction Documents.

C. Identify variations from Construction Documents and Product or system limitations that may be detrimental to successful performance of completing the Work.

D. Revise and resubmit submittals as required; identify all changes made since previous submittal.

1.14 PROPOSED PRODUCTS LIST

A. Within fifteen (15) business days after date of Award of Contract, submit complete list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

1.15 SHOP DRAWINGS

A. Submit number of copies that Contractor requires, plus three (3) copies that shall be retained by Public Works Project Manager.

1.16 PRODUCT DATA

A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Manager.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

1.17 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of Product.

B. Submit samples of finishes from full range of manufacturers' standard colors, textures, and patterns for Public Works Project Manager's selection.

1.18 MANUFACTURERS' INSTRUCTIONS

A. When specified in individual Specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

1.19 MANUFACTURERS' CERTIFICATES

A. When specified in individual Specification sections, submit manufacturers' certificate to Public Works Project Manager for review, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.20 QUALITY ASSURANCE / QUALITY CONTROL OF INSTALLATION

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

B. Comply fully with manufacturers' instructions.

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

1.21 REFERENCES

A. Conform to reference standard by date of issue current as of date for receiving bids.

B. Should specified reference standard conflict with Construction Documents, request clarification from Public Works Project Manager before proceeding.

1.22 INTERIOR ENCLOSURES

A. Provide temporary partitions as required to separate work areas from Owner occupied areas, to prevent distribution of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

1.23 PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection where specified in individual Specification sections.

1.24 PARKING

A. Arrange for temporary parking areas to accommodate construction personnel. Parking shall be available at the Work site.

B. All contractors and their employees shall cooperate with General Contractor and others in parking of vehicles to avoid interference with normal operations and construction activities.

C. Do not obstruct existing service drives and parking lots with equipment, materials and / or vehicles. Keep accessible for Owner’s use at all times.

1.25 STAGING AREAS

A. Coordinate staging areas with Public Works Project Manager prior to starting the Work.

B. On-site space for use as staging areas and storage of materials is limited and will be apportioned among various Contractors as their needs dictate with due regard for storage requirements of each Contractor. Each Contractor shall be responsible for safety of equipment and materials that are stored on site.

1.26 OCCUPANCY DURING CONSTRUCTION AND CONDUCT OF WORK

A. Contractors are asked to not work at facility if they are ill with something contagious.

B. All contractors are expected to leave work areas in conditions; such that area can be occupied immediately upon leaving area.

C. Smoking is prohibited on Dane County property.

D. Owner reserves right at any time to dismiss from premises any Contractor or construction personnel that do not uphold requirements of this Section.

E. Owner shall not be held liable for any lost time, wages, or impacts to construction schedule by any Contractor or construction personnel dismissed for failure to uphold requirements of this Section.

F. Areas of existing facility will be occupied during period when the Work is in progress. Work may be done during normal business hours but confer with Owner, schedule work and store materials so as to interfere as little as possible with normal use of premises. Work performed on Saturday shall be by permission of Owner. Notify Owner when coring or similar noise making work is to be done and obtain Owner's written approval of schedule. If schedule is not convenient for Owner, reschedule and resubmit new times for Owner approval. Coring of floor along with other noisy work may have to be done on second and third shifts.

G. Work shall be done and temporary facilities furnished so as not to interfere with access to any occupied area and so as to cause least possible interference with normal operation of facility or any essential service thereof.

H. Contractor shall, at all times, provide approved, safe walkways and facility entrances for use by Owner, employees and public.

I. Contractor shall provide adequate protection for all parts of facility, its contents and occupants wherever the Work under this Contract is to be performed.

J. Each Contractor shall arrange with Owner to make necessary alterations, do new work, make connections to all utilities, etc., and at such times as will not cause interruption of utility services to facility. Contractor doing this work shall protect, cap, cut off and / or replace and relocate existing pipes, electrical work and other active utilities encountered which may interfere with new construction work.

K. New work in extension of existing work shall correspond in all respects with that to which it connects or similar existing work unless otherwise indicated or specified.
   1. Existing work shall be cut, altered, removed or replaced as necessary for performance of Contract obligations.
   2. Work remaining in place, damaged or defaced by reason of work done under this Contract shall be restored equal to its condition at time of Award of Contract.

3. If removal of work exposes discolored or unfinished surfaces or work out of alignment, such surfaces shall be refinished or materials replaced as necessary to make continuous work uniform and harmonious.

L. Contractor is not responsible for providing & maintaining temporary toilet facilities.

1.27 PROTECTION

A. Contractor shall protect from damage / injury all mechanical, electrical & plumbing equipment, walks and driveways and pay for any damage to same resulting from insufficient or improper protection.

1.28 PROGRESS CLEANING

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

1.29 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.

B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by Construction Documents.

1.30 TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

A. Transport, handle, store and protect Products in accordance with manufacturer's instructions.

1.31 PRODUCT OPTIONS

A. Where definite material is specified, it is not intentional to discriminate against "equal" product made by another manufacturer. Intention is to set definite standard of material quality. Should bidder choose to bid materials other than those specified, bidder shall submit said materials specifications to [Public Works, Waste & Renewables] Project Manager for approval at least seven (7) business days prior to Bid Due Date.

B. Products and materials that are not specified, but have been approved for use by Public Works Project Manager shall be identified in addenda to all bidding contractors.

C. Requests for material or product substitutions submitted after Bid Due Date may be considered. Owner reserves right to approve or reject substitutions based on Specification requirements and intended use.

1.32 SUBSTITUTIONS

A. Public Works Project Manager shall consider requests for Substitutions only within fifteen (15) calendar days after date of Public Works Construction Contract.

B. Document each request with complete data substantiating compliance of proposed Substitution with Construction Documents.

C. Submit three (3) copies of requests for Substitution for consideration. Limit each request to one (1) proposed Substitution.

D. Substitutions shall not change contract price established at Bid Due Date.

1.33 STARTING SYSTEMS

A. Provide written notification prior to start-up of each equipment item or system.

B. Ensure that each piece of equipment or system is ready for operation.

C. Execute start-up under supervision of responsible persons in accordance with manufacturers' instructions.

D. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.34 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of final inspection.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.

C. Owner may choose to photograph or videotape demonstration session; demonstration and demonstrator shall be to level of satisfaction of Owner.

1.35 CONTRACT CLOSEOUT PROCEDURES

A. Submit written certification that Construction Documents have been reviewed, the Work has been inspected, and the Work is complete in accordance with Construction Documents and ready for [Public Works, Waste & Renewables] Project Manager's inspection.

B. Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due.

1.36 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior surfaces exposed to view.

C. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.37 ADJUSTING

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

1.38 OPERATION AND MAINTENANCE MANUAL

A. Provide two (2) bound, hard-copy operation and maintenance manuals that include all systems, materials, products, equipment, mechanical and electrical equipment and systems supplied and installed in the Work. Provide electronic version of operation and maintenance manual also.

1.39 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide Products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.

B. Deliver to the Work site and place in location as directed.

1.40 AS-BUILT AND RECORD DRAWINGS AND SPECIFICATIONS

A. Contractor-produced Drawings and Specifications shall remain property of Contractor whether Project for which they are made is executed or not. Contractor shall furnish Architect / Engineer with original marked up redlines of Construction Documents' drawings and specifications that shall include all Addendums, Change Orders, Construction Bulletins, on-site changes, field corrections, etc. These are project As-Built Drawings & Specifications.

B. Architect / Engineer shall update original Construction Documents to include all Addendums & any other changes including those provided by Contractor in As-Built Drawings & Specifications. These updates are project Record Drawings & Specifications.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT, DISPOSAL & RECYCLING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Summary
2. Waste Management Goals
3. Construction and / or Demolition Waste Management
4. Waste Management Plan
5. Reuse
6. Recycling
7. Materials Sorting and Storage On Site
8. Lists of Recycling Facilities Processors and Haulers
9. Waste Management Plan Form

B. Related Sections:
1. Section 01 00 00 - General Requirements

1.2 WASTE MANAGEMENT GOALS

A. Dane County requires that as many waste materials as possible produced as result of this project be salvaged, reused or recycled in order to minimize impact of construction waste on landfills and to minimize expenditure of energy and cost in fabricating new materials. Additional information may be found in Dane County Green Building Policy, Resolution 299, 1999-2000.

1.3 CONSTRUCTION AND / OR DEMOLITION WASTE MANAGEMENT

A. All construction and demolition waste suitable for recycling must go to Dane County Construction & Demolition Recycling Facility located at 7102 US Hwy 12, Madison, located across from Yahara Hills Golf Course. This facility can receive mixed loads of construction and demolition waste. For complete list of acceptable materials see www.countyofdane.com/pwht/recycle/CD_Recycle.aspx.

B. Dane County Landfill, also at 7102 US Hwy 12, Madison, must receive all other waste from this project. www.countyofdane.com/pwht/recycle/landfill.aspx.

1.4 WASTE MANAGEMENT PLAN

A. Contractor shall develop Waste Management Plan (WMP) for this project. Dane County's Special Projects & Materials Manager may be contacted with questions. Outlined in RECYCLING section of this specification are examples of materials that can be recycled or reused as well as recommendations for waste sorting methods.

B. Contractor shall complete WMP and include cost of recycling / reuse in Bid. WMP will be submitted to Public Works Project Manager within fifteen (15)

business days of Bid Due date. Copy of blank WMP form is in this Section. Submittal shall include cover letter and WMP form with:

1. Information on:
    a. Types of waste materials produced as result of work performed on site;
    b. Estimated quantities of waste produced;
    c. Identification of materials with potential to be recycled or reused;
    d. How materials will be recycled or reused;
    e. On-site storage and separation requirements (on site containers);
    f. Transportation methods; and
    g. Destinations.

1.5 REUSE

A. Contractors and subcontractors are encouraged to reuse as many waste materials as possible. Salvage should be investigated for materials not reusable on site.

1.6 RECYCLING

A. These materials , must be recycled at Dane County Construction & Demolition Recycling Facility:
    1. Wood.
    2. Wood Pallets.
    3. PVC Plastic (pipe, siding, etc.).
    4. Asphalt & Concrete.
    5. Bricks & Masonry.
    6. Vinyl Siding.
    7. Cardboard.
    8. Metal.
    9. Unpainted Gypsum Drywall.
    10. Shingles.

B. These materials can be recycled elsewhere in Dane County area:
    1. Fluorescent Lamps.
    2. Foam Insulation & Packaging (extruded and expanded).
    3. Carpet Padding.
    4. Barrels & Drums.

C. All materials must be recycled at WDNR permitted waste processing facilities that adhere to all State Statutes.

1.7 MATERIALS SORTING AND STORAGE ON SITE

A. Contractor shall provide separate containers for recyclable materials. Number of containers will be dependent upon project and site conditions.

B. Contractor shall provide on-site locations for subcontractors supplied recycling containers to help facilitate recycling.

C. Mixed loads of recycled materials are allowed only per instructions at www.countyofdane.com/pwht/recycle/CD_Recycle.aspx.

1.8 LISTS OF RECYCLING FACILITIES PROCESSORS AND HAULERS

A. Refer to www.countyofdane.com/pwht/recycle/CD_Recycle.aspx for information on Dane County Construction & Demolition Recycling Facility.

B. Web site www.countyofdane.com/pwht/recycle/categories.aspx lists current information for Dane County Recycling Markets. Contractors can also contact Allison Rathsack at 608/266-4990, or local city, village, town recycling staff listed at site www.countyofdane.com/pwht/recycle/contacts.aspx. Statewide listings of recycling / reuse markets are available from UW Extension at https://www.uwgb.edu/shwec/.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

WASTE MANAGEMENT PLAN FORM

Contractor Name: _____

Address: _____

_____

Phone No.: _____ Recycling Coordinator: _____

MATERIAL	ESTIMATED QUANTITY	DISPOSAL METHOD (CHECK ONE)	RECYCLING / REUSE COMPANY OR DISPOSAL SITE
Salvaged & reused building materials	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Wood	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Wood Pallets	_____ units	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
PVC Plastic	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Asphalt & Concrete	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Bricks & Masonry	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Vinyl Siding	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Cardboard	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Metals	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Unpainted Gypsum / Drywall	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Shingles	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Fluorescent Lamps	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Foam Insulation	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Carpet Padding	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Barrels & Drums	_____ units	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Glass	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____

WASTE MANAGEMENT PLAN FORM

Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____

SECTION 02 41 19

SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division One of this Project Manual apply to this Section as though repeated herein.

1.02 WORK INCLUDED

A. The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide for the demolition of such features as required in these specifications and on the drawings. Included are the following:
   1. Demolish partitions, ceilings, flooring, finishes, doors and other items as indicated.
   2. Protect portions of building adjacent to or affected by selective demolition. Take appropriate measures to protect existing facilities operations against dust contamination. Materials shall be removed from the existing building without disruption to the Owner or facility operations.
   3. Remove and legally dispose of demolished materials off-site.
   4. Demolish and salvage for reuse those items noted on the drawings.
   5. Recycle construction and demolition waste including metals and cardboard. Recycle carpet and ceiling tiles if practicable.
   6. Salvage existing hardware for reinstallation as indicated on drawings or turn over to Owner.
   7. Salvage acoustic ceiling tile to patch to match and as indicated on drawings.

1.03 RELATED WORK

A. Recycling, Section 01 74 19.

1.04 SUBMITTALS

A. For utilities or other services requiring removal or abandonment in-place, submit materials documenting completion of such work.

B. Submit copies of records documenting recycling of demolition materials from the site.

1.05 DEFINITIONS

A. “Remove”: Remove and legally dispose of items, except those indicated to be reinstalled.

B. “Remove and Reinstall”: Remove items indicated; clean, service and otherwise prepare them for reuse; store and protect against damage. Reinstall in the same location or in locations indicated.

C. “Existing to Remain”: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the A/E, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.06 QUALITY ASSURANCE

A. Comply with governing codes and regulations.

1.07 RECORD DRAWINGS

A. Maintain record drawings showing actual locations of utilities and other features encountered, and any deviations from the original design. Show actual limits of removal and demolition.

1.08 SAFETY

A. Verify that all gas and electrical utilities have been abandoned or disconnected and associated hazards mitigated, prior to beginning any demolition.

B. Take all necessary precautions while dismantling piping containing gas, gasoline, oil or other explosive or toxic fluids or gases. Purge lines and contain materials in accordance with all applicable regulations. Store such piping outdoors until fumes are removed.

C. Maintain a clean and orderly site. Remove debris at end of each workday.

D. If hazardous materials are not anticipated, but encountered, terminate operations and contact the Owner immediately. Follow all applicable local, state and federal regulations pertaining to hazardous materials.

1.09 PERMITS

A. Unless otherwise noted, Contractor shall be responsible for obtaining and paying for all permits necessary to complete demolition work.

B. If necessary, file and maintain Notification of Demolition and/or Renovation and Application for Permit Exemption (WDNR Form 4500-113) in accordance with the Wisconsin Administrative Code Chapter NR447.

1.010 DISCONNECTION OF SERVICES

A. Prior to starting removal and/or demolition operations be responsible and coordinate disconnection of all existing utilities, communication systems, alarm systems and other services.

B. Disconnect all services in manner which insures continued operation in facilities not scheduled for demolition.

C. Disconnect all services in manner which allows for future connection to that service.

D. Disconnect services to equipment at unions, flanges, valves, or fittings wherever possible.

1.011 REMOVAL/SALVAGING OF ITEMS

A. Carefully remove all items that are scheduled to be salvaged.

B. Secure salvaged items to allow for future movement; provide pallets, skids and other devices as necessary. Secure all loose parts.

C. Provide crates, padding, tarps and other measures necessary to protect salvaged items during storage. Store items in secure location, safe from vandalism, weather, dust and other adverse elements.

D. Where salvaged items are indicated to be turned over to Owner, deliver to location on property where designated by Owner.

E. Where indicated to be incorporated into new work, store the salvaged item in secure location until trade responsible for re-installation mobilizes his equipment and storage facilities to the site, or otherwise accepts responsibility for the salvaged item.

F. Items of salvage value that are not to be returned to the Owner or the A/E shall be removed from the structure. Storage or sale of such salvage items at project site is prohibited.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. Use Contractor's normal equipment for demolition purposes and which meets all safety requirements imposed on such equipment.

PART 3 - EXECUTION

3.01 GENERAL

A. Examine all areas of work, verify all existing conditions, and report any unsatisfactory conditions.

3.02 PROTECTION OF EXISTING WORK AND FACILITIES

A. Verify the locations of, and protect, any building elements, utilities, and all other such facilities that are intended to remain or be salvaged.

B. Make such explorations and probes as necessary to ascertain any required protection measures that shall be used before proceeding with demolition.

C. Take all measures necessary to safeguard all existing work and facilities which are outside the limits of the work.

D. Furnish and install temporary enclosures or other barriers as shown on the plans or as otherwise necessary to protect existing features.

E. Protect adjacent interior areas from collection of dust and noxious fumes. Seal HVAC system ductwork and grilles to prevent contamination of building or mechanical systems.

F. Provide protection for workers, public, adjacent construction and occupants of existing building(s).

G. Report damage of any facilities or items scheduled for salvaging to the Owner.

H. Repair or replace any damaged facilities that are not scheduled for demolition.

I. Do not damage building elements and improvements indicated to remain.

J. Do not close or obstruct walks, drives, other occupied or used spaces, or facilities without the written permission from the A/E and the authorities having jurisdiction.

K. Do not interrupt utilities serving occupied facilities without permission from the A/E and authorities having jurisdiction. If necessary, provide temporary utilities.

L. Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.

M. If necessary, provide additional materials to protect existing building components that are to remain.

N. Where necessary to prevent collapse of any construction, install temporary shores, struts or bracing. Do not commence demolition work until all temporary construction is complete.

O. Take precautions to guard against movement, settlement or collapse of any surrounding construction designated to remain and be liable for any such movement, settlement or collapse.

3.03 DEMOLITION

A. Remove all equipment, fixtures and other materials scheduled for salvage prior to beginning demolition operations.

B. Abandon gas, electric and communication utilities in accordance with local utility company requirements, or applicable substantive requirements if considered private.

C. Remove all sealant, fasteners and damaged or rotten blocking from existing construction to remain where demolition occurs.

3.04 RECYCLING

A. Transport and dispose all demolition waste in accordance with local, state, and federal guidelines and Section 01 74 19 Recycling.

3.05 SCHEDULE

A. Items to be removed shall be as indicated on the Drawings.
   1. Items to be stored and reinstalled.
   2. Items to be removed from site by Contractor.

B. Items to remain (if clarification required).

3.06 CLEANING

A. All adjacent areas shall be broom cleaned and ready to receive new construction.

B. Remove from the site all debris resulting from the Work of this Section.

END OF SECTION 02 41 19

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Applicable provisions of Division 1 shall govern all work under this section.

1.02 WORK INCLUDED

A. Extruded metal over existing exterior window openings.

B. Metal accessories.
1. Including, but not limited to, anchors, bolts, screws, joist hangers, and fasteners.

C. Misc. Metal Brackets, supports, etc. as shown on drawings.

1.03 RELATED WORK

A. Finished Carpentry: Section 06 20 00.

B. Painting: Section 09 90 00.

1.04 REFERENCES

A. Metal Fabrications shall be in strict accord with Wisconsin Commercial Building Code, Chapter 11 - "Accessibility".

1.05 SUBMITTALS

A. Submit in accord with the General Conditions of the Contract.
1. Shop drawings required for all items. Show all work to be fabricated with all construction details shown in appropriate scale, methods of attachments to other materials, finished dimensions, shop welds and grinding of welds, field assembly joints, etc.
2. Coordinate work with other suppliers and subcontractors; obtain their approved shop drawing where necessary, or obtain any necessary additional detail information regarding mounting conditions or other aspects of related work.
3.

1.06 QUALITY ASSURANCE

A. Take field measurements prior to shop drawing preparation and fabrication.

B. Comply with the provisions of the following except as otherwise indicated:
1. AISC "Code of Standard Practice for Steel Buildings and Bridges".
2. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", including the "Commentary" and Supplements thereto as issued.
3. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
4. AWS D1.1 "Structural Welding Code".

C. Qualify welding process and welding operators in accordance with the AWS "Standard Qualification Procedure". Provide certification that welders to be employed in the work have satisfactorily passed AWS qualification tests within the previous twelve months. If recertification of welders is required, retesting will be the Contractor's responsibility.

D. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.07 DELIVERY, STORAGE AND HANDLING

A. Package, handle, deliver and store at the job site in a manner that will avoid damage or deformation. Damaged material will be rejected.

1.08 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh units by field measurement before fabrication.

B. Verify dimensions in field for pre-cut or prefabricated items.

C. Examine job conditions and adjoining construction which may affect the acceptability of the work.

D. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing embedments and other items that are to be embedded in concrete. Deliver such items to Project site in time for installation.

1.09 SUSTAINABLE DESIGN REQUIREMENTS

A. Low-Emitting Materials, Field applied Paints and Coatings: Interior paints and coatings applied on-site must meet the limitations and restrictions concerning chemical components set by the following standards:
1. Topcoat Paints, Green Seal Standard GS-11, Paints: First Edition, May 20, 1993.
2. Anti-Corrosive and Anti-Rust Paints: Green Seal Standard GS-03, Anti-Corrosive Paints", Second Edition, January 7, 1997. For applications on ferrous metal substrates.
3. "All Other Architectural Coatings, Primers and Undercoats: South Coast Air Quality Management District (SCAQMD) Rule #1113, Architectural Coatings", rules in effect on January 1, 2004.

PART 2 - PRODUCTS

2.01 METAL FOR FABRICATIONS

A. Extruded metal or mesh: 1 x 1 inch square mesh, 10 minimum gauge wire or mesh 0.135 diameter, intermediate-crimp steel wire woven into 1 ½" diamond mesh.

B. Horizontal Panel Framing: 1-by-1/2-by-1/8-inch cold-rolled steel channels. Mortise and tenon at intersection.

C. Horizontal Panel Stiffeners: 2 cold-rolled steel channels, not less than 1"x 3/8" x 1/8 inch, bolted each side of mesh.

D. Cold-rolled carbon steel sheets: ASTM A336.

E. Structural Steel Sheet: Hot rolled ASTM A570, or cold-rolled ASTM A611, of grade required for design loading, minimum of Grade C.

F. Welding materials: AWS D1.1; type required for materials being welded.

G. Shop coat primer: FS-TT-P-32, for shop application and field touch-up.

H. Structural Steel: ASTM A36.

I. Structural Steel Angles: ASTM A36, hot dipped galvanized.

J. Steel Pipe: ASTM A53, Type S, Grade A, standard weight, schedule 40.

K. Steel Bars and Bar Size Shapes: ASTM A 306, Grade 65, or ASTM A 36.

L. Castings: Gray iron, ASTM A48-83 Class 35B; or Ductile iron ASTM A536-80 Grade 65-45-12.

2.02 ACCESSORIES

A. Concrete Inserts: Threaded or wedge type, galvanized ferrous castings, either malleable iron ASTM A 47 or cast steel ASTM A 27. Provide bolts, washers and shims as require, hot-dipped galvanized, ASTM A 153.

B. Fasteners: Including, but not limited to the following;
   1. Provide zinc-coated fasteners for exterior use where built into exterior walls or where shown on drawings. Select fasteners for the type, grade and class required.
      a. Provide hot-dipped galvanized coating for fasteners less than 1/2" diameter that are in contact with pressure-treated wood.
   2. Bolts and Nuts: Regular hexhead type, ASTM A 307, Grade A or Type 304 stainless steel, ASTM A 320. High Strength bolts and nuts, ASTM A 325.
   3. Lag Bolts: Type, FS FF-B-561.
   4. Machine Screws: Cadmium plated steel, FS FF-S-92, Security Screw
   5. Wood Screws: Carbon steel, FS FF-S-111.
   6. Plain Washers: Round, carbon steel, FS FF-W-92.
   7. Concrete Anchorage Devices: Wedge-type expansion bolts, FS FF-S-325, Group II, Type 4, Class 1, zinc coated or stainless steel as shown on the drawings and installed in accordance with manufacturer's recommendations.
      a. "Kwik-bolt", Hilti Corporation.
      b. "Wej-it", Wej-it Corporation.
   8. Masonry Sleeve Anchors: zinc coated or stainless as shown on the drawings.
      a. Rawl "Lok/Bolt".
      b. HILTI - Sleeve anchor.
   9. Toggle Bolts: Spring-wing type, FS FF-B-558, Type I, Class I and Style 1 zinc coated or stainless steel as shown on the drawings.
   10. Lock Washers: Helical spring type carbon steel, FS FF-W-84.
   11. Epoxy bolt anchorage: HILTI (HY-10 or equal)

C. Electrodes for Welding: Comply with AWS code.

2.03 FABRICATION

A. General: Fabricate wire mesh items from components of sizes not less than those indicated. Use larger sized components as recommended by wire mesh manufacturer. As required for complete installation, provide bolts, hardware, and accessories with manufacturer's standard finishes.
   1. Fabricate wire mesh items to be readily disassembled only from interior.
   2. Welding: Weld corner joints of framing and grind smooth, leaving no evidence of joint.

B. Do shop cutting, drilling, fitting wherever possible. Field measure before fabrication when necessary or required.

C. Workmanship: Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.

D. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, security (countersunk) screws or bolts.

F. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

2.04 STEEL FINISHES

A. Finish: Powder Coat: Color and Gloss: Chosen by A/E from full range.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Anchorage to masonry with expansion bolts, sleeves, toggle bolts or approved similar. Do not use wood plugs for anchorage.

B. Bolts, screws, and similar fastenings for field connections shall be of the same material and finish as the parts being fastened.

C. Immediately after erection, repaint field connections, weld burns, abraded surfaces. Scrape and wire brush loose and scaling paint to sound metal, follow with spot priming.

D. Install manufactured units and specialty products in accordance with the manufacturer's instructions and approved shop drawings.

E. Do not proceed with installation until conditions are satisfactory.

F. Install in accordance with approved shop drawings.

G. Perform field welding in accordance with AWS D1.1.

H. Corrosion Protection: Coat concealed metal surfaces that will come into contact with grout, concrete, or dissimilar metals with a heavy coat of bituminous paint.

3.02 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

END OF SECTION

SECTION 06 20 00

FINISH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Applicable provisions of Division 1 shall govern all work under this section.

1.02 WORK INCLUDED

A. Carpentry work which is exposed to view, non-structural, and not specified as part of other sections.

B. The types of finish carpentry include, but are not necessarily limited to the following:
   1. Reinstalled salvaged wood casings, moldings.

1.03 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

B. Joint Sealants: Section 07 92 00.

C. Door Hardware: Section 08 71 00.

D. Painting: Section 09 90 00 for painting and refinishing cut salvaged wood.

1.04 SUBMITTALS

A. General: Submit each item in this article according to the General Conditions of the Contract.
   1. Shop drawings for all millwork; receive approval prior to fabrication; draw in related or dimensional position with sections shown either full size or 3-inch scale.
   2. Samples:
      a. One 24-inch- long section of wood running trim, casing, moulding, or similar lineal mill work where fabrication required to match existing.

B. Product Data: For each type of component required. Include but not limited to the following:
   1. Manufacturer’s data on hardware, accessories, and finishes.

1.05 QUALITY ASSURANCE

A. Quality Standards: Architectural Woodwork Quality Standards, Guide Specification and Quality Control Program as set forth by the Architectural Woodwork Institute (AWI).

B. Architectural Woodwork Manufacturer: Experienced in this type of work; successfully completed comparable work.

C. Deviations from quality, grade, species, and finish specified under AWI Interior Woodwork for Transparent Finish and Interior Woodwork for Paint Finish will be allowed for individual items or components only if specified under separate headings covering such items.

1.06 DELIVERY, STORAGE AND HANDLING

A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver finish carpentry materials until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed.

C. If finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.
   1. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
   2. Maintain temperature and humidity in installation area as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Lumber standards: Comply with DOC PS 20, "American Softwood Lumber Standard," for lumber and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee Board of Review.

B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
   1. NELMA – Northeastern Lumber Manufacturers Association.
   2. NHLA – National Hardwood Lumber Association.
   3. NLGA – National Lumber Grades Authority.
   4. SPIB - Southern Pine Inspection Bureau.
   5. WCLIB – West Coast Lumber Inspection Bureau.
   6. WWPA – Western Wood Products Association.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. For exposed lumber, furnish pieces with grade stamps applied to ends of back of each piece, or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.

2.011 SCHEDULE OF MATERIALS

A. Wood, Solid
   1. Match existing wood frames if replacement required in lieu of reinstallation of salvaged wood.
      a. Stain.

2.012 ACCESSORIES

A. Provide nails, screws and other anchoring devices of the proper type, size, material and finish for application to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.
   1. Nails, Wire, Brads and Staples: FS FF-N-105.
   2. Power-Driven Fasteners: CABO NER-272.

B. Where interior finish carpentry materials are exposed in areas of high humidity, provide fasteners and anchorages with hot-dip galvanized coating complying with ASTM A 153 or No. 304 stainless steel.

C. Glue: Aliphatic- or phenolic-resin wood glue recommended by manufacturer for general carpentry use. Exterior rated for exterior use.

D. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. BASF Building Systems; Sonolac.
   b. OSI, Green Series, SA-167.
   c. Pecora Corporation; AC-20+.
   d. Tremco Incorporated; Tremflex 834.

2. Paintable.

E.

2.013 FABRICATION

A. Wood Moisture Content: Comply with requirements of specified inspection agencies and manufacturer's recommendations for moisture content of finish carpentry on relative humidity conditions existing during time of fabrication and in installation areas.

B. Field Dimensions
1. Millwork Manufacturer: Responsible for details, dimensions not controlled by job conditions; show on shop drawing all field measurements beyond his control. Contractor, Woodwork Manufacturer: Cooperate to establish, maintain these field dimensions.

C. Leave all surfaces clean and true and all exposed wood surfaces sanded parallel with grain, free of discernible marks and ready for work under Division 9 Section "Painting".

D. Back out or kerf backs of the following members, except members with ends exposed in finished work:
1. Standing and running trim wider than 5 inches.

E. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius.

F. Ease edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and performance of finish carpentry. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.

B. Examine substrate before installation. Verify that substrate is sound and plumb/level. Proceed with installation only after unsatisfactory conditions have been corrected.

3.03 INSTALLATION

A. Do not use finish carpentry materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
   1. Do not use manufactured units with defective surfaces, sizes or patterns.

B. Install finish carpentry plumb, level, true and aligned with adjacent materials. Use concealed shims where required for alignment.

C. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
   1. Countersink nails; fill surface flush and sand where face nailing is unavoidable.

D. Install to tolerance of 1/8 inch in 96 inches for plumb and level. Install adjoining finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

E. Coordinate finish carpentry with materials and systems in or adjacent to standing and running trim and rails.
   1. Provide cutouts for mechanical and electrical items that penetrate exposed surfaces of trim and rails.

F. Finish according to specified requirements.
   1. Refer to Division 9 Sections for final finishing of finish carpentry.

3.04 INSTALLATION

A. Install wood doors plumb and square, with maximum diagonal distortion of 1/16 inch.

B. All frames, moldings and sticking to match existing or as shown on drawings.

C. Drill pilot holes in hardwood species before fastening as required to allow penetration of fasteners and to prevent splitting.
   1. Fasten to prevent movement or warping.
      a. Countersink fastener heads on exposed carpentry work.

3.05 ADJUSTING

A. Repair damaged or defective work as directed.

B. Adjust and lubricate hardware for proper operation.

3.06 CLEANING

A. Clean shop-finished woodwork, touch-up finish as required and remove and refinish damaged or soiled areas of finish.

B. Protect finish carpentry and maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION 06 20 00

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division One of this Project Manual apply to this Section as though repeated herein.

1.02 WORK INCLUDED

A. Door Hardware and verification of existing hardware for coordination of specified components.

1.03 RELATED SECTIONS

A. Finish Carpentry: Section 06 20 00.

1.04 REFERENCES

A. Federal Specifications (FS)
   1. FF-H-106a Hardware, Builders'; Locks and Door Trim-Standard Finishes for Builders Hardware.

B. National Fire Protection Association, Inc. (NFPA), Battery March Park, Quincy, MA 02269.
   1. NFPA 80 - Standard for fire doors and windows.
   2. NFPA 101 - Code for safety to life from fire in buildings and structures.

C. Underwriter's Laboratories, Inc. (UL), 333 Pfingsten Road, Northbrook, IL 60062.
   1. Building Materials Directory.

D. Hardware shall be in strict accord with Wisconsin Administrative Code Chapter Comm. 69 - "Barrier Free Design".

1.05 SUBMITTALS

A. Submit in accordance with the General Conditions of the Contract.
   1. Five (5) copies of a detailed, vertical type hardware schedule for approval.
      a. List and describe each opening separately. Include doors with identical hardware, except hand, in a single heading. Include door number, room designations, degree of swing, and hand.
      b. List related details. Include dimensions, door and frame material, and other conditions affecting hardware.
      c. List all hardware items. Include manufacturer's name, quantity, product name, catalog number, size, finish, attachments, and related details.
      d. Resubmit four (4) copies of the corrected schedule when required.
      e. Determine keying requirements, as directed by the Owner's Representative and submit five (5) copies of a detailed keying schedule for approval; resubmit four copies (4) of the corrected schedule when required.
      f. Prior to final payment, provide a record copy of hardware schedules, including all revisions and updates. All openings shall be listed to reflect final installed configuration only.

   2. Samples of hardware items as may be required. Identify each sample and indicate the location of subsequent installation in the project.

3. A copy of the approved hardware schedule and all pertinent templates or template information to each fabricator of material factory-prepared for the installation of hardware.

1.06 QUALITY ASSURANCE

A. Manufacturers and product numbers listed herein establish a standard of quality. Similar items by other manufacturers may be accepted by prior written approval by the architect in accord with the General Conditions of the Contract. Except where specified in the hardware schedule, furnish products of only one manufacturer for each type of hardware.

B. Supplier: Hardware Supplier: The hardware supplier shall be a corporate member in good standing of The Door and Hardware Institute (DHI), employing at least one Architectural Hardware Consultant (AHC) who is currently participating in DHI's continuing education program (CEP).

C. Items of hardware not definitely specified herein but necessary for completion of the Work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to the adjacent hardware. Where size and shape of members is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified. Sizes shall be adequate for the service required. Include such nuances as strike type, strike lip, raised barrel hinges, mounting brackets, fasteners, shims, and coordination between conflicting products. All doors shall be provided with a stop.

1.07 REGULATORY REQUIREMENTS

A. Furnish UL listed hardware for all UL labeled openings in conformance with requirements for the class of opening scheduled.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver hardware to the job site in the manufacturer's original containers marked to correspond with the approved hardware schedule for installation location.

B. Store hardware in dry surroundings and protect against loss and damage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Refer to the Hardware Schedule at the end of this Section.

2.02 ACCESSORIES

A. Furnish all necessary hardware accessories such as wood or machine screws, bolts, nuts, anchors, toggle bolts, and other fasteners, each of the type, size, material and finish for its intended purpose and each according to the material to which the hardware is being applied.

B. Keying system will be determined by the Owner's Representative.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to the submittal of hardware, installer is to field inspect and assess existing conditions to ensure compatibility of product and concealed installation of electrified hardware components.

B. No surface mount or wiremold acceptable. Cut and patch existing plaster walls to match.

C. Modify existing wood frame and casing for installation of hardware. Refer to 06 20 00, finish carpentry and 09 90 00, stain.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's recommendations and instructions.

B. Install hardware on UL labeled openings in accordance with manufacturer's requirements to maintain the fire rating.

C. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work.

D. Remove, cover or protect hardware after fitting until paint or other finish is applied. Permanently install hardware after finishing operations are complete.

E. Deliver one complete set of installation and adjustment instructions, and tools with the hardware.

F. Coordinate all Owner Furnished Contractor Installed hardware.

3.03 ADJUSTING

A. At final completion, adjust and test all hardware for function and performance and leave in good operating condition.

3.04 CLEANING

A. Clean all hardware to restore the original finish.

3.05 PROTECTION

A. Protect the finished installation until acceptance of the project.

3.06 HARDWARE SCHEDULE

A. Manufacturers

1. Hinges	Hager Hinge Co.	HAG
a. Approved Equals:	Stanley McKinney	
2. Lockset	Best Access Systems	BES
a. Approved Equals:	Provide 7-pin cylinders to match existing. Coordinate with Best Access Systems for keying of project, No Substitutions. Best Access Systems is indicated in this specification as a basis of design, Marshall Best Security Corporation to accept Best Access System Core is an acceptable equal.	
3. Door Closers	LCN	LCN
a. Approved Equals:	No substitutions.	

B. Hardware Sets:

SET 01, Openings 209A and 329

	EA	HINGES	Existing		
1	EA	CLOSER	Existing		
1	EA	STOREROOM LOCKSET	Existing		

Remove, salvage and modify wood frame for installation of:

1	EA	ELECTRIC STRIKE	6211WF- 24 volt DC	630	VON
1	EA	DOOR POS SWITCH	1076W	WHT	GE
1	EA	CARD READER	BY SECTION 28 13 00		

END OF SECTION 08 71 00

SECTION 09 23 00

PORTLAND CEMENT PLASTERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Applicable provisions of Division 1 shall govern all work under this Section.

1.2 WORK INCLUDED

A. Interior Portland cement plasterwork on existing substrates.

1.3 RELATED WORK

A. 09 20 00, Gypsum Board

1.4 SUBMITTALS

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

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 PROJECT CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Interior Plasterwork: Maintain room temperatures at greater than 40 deg F (4.4 deg C) for at least 48 hours before plaster application, and continuously during and after application.
   1. Avoid conditions that result in plaster drying out during curing period. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
   2. Ventilate building spaces as required to remove water in excess of that required for hydrating plaster in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS MATERIALS

A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. L-shaped Metal Trim for Veneer Plaster: USG No. 801-B.

2.2 PLASTER MATERIALS

A. Portland Cement: ASTM C 150, Type I.
   1. Color for Finish Coats: White.

2.3 PLASTER MIXES

A. Veneer Plaster Finishes
1. One Coat System: USG Imperial Finish Plaster.

B. General: Comply with ASTM C 926 for applications indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

3.3 PLASTER APPLICATION

A. General: Comply with ASTM C 926.
1. Do not deviate more than plus or minus 1/4 inch in 10 feet (6.4 mm in 3 m) from a true plane in finished plaster surfaces, as measured by a 10-foot (3-m) straightedge placed on surface.
2. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Plaster Finish Coats: Apply to provide finish to match existing.

3.4 CUTTING AND PATCHING

A. Cut, patch, replace, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections. Repair or replace work to eliminate blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.5 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of other work. Promptly remove plaster from doorframes, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 23 00

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division One of this Project Manual apply to this Section as though repeated herein.

1.02 WORK INCLUDED

A. Metal Studs.

B. Gypsum Board.

C. Trim and Accessories.

D. Acoustical Batt Insulation.

1.03 RELATED WORK

A. Section 09 90 00 Painting.

1.04 REFERENCES

A. Referenced Specifications: The more stringent requirement of this section or referenced specification applies.
   1. "Using Gypsum Board for Walls and Ceilings", The Gypsum Association - GA-201-85.
   2. "Recommended Specifications for the Application and Finishing Gypsum Boards", The Gypsum Association - GA-216.

1.05 SUBMITTALS

A. Submit in accordance with the General Conditions of the Contract.
   1. Manufacturer’s product data.
   2. Texture finish sample.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the project site with manufacturer's labels intact and legible.

B. Handle materials with care to prevent damage.

C. Deliver fire-rated material bearing testing agency label and required fire classification numbers.

D. Storage
   1. Store materials inside under cover, stack flat, off floor.
   2. Stack wallboard so that long lengths are not over short lengths.
   3. Avoid overloading floor system.
   4. Store adhesives in dry area, provide protection against freezing at all times.

1.07 PROJECT CONDITIONS

A. During cold weather, maintain temperature range between 55 degrees F. to 70 degrees F. for 24 hours before, during, and after gypsum board and joint treatment applications.

B. Ventilation
   1. Provide ventilation during and following adhesive and joint treatment applications.
   2. Use temporary air circulators in enclosed areas lacking natural ventilation.
   3. Protect installed materials from drafts during hot, dry weather.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Georgia Pacific.

B. LaFarge.

C. National Gypsum Company, Gold Bond.

D. United States Gypsum Company.

E. BPB America, Inc.

F. Chicago Metallic.

G. Dietrich Industries.

H. Or approved equal.

2.02 MATERIALS

A. Gypsum Board: ASTM C 36, long edges tapered; in lengths as long as practical to keep number of end joints to absolute minimum.
   1. Regular Gypsum Board.
   2. Water Resistant Wallboard: 5/8-inch thick.
   3. Cementitious Backer Board: Aggregated, Portland cement board with woven, glass fiber, mesh facing; complying with ANSI A118.9.
      a. Manufacturer: USG, Durock Interior Tile Backer Board or approved equal.
      b. Thickness: 1/2 inch.
   4. Veneer Plaster Base: USG Imperial Gypsum Base, 5/8-inch thick.
   5. Fire Rated 1 Inch thick gypsum wall board panels, supplied in nominal 24 inch widths type SLX.
   6. Fire Rated Face Layer: 5/8 inch Gypsum Board:
      a. American Gypsum; Types AGX-1, AG-C
      b. Certainteed Gypsum; ProRoc Type C
      c. Georgia Pacific Gypsum; Type S
      d. USG; Type C, FRX-G, IP-X2, IPC-AR, SCX, or WRC.
      e. Or approved equal.

B. Accessories
   1. Metal Trim: USG No. 200-A.
   2. L-shaped Metal Trim for Veneer Plaster: USG No. 801-B.
   3. Metal Reveal Molding: Fry Reglet DRM-625-75.
   4. Metal ‘Z’ Reveal Molding, 1/4” wide: Fry Reglet DRMZ-625-25.

5. Metal ‘Z’ Reveal Molding, 1” wide: Fry Reglet DRMZ-100-100.
6. Expansion Joints: USG No. 093.
7. Drywall Screws for Metal Framing: 1" Type S-12 or Type S bugle head.
8. Outside Corner Reinforcement: USG No. 104, 1-1/8" x 1-1/8" corner bead.
9. Acoustical Sealant: Equal to Tremco “Tremflex 834” or Pecora “Acoustic and Insulation Sealant”, low VOC formulation.
    a. VOC content less than 50 g/l.
10. Tie Wire: No. 18 SWG, steel wire.
11. Steel runner channel brackets: 25 MSG galvanized steel.
12. Corner angles: 25 MSG galvanized steel.
13. Sound Attenuation Blanket: U.S. Gypsum Thermafiber, or approved equal, 3” for an STC of 49.

C. Metal Studs/Resilient Furring Channels.
1. Unless indicated otherwise, use 25-gage for partitions up to 12'-0" high, use 20-gage for partitions over 12'-0" high.
2. Unless indicated otherwise, use 20-gage studs at door jambs, head.
3. Track gauge shall be same gauge as nested studs.
4. 2 ½ inch wide by 1 ½ inches deep C-H studs 24 inch on center. Fabricated from minimum 25 MSG galvanized steel.

D. Suspension System
1. Chicago Metallic 640 system
    a. Hanger Wire: 8-gage, annealed.
    b. Carrying Channels: 1-1/2 inch cold rolled steel.
    c. Screws: USG 1-inch type S.
    d. Furring Channels: USG metal furring channel, attached with USG furring channel clips.
2. Chicago Metallic 650 System complying with UL Design No. D502.
    a. Hanger clips: 18 gauge galvanized steel.
    b. Hanger wire: No. 12 SWG galvanized steel.
    c. Carrying Channels: 16 gauge 1 ½ inch cold rolled.
    d. Furring Cross Channel: 16 gauge 7/8 inch where required.
    e. Wall Molding: 26 gauge steel channel 1 11/16 inch deep with 15/16 inch flanges.
3. Or approved equal.

E. Drywall Finishing Accessories
1. Joint Compounds: Ready mixed type.
2. Joint Reinforcement: USG Perf-A-Tape or approved equivalent.

F. Texture Finish Materials
1. Ceilings: USG Spray Fine Sand Texture Finish or approved equal.
2. Walls (Painted Only): USG Spray Fine Sand Texture Finish, or approved equal.
    a. To match existing, adjacent plaster texture.

PART 3 - EXECUTION

3.01 GYPSUM BOARD

A. Follow Gypsum Association's recommendations for installation procedures.

B. Cut wallboards by scoring and breaking or sawing; scribe neatly at wall projections.

C. Apply first to ceilings then to walls.

D. Locate wallboard joints at openings so that no end joint aligns with edge of opening.

E. Set fasteners with heads slightly below surface of wallboard. Avoid breaking face paper.

F. Provide water resistant wallboard at rooms/areas with high humidity.

3.02 METAL STUDS

A. Attach metal runners at floor and at ceiling or structural elements above with suitable fasteners located 2 inches from each end, spaced 16 inches on center.

B. Position studs vertically, engaging floor and ceiling runners. Splice studs with 8-inch nested lap, one positive attachment per stud flange. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners, existing construction elements.

C. Provide double studs at jambs and head of each door frame. Securely anchor studs to jamb and head anchor clips at metal door frames by bolt or screw attachment. Over metal frames, place a cut-to-length section of runner horizontally with web-flange bent at each end; secure with one positive attachment per flange. Position a cut-to length stud (extend to ceiling runner) at vertical board joints over door frame header. Place an additional track-to-track stud 6 inches from double jamb studs on both sides of framed openings.

D. At curved surfaces, space studs and framing members 8 inches on center maximum.

3.03 CEILING SUSPENSION SYSTEM

A. Suspend carrying channels with 8-gage hanger wires spaced 48 inches on center, within 6 inches of ends.

B. Install carrying channels 48 inches on center and within 6 inches of walls. Provide 1 inch clearance between channel ends and abutting walls, partitions.

C. At splices, interlock flanges, overlap ends 12 inches, and secure with 16-gage double standard tie wire at each end.

D. Erect furring channels at right angles to carrying channels, spaced 24 inches on center and within 6 inches of walls. Provide 1-inch clearance between channel ends and abutting walls, partitions.

E. Secure to carrying channels with clips, or, saddle tie with 16-gage double standard tie wire. At splices nest channels at least 8 inches, securely wire tie at each end.

F. Install additional cross reinforcing to restore lateral stability of suspension system at openings that interrupt carrying or furring channels.

G. Apply wallboard of maximum practical length with long dimension at right angles to furring channels. Position and stagger end joints over channel web. Fit ends and edges closely, but not forced together.

H. Fasten board to channels with 1-inch Type S screws spaced 12 inches on center in field of board, along abutting ends, edges.

3.04 EXPANSION JOINTS

A. At Ceilings: 50'-0" on center each way maximum.

B. At Walls: 30'-0" on center maximum.

C. Provide at intersections with exposed masonry construction.

3.05 SINGLE LAYER/ERECTION

A. Position all ends, edges over framing members, except when edge joints are at right angles to framing members, or when end joints are back-blocked. Apply wallboard horizontally or vertically on walls to minimize the number of joints.

B. Attach wallboard to metal framing supports by power driven screws. For vertical application space screws 12 inches on center in field of board, 8 inches on center staggered along vertical abutting edges. For horizontal application space screws 12 inches on center in field, along abutting end joints.

3.06 MULTI-LAYER WALLBOARD ERECTION

A. Base Layer: Erected as specified for "Single Layer Erection".

B. Joints in face layer to fall at least 10 inches from parallel joints in base layer.

C. Apply face layers with adhesive in accordance with wallboard manufacturer's printed instructions. Provide sufficient number and spacing of fasteners to hold top layer tight with bottom layer until adhesive dries.

3.07 JOINT TREATMENT APPLICATION

A. Mix joint compound in accordance with manufacturer's recommendations.

B. Apply compound in thin uniform layer to all joints, angles to be reinforced. Apply reinforcing tape centered over joint, seated into compound. Follow immediately with thin skim coat or embed tape. Fold and embed tape in interior angles to provide true angle.

C. When embedding coat is thoroughly dry, apply second coat of compound, filling board taper flush with surface. Cover tape, feather out slightly beyond tape.

D. On joints with no taper, cover tape, feather out at least 4 inches on either side of tape.

E. No second coat is required on interior angles.

F. When second coat is thoroughly dry, spread finish coat evenly over and extend slightly beyond second coat. Feather to a smooth, uniform finish.

G. Over taped edges, do not allow finish coat to protrude beyond plane of surface. Apply finish coat to cover tape, taping compound at taped angles to provide true angle. When necessary, sand between coats and follow with final coat to provide smooth surface ready for decoration.

H. Do not abrade adjacent face-paper surfaces.

I. Gypsum substrate where located behind dry erase wallcoverings must meet level 4 requirements: All joints and interior angles have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free from tool marks and ridges.

3.08 FINISHING FASTENERS

A. Apply compound to fastener depressions. Follow with minimum of two additional coats leaving depressions level with surface.

B. Do not abrade adjacent face-paper surfaces.

3.09 FINISHING BEAD AND TRIM

A. Apply first coat to beads, trim. Properly feather out from ground to plane of surface. Embed flanges of corner reinforcement with compound.

B. When embedding coat is thoroughly dry, apply second coat in same manner as first-coat, extending compound slightly beyond onto face of board.

C. When second coat is thoroughly dry, apply finish coat extending compound slightly beyond second coat, properly feathering from ground to plane of surface. Sand finish coat as necessary to provide a level 4 flat smooth surface, ready for decoration. See specification section 09 72 00, Wall Coverings and provide surface required by manufacturer’s recommendation.

D. Do not abrade adjacent face-paper surfaces.

3.010 ACOUSTIC SEALANT

A. Apply sealant at intersections of wallboard and adjacent materials to form a complete seal to air and noise.

3.011 TEXTURE FINISH

A. Apply texture finish in accord with manufacturer's printed instructions.

B. Provide uniform texture over entire surface.

3.012 ADJUST AND CLEAN

A. Ridging
   1. Sand ridges to reinforcing tape without cutting through tape.
   2. Fill concave areas on both sides of ridge with topping compound.
   3. After fill is dry, blend in topping compound over repaired area.

B. Fill cracks with compound and finish smooth and flush.

END OF SECTION 09 29 00

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division One of this Project Manual apply to this Section as though repeated herein.

1.02 WORK INCLUDED

A. Modification and reinstallation of Salvaged Acoustical Ceiling Tile.

B. Suspension Systems.

1.03 RELATED WORK

A. Fire Suppression: Division 21.

B. Heating, Ventilating and Air Conditioning: Division 23.

C. Electrical: Division 26.

1.04 SUBMITTALS

A. Submit in accord with the General Conditions of the Contract.
1. Manufacturer's product specifications for suspension system required to match existing.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unopened, protective packaging, with manufacturer's labels indicating brand name, pattern, size and thickness as applicable, legible and intact.

B. Store materials in original protective packaging to prevent soiling, physical damage or wetting.

1.06 PROJECT CONDITIONS

A. Do not install interior acoustical ceilings until space is enclosed and weatherproof. Complete installation of damp materials before beginning work.

B. Maintain humidity of 65 - 75 percent in areas where acoustical materials are to be installed 24 hours before, during, and after installation.

C. Maintain a uniform temperature in the range of 55 to 70 degrees F. prior to and during installation of materials.

1.07 EXTRA MATERIALS

A. Not required.

PART 2 - PRODUCTS

2.01 BOARD TYPE 1

A. Modify and reinstall existing salvaged 2”x4” ceiling tile, square edge.

2.03 INTERMEDIATE DUTY SUSPENSION SYSTEM TYPE 1

A. Armstrong, “Prelude ML, 15/16" Exposed Tee”.
   1. Material: Hot-dipped, galvanized steel.
   2. Surface Finish: Baked polyester paint.

B. Or approved equal by Chicago Metallic, National Rolling Mills, Donn/USG.

E. Conform to all requirements of ASTM C-635 intermediate structural classification.

F. Provide flat white finish, 15/16” face.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine surfaces scheduled to receive suspended or directly attached acoustical units for unevenness, irregularities, and dampness that would affect quality and execution of work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Do not begin installation until sufficient materials to complete a room are received.

B. Install materials in accordance with manufacturer's printed instructions, governing regulations, fire resistance rating requirements, and industry standards applicable to work.

C. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

D. Symmetrically locate grid layout in each space. Coordinate work with other trades so that lighting fixtures, grilles, and other ceiling fixtures work with grid layout.

E. Do not use universal splices or other splices which would obstruct passage of recessed lighting fixtures through grid openings or limit fixture relocation upon flanges of ceiling grids.

F. Support suspension system from structure above, not from ductwork, metal deck, equipment or piping.

G. Space hangers not more than 6 inches from ends and not more than 4 feet on center.

H. Install edge moldings at the perimeter of each acoustical ceiling area and at locations where edge of units would otherwise be exposed.
   1. Secure moldings to building construction by fastening with screw anchors into the substrate, through holes drilled in vertical leg. Space holes not more than 3 inches from each end and not more than 16 inches on center along each molding.
   2. Level moldings with ceiling suspension system, to a level tolerance of 1/8 inch in 12 feet.
   3. Miter corners of moldings accurately to provide hairline joints, securely connected to prevent dislocation. Cope exposed flanges of intersecting suspension system members, so that flange faces will be flush.

4. Furnish additional tees for supporting grilles, diffusers and light fixtures. Refer to the reflected ceiling, HVAC and electrical plans for locations.

I. Arrange acoustical units and orient directionally-patterned units, if any, in manner shown on reflected ceiling plans.

3.03 CLEANING

A. Clean exposed surfaces of acoustical ceilings, trim, edge moldings, and suspension members to comply with manufacturer's instructions for cleaning and touch-up of minor finish damage.

B. Remove work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.04 PROTECTION

A. Provide required protection for the acoustical ceilings, including temperature, humidity limitations and dust control so that the work will be without damage and deterioration at the time of acceptance by the Owner.

END OF SECTION 09 51 00

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SECTION 09 65 00

RESILIENT FLOORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division One of this Project Manual apply to this Section as though repeated herein.

1.02 WORK INCLUDED

A. Resilient Base.

B. Installation of floor patch flush with finished floor where existing concrete or existing terrazzo are damaged by demolition. Refer to drawings for scope of demolition.

1.03 RELATED WORK

A. Selective Structure Demolition: Section 02 41 19.

1.04 QUALITY ASSURANCE

A. Provide each type of resilient flooring and accessories from a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.

B. Installers Qualifications: Installer experienced (minimum of 2 years) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to the product manufacturer.

C. Materials: For each type of material required for the work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturer of the primary materials.
   1. Comply with applicable regulations regarding VOC (volatile organic compound) content of adhesives.

1.05 SUBMITTALS

A. Submit in accordance with the General Conditions of the Contract.
   1. Manufacturer's technical data for each type of resilient flooring and accessory.
      a. Data indicating adhesive and accessories meet VOC requirements.
   2. Manufacturer's standard color charts in form of actual sections of resilient flooring, including accessories, showing full range of colors and patterns available, for each type of resilient flooring required.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in manufacturer's original, unopened containers with labels indicating brand names, colors and patterns, and quality designations legible and intact.

B. Store and protect materials in accordance with manufacturer's recommendations.

1.07 PROJECT CONDITIONS

A. Maintain minimum temperature of 65 degrees F and maximum temperature of 90 degrees F in spaces to receive resilient flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Subsequently, maintain minimum temperature of 55 degrees F in areas where work is completed.

B. Store resilient flooring materials in spaces where they will be installed for at least 48 hours before beginning installation.

C. Install resilient flooring and accessories after other finishing operations, including painting, have been completed.

D. Close areas to traffic and to other work until flooring is firmly set.

E. Where solvent based adhesives are used, provide safety sparkproof fans when natural ventilation is not adequate.

1.08 WARRANTY

A. Provide current, detailed manufacturer's warranty for each flooring product as applicable including limited wear, defect and conductivity.

B. Provide manufacturer's standard one-year warranty against defects in manufacturing and workmanship of resilient flooring products. Provide manufacturer's standard limited wear warranty/conductivity warranty as specified under each product as applicable.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Low-Emitting Materials, Adhesives, and Sealants: Materials used on the interior of the building (defined as inside the weatherproofing system and applied on site) must not exceed the following requirements.
   1. Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management (SCAQMD) Rule # 1168, requirements in effect on July 1, 2005, and rule amendment date January 7, 2005.
   2. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36, requirements in effect on October 19, 2000.

PART 2 - PRODUCTS

2.01 RESILIENT WALL BASE

A. General: Rubber, cove base, top set, roll stock.
   1. Height: 4".
   2. Color RB-1: To be selected by architect from manufacturer's full range.

B. Manufacturers: Armstrong (colors to be selected from manufacturers' full range) or approved equal by:
   1. Flexco.
   2. Freudenberg Building Systems, Nora.
   3. Johnsonite.
   4. Roppe.

2.02 ACCESSORIES

A. Adhesive for Wall Base: W.W. Henry "595 Cove Base Adhesive", zero-VOCs; W.F. Taylor "2035 Cove Base Adhesive" or "2040 Premium Cove Base Adhesive", GreenGuard certified; PL Adhesives & Sealants "Cove Base Adhesive"; Bostik Findley, Durabond "D-740 Multipurpose Wall Adhesive".

1. Low-VOC type: VOC content less than 100 g/l.

B. Patching, Leveling, Underlayments: The leveling materials must be portland cement based and provide a minimum 3,500 PSI compressive strength (ASTM C 109) and sufficient bond to existing subfloor surface. Installer to review existing flooring types and provide compatible product.
   1. Ardex, Laticrete, Duralox, Mapei, or equivalent, approved by flooring manufacturer.
   2. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation as recommended by flooring manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. The subfloor must be prepped to meet meets the requirements as described in the manufacturer's installation instructions.

B. A clean non-burnished concrete surface free from any paint, wax, oil, grease, and film forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds is required. The surface should not have any alkaline salts, laitance, mold, mildew, residual adhesive, chemical adhesive removers or anything that may prevent appropriate products bonding to it. If not then the general contractor should provide the mechanical means to remove them. This could be dustless diamond grinding (DiamaBrush), bead-blast or similar with a suitable HEPA vacuum attachment. Review and comply with all relevant local, state and federal regulations.

C. Clean out and fill or repair any dormant saw cuts and cracks with an appropriate product following the manufacturers written usage instructions. For any expansion (moving) joints, use an industry standard expansion joint assembly.

D. When required, use a leveler following the manufacturers written instructions. The surface should be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives, and other extraneous materials that may interfere with the bond. These should be completely removed by mechanical means only. Dustless diamond grinding or bead blasting are the preferred method to remove contaminates and bond breakers, as it also helps to level the concrete.

3.02 PREPARATION

A. Sand or grind subfloors to remove mortar, paint, other surface irregularities.

B. Where filling, patching, leveling is required of thickness exceeding 1/8-inch apply latex type underlayment in two or more applications. Apply compound in accordance with manufacturer's printed instructions.

C. Remove all debris, sand, and other materials which would result in lack of adhesion and/or star cracking.

3.03 WALL BASE INSTALLATION

A. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required.

B. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Cut no shorter than full wall length. Install to next inside finished corner.

C. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
   1. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
   2. Adhesive shall cover a minimum of 90 percent of ribbed back of base.
   3. Leave 1/4 inch uncovered space at top edge of base to prevent oozing.
   4. Roll base firmly, roll back toward starting point.

3.04 CLEANING

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
B. Perform the following operations immediately after completing resilient product installation:
   a. Remove adhesive and other blemishes from exposed surfaces.
   b. Sweep and vacuum surfaces thoroughly.
   c. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

3.05 PROTECTION

A. Protect flooring against damage during construction period to comply with resilient flooring manufacturer's directions.

END OF SECTION 09 65 00

SECTION 09 90 00

PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division One of this Project Manual apply to this Section as though repeated herein.

1.02 WORK INCLUDED

A. Painting and finishing of interior exposed items and surfaces throughout Project.

B. Refinishing as indicated on Drawings, including removal of paint and finishes, preparation, painting and finishing.

C. Field painting of exposed bare and covered pipes and ducts and hangers, conduits, uni-strut, exposed steel and iron work, all metal fabricated Section 05 50 00 items, and primed metal surfaces including but not limited to, hollow metal work, equipment installed under mechanical and electrical work.

D. "Paint" as used herein means all coating systems materials including primers, emulsions, enamels, stains, sealers and fillers, and other applied material whether used as prime, intermediate or finish coats.

E. Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces. Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas.

F. Following categories are not included as part of field-applied finish work.
   1. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer-finishing is specified.
   2. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces in concealed areas and generally inaccessible areas.
   3. Finished Metal Surfaces.
   4. Operating Parts.

1.03 RELATED WORK

A. Section 09 65 00, Resilient Floor for repair of existing floor to provide flush finished surface where damaged by demolition.

B. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work and similar items.

C. Examine the Contract Documents and be familiar with all their provisions regarding painting. All surfaces that are left unfinished by the requirements of other Sections shall be painted or finished as part of this Section.

1.04 SUBMITTALS

A. Submit in accordance with the General Conditions of the Contract:
   1. Paint: Submit a list of specified products with corresponding name of manufacturer, identifying name and number of proposed products along with manufacturer's written instructions for use of each product.

2. If manufacturer to be used is different from that of color chips furnished, prepare and submit two approximately 6 inch square, properly labeled samples of each color and sheen required on properly prepared paint-out cards or hardboard.

3. Prepare and repaint an area of each designated interior surface to requirements specified herein, with specified paint or coating showing selected color, gloss/sheen, texture and workmanship to MPI Repainting Manual standards for review and approval by Owner and A/E. When approved, interior surface shall become acceptable standard of finish quality and workmanship for similar on-site repainting work.

1.05 QUALITY ASSURANCE

A. Master Painters Institute (MPI) Standards:
1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."

2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.
a. For areas to be renovated, comply with requirements in "MPI Maintenance Repainting Manual".

1.06 DELIVERY, STORAGE AND HANDLING

A. Do not deliver materials to site until having received all written approvals of submitted information and samples.

B. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label.

C. Store materials not in actual use in tightly covered containers.

D. Take all precautions to ensure that workers and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

E. Remove rags and waste from storage areas daily.

1.07 PROJECT CONDITIONS

A. Apply water-base paints only when temperatures of surfaces to be painted and surrounding air temperatures are between 50 and 95 degrees F.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F. and 95 degrees F.

C. Do not apply paint when relative humidity exceeds 85%; at temperatures less than 5 degrees F. above the dew point; or to damp or wet surfaces.

1.08 SEQUENCING AND SCHEDULING

A. Schedule cleaning and painting so that contaminants from cleaning process will not fall onto newly-painted surfaces.

1.09 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. of each material and color applied.

1.010 ENVIRONMENTAL REQUIREMENTS

A. Low-Emitting Materials, Field applied Paints and Coatings: Interior paints and coatings applied on-site must meet the limitations and restrictions concerning chemical components set by the following standards:
1. Topcoat Paints, Green Seal Standard GS-11, Paints: First Edition, May 20, 1993.
2. Anti-Corrosive and Anti-Rust Paints: Green Seal Standard GS-03, Anti-Corrosive Paints", Second Edition, January 7, 1997. For applications on ferrous metal substrates.
3. "All Other Architectural Coatings, Primers and Undercoats: South Coast Air Quality Management District (SCAQMD) Rule #1113, Architectural Coatings", rules in effect on January 1, 2004.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. AFM Safecoat.

B. Benjamin Moore & Co.

C. Cabot.

D. ICI/Dulux.

E. PPG Architectural Finishes, Inc.

F. Sherwin Williams Company.

G. U-C Coatings Corp.

H. Target Coatings

I. Diamond Vogel Paint

J. Or approved equal.

2.02 MATERIALS

A. Use the materials of the same manufacturer for each system.

B. Sherwin Williams systems are called out in the system schedules to establish quality and dry mil thickness of finished installation for all systems. A different manufacturer may be used for color selection. Any manufacturer noted above may be used as long as quality and color requirements are met.

1. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.

C. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers.

D. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

E. Chemical Components of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:

1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
2. Non-flat Paints and Coatings: VOC content of not more than 150 g/L.
3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
4. Restricted Components: Paints and coatings shall not contain any of the following:

a. Acrolein.
b. Acrylonitrile.
c. Antimony.
d. Benzene.
e. Butyl benzyl phthalate.
f. Cadmium.
g. Di (2-ethylhexyl) phthalate.
h. Di-n-butyl phthalate.
i. Di-n-octyl phthalate.
j. 1,2-dichlorobenzene.
k. Diethyl phthalate.
l. Dimethyl phthalate.
m. Ethylbenzene.
n. Formaldehyde.
o. Hexavalent chromium.
p. Isophorone.
q. Lead.
r. Mercury.
s. Methyl ethyl ketone.
t. Methyl isobutyl ketone.
u. Methylene chloride.
v. Naphthalene.
w. Toluene (methylbenzene).
x. 1,1,1-trichloroethane.
y. Vinyl chloride.

F. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

2.03 PRIMERS/SEALERS

A. Interior Latex Primer/Sealer: MPI #50.

2.04 METAL PRIMERS

A. Rust-Inhibitive Primer (Water Based): MPI #107.

2.05 LATEX PAINTS

A. Institutional Low-Odor/VOC Latex (Flat): MPI #143 (Gloss Level 1).

B. Institutional Low-Odor/VOC Latex (Low Sheen): MPI #144 (Gloss Level 2).

C. Institutional Low-Odor/VOC Latex (Eggshell): MPI #145 (Gloss Level 3).

D. Institutional Low-Odor/VOC Latex (Semigloss): MPI #147 (Gloss Level 5).

2.06 EQUIPMENT

A. Provide all brushes, rollers, ladders, scaffolding, and other equipment of any kind to properly execute each type of work.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
   1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.02 PREPARATION

A. Perform preparation and cleaning procedures in accord with paint manufacturer's instructions and as specified for each particular substrate condition.
   1. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations.
      a. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
      b. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   2. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning.
   3. Remove dirt, rust, scale, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

B. Gypsum Board: Fill minor irregularities with patching material and sand to smooth level surfaces taking care not to raise nap of paper.

C. Existing Ferrous Metal

1. Spot remove failed, damaged or rough existing paint to bare metal by means of stripping as indicated above. If existing metal surface is not smooth, sand or wire brush.
   a. Sand edges of existing paint to a feather edge.
2. Remove dirt and grease with mineral spirits or solvent recommended by paint manufacturer and clean cloths.

D. Ferrous Metal

1. Remove dirt and grease with mineral spirits or solvent recommended by paint manufacturer and clean cloths.
2. Where not galvanized, shop coat of primer will exist on surface. If prime coat is not smooth, sand to bare metal and re-prime.

3.03 APPLICATION

A. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases.

B. Do work under adequate illumination and dust-free conditions.

C. Apply paints according to manufacturer's written instructions.
1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

D. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

E. Materials
1. Do not open containers until required for use.
2. Stir materials thoroughly and keep at uniform consistency during application.

F. Coats
1. Number specified is minimum.
2. Touch up suction spots between coats.
3. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
4. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
5. Refinish surfaces affected by refitting work.

3.04 COLOR SEPARATION

A. An average of one or two wall colors will be used per room. Ceilings generally will be a different color than walls. Finished closets will usually be same as adjoining rooms.

B. Job painted metal items such as diffusers, grilles and registers will generally be same color as adjacent surface.

C. Hardwood generally will be the same color stain throughout.

3.05 CLEANING

A. During the progress of this work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.

B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.06 PROTECTION

A. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct damage by cleaning, repairing or replacing.

B. Provide "wet paint" signs to protect newly-painted finishes. Remove temporary protective wrappings, after completion of painting operations.

C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

3.07 SCHEDULE OF INTERIOR WORK

A. In addition to obvious surfaces, the following do not require painting or finishing.
   1. Do not include painting when factory-finishing or installer-finishing is specified for such items as (but not limited to) acoustic materials, finished mechanical and electrical equipment including light fixtures and distribution cabinets.
   2. Painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
   3. Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise indicated.
   4. Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting, unless otherwise indicated.
   5. Do not paint over any code-required labels, such as Underwriter's Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plate.
   6. N/A indicates system not applicable to this Project.

B. Walls and Ceilings
   1. Paint all rooms. Paint patched walls from 90 degree corner and patched ceilings complete.
   2. Do not apply next coat until previous is thoroughly dry.
   3. Provide final coat which is solid and even in color, free from runs, laps, sags, brush marks, air bubbles and excessive roller stipple and worked into crevices, joints and similar areas.

C. Electrical Panel Box Covers and Doors
   1. Remove, paint and reinstall after paint is dry.

D. Other Unfinished and Primed Surfaces

   1. Provide specified finish on exposed surfaces. This includes prime coated mechanical units, piping, pipe covering, conduit, and interior duct surfaces visible behind grilles.

E. Material Type Number and Type of Coating

1.	IPS 4 – Wood	Water based Stain, satin	One coat “Wood Classics 250”; Two coats “Target Coatings 9000 Series ‘Clear Coat’ Polyurethane Ultra-Low VOC”; custom colors to match existing.
2.	IPS 5 – Plaster	Latex-Flat Eggshell	Primer”, One coat primer, “PrepRite Interior Masonry Two top coats, “Harmony Interior Latex Eggshell”.
3.	IPS 7 - Gypsum Board	Latex-Eggshell Zero-VOC	One coat "Harmony Interior Latex Primer", Two coats "Harmony Interior Latex Eggshell".
4.	IPS 13 - Ferrous Metal Metal (Unprimed)	Latex -Semi-gloss	One coat "Pro-Cryl Universal Primer", two coats "ProClassic Waterborne”.
5.	IPS 14 - Ferrous Metal (Primed)	Latex -Semi-gloss	One coat “Pro-Cryl Universal Primer”, two coats “ProClassic Waterborne ".
6.	IPS 16 - Galvanized (Finished Rooms Only)	Latex-Flat	One coat "DTM Acrylic Primer Finish”, two coats "ProMar 200 Interior Latex Flat".
7.	IPS 17 – Concrete Floor	Epoxy	Two coats “Armorseal Tread-Plex”

F. Color Schedule

Confirm all color selections and facility standard colors prior to submitting draw downs.

END OF SECTION 09 90 00

SECTION 10 14 00

INFORMATION SPECIALTIES

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division One of this Project Manual apply to this Section as though repeated herein.

1.02 WORK INCLUDED

A. Pressure Sensitive Graphic Window Films.

1.03 SUBMITTALS

A. Submit in accordance with the General Conditions of the Contract.
   1. Manufacturer's Literature: Materials description, colors, and application instructions.

1.04 DELIVERY, STORAGE AND HANDLING

A. Handle and store to prevent damage and soiling.

PART 2: PRODUCTS

2.01 PRESSURE SENSITIVE GRAPHIC WINDOW FILMS

A. Vinyl glass film, 50 micron
   1. Basis of Design: 3M 7725-314 Dusted Crystal
   2. Color and pattern to be selected by A/E
   3. Clear release liner.
   4. Pressure sensitive adhesive.
   5. To give appearance of etched glass as chosen by A/E. Application locations as indicated on drawings.

B. Manufacturers.
   1. Metamark Signviny
   2. 3M
   3. Or approved equal.

PART 3: EXECUTION

3.01 INSTALLATION

A. Comply with manufacturer's specifications and recommendations for the installation.

3.02 CLEANING

A. Clean surfaces of identifying devices, dedication plaque and surrounding surfaces.

END OF SECTION 10 14 00

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SECTION 10 28 00

TOILET, BATH AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Applicable provisions of Division 1 shall govern the work under this section.

1.02 WORK INCLUDED

A. Commercial Toilet and Bath Accessories

1.03 REFERENCES

A. All work of this section shall be in strict accord with Wisconsin Enrolled Commercial Building Code.

1.04 SUBMITTALS

A. Submit in accordance with the General Conditions of the Contract.
   1. Manufacturer's product data.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packaging with seals unbroken and bearing manufacturer's name and product.

B. Store all materials in secure place to prevent damage.

C. Remove all damaged materials from project immediately.

1.06 SUSTAINABLE DESIGN REQUIREMENTS

A. Low-Emitting Materials, Adhesives, and Sealants: Materials used on the interior of the building (defined as inside the weatherproofing system and applied on site) must not exceed the following requirements.
   1. Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management (SCAQMD) Rule # 1168, requirements in effect on July 1, 2005, and rule amendment date January 7, 2005.
   2. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36, requirements in effect on October 19, 2000.

PART 2 - PRODUCTS

2.01 MANUFACTURED COMMERCIAL UNITS

A. Grab Bars:
   1. Bradley Model 812
      1. Or approved equal
   2. 1-1/2” diameter, 18 gauge, type 304 stainless steel
   3. Concealed-mounting
   4. Lengths as indicated on drawings

END OF SECTION

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SECTION 23 05 00
COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

SCOPE

This section includes information common to 2 or more technical Specification Sections or items of a general nature, not conveniently fitting into other technical Sections. Included are the following requirements:

PART 1- GENERAL
- Scope
- Related Work
- Reference Standards
- Quality Assurance
- Abbreviations
- Definitions
- Drawings
- Electronic Drawings
- Codes and Standards
- Protection of Finished Surfaces
- Owner Furnished Equipment
- Provisions for Future
- Submittals
- Specified Materials and Equipment
- Equipment Installation
- Off Site Storage
- Certificates and Inspections
- Operating and Maintenance Instructions
- Training of Owner Personnel
- Record Drawings
- Project Closeout
- Warranty

PART 2- PRODUCTS
- Access Panels
- Sealing and Fire Stopping

PART 3 - EXECUTION
- Concrete Work
- Cutting and Patching
- Painting
- Building Access
- Equipment Access
- Coordination of Work
- Pipe Penetrations
- Cleaning
- Identification
- Lubrication
- Project Closeout

Division 23 work as specified shall be provided by HVAC Contractor unless otherwise specified on Bid Form.

RELATED WORK

Applicable provisions of Division 01 govern work under this Section.

Section 07 84 00 – Fire Stopping
Section 23 05 13 – Common Motor Requirements for HVAC Equipment
Section 23 33 00 – Air Duct Accessories
Section 23 05 93 – Testing, Adjusting and Balancing for HVAC

REFERENCE STANDARDS

Abbreviations of standards organizations referenced in other Sections are as follows:

AABC	Associated Air Balance Council
ADC	Air Diffusion Council
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
EPA	Environmental Protection Agency
IEEE	Institute of Electrical and Electronics Engineers
ISA	Instrument Society of America
MCA	Mechanical Contractors Association
MICA	Midwest Insulation Contractors Association
MSS	Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
NBS	National Bureau of Standards
NEBB	National Environmental Balancing Bureau
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association. Inc.
ASTM E814	Standard Test Method for Fire Tests of Through-Penetration Fire Stops
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
UL1479	Fire Tests of Through-Penetration Firestops
UL723	Surface Burning Characteristics of Building Materials

QUALITY ASSURANCE

Substitution of Materials: Refer to Division 01 and the General Conditions of the Contract

Contractor shall review his own work for compliance with Construction Documents. Prior to punch list activity by A/E, contractor shall provide documentation to A/E that a review has taken place and shall issue a letter indicating that Work has been performed in compliance with Construction Documents. In the event Contractor does not satisfactorily review his own work and results in additional site visits by A/E, Contractor shall reimburse A/E for additional time required to close out Project.

ABBREVIATIONS

A/E	Architect/Engineer
GC	General Contractor
PC	Plumbing Contractor
HC	Heating Contractor
EC	Electrical Contractor
TCS	Temperature Control System

DEFINITIONS

Furnish:

Supply and deliver to Project site ready for unpacking, assembly and installation

Install:

Operations at Site including unpacking, assembling, erecting, placing, anchoring, applying, finishing, cleaning, and connecting related devices required for product fully functional for intended use after installation.

Provide:

Furnish and install, such that product is fully functional for intended use.

DRAWINGS

Drawings show general arrangement of piping, equipment and appurtenances and shall be followed as closely as actual building construction and work of other trades permits. Work shall conform to requirements shown on Drawings. General and structural drawings shall take precedence. Because of the scale of Drawings, it is not possible to indicate all offsets, fittings and accessories required. Investigate structural and finish conditions affecting work and arrange work accordingly, providing offsets, fittings and accessories required to meet constructed conditions.

HVAC equipment and systems, including piping and ductwork shall be installed as high as possible unless otherwise noted on Drawings. Equipment and systems shall also be installed to maintain required operation and maintenance clearances.

ELECTRONIC DRAWINGS

Drawings in electronic format will be made available to successful HVAC contractor at a non-refundable cost specified under Division 01 of Specifications. Drawings provided may or may not be updated to reflect Addenda items. Use of Drawings is limited to this Project and may not be forwarded to any other party for any purpose. Use of files will be at Contractor's sole risk and without liability or legal exposure to JDR Engineering, Inc or its employees. Architectural drawings or any other drawings not produced by JDR Engineering will not be provided.

Drawings in electronic format will not be made available to successful contractor for this project.

CODES AND STANDARDS

Materials and workmanship shall comply with applicable codes, specifications, local ordinances, industry standards and utility company regulations. In case of differences between building codes, specifications, state laws, local ordinances, industry standards and utility company regulations and contract documents, the most stringent shall govern. Promptly notify A/E in writing of differences.

Non-Compliance:

If Contractor installs materials or performs Work that does not comply with above requirements, he shall correct Work and shall bear costs arising from correcting deficiencies.

PROTECTION OF FINISHED SURFACES

Refer to Division 01 of the Project Manual.

Furnish 1 can of touch-up paint for each different color factory finish to be finished surface of product. Deliver touch-up paint with other "loose and detachable parts" as covered in General Requirements.

OWNER FURNISHED EQUIPMENT

None.

PROVISIONS FOR FUTURE

None.

SUBMITTALS

Refer to Division 01 and General Conditions of the Contract.

Shop Drawings are to be reviewed by lead contractor and HVAC contractor before submission to A/E. Submittals shall be stamped by contractor and clearly indicate corrections made by contractor during review process. Submittals not reviewed and stamped by contractor will be automatically rejected.

Submit for equipment and systems specified in respective specification sections, marking each submittal with specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and number, as identified in Contract Documents. Include plan designation mark (i.e. "AHU-1") on submittals. Include dimensions, capacities, ratings, and installation instructions.

Before submitting electrically powered equipment, verify electrical power and control requirements for equipment are in agreement with motor schedule on HVAC and electrical drawings. Include statement on Shop Drawing transmittal to Architect/Engineer if equipment submitted and motor schedules are not in agreement, indicating discrepancies. See related comments in Section 23 05 13, Part 1 under Electrical Coordination.

Include wiring diagrams of electrically powered equipment.

Firestop Systems:
Contractor shall submit product data for each firestop system. Submittals shall include product characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for each method of installation applicable to this project. For non-standard conditions where no UL tested system exists, submit manufacturer's drawings for UL system with known performance for which an engineering judgement can be based upon.

Submit manufacturer's color charts where finish color is specified to be selected by Architect/Engineer.

Submit quantity of Shop Drawings specified under Division 01 Specification Section titled “Submittals.”

Submittals shall be legible, clear and complete. Shop Drawings submitted incomplete, illegible or not specific to Project will be returned as “not reviewed”. In addition, equipment installed without having approved Shop Drawings will be considered defective and shall be removed and replaced with approved equipment at no expense to Project.
Submit electronic (Adobe PDF) copies of all submittals for review by A/E, Architect, Owner, Owners Representative and Building Operator.

SPECIFIED MATERIALS AND EQUIPMENT

Design is based on equipment specified by manufacturer and model number as specified on Drawing schedules. Where certain items are specified by manufacturer or trade name, Contractor's bid shall be based on use of named item. Where one (1) manufacturer/model is described and other makes are listed, comparable models of other named equipment may also be used, provided they meet requirements of Specifications.

When equipment or accessories used differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those on Drawing schedules, Contractor shall be responsible for costs involved in integrating equipment or accessories into system. Contractor shall be responsible for obtaining original design performance from system into which items are placed, regardless of whether manufacturer/model is specified equivalent or substitute. This may include changes found necessary during testing, adjusting, and balancing phase of Project.

If Contractor wishes to use items other than those named in Specifications in base bid, request for approval of substitution must be made in writing to A/E at least 14 days prior to opening of bids. Include complete technical and descriptive data with request. If approved, an Addendum will be issued notifying bidders of approval. Request for approval will be considered only if requested by prime bidding Contractor.

EQUIPMENT INSTALLATION

Drawings show general arrangement and location of equipment and appurtenances. It is Contractor's responsibility to install equipment in a location and manner that allows for proper service and maintenance access to equipment. Work shall generally conform to requirements shown on Drawings. However, location of equipment may require field adjustments to obtain required service space. DO NOT SCALE OFF PLANS to determine proper location of equipment. Because of scale of Drawings, it is not possible to indicate exact routing of ductwork and piping, and offsets, fittings and accessories required to provide proper service access to equipment. Contractor shall route and install ductwork and piping to provide required service access to equipment.

If, during construction phase of Project, contractor feels inadequate space exists, or equipment locations must be substantially modified to provide proper service and maintenance access, prior to installing equipment, contractor shall notify engineer in writing, outlining general concerns and proposed modifications. Equipment installed without providing manufacturer's required maintenance and service clearance shall be considered defective. Contractor shall remove and relocate piping, ductwork and equipment, to provide required service clearances at contractor's expense.

OFF SITE STORAGE

Refer to Division 01 of the Project Manual.

CERTIFICATES AND INSPECTIONS

Refer to Division 01 of the Project Manual.

Obtain and pay for required Federal, State and local installation inspections, certificates and permits required, except those provided by Architect/Engineer in accordance with State and local Codes. Deliver originals of certificates to Architect or Construction Manager.

OPERATING AND MAINTENANCE INSTRUCTIONS

Refer to Division 01 of the Project Manual.

Provide HVAC systems and equipment operation and maintenance manuals in accordance with requirements of Project Specifications.

In addition to the general content specified under GENERAL REQUIREMENTS, supply the following additional documentation:

- Copies of all approved shop drawings.
- Manufacturer's instructions for installation, operation, and maintenance.
- Manufacturer's wiring diagrams for electrically powered equipment.
- Records of tests performed to indicate compliance with system requirements (system start-up reports).
- Parts lists for manufactured equipment.

- Lubrication instructions, including list/frequency of lubrication done during construction.
- Warranties.
- Additional information as required in technical specification sections.
- Record drawings.

Provide three (3) hard copies of the Operation and Maintenance Manual. Manuals shall be organized in three ring binders with dividers and reference tabs. Manuals shall be delivered as follows:

- One copy to Public Works.
- One copy to the site.
- One additional copy.

Provide three (3) electronic (Adobe PDF) copies of the Operation and Maintenance Manual.

- Provide a copy on a separate portable USB flash drive.
- Deliver each portable USB drive with hardcopy manuals to parties listed above.

TRAINING OF OWNER PERSONNEL

Instruct Owner's personnel in proper operation and maintenance of systems and equipment provided as part of Project, using Operating and Maintenance manuals during instruction. Demonstrate startup and shutdown procedures for equipment. Training shall be during normal working hours.

Provide a total of 4 hours of training (minimum). Coordinate with Owner at least 2 weeks prior to scheduling training systems.

RECORD DRAWINGS

Refer also to Division 01 of the Project Manual.

Maintain accurate as-built or record drawings throughout the duration of the project. As-built drawings shall be available on site at all times for review by the A/E or owner.

If, during project closeout, the A/E or owner observes installations that are not accurately recorded on the as-built or record drawings, the record drawings will not be accepted and the contractor will be required, at their own expense, to provide updated and accurate record drawings.

Maintain temperature control record drawings on originals prepared by installing contractor/subcontractor. Include copies of record drawings with Operating and Maintenance manuals.

PROJECT CLOSEOUT

Refer to Division 01 of Project Manual.

The Contractor shall complete and provide items and materials, training and start-up associated with project closeout as specified under Division 1 of the Project Manual. In addition to these items, the Contractor shall provide the following items prior to acceptance of the installation as specified in accordance with with 2009 IMC 403.7 and 2009 IECC 503.2.9.1 through 503.2.9.3:

- Submission of Operating and Maintenance instructions in accordance with the requirements of Division 1, this Section, and code. Operation and Maintenance Manuals shall include a copy of completed testing, adjusting and balancing report for Owner's records.

- Submission of start-up report for each system, signed by technician in responsible charge of control system, indicating system has been adjusted, calibrated and put into operation in accordance with requirements of this project and applicable local and state codes.

WARRANTY

Warrant that work shall function for one year immediately following the acceptance of the system(s). The date of acceptance shall be an agreed upon date by all parties, including Division 23 contractor, General Contractor, Owner, Tenant and A/E.

Keep the system in good working order at no expense, unless defects are clearly the result of improper usage.

Warranty calls shall be at no cost to the owner.

Submit for acceptance of the work, written certification that the entire system has been installed and adjusted for operation in accordance with the Contract Documents.

PART 2 - PRODUCTS

ACCESS PANELS

Provide access panels at locations requiring access to mechanical equipment. Locations include, but are not limited to areas above drywall ceilings, shaft enclosures and other furred-in spaces concealing valves, ducts or equipment. Provide UL listed, fire rated access panels when penetrating fire rated chase or shaft areas.

Access panels shall be of size required to provide adequate access to equipment. Minimum size shall be 12 inch by 12 inch for hand access and 24 inch by 24 inch for body access.

Panels shall be Milcor brand or equivalent.

Panels shall include concealed hinges, cam type locking devices, and have frame/border type necessary for particular wall or ceiling construction they are installed. Access panels shall be flush mounted, recessed frame type units. Access panels shall be prime coated steel, able to accept field painting for general applications and stainless steel for use in toilet rooms, shower rooms and similar wet areas.

Refer to Architectural Room Finish Schedule for wall and ceiling surfaces and finishes.

Panel construction shall utilize 16 gauge frame with not less than 18 gauge hinged door panel. Door locks shall be screwdriver operated for panels in general location applications and shall be key locked for public area applications.

SEALING AND FIRE STOPPING

Piping - Fire, Smoke and Fire/Smoke Rated Surfaces:

3M CP 25N/S or CP 25S/L caulk, 3M FS 195 wrap/strip with restricting collar, 3M CS 195 composite sheet, Pipe Shields Inc. Series F fire barrier kits, Proset Systems fire rated floor and wall penetrations, Insta-Foam Products Insta-Fire Seal Firestop Foam or Dow Corning Fire Stop System.

All fire stopping systems shall be provided by the same manufacturer.

UL listed or tested by independent testing laboratory, approved by State and Local Code jurisdictions. Use product that has a rating not less than rating of wall or floor being penetrated.

Sleeves in concrete to be Schedule 40 steel pipe with integral water stop unless fire stop material used includes a sleeve that is an integral part of rated assembly.

Non-Rated Penetrations:

Pipe Penetrations:
At pipe penetrations of non-rated interior walls, floors and exterior walls above grade, use urethane caulk in annular space between pipe insulation and sleeve. For non-rated drywall, plaster or wood walls where sleeve is not required use urethane caulk in annular space between pipe insulation and wall material.

IDENTIFICATION
Stencils:
Not less than 1 inch high letters/numbers for marking pipe and equipment.

Engraved Name Plates:
White letters on black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting, Setonply ® Style 2060 by Seton Name Plate Company or Emedolite Style EIP by EMED Co., or equal by W. H. Brady.

PART 3 - EXECUTION

CONCRETE WORK
This contractor to provide all cast-in-place concrete pads (both indoor and outdoor).

CUTTING AND PATCHING
Refer to Division 01 requirements.

Contractor shall be responsible for cutting and patching of existing general construction to accommodate installation of new HVAC system(s).

Patching includes repairing openings remaining from removal or relocation of existing system components and painting surface to match existing. Painting means covering entire wall where patching is to be done unless indicated to be done by other trades.

Required cutting and patching shall be performed by personnel skilled in cutting and patching work.

Do not pierce beams or columns without permission of A/E. If piping is required through walls or floors where no sleeve has been provided, use core drill to avoid unnecessary damage and structural weakening.

PAINTING
Refer to Division 09 requirements.

All exposed steel support structures (all metal surfaces located both inside and outside the building) shall be painted after installation with one coat of a compatible metal primer coat and two coats of a finish coat of paint applicable to exterior applications.

BUILDING ACCESS
Arrange for necessary openings in building to allow for admittance of all apparatus. When building access was not previously arranged and must be provided by Contractor, restore opening to original condition after the apparatus has been brought into building. Coordinate with Architect/Engineer.

EQUIPMENT ACCESS

Install piping, conduit, ductwork, and accessories to permit access to equipment for maintenance. Coordinate exact location of wall and ceiling access panels and doors with General Contractor, making sure access is available for equipment and specialties. Where access is required in plaster walls or ceilings, furnish and install access doors required. Coordinate for installation of access doors utilizing General Contractor and other appropriate on-site subcontractor for access door installation.

Accessible ceilings, (i.e. lay-in ceilings) do not require access panels. Provide color coded thumb tacks or screws, depending on surface, for use in accessible ceilings.

COORDINATION OF WORK

Verify devices are compatible for surfaces on which they are used. This includes, but is not limited to, diffusers, registers, grilles, and recessed or semi-recessed heating and cooling terminal units installed in/on architectural surfaces.

Coordinate work with other contractors prior to installation. Installed work not coordinated and that interferes with other contractor's work shall be removed or relocated at installing contractor's expense.

Verify system completion prior to start of testing and balancing. Work to be completed prior to testing and balancing shall include, but not be limited to the following: flushing, pressure testing, chemical treatment, filling of hydronic systems, proper pressurization and air venting of hydronic systems, cleaning and replacement of filters, cleaning of strainers, duct and pipe system cleaning, adjusting and calibration of controls, controls cycled through their sequences. Install dampers, shutoff and balancing valves, flow measuring devices, gauges, temperature controls for fully functional and balanced systems. Demonstrate starting, interlocking and control features of each system so test and balance agency can perform work. Provide appropriate sections of work with required wall, roof and floor opening locations and dimensions. If Contractor neglects to coordinate information, openings shall be the responsibility of Contractor.

PIPE PENETRATIONS

General:

Coordinate location of building surface penetrations with appropriate contractors. Furnish sleeves, inserts, and devices to be built into structure to contractor performing Work. Prepare Shop Drawings for approval for penetrations of structural elements, including floor slabs, shear walls, and bearing walls. Do not allow penetrations to be made until Shop Drawings are approved.

Non-Rated Surfaces:

Install escutcheons or floor/ceiling plates where pipe penetrates non-fire rated surfaces in occupied spaces. Size units to accommodate insulation, where applicable. Escutcheons are not required when insulation completely covers wall opening and insulation end is trimmed in a neat manner. Occupied spaces for this Paragraph include only those rooms with finished ceilings and penetration occurs below ceiling.

In exterior wall openings below grade, place water-stop type wall sleeve before concrete pour or core drill opening after pour. Assemble rubber links to proper size for pipe and tighten in place in accordance with manufacturer's instructions.

Install galvanized sheet metal sleeve in hollow wall penetrations to provide backing for sealant. Apply sealant to both sides of penetration in a manner that annular space between pipe sleeve and pipe or insulation is completely blocked.

Completely seal all pipe penetrations.

CLEANING

Contractor shall, at all times, keep premises free of waste or surplus materials, rubbish and debris caused by his employees or resulting from his work.

After equipment and fixtures have been installed, Contractor shall remove stickers, stains, labels and temporary covers.

Foreign matter shall be removed from pipes, tanks, pumps, fans, motors, devices, switches, fixtures, panels and ductwork before acceptance of systems.

Contractor shall leave his portion of Work in safe and clean condition ready for operation.

In case of dispute, Owner may remove rubbish, excess materials or do cleaning, and charge cost to Contractor.

IDENTIFICATION

Identify equipment in mechanical equipment rooms and above ceilings, including terminal heating devices by stenciling equipment number and service with 1 coat of black enamel against light background or white enamel against dark background. Use primer where necessary for proper paint adhesion. Do not label equipment in occupied spaces (for example cabinet heaters and ceiling fans).

Identification plates on equipment shall be free of excess paint and shall be legible.

Where stenciling is not appropriate for equipment identification, engraved nameplates shall be used.

LUBRICATION

Lubricate bearings with lubricant as recommended by manufacturer before equipment is operated for any reason. Once equipment has been run, maintain lubrication in accordance with manufacturer's instructions until Owner accepts Work. Maintain log of lubricants used and frequency of lubrication. Include information in Operating and Maintenance Manuals at completion of Project.

PROJECT CLOSEOUT

Contractor shall provide the following submittal data prior to final site walk-through review (found on next page). If this closeout work is not completed or is inaccurately completed, the Contractor shall be responsible for the expense of additional site reviews made by A/E.

END OF SECTION

1

PROJECT CLOSEOUT SUBMITTAL DATA REQUIREMENTS			
Project Name:	***Northport IT Upgrade***		
SPECIFICATION SECTION	**CLOSEOUT SUBMITTAL REQUIREMENT**		
23 05 00	• Equipment/System Start-Up Reports		
	• Operation and maintenance manuals		
	• Owner training and instructional walk thru		
	• Inspectors test reports (fire department, HVAC inspection reports and certifications)		
	• Warranty letter		

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SECTION 23 81 25
SPLIT-SYSTEMS

PART 1 - GENERAL

SCOPE

This Section contains specifications for split system heating, ventilating and air conditioning units. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference Standards
- Quality Assurance
- Design Criteria
- Submittals
- Warranty

PART 2 - PRODUCTS
- Manufacturers
- Indoor Unit – Fan Coil
- Outdoor Unit – Air Cooled Compressor Condensing Unit
- Cooling Coil Condensate Piping
- Condensate Pump
- Refrigerant Piping
- Refrigerant Pipe Accessories
- Unit Electrical
- System Controls and Sequence of Operation

PART 3 - EXECUTION
- General
- Indoor Unit – Fan Coil
- Outdoor Unit – Air Cooled Compressor Condensing Unit
- System Controls
- Refrigerant Pipe Sizing
- Refrigerant Pipe Accessories
- Start-up, Verification and Commissioning

RELATED WORK

Applicable provisions of Division 01 govern work under this Section.

Section 23 05 00 – Common Work Results for HVAC
Section 23 05 13 – Common Motor Requirements for HVAC Equipment

REFERENCE STANDARDS

ARI 210/240	Unitary Air Conditioning and Heat Pump Equipment
ARI 365	Commercial and Industrial Unitary Air Conditioning Condensing Units
ASHRAE 15	Safety Standard for Refrigeration Systems
ASHRAE 90.1	(2015 Edition) Energy Standard for Buildings Except Low Rise Residential Buildings
NEC	National Electrical Code
ASTM B117	Standard Practice for Operating Salt Spray (fog) Apparatus
UL	Underwriters Laboratory

QUALITY ASSURANCE

Refer to Division 1, General Conditions, Equals and Substitutions.

Unit Energy Efficiency Ratio (EER), Season Energy Efficiency Ratio (SEER), Coefficient of Performance (COP) and Integrated Part Load Value (IPLV) shall meet the minimum applicable requirements of Wisconsin Building Code and ASHRAE 90.1(2015 edition) whichever is more stringent.

Rate unit performance in accordance with the latest edition of ARI Standard 365 or ARI Standard 210/240, whichever is applicable for the equipment.

Construct units in accordance with ASHRAE 15, UL standards and the NEC. Units shall carry the UL label.

Factory run test units to see that each control device operates properly. Pressure test, evacuate, charge with holding charge of refrigerant and full oil charge prior to shipping from the factory.

DESIGN CRITERIA

Units shall be certified in accordance with ARI Standard 210.

Units and remote electrically powered components shall contain unit mounted, factory prewired terminal block. Electrical components shall be U.L. tested and U.L. labeled.

Units (except for power and control wiring to remote condensing units, thermostats and other specialty control interlocking) shall be factory prewired within unit cabinet and shall meet National, State and local codes. Wiring shall be numbered and connected to numbered wiring terminal.

Split system air conditioning unit shall be furnished and installed with components and accessories required for a fully functional system. Verify field piping requirements with the manufacturer.

SUBMITTALS

Submit Shop Drawings for equipment specified under this Section. Include data concerning sizes, dimensions, weights, heating capacities, materials of construction, ratings, electrical data, wiring diagrams, refrigerant piping diagrams, controls, options and manufacturers installation requirements, instructions and recommendations.

Manufacturer's Shop Drawing submittal shall include complete component descriptive literature, detailed electrical wiring and refrigerant piping diagrams and drawings specifically prepared for this Project.

WARRANTY

Provide a one-year parts and labor warranty on the entire unit beginning upon substantial completion of project.

Provide a five-year parts warranty on the compressor(s) beginning upon substantial completion of project.

PART 2 - PRODUCTS

MANUFACTURERS

Carrier, Lennox, Trane, Johnson Controls, McQuay or approved equal..

INDOOR UNIT- FAN COIL

System includes horizontally mounted indoor fan coil with direct expansion (DX) heating/cooling coil and 1” filter section.

Galvanized prepainted frame and cabinet with 1" foil faced insulation.

Fans shall be forward curved double inlet with internal vibration isolation and direct drive.

Cooling system shall consist of a DX coil (air conditioner).

Unit evaporator coil shall have copper tubes, with aluminum fins, refrigerant distributor, and a sloping condensate drain pan with primary and auxiliary drain connections.

Provide single point electrical connection to unit complete with motor starters, relays, etc. to power fan, controls and electric heater. Provide control transformer(s) and connections as required to accomplish specified sequence of operation.

Units shall be complete with motor starters, relays, and control thermostat. Indoor unit fan shall have fan speed controller to allow for fan speed selection from 3 speeds.

Units shall have single point electrical connection (on each section) with electrical characteristics as specified on Equipment Schedule and shall allow either aluminum or copper main conductors to be connected to terminal block power connections.

OUTDOOR UNIT – AIR COOLED COMPRESSOR CONDENSING UNIT

Manufacturers: Carrier, Lennox, Trane, York, McQuay or approved equal.

Provide factory assembled, outdoor mounted, air-cooled compressor condensing unit suitable for on grade installation. Include compressor, air cooled condenser, refrigerant, lubrication system, interconnecting wiring, safety and operating controls, motor starting components and additional features as specified herein or required for safe, automatic operation. Capacity and steps of unloading as indicated in the equipment schedule. Refrigerant is to be R-410A.

CABINET

Construct cabinet of heavy gauge, galvanized steel coated with weather resistant paint. Provide removable access panels to facilitate full access to the compressor, fan and control components.

COMPRESSOR

Provide hermetic scroll type compressor with built in motor winding temperature and current protection, liquid and suction service valves, gage ports, sight glass and liquid line filter dryer. Provide crankcase heater with reciprocating type compressors. Mount compressors on vibration isolators.

CONDENSER

Provide condenser coils with aluminum alloy plate fins mechanically fastened to seamless copper tubing with integral subcooler. Construct coils with design working pressure suitable for the refrigerant.

Provide direct-drive statically and dynamically balanced propeller type fans with vertical or horizontal discharge as indicated on the drawings and guards constructed of heavy gage PVC coated wire or galvanized steel.

POWER WIRING

Provide factory installed 24-volt control circuit with fusing; control power transformer and all associated internal wiring. Provide a single point power connection to the unit(s). Provide factory installed magnetic contactors for compressor and condenser motors.

Electrical characteristics shall be as indicated in the equipment schedule.

CONTROLS

Provide high/low refrigerant pressure cutouts with manual reset and anti-short cycle compressor timer.

Low Ambient Kit: Provide wind baffle and regulate fan motor cycles in response to saturated condensing temperature of the unit. The control shall be capable of starting and operation down to -15 degrees F ambient air temperature. Installation of kit shall not require changing the outdoor fan motor.

COOLING COIL CONDENSATE PIPING

Provide ASTM B88, type L hard temper copper tubing with ASTM B145/ANSI B16.23 cast red bronze or ASTM B75/ANSI B16.29 wrought solder-type drainage fittings.

Insulate condensate piping with 0.5" rigid fiberglass insulation (3 lbs per cu.ft. density) with all service jacket.

CONDENSATE PUMP

The condensate pump shall remove condensate from the drain pan. Pump shall be designed for quiet operation. Pump shall consist of two parts: an internal reservoir/sensor assembly and a remote sound shielded pump assembly.

REFRIGERANT PIPING

Provide precharged refrigerant lines that can be oriented to connect to the side or back of unit.

Insulate both refrigerant lines with elastomeric insulation. Exterior pipe insulation shall have a protective self-adhering jacket (5-plyself-adhering multiple laminated waterproofing material with reflective aluminum foil, high density polymer films and cold weather acrylic adhesive providing zero (0.0) permeance).

REFRIGERANT PIPING ACCESSORIES

Provide all refrigerant piping specialties with a maximum working pressure of full vacuum to 450 psig and a maximum working temperature of 225 deg F. For systems using R-410A, provide all refrigerant piping specialties with a maximum working pressure of full vacuum to 850 psig and a maximum working temperature of 225 deg F.

Flexible pipe connectors: Double braided bronze hose flexible pipe connectors with solder end connections.

Filter Dryers: For circuits 15 tons and over provide angle pattern filter dryers with replaceable core. For circuits below 15 tons provide straight pattern filter dryers without replaceable core.

Sight glasses: Two piece brass construction with solder end connections. Include color indicator for sensing moisture.

Solenoid Valves: Two way normally closed with two piece brass body, full port, stainless steel plug, stainless steel spring, teflon diaphragm and solder end connections. Provide replaceable coil assembly.

Hot Gas Bypass Valves: Provide with integral solenoid valve, external equalizer connection and adjustable pilot assembly.

Thermostatic Expansion Valves: Brass body, bronze disc, neoprene seat, bronze bonnet, stainless steel spring and solder end connections.

Charging Valves: Provide ¼" SAE brass male flare access ports with finger tight, quick seal caps. Provide 2-inch long copper extension sections.

Check valves: Spring loaded type with bronze body, bronze disc, neoprene seat, bronze bonnet, stainless steel spring and solder end connections.

SYSTEM CONTROLS AND SEQUENCE OF OPERATION

Control thermostat shall be electronic Wi-Fi/networkable, 7-day programmable type with LCD display, auto-changeover control, set-up and set-back schedules, built-in compressor time delay, battery back-up and ability to control the system, including multiple modes of heat, multiple exhaust fans and occupied/unoccupied sequences of operation as indicated below.

The system consists of:

- Fan coil with DX coil (cooling only).
- Outdoor air cooled compressor condensing unit.
- Digital programmable thermostat.

Operation

- The fan shall cycle on and air cooled compressor-condensing unit shall start on a call for cooling.
- Once the space temperature is satisfied, the air cooled compressor-condensing unit shall de-energize and the fan coil shall cycle off.

PART 3 - EXECUTION

GENERAL

System and components shall be installed and operated in strict accordance with manufacturer's instructions and recommendations.

INDOOR UNIT – FAN COIL

Mount unit as indicated on the drawings.

Extend cooling coil condensate drain line from unit condensate connection condensate pump. Pump shall discharge to exterior of the building following the route of the condensate piping removed.

Adjust unit fan speed to provide proper unit operation.

OUTDOOR UNIT – AIR COOLED COMPRESSOR CONDENSING UNIT

INSTALLATION

Furnish weatherproof fusible electrical disconnect switch with fuses to disconnect electrical power to outside units.

Install unit, piping and accessories in accordance with the manufacturer’s written instructions and recommendations. Mount unit(s) on a poured concrete pad on grade.

Maintain adequate service access and airflow clearances for all components as recommended by the manufacturer and as indicated on the drawings.

Charge unit(s) with full oil charge and refrigerant charge based on the entire refrigeration system pipe size and length.

Coordinate power wiring requirements with the electrical trade.
Provide all control wiring in conduit in compliance with Division 26 - Electrical.

SYSTEM CONTROLS

Provide all required control wiring, relays, transformers, conduit/infrastructure, programming, etc. for a fully operational system.

REFRIGERANT PIPE SIZING

The unit manufacturer shall verify the final refrigeration pipe sizing process to insure conformance to specific unit requirements such as max lengths, refrigerant velocities, unloading considerations and proper oil return. This contractor shall provide refrigeration piping drawings from the field which details the way the piping will actually be installed.

REFRIGERANT PIPING ACCESSORIES

Install accessories in accordance with the manufacturer's written instructions and recommendations.

START-UP, TRAINING, VERIFICATION AND COMMISSIONING

Contractor to provide factory authorized representative and/or field personnel knowledgeable with the operations, maintenance and troubleshooting of the system and/or components defined within this section for a minimum period of 6 hours.

At the completion of the system installation, and prior to substantial completion, the contractor shall verify and commission the HVAC controls to verify the system is calibrated, under control and functioning as specified and designed.

Contractor shall provide temperature control system self-commissioning and closeout report indicating that all systems are functioning as specified and designed.

Provide written start-up and commissioning report to be included in Operation and Maintenance Manuals. Start-up report shall be included in the Operation and Maintenance Manuals. It shall indicate installation is compete, readings taken, and state unit has been placed in proper running condition as recommended by unit manufacturer and within intent of Contract Documents.

END OF SECTION

SECTION 23 81 26
DUCTLESS SPLIT-SYSTEM AIR-CONDITIONERS

P A R T 1 - G E N E R A L

SCOPE

This section includes specifications for split-system ductless heat pump and cooling only type systems. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Submittals
- Operation and Maintenance Data
- Delivery, Storage and Handling
- Warranty

PART 2 – PRODUCTS
- Units up to 3 Tons
- Cooling Coil Condensate Piping
- Integral Condensate Pump
- Refrigerant piping

PART 3 - EXECUTION
- Installation
- Refrigerant Piping Sizing
- Refrigerant Piping
- Refrigerant Piping Accessories
- Startup

RELATED WORK

Section 23 05 00 - Common Work Results for HVAC

REFERENCE

Applicable provisions of Division 1 shall govern work under this section.

REFERENCE STANDARDS

ARI 210/240	Unitary Air Conditioning and Heat Pump Equipment
ARI 365	Commercial and Industrial Unitary Air Conditioning Condensing Units
ASHRAE 15	Safety Standard for Refrigeration Systems
ASHRAE 90.1	(2004 edition) Energy Standard for Buildings Except Low Rise Residential Buildings
NEC	National Electrical Code
ASTM B117	Standard Practice for Operating Salt Spray (fog) Apparatus
UL	Underwriters Laboratory

QUALITY ASSURANCE

Unit rated performance in accordance with the latest edition of ARI Standard 365 or ARI Standard 210/240, whichever is applicable for the equipment.

Construct units in accordance with ASHRAE 15, UL standards and the NEC. Units shall carry the UL label.

Factory run and test units to see that each control device operates properly. Pressure test, evacuate, charge with holding charge of refrigerant and full oil charge prior to shipping from the factory.

SUBMITTALS
Refer to division 1, General Conditions, Submittals

Submit air cooled condensing unit and evaporative unit shop drawings including the following information: specific manufacturer and model numbers, dimensional and weight data, required clearances, materials of construction, capacities and ratings, efficiencies, stages of unloading capacity achievable without hot gas bypass, refrigerant type and charge, component information, size and location of piping connections, electrical connections, wiring diagrams and information for all specialties and accessories.

Submit manufacturer's installation and start-up instructions, maintenance data, troubleshooting guide, parts lists, controls and accessories.

At substantial completion, submit warranty certificate and copy of start-up report.

OPERATION AND MAINTENANCE DATA
Provide operation and maintenance information as indicated in Section 23 05 00.

DELIVERY, STORAGE AND HANDLING
Comply with manufacturer's instructions for storing, rigging, unloading, and transporting units. Protect units from physical damage. Leave factory-shipping covers in place until installation.

Ship units to jobsite fully assembled.

WARRANTY
Provide a one year parts and labor warranty on the entire unit beginning upon substantial completion of project.

Provide a five year parts warranty on the compressor(s) beginning upon substantial completion of project.

P A R T 2 – P R O D U C T S

UNITS UP TO 3 TONS
Manufacturers: Carrier, Daikin, Mitsubishi or approved equal.

GENERAL
Provide a heating and cooling Heat Pump unit or Cooling Only unit with an indoor ceiling or wall mounted fan coil with matched outdoor condensing unit as scheduled.

Indoor fan coil units shall be complete with coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, R-410A or R32 refrigerant and integral Temperature sensing. Unit shall be furnished with integral wall mounting bracket and mounting hardware.

Outdoor condensing unit shall be factory assembled suitable for ground, rooftop, or wall hung mounting. Units shall consist of a compressor, an air cooled coil, propeller type outdoor fan, metering device(s), and control box. Units shall discharge air horizontally or vertically as shown on the drawings.

INDOOR FAN COIL UNIT (Wall/Ceiling Mounted)
Cabinet shall be constructed of a durable material with a galvanized steel sub-chassis. Unit shall be fully insulated for improved thermal and acoustic performance.

Unit cabinet discharge and inlet grilles shall be constructed of high-impact plastic.

Fans shall be direct drive blower type with air intake and discharge on the unit. Automatic, motor driven air sweep shall be provided.

Horizontal and/or vertical discharge louvers shall be adjustable.

Coils shall be copper tube with aluminum fins and galvanized steel tube sheets. Fins shall be bonded to the tubes by mechanical expansion and specially coated for enhanced wettability. A drip pan under the coil shall have drain connections for hose attachment, on either the left or right hand side, to remove condensate. Condensate pan shall be corrosion resistant.

Motors shall have permanently lubricated ball bearing with inherent overload protection. Fan motors shall a minimum of 3 speeds.

Unit shall have filter track with factory supplied mildew proof cleanable filters.

Minimum performance shall be 16.0 SEER and 10.0 HSPF for units.

AIR-COOLED CONDENSING UNIT
Unit cabinet shall be constructed of galvanized steel, bonderized, and coated with a baked enamel finish on the inside and outside. Unit cabinet shall be capable of withstanding 500 hour salt spray test per Federal Test Standard No. 141 (method 6061). Unit access panels shall be removable with minimal screws and shall provide full access to the compressor, fans, and control components. Outdoor compartment shall be isolated and have an acoustic lining.

Outdoor fans shall be direct drive propeller type and shall discharge air horizontally or vertically. Outdoor fan motors shall be totally enclosed, single phase motors with class B insulation and permanently lubricated bearings. Motor shall be protected by internal thermal overload protection and shafts shall have inherent corrosion resistance.

Fan blades shall be statically and dynamically balanced.

Outdoor fan openings shall be equipped with protective grille over fan.

Compressor shall be fully hermetic scroll or a rotary swing type variable speed compressor. Compressor shall be equipped with operating oil charge, and motor. Internal overloads shall protect the compressor from over temperature and over current. Motor shall be NEMA rated class F, suitable for operation in a refrigerant atmosphere. Compressor assembly shall be installed on rubber vibration isolators. Compressors shall be provided with crankcase heater.

Outdoor coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes, which are cleaned, dehydrated, and sealed. Air cooled condenser coils shall be leak tested at 573 psig.

Refrigerant circuit components shall include service valves with service gage port connections on compressor suction and discharge lines, each with brass caps, accumulator, and a reversing valve (for heat pump units).

Low Ambient Kit: Provide wind baffle and regulate fan motor cycles in response to saturated condensing temperature of the unit. The control shall be capable of starting and operation down to -22 degrees F ambient air temperature. Installation of kit shall not require changing the outdoor fan motor.

Condensing unit controls and safeties shall be factory selected, assembled, and tested. The minimum control functions shall include the following:

- A time delay control sequence.
- Outdoor fan failure detection.
- Compressor motor current and temperature overload protection.
- Compressor low and high pressure protection.

CONTROLS

Controls shall consist of a microprocessor based control system which shall control space temperature, determine optimum fan speed, and run self-diagnostics. The temperature control range shall be from 62 degrees F to 84 degrees F (16.7 degrees C to 28.9 degrees C). User interface with the unit shall be accomplished through a wired remote control (can be configured for degrees F or degrees C).

The unit shall have the following functions as a minimum:

- An automatic restart after power failure at the same operating conditions as at failure.
- A timer function to provide a minimum 24 hour timer cycle for system Auto Start/Stop.
- Temperature sensing controls shall sense return air temperature.
- Automatic air sweep control to provide on or off activation of air sweep louvers.
- Dehumidification mode shall provide increased latent removal capability by modulating system operation and set point temperature.
- Fan only operation to provide room air circulation when no cooling or heating is required.
- Diagnostics shall provide continuous checks of unit operation and warn of possible malfunctions. Error messages shall be displayed at the unit.
- Evaporator fan speed control shall be user selectable: high, medium, low, or microprocessor controlled automatic operation during all operating modes.
- Automatic heating to cooling changeover. Control shall include dead band to prevent rapid mode cycling between heating and cooling.
- A liquid level sensor in the condensate reservoir shall stop cooling operation if the liquid level in the reservoir is too high.

Provide thermostat for wall mounting.

ELECTRICAL

Unit’s electrical requirements shall be 208/230 volt, single phase, and 60 hertz.

This contractor shall provide conduit for both the power and control wiring between indoor unit and outdoor unit.

All power and control wiring must be installed per NEC and all local electrical codes.

COOLING COIL CONDENSATE PIPING

Provide ASTM B88, type L hard temper copper tubing with ASTM B145/ANSI B16.23 cast red bronze or ASTM B75/ANSI B16.29 wrought solder-type drainage fittings.

Insulate condensate piping with 0.5” rigid fiberglass insulation (3 lbs per cu.ft. density) with all service jacket.

INTEGRAL CONDENSATE PUMP

The condensate pump shall remove condensate from the drain pan. Pump shall be designed for quiet operation. Pump shall consist of two parts: an internal reservoir/sensor assembly and a remote sound shielded pump assembly.

REFRIGERANT PIPING

Provide precharged refrigerant lines that can be oriented to connect to the side or back of unit.

Insulate both refrigerant lines with elastomeric insulation. Exterior pipe insulation shall have a protective self-adhering jacket (5-plyself-adhering multiple laminated waterproofing material with reflective aluminum foil, high density polymer films and cold weather acrylic adhesive providing zero (0.0) permeance).

P A R T 3 - E X E C U T I O N

INSTALLATION

Install units, piping and accessories in accordance with the manufacturer's written instructions and recommendations. Mount condensing unit(s) on a stand as indicated on the drawings.

Maintain adequate service access and airflow clearances for all components as recommended by the manufacturer and as indicated on the drawings.

Charge unit(s) with full oil charge and refrigerant charge based on the entire refrigeration system pipe size and length.

Provide all control wiring.

Coordinate power wiring requirements with Division 26 00 00 contractor.

REFRIGERANT PIPE SIZING

The unit manufacturer shall verify the final refrigeration pipe sizing process to insure conformance to specific unit requirements such as maximum lengths, refrigerant velocities, unloading considerations and proper oil return. This contractor shall provide refrigeration piping drawings from the field which details the way the piping will actually be installed.

REFRIGERANT PIPING ACCESSORIES

Install accessories in accordance with the manufacturer's written instructions and recommendations.

STARTUP

Adjust units for maximum operating efficiency, adjust all controls to required final settings and demonstrate that all components are functioning properly. Submit four copies of a written startup report following the initial startup. Include in the report: work done to the system, all readings taken, a statement certifying that the refrigeration system(s) are leak free and a statement certifying that the unit(s) have been placed in proper running condition as recommended by the manufacturer and as intended in the drawings and specifications.

Provide start-up report to be included in the Operation and Maintenance Manuals per Section 23 05 00 requirements.

END OF SECTION

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SECTION 26 05 00

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SCOPE

A. Division 00 and Division 01 of this Project Manual apply to this Section as though repeated herein.

1.02 GENERAL PROVISIONS

A. In general, the work includes: Electrical work and the kindred materials and operations as indicated on the drawings and as specified in the following articles of:

Section 26 05 00	General Electrical Requirements
Section 26 20 00	Basic Materials and Methods
Section 27 10 00	Telecommunications Distribution System
Section 28 13 00	Access Control System
Section 28 31 00	Fire Alarm System

B. Job Information: Obtain at building including:

1. Conditions affecting this Section of the Work.
2. Accessibility
3. Storage space.

1.03 GENERAL REQUIREMENTS

A. This Section of the Specifications applies to all electrical work. Divisions 00 and 01 form a part of these specifications and the Contractor shall consult them in detail. Electrical work indicated in other Sections of the Specifications to be done by the Electrical Contractor shall be included in the Work of this Section.

1.04 DEFINITIONS

A. Certain terms used herein; on the drawings; and in the contract documents, shall be defined as follows:

B. Provide: Furnish and install complete and ready for service.

C. Exposed: Exposed to view in any room, hallway, passageway, or outside.

D. Approval: The approval of the Architect in writing or by signed rubber stamp applied to drawings, illustrations, etc.

1.05 INTENT OF DRAWINGS AND SPECIFICATIONS

A. These specifications and attendant drawings are intended to cover a complete installation of systems. The omission of expressed reference to any item of labor or material necessary for the proper execution of the work in accordance with present practice of the trade shall not relieve the Contractor from providing such additional labor and materials.

1.06 DRAWINGS

A. The Electrical drawings do not attempt to show the complete details of building construction which affect the electrical installation. The Contractor shall refer to the architectural, civil, structural and mechanical drawings for additional details which affect the proper installation of this work. The Contractor is cautioned that diagrams showing electrical connections and/or circuiting are diagrammatic only and must not be used for obtaining lineal runs of wire to conduit. Wiring diagrams do not necessarily show the exact physical arrangement of the equipment.

1.07 MATERIAL AND EQUIPMENT

A. All material and equipment shall be new and of the quality used for the purpose in good commercial practice and shall be standard product of reputable manufacturers. Each major component of equipment shall have the manufacturer's name, catalog number, and capacity or rating on a nameplate, securely affixed on the equipment in a conspicuous place.

1.08 SUBSTITUTION AND APPROVAL OF MATERIAL

A. See Section 00 72 13.

B. Such requests shall be accompanied by three copies of all necessary illustrations, cuts, drawings and descriptions of material proposed for substitution and shall fully describe all points in which it differs from the articles specified. Two copies will be retained by the Architect and one copy returned to the Contractor with approval or revisions indicated thereon.

1.09 DAMAGE TO OTHER WORK

A. The Electrical Contractor will be held rigidly responsible for all damages to the work of his own or any other trade resulting from the execution of his work. It shall be the Contractor's responsibility to adequately protect his work always. All damages resulting from his operations shall be repaired or the damaged portions replaced by the party originally performing the work, (to the entire satisfaction of the Architect), and all cost thereof shall be borne by the Contractor responsible for the damage.

1.10 COOPERATION WITH OTHER TRADES

A. This Contractor shall completely cooperate with all other trades in the matter of planning and executing of the work. Every reasonable effort shall be made to prevent conflict and interferences as to space requirements, dimensions, locations, openings, sleeving or other matters which tend to delay or obstruct the work of any trade.

1.11 NEGLIGENCE

A. Should the Contractor fail to provide materials, templates, etc., or other necessary information causing delay or expense to another party, he shall pay the actual amount of the damages to the party who sustained the loss.

1.12 FIELD CHANGES

A. Should any change in drawings or specifications be required to comply with local regulations and/or field conditions, the Contractor shall refer same to Architect for approval before any work which deviates from the original requirements of the drawings and specifications is started. In the event of disagreements as to the necessity of such changes, the decision of the Architect shall be final.

1.13 CUTTING AND PATCHING IN NEW CONSTRUCTION

A. As necessary and with approval to permit the installation of conduit or any part of the work under this branch. Any cost caused by defective or ill-timed work shall be by the party responsible therefor. Patching of holes, openings, etc. resulting from the work of this branch shall be furnished by this contractor.

B. See General Conditions for additional requirements.

1.14 COMPLETION DATES

A. This Contractor shall be able to meet all completion dates established by the Architect and shall furnish all labor of all classes required to meet such schedules and completion dates.

1.15 STANDARDS, CODES AND PERMITS

A. All work shall be installed in accordance with National, State and Local electrical codes, laws, ordinances and regulations. Comply with all applicable OSHA regulations.

B. All materials shall have a U.L. label where a U.L. standards and/or test exists.

C. Prepare and submit to all authorities having jurisdiction, for their approval, all applications and working drawings required by them.

D. Secure and pay for all permits and licenses required.

1.16 CLEAN-UP

A. This Contractor shall always keep the premises free from excessive accumulation of waste material or rubbish resulting from his work, including tools, scaffolding and surplus materials, and he shall leave his work broom clean or its equivalent.

B. In case of dispute, Architect may order the removal of such rubbish and charge the cost to the responsible contractor as determined by the Architect. At the time of final clean-up all fixtures and equipment shall be thoroughly cleaned and left in proper condition for their intended use.

1.17 TESTS

A. The Contractor shall provide all instrumentation, labor and conduct all tests required by the Architect. All tests shall be made before any circuit or item of equipment is permanently energized. Circuits shall be phased out and loads shall be distributed as evenly as possible on all phases. All phase conductors shall be entirely free from grounds and short circuits. All instrumentation and personnel required for testing shall be provided by the Contractor and all tests shall be conducted in the presence of the Architect or his authorized representative.

B. System Tests:

1. The following tests are required prior to energization of the electrical system:

a. Secondary feeders shall have an insulation resistance test utilizing a megger applying a test potential of 500 volts DC minimum.

b. Establish secondary phase to ground voltages.

c. Establish proper phase relationship and motor rotation.

2. The following tests are required under normal load condition:

a. Record secondary phase to phase and phase to ground voltages and phase currents at all major equipment, apparatus, and on all secondary feeders. Voltage readings shall be taken at line side terminals of distribution centers and panelboards.

b. Confirm proper phase relationship and motor rotation.

c. Confirm load balance at distribution centers and panels. Rebalance load if necessary such that the minimum unbalance between phases shall not exceed 7-1/2%.

d. Confirm operation of all electrically operated apparatus, such as circuit breakers, transfer switches, etc., by exercising same under load.

e. Record all settings and calibrations of circuit breakers, transfer switches, transformers, meters, timing devices, etc.

C. Records:

1. All test data obtained by the E.C. or manufacturer/supplier shall be recorded and filed with the maintenance manual as part of permanent job records. Test data shall include identification of instruments employed (field test only), condition of test (time, date, weather, etc.), parameters of test, personnel conducting test, and any pertinent information or conditions noted during the test.

1.18 SHOP DRAWINGS

A. Submit to Engineer for review, copies of manufacturer's shop drawings and/or equipment brochure depicting:

1. Lighting Fixtures

2. Telecommunications Equipment and Cabling

3. Wiring Devices

4. Fire Alarm System
5. Access Control System
6. Other materials at the request of the Engineer

B. See Section 00 72 13.

C. Shop drawings shall bear the Contractor's stamp indicating approval.

D. Any equipment fabrication prior to shop drawing review shall be at the Contractor's risk.

1.19 WORKMANSHIP

A. The installation of all work shall be made so that its several component parts will function as a workable system complete with all accessories necessary for its operation and shall be left with all equipment properly adjusted and in working order. The work shall be executed in conformity with the best accepted standard practice of the trade to contribute to efficiency and appearance. It shall also be executed so that the installation will conform and adjust itself to the building structure, its equipment and its usage.

1.20 DRAWINGS OF OTHER TRADES

A. The Contractor shall consult the drawings of the work for the various other trades; field layouts of the parties performing the work of the other trades; their shop drawings, and he shall be governed accordingly in laying out his work.

B. Specifically examine shop drawings to confirm voltage, current characteristics, and other wiring requirements for utilization equipment. Bring any discrepancies to the attention of the A/E.

1.21 FIELD MEASUREMENTS

A. The Contractor shall take all field measurements necessary for his work and shall assume the full responsibility for their accuracy.

1.22 STRUCTURAL INTERFERENCES

A. Should any structural interferences prevent the installation of the outlets, running of conduits, etc., at points shown on drawings, the necessary minor deviation therefrom, as determined by the Architect, may be permitted. Minor changes in the position of the outlets or equipment if decided upon before any work has been done by the Contractor shall be made without additional charge.

1.23 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE

A. Before submitting a bid, the Contractor shall visit the site and familiarize himself with all features of the building and site which may affect the execution of his work. No extra payment will be allowed for the failure to obtain this information. If in the opinion of the Contractor there are omissions or errors in the plans or specifications, the Contractor shall clarify these points with the Architect before submitting his bid. In lieu of written clarification by addendum, resolve all conflicts in favor of the greater quantity or better quality.

1.24 GUARANTEE

A. The Contractor shall unconditionally guarantee his work and all components thereof, excluding lamps, for a period of one year from the date of his final payment. He shall remedy any defects in workmanship and repair or replace any faulty equipment which shall appear within the guarantee period to the entire satisfaction of the Architect at no additional charge.

1.25 TEMPORARY WIRING AND SERVICE

A. Provide temporary service from existing service. Temporary service shall support construction activities.

B. All contractors shall provide and maintain their own extension cords and additional lamps as required to perform his work properly. Contractors requiring temporary connections to 3 phase power service and single-phase feeders for other than lighting and small fractional horsepower motorized tools shall

make arrangement with the Electrical Contractor. Contractors requiring lighting outside of the building shall make their own arrangements with the Electrical Contractor and pay all costs for installation, maintenance and removal. Contractors requiring electrical equipment over one HP, including welders, hoists, heaters and coolers shall make their own arrangements for such service beyond the main switch and shall pay all costs thereof.

C. No permanent electrical equipment or wiring shall be used for temporary connections, unless authorized by this Section, upon signed order and with approval by the Architect in behalf of the Owner. Such approvals shall not shorten guarantee period.

D. Electrical energy to be paid for by owner.

1.26 ELECTRICAL SERVICE

A. The service is existing and provides 208Y/120 volts, three phase, four wire.

1.27 BRANCH CIRCUIT WIRING

A. See plans for general arrangement of circuits, conduit runs, and ratings of branch circuits and special circuits.

B. Provide everything necessary to comply with the general scheme shown, including all types of control.

C. Circuit numbers as shown on plans are for contractor to plan his wiring and for estimating purposes. These numbers are not necessarily consecutive numbers of the panelboard breakers. Balanced load on bus is to be the determining factor in arrangement of circuits. Balance loading to within 7 1/2%.

D. Minimum size of lighting system branch circuit conductors to be #12 AWG.

E. Conductors terminating at wired outlets shall extend at least eight (8) inches beyond outlet box conduit fitting.

F. 120-volt circuit home runs greater than 50 feet in length shall have #10 AWG minimum size between panel and first receptacle or fixture outlet.

G. The use of single-phase, multi-wire branch circuits with a common neutral is not permitted. All branch circuits will be furnished and installed with an individual accompanying neutral, sized the same as the phase conductors

1.28 MOTOR WIRING

A. Unless otherwise indicated on the drawings or elsewhere in these specifications, all motors shall be furnished by others.

B. Motors shall be set in place by others and the associated motor starters and controllers shall be turned over to this Contractor for erection and line voltage power wiring.

C. Any contractor supplying starters and controllers that are not part of this contract shall index same and provide this Contractor with instructions as to proper location in sufficient time to permit the installation of a concealed raceway system.

D. Where this Contractor is required to provide control wiring, the Contractor supplying the controllers shall provide all necessary and required wiring diagrams for proper installation.

E. Low voltage (less than 115 volts) control wiring shall be by others, unless noted elsewhere in the specifications except that this Contractor shall extend circuit to associated transformers, wire and connect to same.

F. This Contractor shall examine the plans and specifications of other sections and shall include in his bid all control wiring, as referenced to be performed by Section 26 05 00.

G. Required disconnect switches furnished by other sections shall be installed by Section 26 05 00. Furthermore, this Contractor shall provide all disconnect switches required by code that are not furnished by other sections.

1.29 SPECIAL OUTLETS

A. General: Furnish and install outlets, wiring and receptacles accordingly, at locations required by equipment serviced or otherwise as directed. Extend wiring to outlets on equipment and make final connection.

1.30 IDENTIFICATION

A. General:

1. Materials and equipment installed under this Section shall be clearly identified as listed below.
2. Locate identification conspicuously.
3. Terminology to be approved by Architect.
4. See plans for any additional items to be identified.
5. Loads such as motors shall be described by function rather than by the system of arbitrary number as shown on electrical plans.
6. Use abbreviations sparingly.

B. Laminated Bakelite Plates: Engraved plastic nameplate shall be securely screwed or riveted to the following equipment. Size 1" x 4" with 3/8" high letters; unless space available dictates differently.

1. Each panelboard, contactor, time switch, starter or disconnect switch. Locate on inside cover of panels.
2. Each feeder at all accessible locations.
3. Each end of empty conduit runs to indicate the intended use of the conduit and the location of opposite end. Use room numbers that are permanently assigned.

C. Typewritten Directory: Each panelboard affected by the project both new and existing shall be provided with a typewritten directory attached to the inside of panel door and covered with clear plastic indicating load served and rooms served by each protective device in the respective panel. Spares and spaces shall be clearly identified for existing panels, trace existing circuits to confirm use.

D. Switch Station:

1. All key switches shall be engraved indicating controlled item.
2. All remote switches shall be engraved indicating controlled item.

E. Conductor Identification:

1. Identify each conductor at each wiring device, connector or splice point with permanently attached wrap-around adhesive markers as manufactured by Brady Co. or 3M.
2. This identification shall include branch circuit number, control circuit, or any other appropriate number or lettering that will expedite future tracing and trouble shooting.

1.31 LOCATIONS OF OUTLETS AND WIRING DEVICES

A. Outlets:

1. Locations of outlets and electrical equipment on the drawings are approximate only. Unless otherwise indicated on the drawings or established in the specifications, the exact locations of electrical outlets shall be established in the field by directive from the Architect. Generally, outlets shall be located as required for proper installation of equipment served and otherwise locations shall be established by construction or code requirements and such as to be coordinated with equipment of other trades.
2. This Section shall consult with the Architect and refer to all details, sections, elevations and equipment plans and the plans of other trades for exact location.
3. The Architect reserves the right to make reasonable changes in the location of outlets, apparatus or equipment up to the time of roughing in. Such changes as directed shall be made by the Contractor without additional compensation.
4. Dimensions taken by scale shall not be used to establish rough-in locations.

B. Wiring Devices:

1. The approximate location of wiring devices is indicated on the drawings; the specific location shall be determined in accordance with "Location of Outlets" of these specifications and as follows.
2. This Section is referred to equipment plans, equipment shop drawings, elevation drawings and other detail or dimensional drawings, and he shall consult with the Architect before installation of proceeding with any work dependent upon this information.
3. Generally, wiring devices shall be located as follows:
    a. Wall receptacles shall generally be centered 15" above the finished floor and 6" above surface of built-in counters and tables where same abuts wall and 4" above backsplashes if counters are so equipped.
    b. Special purpose receptacles shall be located as required by equipment served.
    c. Switches shall be centered 48" above finished floor on latch side of door opening with edge of plate not more than 12" from door frame, except as noted on the drawings.
    d. In hazardous areas, the location of wiring devices shall be established by Code requirements which shall take precedence over conflicting information on the drawings or included herein.

1.32 TELEPHONE SYSTEM

A. Refer to the electrical specification section 27 10 00 – Telecommunication Distribution System for detailed information on the telephone system.

B. Dane County is currently using a VOIP (voice over internet protocol) telephone system so all telephone cabling will be using same cabling used for data.

C. Telephone instruments, switching equipment, wiring, terminal blocks, and other accessories shall be furnished and installed by the Owner (Dane County)

D. This Contractor shall supply all required conduit, sleeves, and service fittings for the telephone system.

E. All conduits shall be complete with fish wire by this Contractor, and all telephone outlets shall be fed by a minimum 1" conduit.

F. All telephone boxes shall be two gang boxes with one gang plaster cover.

G. Verify all phone locations with the Architect in the field.

1.33 SEALING AND FIREPROOFING

A. Sealing and fireproofing of openings between conduit, cable tray, wireway, trough, cable bus, busduct, etc. and fire rated surfaces shall be the responsibility of the contractor whose work penetrates the opening.

B. Sealing and fireproofing shall use materials and methods complying with ASTM E814 requirements appropriate to the rating of the material penetrated.

C. Materials by Dow-Corning, 3M, Specified Technologies, Inc., and Chase-Foam are acceptable if in accordance with (B) above.

D. Submit manufacturer’s penetration details to authority having jurisdiction. Details shall confirm method’s compliance with ASTM E814.

E. Include copies of penetration details in Project Operation and Maintenance Manuals.

1.34 DEMOLITION, RENOVATION AND DISPOSITION OF EXISTING EQUIPMENT

A. This Contractor shall note that portions of the existing building will remain in service during portions of the construction period. Areas of the building will be vacated as required to facilitate construction. This Contractor shall proceed with the completion of his work in such a manner as to cause the least possible interference with the Owner's operation. All work required in the existing building shall be done in a manner and time acceptable to the Owner.

B. Outages and other work rendering existing equipment inoperative shall be held to a minimum - prior arrangements for each shall be made with the Owner and shall be acceptable as to time and duration.

C. Electrical equipment in conflict with construction shall be removed and/or relocated as indicated on the drawings, as directed or required. This Contractor shall remove all electrical equipment released from service because of construction, and no equipment removed shall be reused, except as specifically directed on the drawings or elsewhere herein. All electrical equipment removed during construction shall be presented to the Owner for his acceptance or rejection. Materials rejected by the Owner become the Contractor's property and shall be removed from the site.

D. This Contractor shall be responsible for the work of other trades as may be necessary to facilitate the installation of electrical work in the existing building. Such work necessary that is normally done by other trades and is not covered as a part of other divisions of the work shall be done under the direction and at the expense of the Electrical Contractor. This work shall include but is not limited to cutting, patching, and all work necessary and required to leave existing building in condition acceptable to the Architect.

E. Any existing circuits or equipment not shown on the drawings and which are logically expected to be continued in service and which may be interrupted or disturbed during construction shall be reconnected in an approved manner. In addition, any existing circuit or equipment which may require relocations or rerouting, because of construction, shall be considered a part of the work of this branch and shall be done by this contractor with no additional compensation.

F. All coring that is required for electrical work shall be by this Contractor.

G. All new conduit and wiring shall be concealed where possible to do so without extensive cutting and patching. All exposed work shall be run in wire mold and installed only where approved by Architect. Routing shall be subject to Architects approval. Make use of all standard wire mold colors to match surfaces as closely as possible.

H. All ballasts and lamps removed during the project, unless part of fixtures claimed by the Owner, become the Contractor's property and he shall dispose of them in accordance with applicable DNR and EPA regulations.

1.35 ALTERNATE BIDS

A. See Instructions to Bidders for descriptions of alternates required.

END OF SECTION 26 05 00

SECTION 26 20 00

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SCOPE

A. Division 00 and Division 01 of this Project Manual apply to this Section as though repeated herein.

1.02 REFERENCES

A. National Electrical Manufacturer's Association (NEMA).

B. Underwriters Laboratories, Inc. (UL).

C. American Society for Testing and Materials (ASTM).

D. National Fire Protection Association (NFPA).

1.03 SUBMITTALS

A. Product Data

1. Submit for disconnects, motor starters, panelboards, circuit breakers, overcurrent protective devices, transformers, and mini-power centers.
2. Product data sheets with printed installation instructions.

B. Shop Drawings:

1. Submit for motor starters.
2. Show enclosure dimensions, nameplate nomenclature, electrical ratings, and thermal unit schedule.
3. Wiring diagrams and schematics.

C. Approval of equipment supplied in this section is contingent upon Contractor verification of available fault current from electric utility.

1. Notify ENGINEER if available fault current is higher than specified equipment.

D. Submit in accordance with Section 00 72 13.

E. Operation and Maintenance (O&M) Data:

1. Maintenance data for materials and products for inclusion in Operating and Maintenance specified in Section 01 00 00.
2. Submit in accordance with Section 00 72 13 and 00 10 00.

F. Test Results:

1. Report of field tests and observations certified by Contractor.

1.04 QUALITY ASSURANCE

A. Items provided under this section shall be listed and labeled by UL or other Nationally Recognized Testing Laboratory (NRTL).

1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code, Article 100.

B. Regulatory Requirements:

1. National Electrical Code: Components and installation shall comply with NFPA 70.
2. Local codes and ordinances.

PART 2 - PRODUCTS

2.01 ELECTRICAL METALLIC TUBING (EMT)
INTERMEDIATE METALLIC CONDUIT (IMC)
GALVANIZED RIGID STEEL CONDUITS (GRS)

A. Manufacturers:
   1. Allied Steel
   2. Omega
   3. Wheatland
   4. Columbia

B. Manufacturer's standard lengths and size.

C. Protected inside and out by hot-dipped galvanized or electrogalvanized coating.

D. Minimum size: 1/2 inch.

E. Do not use aluminum conduit.

2.02 PLASTIC CONDUIT (PVC)

A. Manufacturers:
   1. Carlon.
   2. Genova.
   3. Certainteed.

B. Standard lengths and sizes.

C. Schedule 40 or 80, heavy wall rigid plastic (PVC) conduit manufactured to NEMA TC2 standards, UL listed, and as required by NEC.

D. Rated for 90 degrees C cable.

E. Minimum size: 2" inches.

2.03 FLEXIBLE CONDUIT

A. Manufacturers:
   1. Triangle PWC, Inc.
   2. Anaconda
   3. Flexsteel
   4. American Flexible Conduit

B. Galvanized flexible steel.

C. Standard conduit sizes.

D. Minimum Size: 1/2 inch.

2.04 LIQUIDTIGHT FLEXIBLE CONDUIT

A. Manufacturers:
   1. O-Z/Gedney Company
   2. American Flexible Conduit
   3. Flex-Guard, Inc.
   4. Liquatite
   5. Anaconda

B. Galvanized flexible steel.

C. Standard conduit sizes.

D. Minimum Size: 1/2 inch.

E. Heavy wall PVC jacket.

2.05 FITTINGS

A. Manufacturers:
   1. Appleton Electric Company.
   2. Steel City, American Electric.
   3. Oz-Gedney Co.

B. Steel or malleable iron, zinc galvanized or cadmium plated.

C. Do not use indentor type fittings. Set screw fittings are acceptable.

D. Do not use aluminum or die cast fitting.

E. EMT IMC and GRS Connectors and Couplings:
   1. Threaded.
   2. Insulated throat.
   3. Rain and concrete type.

F. Flexible Conduit Connectors and Couplings:
   1. Threaded.
   2. Insulated throat.
   3. Grounding type.

G. Liquidtight Flexible Conduit Fittings:
   1. Liquidtight.
   2. Insulated throat.
   3. Threaded.
   4. Grounding type.

H. Expansion Joints:
   1. Conduit expansion fittings complete with copper bonding jumper, Crouse-Hinds Type XJ.
   2. Conduit expansion/deflection fittings with copper bonding jumper, Crouse-Hinds Type XD.

I. Seals:
   1. Wall entrance, Appleton Type FSK or FSC.

J. Drain Fittings:
   1. Automatic Drain Breather:
      a. Explosionproof.
         i. Safe for Class I, Groups C and D.
      b. Capable of passing minimum 25 cc water/minimum and minimum 0.05 cubic foot air/minimum at atmospheric pressure.
   2. Condensate Drain:
      a. Conduit outlet body, Type T.
      b. Threaded, galvanized plug with 3/16 inch drilled holed through plug.

2.06 WIRES, CABLES, AND CONNECTORS

A. Manufacturers:
   1. Wire and Cable:
      a. Continental

b. Southwire.
c. Rome Cable.
d. Houston Wire and Cable.
e. Beldon.
f. Dekoron.
g. Royal
h. South
i. General

2. Connectors:
a. Burndy.
b. Thomas and Betts.
c. Blackburn, American Electric.

3. Electrical Tape:
a. 3M Scotch Brand.
b. Plymouth.
c. or equal.

B. Copper wire only.

C. 600 v insulation (ASTM standard compounds) and color code conductors for low voltage (secondary feeders and branch circuits) as required by NEC.

1. Type THWN-2 Stranded: Single conductor No. 12 AWG minimum for branch circuit and feeder conductors size No. 8 AWG and smaller.

2. Type XHHW-2 Stranded: Single conductor for branch circuits, feeders and service conductors larger than No. 8 AWG.

3. Provide grounding conductor with same insulation as circuit conductors when run with circuit conductors.

4. Type THWN-2 Stranded: Single conductor No. 12 AWG minimum for 120 v control wiring and No. 14 AWG minimum for graphic indication, nonshielded instrumentation and other control wiring operating at less than 120 v unless otherwise noted on Drawings.
a. Provide high density polyethylene jacketed multi-wire cable assemblies in underground conduit or duct.

D. Joints, Taps, and Splices:

1. Joints, Taps, and Splices in Conductors No. 10 AWG and Smaller: UL listed compression spring-type solderless connectors with plastic cover.

2. Joints, Taps, and Splices in Conductors No. 8 AWG and Larger: Solderless two or four-bolt compression type connectors of type that will not loosen under vibration or normal strains.

3. Terminations: Compression-type crimp lugs.

2.07 BOXES

A. Manufacturer:

1. Interior Outlet Boxes:
a. Appleton Electric Company.
b. Raco.
c. Steel City, American Electric.

2. Weatherproof Outlet Boxes:
a. Appleton Electric Company.
b. Crouse-Hinds Company.

c. O-Z/Gedney company.

d. Perfect-Line, American Electric.

3. Junction and Pull Boxes:

a. Hoffman Engineering Company.

b. Keystone Columbia, Inc.

c. Electromate.

B. Outlet Boxes - Flush Mounted:

1. Wall Outlets: Square corner, galvanized masonry type with internally mounted ears or 4-inches square with raised cover having square corners and internally mounted ears.

2. Ceiling Lighting Fixture Outlet Boxes: 4-inch square galvanized box with raised cover set flush with finished surface, complete with 3/8 inch fixture stud.

C. Outlet Boxes - Surface Mounted:

1. General Use: 4-inches square with raised device cover.

2. Weatherproof: Cast galvanized with threaded hub.

3. Safety outlet enclosure - Tay Mac Co. - Verify outlet configuration.

4. Hazardous Locations: Cast galvanized approved for classification of area.

D. Junction and Pull Boxes:

1. Fabricate from code gauge galvanized steel, with covers held in-place by corrosion resistant machine screws.

2. Size as required by code for number of conduits and conductors entering and leaving box.

3. Provide with welded seams where applicable, and equipment with corrosion resistant nuts, bolts, screws, and washers.

4. Finish with rust inhibiting primer.

2.08 FIRE RATED THROUGH FLOOR FITTINGS

A. None required.

2.09 WIRING DEVICES

A. Manufacturers:

1. Hubbell Wiring Device Division.

2. Pass and Seymour, Inc.

3. Leviton

4. Cooper Wiring Devices

B. Fabricated Devices:

1. Factory-fabricated, specification grade wiring devices in type, color, and electrical rating for service indicated. White color or as selected by ENGINEER OR OWNER.

2. Wiring devices of one manufacturer.

3. See Drawing symbol schedule for identification of device type.

C. Switches:

1. General Use Lighting Switches: 20-amp toggle, equal to Hubbell No. 1221-I series.

2. Switches controlling equipment, operation of which is not evident from switch position, shall include flush neon pilot light in conjunction with proper switch. Each switch shall be complete with engraved plate to identify equipment being controlled (white letters on black, 1/8 inch high minimum).

D. Receptacles:

1. General use duplex receptacles: NEMA No. 5-20R, grounding type, 20-amp Hubbell No. 5362 Specification Grade.
2. Special purpose receptacles as shown on Drawings and schedules.
3. GFI receptacles shall be Hubbell GFR5352IA

E. Wiring Device Plates and Covers:

1. Wall plates for wiring devices with ganging and cut-outs as indicated, provided with metal screws for securing plates to devices, screw heads colored to match finish of plate.
2. Plates for Flush Mounted Devices: Equal to Sierra P line specifications grade Type No. 430 brushed stainless steel.
3. Telephone outlet configuration to match telephone outlet jack or cable.
4. Device plates for surface mounted Type FS or FD boxes to be Type FSK galvanized steel.
5. Device plates for surface mounted, 4-inch square bossed to be ½ inch raised galvanized steel covers.
6. Weatherproof outlet enclosure for exterior devices or devices in damp locations to be marked galvanized gray cast malleable with gasketed lift cover plate as shown on Drawings. Suitable for wet locations while in use. Enclosure must be gasketed. Provide Intermatic WP1010MC, WP1010HMC, or WP1030MC with appropriate mounting base(s) and inserts.

2.10 MOTOR STARTERS

A. None required.

2.11 MOTOR AND CIRCUIT DISCONNECTS

A. Manufacturers:

1. Eaton/Cutler-Hammer
2. Square D
3. General Electric

B. Enclosed Circuit Breaker Construction:

1. Dual cover interlock.
2. External trip indication.
3. Provisions for control circuit interlock.
4. Padlock provisions for padlock in Off position.
5. Handle attached to box, not cover.
6. Handle position indicates On, Off or Tripped.
7. Provisions for insulated or groundable neutral.

C. Safety Switches:

1. NEMA heavy duty Type HD.
2. Dual cover interlock.
3. Visible blades.
4. Provisions for control circuit interlock.
5. Pin type hinges.
6. Tin plated current carrying parts.
7. Quick make and break operator mechanism.
8. Handle attached to box, not cover.
9. Handle position indication, On in up position and Off in down position.
10. Padlock provisions for up to 3 padlocks in Off position.

11. UL listed lugs for type and size of wire specified.
12. Spring reinforced fuse clips for Class R fuses.
13. Provisions for insulated or groundable neutral.
14. UL listed short circuit rating 200,000 RMS amp with Class R fuses.

D. Enclosures:
1. Indoor: NEMA 1 code gauge steel with rust inhibiting primer and baked enamel finish.
2. Outdoor: NEMA 3R code gauge zinc coated steel with baked enamel finish.

2.12 FUSES

A. Manufacturers:
1. Bussmann
2. Gould Shawmut
3. Littlefuse
4. Brush

B. 250 v. Fuses:
1. Class RK-1, 1-end rejection or to fit mountings specified, 1/10 to 600 amps, 200,000-amp interrupting rating.
a. Gould Shawmut Tri-Onic TR-R, dual element, time delay with short circuit protection for motor, transformer, welder, feeder, and main service protection.

C. 600v Fuses:
1. Class RK-1, 1-end rejection or to fit mountings specified, 1/10 to 600 amps, 200,000-amp interrupting rating.
a. Gould Shawmut Tri-Onic TR-R, dual element, time delay with short circuit protection for motor, transformer, welder, feeder and main service protection.
2. Class L, bolt-in 601 to 6,000 amps, 200,000-amp interrupting rating.
a. Gould Shawmut A48Y, time delay for overload and short circuit protection for motor, transformer, feeder, and main service protection.
3. Class CC, fast acting, single element, 1/10 to 30 amps, 200,000-amp interrupting rating.
a. Gould Shawmut ATDR, UL listed for motor control circuits, lighting ballasts, control transformers, and street lighting fixtures.

D. Spare Fuses:
1. 10%, minimum of 3, of each type and rating of installed fuses.

E. Spare Fuse Cabinet:
1. Cabinet: Wall-mounted, 18-gauge minimum steel unit with full-length, recessed piano-hinged door with key coded cam lock and pull.
2. Size: Provide for orderly storage of spare fuses of this project plus 15% spare capacity, minimum.
3. Finish: Gray baked enamel.
4. Cabinet Door: Bear legend in stencilled 1-1/2 inch high letters, "Spare Fuses."

2.13 PANELBOARDS

A. Panelboards are existing.

2.14 MOLDED CASE CIRCUIT BREAKERS

A. Manufacturers:
1. Square D to match existing panels.

2.15 GROUND-FAULT CIRCUIT INTERRUPTER RECEPTACLES (GFCI)

A. Ratings:
1. 120 vac.
2. 20 amp.

B. Tripping Requirement:
1. UL Class A.

C. Construction:
1. Shallow depth.
2. Line and load terminal screws.
3. Noise suppression.
4. Feed through.
5. Standard duplex wall plates shall fit.
6. NEMA 5-20R configuration.

D. Meet requirements of UL 943 ground-fault circuit interrupters.

2.16 GROUNDING AND BONDING

A. Products: Of types indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, more stringent requirements and greater size, rating, and quantity indications govern.

B. Conductor Materials: Copper.

C. Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.

D. Equipment Grounding Conductor: Green insulated.

E. Grounding Electrode Conductor: Stranded cable.

F. Bare Copper Conductors:
1. Solid Conductors: ASTM B3.
2. Assembly of Stranded Conductors: ASTM B8.
3. Tinned Conductors: ASTM B33.

G. Ground Bus: Bar annealed copper bars of rectangular cross section.

H. Braided Bonding Jumpers: Copper tape, braided No. 30 gage bar copper wire, terminated with copper ferules.

I. Bonding Strap Conductor/Connectors: Soft copper, 0.05 inches thick and 2 inches wide, except as indicated.

J. Connector Products
1. General: Listed and labeled as grounding connectors for materials used.
2. Pressure Connectors: High-conductivity-plated units.
3. Bolted Clamps: Heavy-duty units listed for application.
4. Exothermic Welded Connections: Provide in kit form and select for specific types, sizes, and combinations of conductors and other items to be connected.

PART 3 - EXECUTION

3.01 GENERAL

A. Install products in accordance with NEC, manufacturer's instructions, applicable standards, and recognized industry practices to ensure products serve intended function.

3.02 CONDUITS AND CONDUIT FITTINGS

A. Complete conduit installation prior to installing cables.

B. Unless specifically indicated otherwise on Drawings, use rigid galvanized steel conduit for general wiring.

C. Provide watertight conduit system where installed in wet places, underground or where buried in masonry or concrete.

D. EMT conduit may be used for conduit sizes up to 4 inches.

E. Conduit shall be run concealed except exposed surface conduit may be installed where noted on Drawings or where concealment found to be impractical or impossible, and only with approval of ENGINEER.

F. Continuous from outlet to outlet and from outlets to cabinets, junction or pull boxes.

G. Enter and secure to boxes ensuring electrical continuity from point of service to outlets.

H. Conduit runs extending through areas of different temperature or atmospheric conditions or partly indoors and partly outdoors shall be sealed, drained, and installed in manner preventing drainage of condensed or entrapped moisture into cabinets, motors or equipment enclosures.

I. Run conduits within concrete structures parallel to each other and spaced on center of at least three times conduit trade diameter with minimum 2-inch concrete covering. Conduits over 1 inch may not be installed in slab without approval of ENGINEER.

J. Run exposed conduits parallel to or at right angles with lines of building.

K. Route conduit runs above suspended acoustical ceilings not interfering with tile panel removals.

L. Secure conduit in-place with not less than 1 malleable corrosion-proof alloy strap or hanger per 8 feet of conduit.

1. Do not use perforated strapping.

M. Connections to Motors and Equipment Subject to Vibration:

1. Flexible steel conduit not over 3 feet long or where exposed in mechanical and utility areas and not subjected to moisture, dirt, and fumes.

2. Liquidtight flexible conduit not over 3 feet long where exposed in finished areas or where subject to moisture, dirt, fumes, oil, corrosive atmosphere, exposed or concealed, with connectors to ensure liquid tight, permanently grounded connection. Locate where least subject to physical abuse.

N. Use double lock nuts and insulated bushings with threads fully engaged.

O. Connectors at fixture bodies and boxes shall be rigidly secured with galvanized lock nut and bushing.

P. Cap conduits after installation to prevent entry of debris.

Q. Install conduit expansion fittings complete with bonding jumper in following locations.

1. Conduit runs crossing structural expansion joint.

2. Conduit runs attached to two separate structures.

3. Conduit runs where movement perpendicular to axis of conduit may be encountered.

R. Install 4 feet-0 inch to 6 feet-0-inch flexible steel conduit drops from independent junction box mounted above ceiling and accessible from below ceiling to recessed ceiling mounted equipment. Allow for positioning of equipment to tile increments.

S. Negotiate beams and changes in ceiling heights with LB conduit fittings on outside corners and ells on inside corners. Arrange bends and offsets in parallel conduits to present neat symmetrical appearance.

T. In precast areas, run conduits in insulation space or in floor topping without crossing conduits, using 3/4 in. maximum conduit size.

U. Core drill through reinforced concrete with approval of ENGINEER.

V. Split, crushed or scarred conduit not acceptable.

W. Do not route over boiler, incinerator or other high temperature equipment.

X. Flexible metal conduit can only be used for final connections to motors, transformers, or to light fixtures above suspended ceilings.

3.03 SURFACE METAL RACEWAY

A. Mount to surface with No. 8 flathead fasteners or approved support clips.

B. Do not pinch wires.

C. Remove metal burrs and sharp edges.

D. Provide bushing.

E. Install in accordance with manufacturer's recommendations.

F. Provide covers where two lengths come together.

3.04 WIRE AND CABLE

A. Run wire and cable in conduit unless otherwise indicated on Drawings.

B. On branch circuits, use standard colors.

C. Each tap, joint or splice in conductors No. 8 AWG and larger shall be taped with 2 half-lap layers of vinyl plastic electrical tape and finish wrap of color coding tape, where required by code.

D. Run ground wire with power circuits; conduit shall not be grounding path.

E. Color Coding: Conductors for lighting and power wiring as indicated below.

Phase	208/120v	480/277v
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

3.05 BOXES

A. Install knockout closures to cap unused knockout holes where blanks have been removed.

B. Locate boxes to ensure accessibility of electrical wiring.

C. Secure boxes rigidly to subsurface upon which being mounted or solidly embed boxes in concrete or masonry. Do not support from conduit.

D. Do not burn holes, use knockout punches or saw.

E. Provide outlet box accessories as required for each installation such as mounting brackets, fixture study, cable clamps, and metal straps for supporting outlet boxes compatible with outlet boxes being used and meeting requirements of individual wiring situations.

F. Location of outlets and equipment shown on Drawings is approximate. Verify exact location.

G. Minor modification in location of outlets and equipment is considered incidental up to distance of 10 feet with no additional compensation, provided notification of modification is given prior to roughing in of outlet.

H. Flush outlets shall have edges or plaster flush with finished wall or ceiling surfaces so plates can be drawn tightly to wall or ceiling surfaces.

I. Mounting heights:

1. Shall conform to ADA guidelines.

2. In general, unless otherwise shown on Drawings:
    a. Switches: 48 inches above floor to top of box.
    b. AC Receptacles and Telephone Outlets: 15 inches above floor to bottom of box or 6 inches above counters, counter backsplashes in finished areas; 48 inches to top of box above floor in unfinished areas.
    c. Wall Bracket Lighting Fixtures: 8 inches above mirrors or 6 feet-6 inches above floor.
    d. Pushbuttons: 48 inches above floor to top of box.
    e. Motor Starters and Disconnect Switches: 60 inches above floor.
        i. Thermostats: 48 inches above floor.
    f. Bells and Horns: 8 feet-0 inches above floor.
    g. Clocks: 8 ft.-0 inches above floor.
    h. Fire Alarm visual signals 80" above floor.
    i. Emergency Battery Units: 8 ft. - 0 inches above floor or 12" below ceiling.

J. Do not install boxes back to back or through wall. Offset outlet boxes on opposite sides of wall, minimum 12 inches.

K. Where emergency switches occur adjacent to normal light switches, install in separate boxes in accordance with NEC and device plate color coding separation.

L. Light Fixture Outlet Boxes:
    1. Securely mount with approved type bar hangers spanning structural members to support weight of fixture.
    2. Do not support from conduit.
    3. Equip with 3/8-inches fixture stud and tapped fixture ears.

3.06 FIRE RATED THROUGH FLOOR FITTINGS

A. None required.

3.07 WIRING DEVICES

A. Do not install devices until wiring is complete.

B. Do not use terminals on wiring devices (hot or neutral) for feed-through connections, looped or otherwise. Make circuit connections by using wire connectors and pigtails.

C. Install gasket plates for devices or system components having light emitting features such as switch with pilot light and dome lights. Where installed on rough textured surfaces, seal with black self-adhesive polyfoam.

D. Ground receptacles with insulated green ground wire from device ground screw to bolted outlet box connection or as shown on Drawings.

E. Wrap wiring devices with insulating tape.

F. Install emergency switches which occur adjacent to normal light switches in separate boxes to maintain systems isolation in accordance with NEC.

3.08 OVERCURRENT PROTECTIVE DEVICES.

A. Install fuses just prior to energizing equipment.

B. Locate circuit breakers as shown on Drawings.

C. Install GFCI receptacles as required by NEC.

3.09 PANELBOARDS

A. Flush or surface mount as specified on Drawings and schedules.

B. Support panel cabinets independently to structure with no weight bearing on conduits.

C. Install recessed Panelboards to allow cover to be drawn tight against wall to provide neat appearance.

D. Install panelboards so top breaker is not higher than 6 feet-0 inches above floor.

E. Adjacent panel cabinets shall be same size and mounted in horizontal alignment.

F. Install typewritten directory in each panelboard, accurately indicating rooms or equipment being served after final circuit changes have been made to balance circuit loads.

G. Install four spare 1 inch conduits from top of each flush mounted panelboard to area above ceiling for future use. On flush mounted panelboards located on first and higher level floors, provide two spare 1 inch conduits from bottom of panelboard to ceiling area of floor below for future use.

3.10 GROUNDING AND BONDING

A. Application

1. Equipment Grounding Conductor Application: Comply with NEC Article 250 for sizes and quantities of equipment grounding conductors, except where larger sizes or more conductors are indicated.

a. Install separate insulated equipment grounding conductors with circuit conductors. Raceway may be used as equipment ground conductor where feasible in non-hazardous areas and permitted by NEC for lighting circuits. Install insulated equipment ground conductor in nonmetallic raceways unless designated for telephone or data cables.

B. Installation

1. General: Ground electrical systems and equipment in accordance with NEC requirements except where Drawings or Specifications exceed NEC requirements.

3.11 FIELD QUALITY CONTROL

A. Control Circuits, Branch Circuits, Feeders, Motor Circuits, and transformers:

1. Megger check to phase-to-phase and phase-to-ground insulation levels.

a. Do not megger check solid state equipment.

2. Continuity.

3. Short circuit.

4. Operational check.

B. Wiring Devices:

1. Test receptacles with Hubbell 5200, Woodhead 1750 or equal tester for correct polarity, proper ground connection, and wiring faults.

3.12 ADJUSTMENT AND CLEANING

A. Circuit Breakers:

1. Adjustable settings shall be set to provide selective coordination, proper operation, and compliance with NEC.

B. Restore damaged areas on PVC jacketed rigid conduit with spray type touch-up coating compound or as directed by manufacturer.

C. Pull cleaning plug through conduits to clear of dirt, oil, and moisture.

END OF SECTION 26 20 00

SECTION 27 10 00

TELECOMMUNICATIONS DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.01 SCOPE

A. The basic scope of this project is as follows:
   1. Remove all existing cables and jacks.
   2. Remove existing raceway.
   3. Provide new cables and patch panels throughout the building.
   4. Provide all certification and testing of the equipment and cabling as required.

B. Section Includes: Equipment, materials, labor, and services to provide telephone and data distribution system including, but not limited to:
   1. Raceway and boxes
   2. Telephone and data cabling terminations
   3. Telecommunications outlets
   4. Terminal blocks/cross-connect systems
   5. System testing
   6. Documentation and submissions

C. Provide all equipment, materials, labor, and services, not specifically mentioned or shown, which may be necessary to complete or perfect all parts of the installation. Ensure that they are in compliance with requirements stated or reasonably inferred by the contract documents.

D. Work not included:
   1. The following work will be done by others:
      a. Off-site services.
      b. Providing data concentrators, hubs, servers, computers, and other active devices.

1.02 REFERENCES

A. Design, manufacture, test, and install telecommunications cabling networks per manufacturer's requirements and in accordance with NFPA-70 (National Electrical Code®), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:
   1. ANSI/NECA/BICSI-568 -- Standard for Installing Commercial Building Telecommunications Cabling
   2. ANSI/TIA/EIA Standards
      a. ANSI/TIA/EIA-568-B.1 -- Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
      b. ANSI/TIA/EIA-568-B.2 -- Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
      c. ANSI/TIA/EIA-568-B.3 -- Optical Fiber Cabling Components Standard
      d. ANSI/TIA/EIA-569-A -- Commercial Building Standard for Telecommunications Pathways and Spaces
      e. ANSI/TIA/EIA-606(A) -- The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
      f. ANSI/TIA/EIA-607(A) -- Commercial Building Grounding and Bonding Requirements for Telecommunications
      g. ANSI/TIA/EIA-526-7 -- Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant

h. ANSI/TIA/EIA-526-14A -- Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant

i. ANSI/TIA/EIA-758(A) -- Customer-Owned Outside Plant Telecommunications Cabling Standard

B. Install cabling in accordance with the most recent edition of BICSI® publications:

1. BICSI -- Telecommunications Distribution Methods Manual
2. BICSI -- Cabling Installation Manual
3. BICSI -- LAN Design Manual
4. BICSI – Customer-Owned Outside Plant Design Manual

C. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor should note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.03 PERMITS, FEES, AND CERTIFICATES OF APPROVAL

A. As prerequisite to final acceptance, supply to the owner certificates of inspection from an inspection agency acceptable to the owner and approved by local municipality and utility company serving the project.

1.04 SYSTEM DESCRIPTION

A. Telecommunications cabling system generally consists of one telecommunications outlet in each workstation, wall telephones in common and mechanical areas and telecommunications rooms (TRs) located on each floor.

B. The typical work area consists of a single-gang plate with three standards compliant work area outlets.

1. Each work area outlet consists of one (1) four-pair data Category 6 cable or above, installed from work area outlet to the TR. Terminate data cables on rack mounted modular patch panels located in the appropriate TR.

1.05 SUBMITTALS

A. Submit to the engineer/designer shop drawings, product data (including cut sheets and catalog information), and samples required by the contract documents. Submit shop drawings, product data, and samples with such promptness and in such sequence as to cause no delay in the work or in the activities of separate contractors. The engineer/designer will indicate approval of shop drawings, product data, and samples submitted to the engineer by stamping such submittals "APPROVED" with a stamp. Submitted shop drawings shall be initialed or signed by the contractor, showing the date and the contractor's legitimate firm name.

1. By submitting shop drawings, product data, and samples, the contractor represents that he or she has carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. It also represents that the contractor has checked, coordinated, and verified that information contained within shop drawings, product data, and samples conform to the requirements of the work and of the contract documents. The engineer/designer remains responsible for the design concept expressed in the contract documents as defined herein.
2. The engineer’s/designer’s approval of shop drawings, product data, and samples submitted by the contractor shall not relieve the contractor of responsibility for deviations from requirements of the contract documents, unless the contractor has specifically informed the engineer/designer in writing of such deviation at time of submittal, and the engineer/designer has given written approval of the specific deviation. The contractor shall continue to be responsible for deviations from requirements of the contract documents not specifically noted

by the contractor in writing, and specifically approved by the engineer in writing.

3. The engineer's/designer's approval of shop drawings, product data, and samples shall not relieve the contractor of responsibility for errors or omissions in such shop drawings, product data, and samples.

4. The engineer's/designer's review and approval, or other appropriate action upon shop drawings, product data, and samples, is for the limited purpose of checking for conformance with information given and design concept expressed in the contract documents. The engineer's/designer's review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the contractor as required by the contract documents. The review shall not constitute approval of safety precautions or of construction means, methods, techniques, sequences, or procedures. The engineer's/designer's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

B. Perform no portion of the work requiring submittal and review of shop drawings, product data, or samples, until the engineer/designer has approved the respective submittal. Such work shall be in accordance with approved submittals.

C. Submit shop drawings, product data, and samples as a complete set within thirty (30) days of award of contract.

1. For initial submission and for resubmission required for approval, submit four (4) copies of each item. The engineer/designer will only return two copies. Make reproductions as required for your use and distribution to subcontractors.

2. Illegible submittals will not be checked by the engineer.

D. General: Submit the following:

1. Bill of materials, noting long lead time items

2. Optical loss budget calculations for each optical fiber run

3. Project schedule including all major work components that materially affect any other work on the project

E. Shop drawings: Submit the following:

1. Backbone (riser) diagrams.

2. System block diagram, indicating interconnection between system components and subsystems.

3. Interface requirements, including connector types and pin-outs, to external systems and systems or components not supplied by the contractor.

4. Fabrication drawings for custom-built equipment.

F. Product Data -- Provide catalog cut sheets and information for the following:

1. Wire and cable

2. Outlets, jacks, faceplates, and connectors

3. All metallic and nonmetallic raceways, including surface raceways, outlet boxes, and fittings

4. Terminal blocks and patch panels

G. Project record drawings:

1. Submit project record drawings at conclusion of the project and include:

a. Approved shop drawings

b. Plan drawings indicating locations and identification of work area outlets, nodes, telecommunications rooms (TRs), and backbone (riser) cable runs

c. Telecommunications rooms (TRs) and equipment room (ER and/or MC) termination detail sheets.

d. Cross-connect schedules including entrance point, main cross-connects, intermediate

cross-connects, and horizontal cross-connects.

e. Labeling and administration documentation.

f. Warranty documents for equipment.

g. Copper certification test result printouts and diskettes.

h. Optical fiber power meter/light source test results.

1.06 QUALITY ASSURANCE

A. The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this type and size.

B. Upon request by the engineer/designer, furnish a list of references with specific information regarding type of project and involvement in providing of equipment and systems.

C. Equipment and materials of the type for which there are independent standard testing requirements, listings, and labels, shall be listed and labeled by the independent testing laboratory.

D. Where equipment and materials have industry certification, labels, or standards (i.e., NEMA - National Electrical Manufacturers Association), this equipment shall be labeled as certified or complying with standards.

E. Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout.

F. Subcontractors shall assume all rights and obligations toward the contractor that the contractor assumes toward the owner and engineer/designer.

1.07 WARRANTY

A. Unless otherwise specified, unconditionally guarantee in writing the materials, equipment, and workmanship for a period of not less than fifteen (15) years from date of acceptance by the owner. The owner shall deem acceptance as beneficial use.

B. Transfer manufacturer's warranties to the owner in addition to the General System Guarantee. Submit these warranties on each item in list form with shop drawings. Detail specific parts within equipment that are subject to separate conditional warranty. Warranty proprietary equipment and systems involved in this contract during the guarantee period. Final payment shall not relieve you of these obligations.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect equipment during transit, storage, and handling to prevent damage, theft, soiling, and misalignment. Coordinate with the owner for secure storage of equipment and materials. Do not store equipment where conditions fall outside manufacturer's recommendations for environmental conditions. Do not install damaged equipment; remove from site and replace damaged equipment with new equipment.

1.09 SEQUENCE AND SCHEDULING

A. Submit schedule for installation of equipment and cabling. Indicate delivery, installation, and testing for conformance to specific job completion dates. As a minimum, dates are to be provided for bid award, installation start date, completion of station cabling, completion of riser cabling, completion of testing and labeling, cutover, completion of the final punch list, start of demolition, owner acceptance, and demolition completion.

1.10 USE OF THE SITE

A. Perform all work with the building occupied.

B. Access to building wherein the work is performed shall be as directed by the owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Hubbell, Ortronics, Panduit

1. Or any other approved equivalent manufacturer that meets the performance requirements of this specification. Category 6 performance is standard.
2. Contractor shall be a certified installer.

B. Berk-Tek

C. Belden

D. Mohawk

E. Commscope

F. Superior Essex

G. Optical Cable Corporation

2.02 FABRICATION

A. Fabricate custom-made equipment with careful consideration given to aesthetic, technical, and functional aspects of equipment and its installation.

2.03 SUITABILITY

A. Provide products that are suitable for intended use, including, but not limited to environmental, regulatory, and electrical.

2.04 STATION CABLE

A. STATION CABLE

1. Solid copper, 24 AWG, 100 W balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 up to 250 MHz.
    a. Listed Type CMP (as required in the NEC 2017).

2.05 WORK AREA OUTLETS

A. VOICE/DATA WORK AREA OUTLETS (Copper only)

1. Single-gang stainless steel mounting plate with four (4) openings containing the following devices:
    a. Four Voice/Data Outlets - 8-pin modular, Category 6, unkeyed, white, pinned to T568A standards.
    b. See plans for other configurations.
2. The device color of outlets and jacket color for cabling that will be used on the project shall be coordinated with the Dane County Information Technology (IT) Department prior to the beginning of any work. It is intended that the Dane County standard being maintained.

B. WALL VOICE OUTLETS

1. Single-gang stainless steel faceplate with six-conductor jack and wall telephone mounting lugs
2. to T568A standards

2.06 PATCH PANELS

A. 19 in. rack mountable, 24-port 8-pin modular to insulation displacement connector (IDC) meeting Category 6 performance standards and pinned to T568 A standards. Typical examples of IDC connections are the 110, BIX, and Krone.

2.07 EQUIPMENT RACKS

A. Free Standing Equipment Rack

1. Rack shall be 84" in height and shall be self-supporting. Base footprint shall be no smaller than 15” x 20”.
2. Channel Upright spacing: Per EIA/ECA-310 to accommodate Industry standard 19” mounting.
3. Construction:
   a. Material: Aluminum
   b. Finish: Powder coated or painted surface
   c. Color: Black
4. Rack Upright shall be double side drilled and tapped to accept 12-24 screws. Uprights shall also be drilled on back to accept cable brackets, clamps, power strip(s), &c.
5. Vertical hole spacing:
   a. Front - Per EIA/ECA-310 (5/8"-5/8"-1/2")
   b. Rear – 3-inch intervals to accept cable brackets
6. Channel Uprights shall be marked with Rack Unit (RU) identifiers per ANSI/TIA-606-B. Numbering shall be “bottom-to-top” (e.g. “#1” at bottom of rack).
7. Jumper Management
   a. Rack shall be equipped with Vertical Jumper Management Hardware as to allow an orderly routing of twisted pair, optical fiber and coaxial jumpers from the patch panels to the customer provided network equipment.
   b. Hardware shall provide for cable routing on front and rear of each rack.
   c. Vertical managers shall:
      i. Have non-metallic fingers spaced no greater than and aligned with each Rack Unit indicator on the equipment rack.
      ii. Be equipped with hinged front and rear doors that cover the cable routing are
   d. Channel dimensions: Minimum width: 6” at end-of-row, 8” between adjacent racks or as shown on project drawings.
   e. Hardware shall be designed to mount on spacers attached to the rack uprights and not on the upright itself.
      i. Where multiple racks are to be installed, mount hardware between the uprights of adjacent racks.
      ii. Secure rack uprights and spacers together per manufacturer recommendations.

B. Enclosed Equipment Cabinet (Floor Mounted)

1. General
   a. Where identified on the drawings, free standing equipment cabinets shall house all termination components installed under this contract. Equipment cabinets shall be fully gasketed to keep contaminants away from equipment.
   b. Hinges and Latch shall be configurable to allow cabinet doors to open Left or Right.
   c. Doors shall be lockable and furnished with two (2) keys.
   d. Doors on all cabinets furnished under this contract shall use the same key.
2. Construction:
   a. Material:
      i. Frame: Steel or High strength extruded Aluminum
      ii. Doors, Sides and Top: Steel or Aluminum
      iii. Front Door: Safety-glass
      iv. Rear Door: Perforated or Louvered.

v. Sides: Solid

vi. Top: Solid; Configure Panel with cable access and/or ventilation as required.

vii. Base: Open; Integral Leveling Feet

b. Finish: Powder coated or painted surface; Black

3. Dimensions (minimum):

a. Usable mounting height – 45 RU (RU = 1-3/4")

b. Width: 32 inches

c. Depth – 48 inches.

4. The cabinet shall be configured as to allow for adjustment of the channel uprights (front to rear) in 1-inch increments (maximum) and be spaced to accommodate industry standard 19-inch mounting. Uprights shall be tapped to accept mounting screws.

5. Cabinets shall be equipped with:

a. Vertical cable management hardware (Left and Right).

b. Integral bonding points for grounding.

c. Ground Bar and #6 AWG Ground lug.

PART 3 - EXECUTION

3.01 PRE-INSTALLATION SITE SURVEY

A. Prior to start of systems installation, meet at the project site with the owner's representative and representatives of trades performing related work to coordinate efforts. Review areas of potential interference and resolve conflicts before proceeding with the work. Facilitation with the General Contractor will be necessary to plan the crucial scheduled completions of the equipment room and telecommunications closets.

B. Examine areas and conditions under which the system is to be installed. Do not proceed with the work until satisfactory conditions have been achieved.

C. The contractor shall be responsible for meeting with the Owner's (Dane County) Information Technology staff prior to the start of any installation to coordinate the work to be installed as part of this project. It is the design intent to maintain any cabling or installation standards that are currently in use by Dane County.

1. Failure to perform this meeting may cause work to be removed and reinstalled if not deemed acceptable by Dane County.

3.02 HANDLING AND PROTECTION OF EQUIPMENT AND MATERIALS

A. Be responsible for safekeeping of your own and your subcontractors' property, such as equipment and materials, on the job site. The owner assumes no responsibility for protection of above named property against fire, theft, and environmental conditions.

3.03 PROTECTION OF OWNER'S FACILITIES

A. Effectively protect the owner's facilities, equipment, and materials from dust, dirt, and damage during construction.

B. Remove protection at completion of the work.

3.04 INSTALLATION

A. Receive, check, unload, handle, store, and adequately protect equipment and materials to be installed as part of the contract. Store in areas as directed by the owner's representative. Include delivery, unloading, setting in place, fastening to walls, floors, ceilings, or other structures where required,

interconnecting wiring of system components, equipment alignment and adjustment, and other related work whether or not expressly defined herein.

B. Install materials and equipment in accordance with applicable standards, codes, requirements, and recommendations of national, state, and local authorities having jurisdiction, and National Electrical Code® (NEC) and with manufacturer's printed instructions.

C. Adhere to manufacturer's published specifications for pulling tension, minimum bend radii, and sidewall pressure when installing cables.

1. Where manufacturer does not provide bending radii information, minimum-bending radius shall be 15 times cable diameter. Arrange and mount equipment and materials in a manner acceptable to the engineer and the owner.

D. Penetrations through floor and fire-rated walls shall utilize intermediate metallic conduit (IMC) or galvanized rigid conduit (GRC) sleeves and shall be fire stopped after installation and testing, utilizing a firestopping assembly approved for that application.

E. Install station cabling to the nearest telecommunications room (TR), unless otherwise noted.

F. Installation shall conform to the following basic guidelines:

1. Use of approved wire, cable, and wiring devices

2. Neat and uncluttered wire termination

G. Attach cables to permanent structure with suitable attachments at intervals of 48 to 60 inches. Support cables installed above removable ceilings.

H. Install adequate support structures for 10 foot of service slack at each TR.

I. Support riser cables every three (3) floors and at top of run with cable grips.

1. Limit number of four-pair data riser cables per grip to fifty (50)

J. Install cables in one continuous piece. Splices shall not be allowed except as indicated on the drawings or noted below:

K. Provide overvoltage protection on both ends of cabling exposed to lightning or accidental contact with power conductors.

3.05 GROUNDING

A. Grounding shall conform to ANSI/TIA/EIA 607(A) - Commercial Building Grounding and Bonding Requirements for Telecommunications, National Electrical Code®, ANSI/NECA/BICSI-568 and manufacturer's grounding requirements as minimum.

B. Bond and ground equipment racks, housings, messenger cables, and raceways.

C. Connect cabinets, racks, and frames to single-point ground which is connected to building ground system via #6 AWG green insulated copper grounding conductor.

3.06 LABELING

A. Labeling shall conform to ANSI/TIA/EIA-606(A) standards. In addition, provide the following:

1. Label each outlet with permanent self-adhesive label with minimum 3/16 in. high characters.

2. Label each cable with permanent self-adhesive label with minimum, 1/8 in. high characters, in the following locations:

a. Inside receptacle box at the work area.

b. Behind the communication closet patch panel or punch block.

c. Use labels on face of data patch panels. Provide facility assignment records in a protective cover at each telecommunications closet location that is specific to the facilities terminated therein.

d. Use color-coded labels for each termination field that conforms to ANSI/TIA/EIA-

606(A) standard color codes for termination blocks.

e. Mount termination blocks on color-coded backboards.

f. Labels shall be machine-printed. Hand-lettered labels shall not be acceptable.

g. Label cables, outlets, patch panels, and punch blocks with room number in which outlet is located, followed by a single letter suffix to indicate particular outlet within room, i.e., S2107A, S2107B. Indicate riser cables by an R then pair or cable number.

h. Mark up floor plans showing outlet locations, type, and cable marking of cables. Turn these drawings over to the owner two (2) weeks prior to move in to allow the owner's personnel to connect and test owner-provided equipment in a timely fashion.

i. Three (3) sets of as-built drawing shall be delivered to the owner within four (4) weeks of acceptance of project by the owner. A set of as-built drawings shall be provided to the owner in magnetic media form (3.5" floppy disks) and utilizing CAD software that is acceptable to the owner. The magnetic media shall be delivered to the owner within six (6) weeks of acceptance of project by owner.

3.07 TESTING

A. Testing shall conform to ANSI/TIA/EIA-568-B.1 standard. Testing shall be accomplished using level IIe or higher field testers.

B. Test each pair and shield of each cable for opens, shorts, grounds, and pair reversal. Correct grounded, and reversed pairs. Examine open and shorted pairs to determine if problem is caused by improper termination. If termination is proper, tag bad pairs at both ends and note on termination sheets.

1. Perform testing of copper cables with tester meeting ANSI/TIA/EIA-568-B.1 requirements.

Category 6 Test Parameters:

			Category 6 Cable Permanent Link Test			
Frequency	TIA/EIA 568B.2-1 Insertion Loss Attenuation	TIA/EIA 568B.2-1 NEXT Worst Pair to Pair	TIA/EIA 568B.2-1 PSNEXT Worst Case Loss	TIA/EIA 568B.2-1 ELFEXT Worst Pair to Pair Loss	TIA/EIA 568B.2-1 PSELFEXT Loss	TIA/EIA 568B.2-1 Return Loss
Mhz	Max. dB	dB	dB	DB	dB	dB
1.00	1.9	65.0	62.0	64.2	61.2	19.1
4.00	3.5	64.1	61.8	52.1	49.1	21.0
8.00	5.0	59.4	57.0	46.1	43.1	21.0
10.00	5.5	57.8	55.5	44.2	41.2	21.0
16.00	7.0	54.6	52.2	40.1	37.1	20.0
20.00	7.9	53.1	50.7	38.2	35.2	19.5
25.00	8.9	51.5	49.1	36.2	33.2	19.0
31.25	10.0	50.0	47.5	34.3	31.3	18.5
62.50	14.4	45.1	42.7	28.3	25.3	16.0
100.00	18.6	41.8	39.3	24.2	21.2	14.0
200.00	27.4	36.9	34.3	18.2	15.2	11.0
250.00	31.1	35.3	32.7	16.2	13.2	10.0

C. Propagation Delay

1. The maximum propagation delay determined in accordance with the ANSI/TIA/EIA –568B.2 for a Permanent Link configuration shall be less than 498-ns measured at 10MHz. (Note: In determining the permanent link propagation delay, the propagation delay contribution of connecting hardware is assumed to not exceed 2.5 ns from 1 MHz to 250MHz).

D. Delay Skew

1. For all frequencies from 1 MHz to 250 MHz, Category 6 cable propagation delay skew shall not exceed 44ns/100m at 20 degrees C, 40 degrees C, and 60 degrees C. In addition, the

propagation delay skew between all pairs shall not vary more than +/- 10ns from the measured value at 20 degrees C when measured at 40 degrees C and 60 degrees C. Compliance shall be determined using a minimum 100m of cable.

E. In order to establish testing baselines, cable samples of known length and of the cable type and lot installed shall be tested. The cable may be terminated with an 8-position Category 6 Modular plug (8-pin) to facilitate testing. Net Propagation Velocity (NPV) and nominal attenuation values shall be calculated based on this test and be utilized during the testing of the installed cable plant. This requirement can be waived if NPV data is available from the cable manufacturer for the exact cable type under test.

F. In the event results of the tests are not satisfactory, the Contractor shall make adjustments, replacement and changes as are necessary, and shall then repeat the test or tests which disclosed faulty or defective material, equipment or installation method, and shall make additional tests as the Engineer deems necessary at no additional expense to the project or user agency.

G. Where any portion of system does not meet the specifications, correct deviation and repeat applicable testing at no additional cost to the owner.

3.08 FIELD QUALITY CONTROL

A. Employ job superintendent or project manager during the course of the installation to provide coordination of work of this specification and of other trades and provide technical information when requested by other trades. This person shall maintain current RCDD® (Registered Communications Distribution Designer) registration and shall be responsible for quality control during installation, equipment set-up, and testing.

B. At least 30 percent of installation personnel shall be BICSI Registered Telecommunications Installers. Of that number, at least 15 percent shall be registered at the Technician Level, at least 40 percent shall be registered at the Installer Level 2, and the balance shall be registered at the Installer Level 1.

C. Installation personnel shall meet manufacturer's training and education requirements for implementation of extended warranty program.

END OF SECTION 27 10 00

SECTION 28 13 00

ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.01 SCOPE

A. Division 00 and Division 01 of this Project Manual apply to this Section as though repeated herein.

1.02 RELATED WORK

A. See Section 08710 DOOR HARDWARE.

1.03 SUMMARY

A. Provide a complete operating card access system compatible with the CBRE/ESI system installed in the Dane County Northport Building. This work shall include power supplies, outlet boxes, cables and wiring as shown on the drawings and as specified herein.

B. Coordinate all work with Section 08710.

1.04 INTEGRATION

A. Obtain materials from CBRE/ESI.

B. Jerry Gitlewski is the contact for this building:

- Jerry Gitlewski | Solutions Architect
- CBRE | ESI
- Global Workplace Solutions | Global Energy & Sustainability
- 3410 Gateway Road
- Brookfield, WI 53045
- T +1 262 832 1308 | F +1 888 280 8837 | C +1 920-360-0326
- jerry.gitlewski@cbre.com | www.cbre.com | www.thinkesi.com
- Support@thinkesi.com

C. Contract with them to completely integrate the functions and components with the existing building access control system, so they operate as an efficient, simple to operate system.

1.05 SUBMITTALS

A. General: Data sheets on all equipment being provided as well as recommended cable types. Internal control cabinet drawings showing internal block diagram connections shall be provided. Wiring diagrams showing typical field wiring connections as well as single line floor plan indicating equipment locations as well as cabling routings and quantities.

B. Product Data: Submit product data, including manufacturer's product sheet, for specified products.

C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage and accessories. Include cabling diagrams, wiring diagrams, station installation details and equipment cabinet details.

D. Quality Assurance Submittals: Submit the following:

1. Test Reports: Certified test reports showing compliance with specified performance characteristics.
2. Manufacturer's Instructions: Manufacturer's installation instructions.

E. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals. Include troubleshooting guide, wiring terminal identification and equipment parts list.
2. Warranty: Warranty documents specified herein.

F. Project Closeout

1. The contractor shall furnish manufacturer's manuals of the completed system including individual specifications sheets, schematics, inter-panel and intra-panel wiring diagrams.
    a. All information necessary for the proper maintenance and operation of the system must be included.
    b. Provide four copies.
2. Demonstrate proper function to Owner and Fire Department.
3. Operating manuals and users' guides shall be provided at the time of the training.

1.06 WARRANTY

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1. Warranty Period: 3 years commencing on the Date of Substantial Completion.
2. All materials and installation shall be guaranteed to be free of defects in material and workmanship for one year after final acceptance of installation and tests.

1.07 INSTALLATION STANDARDS

A. The system shall be installed in accordance with the 2017 NEC.

B. The completed system shall follow state and local electrical codes.

C. All wiring shall test free from grounds and shorts.

PART 2 - PRODUCTS

2.01 POWER SUPPLY

A. Provide an Altronix SMP7PMCTXS.

1. 115 VAC input.
2. 12VDC/24VDC selectable output.
3. 6 ampere continuous supply current output.

4. Filtered and electronically regulated outputs.
5. Short circuit and thermal overload protection.
6. Built-in charger for battery backup.
7. AC input and DC output LED indicators.
8. AC fail supervision (form C contact rated 1A at 28VDC)
9. In NEMA 1 enclosure.

2.02 ACCESS CONTROLLER

A. Provide an Access Controller capable of controlling 4 doors, compatible with the existing system.

B. Provide interface components to link to existing Access Controllers.

C. System must be compatible with existing Dane County proximity cards.

2.03 CARD READERS

A. Provide HID 5355 compatible with the system and matching others in the building.

2.04 ELECTRIC STRIKES

A. To be furnished by the Hardware Section: wired by this Section. Coordinate with supplier to obtain 24 VDC units.

2.05 REQUEST TO EXIT SENSORS

A. Provide Bosch, Honeywell or Securitron PIR compatible with existing system.

2.06 PROXIMITY CARDS

A. Furnished by owner.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Cabling Requirements

1. Wiring may be run concealed, free air. See following article.
2. Verify cable types with the Manufacturer.
3. Provide 120V AC outlet.
4. All cables shall be plenum rated.

B. Locate equipment in existing electrical closet.

3.02 FREE AIR WIRING

A. All wiring shall be run “free-air”, in conduit or in surface raceway. "Free-air" wiring is allowed where it can be completely concealed. If wiring cannot be concealed, it shall be installed in wire mold in finished areas and in conduit in unfinished areas.

B. Where installed “free-air”, comply with the following:

1. Cable shall run at right angles and be kept clear of other trades work.
2. Cables shall be supported according to code utilizing bridle rings anchored to ceiling concrete, piping supports or structural steel beams. Rings shall be designed to maintain cables bend to larger than the minimum bend radius (typically 4 x cable diameter).
3. Supports shall be spaced at a maximum 4-foot interval unless limited by building construction. If

cable "sag" at mid-span exceeds 12-inches, another support shall be used.

4. Cable shall never be laid directly on the ceiling grid.

5. Cables shall not be attached to or supported by, existing cabling, plumbing or steam piping, ductwork, ceiling supports or electrical or communications conduit.

6. A coil of 2 feet in each cable shall be placed in the ceiling at each “free-air” wired device. These "service loops" shall be secured at the last cable support before the cable reaches the device and shall be coiled from 100% to 200% of the cable recommended minimum bend radius.

7. Devices wired with conduit shall be provided with an 8-inch wire tail at each device box

8. To reduce or eliminate EMI, the following minimum separation distances from ≤480V Power lines shall be adhered to:

   a. Twelve (12) inches from power lines of <5-kVa.

   b. Eighteen (18) inches from high voltage lighting (including fluorescent).

   c. Thirty-nine (39) inches from power lines of 5-kVa or greater.

   d. Thirty-nine (39) inches from transformers and motors.

9. All cable shall be free of tension at both ends. In cases where the cable must bear some stress, Kellem grips shall be used to spread the strain over a longer length of cable.

10. Manufacturers minimum bend radius specifications shall be observed in all instances. Care should be taken in the use of cable ties to secure and anchor the station cabling. Ties should not be over tightened as to compress the cable jacket. No sharp burrs should remain where excess length of the cable tie has been cut.

11. All vertical cable extensions to devices located below the finished ceiling shall be in conduit.

C. Contractor shall furnish all required installation tools to facilitate cable pulling without damage to the cable jacket. Such equipment is to include, but not limited to, sheaves, winches, cable reels, cable reel jacks, duct entrance tunnels, pulling tension gauge and similar devices. All equipment shall be of substantial construction to allow steady progress once pulling has begun. Makeshift devices, which may move or wear in a manner to pose a hazard to the cable, shall not be used.

D. All cable shall be pulled by hand unless installation conditions require mechanical assistance. Where mechanical assistance is used, care shall be taken to insure the maximum tensile load for the cable as defined by the manufacturer is not exceeded. This may be in the form of continuous monitoring of pulling tension, use of a “break-away” or other approved method.

3.03 LOCAL CODE AUTHORITY SUBMITTALS

A. This Contractor is responsible for making required submittals to the Madison Fire Department.

B. Pay any fees required for review.

3.04 MANUFACTURER’S INSTRUCTIONS

A. Compliance: Comply with manufacturer’s product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.

3.05 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer’s instructions.

3.06 SYSTEM STARTUP

A. Power shall only be applied to the system after re-checking for proper grounding of the system and measuring all loops for lack of shorts, grounds, and open circuits.

B. System supplier shall be responsible for coordinating all hardware programming of the system with the Dane County. Coordinate all door functions with each tenant representative and Dane County. Cardholder data base programming shall be by Dane County.

3.07 COMMISSIONING

A. After all work is completed and prior to requesting acceptance test, Contractor shall conduct a final inspection and pre-test all equipment and system features. Each building shall be acceptance tested individually when completed. Contractor shall correct any deficiencies discovered as the result of the inspection and pre-test of all contractor installed equipment and materials.

B. Contractor shall submit a request for the acceptance test in writing to the Project Representative no less than fourteen days prior to the requested test date. The request for acceptance test shall be accompanied by a certification from Contractor that all work is complete and has been pre-tested, and that all corrections have been made.

C. During acceptance test, Contractor shall demonstrate all equipment and system features to the State's Project Representative and Tenant. Contractor shall remove covers, open wiring connections, operate equipment, and perform other reasonable work as requested by the Project Representative.

D. Any portions of the work found to be deficient or not in compliance with the Project Drawing and Specifications will be rejected. The Project Representative will prepare a list of any such deficiencies observed during the acceptance test. Contractor shall promptly correct all deficiencies. Upon correction of deficiencies, Contractor shall submit a request in writing to the Project Representative for another acceptance test.

E. If, at the end of the acceptance test, all work is found to be acceptable and in compliance with the Project Drawings and Specifications, the Project Representative will issue a Certificate of Substantial Completion to Contractor.

END OF SECTION 28 13 00

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SECTION 28 31 00

FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The building (1202 Northport Drive) in Madison has a complete fire alarm system in place. This project will provide a renovated fire alarm system with new devices in remodeling areas only. The areas outside the scope of work shall remain as is.

B. Provide wiring as required to incorporate these new devices into the existing SimplexGrinnell fire alarm control panel. Coordinate this work with the Madison sales office of SimplexGrinnell. Contact Jason Ropson at 608-509-2881 (cell) or Jason.ropson@jci.com.

C. The Contractor shall be aware that the building will remain occupied during construction of this remodeled area.

1. The Contractor shall be responsible for turning off/turning on the fire alarm system to allow for work to be performed. Also, the Contractor shall be responsible for contacting Dane County building maintenance staff at any time when the fire alarm system is down. This will allow for an announcement to be made to all building occupants.
2. All testing shall be done during non-occupied hours.
3. Extreme care should be taken on the part of the Contractor to reduce or eliminate nuisance tripping of the fire alarm smoke detectors during construction. Extensive nuisance tripping of the fire alarm system cannot be tolerated due to the high volume of occupants in the building.

1.02 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies

1. National Fire Protection Association (NFPA):
    a. NFPA No. 70 - National Electric Code (NEC).
    b. NFPA No. 101 - Life Safety Code.
2. Wisconsin Enrolled Building Commercial Building Code 2002.
3. Underwriters Laboratories, Inc.
4. Local codes and ordinances.

B. Reference Standards:

1. National Fire Protection Association (NFPA):
    a. NFPA No. 72
2. National Electrical Manufacturer's Association (NEMA).

C. System equipment to be of one manufacturer and supported by factory trained, established service organization of equipment manufacturer who shall stock parts for equipment supplied.

D. Equipment must be manufactured by firm actively manufacturing fire alarm systems for minimum of 10 years.

E. Manufacturer's Services:

1. Manufacturer's representative factory trained service engineer for equipment specified herein shall be present at job site to supervise final adjustment of system after installation complete, equipment startup, and training of OWNER'S personnel for system operation.

2. Manufacturer shall direct services to system and equipment operation, maintenance, troubleshooting, and equipment and system related areas.

1.03 SUBMITTALS

A. Shop Drawings to include:

1. Data sheets and equipment description.
2. Bill of materials listing components.
3. Component wiring diagrams.
4. System wiring and interconnection diagrams showing all devices – not a typical diagram.

B. Operation and Maintenance (O & M) Data: Submit in accordance with Division 1. Provide electronic record drawings in Autocad Version 2016 or newer on CD.

C. Field quality control test results.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Receive equipment at job site, verify applicable components and quantity delivered per invoice.

B. Handle equipment to prevent internal components damage, breakage, denting, and scoring enclosure and finish.

C. Do not install damaged equipment.

D. Store equipment in clean, dry space and protect from dirt, fumes, water, construction debris, and physical damage.

E. After installation, protect from damage by Work of other trades.

PART 2 - PRODUCTS

2.01 GENERAL

A. Use of manufacturer's name and model or catalog number is for purpose of establishing standard of quality, general configuration, and operating characteristics desired only.

2.02 ACCEPTABLE MANUFACTURERS

A. SimplexGrinnell

B. Due to the existence of the existing SimplexGrinnell fire alarm control panel, no other manufacturers will be accepted.

2.03 SYSTEM OPERATION

A. The system operation for the existing SimplexGrinnell fire alarm control panel shall remain as is with no modifications.

2.04 FIRE ALARM CONTROL PANEL

A. The fire alarm control panel is an existing SimplexGrinnell 4002 FACP. This equipment will remain in place and the fire alarm system shall be extended to the areas of remodeling with compatibility with this fire alarm control panel.

2.05 SMOKE DETECTION

A. Smoke detectors shall be Photoelectric type, SimplexGrinnell 4098-9601. Provide 4098-9788 two-wire base.

1. Analog addressable.
2. Light scattering principle.
3. UL magnet test feature.
4. Remote test by control panel command.
5. Dual alarm and power LED.
6. Adjustable sensitivity via panel command.
7. Mounts on 4" octagon or 4" square box with square to round ring.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine areas and conditions under which fire alarm system to be installed and notify ENGINEER in writing of conditions detrimental to proper and timely completion of Work.

3.02 INSTALLATION

A. Installation of the Fire Alarm/Life Safety System shall be in strict compliance with manufacturer's recommendations. Consult the manufacturer's Control Panel and Peripheral Equipment installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system installation.

B. Power Requirements:

1. The Fire Alarm Control Panel (FACP) and/or Notification Appliance Circuit (NAC) panels shall be connected to a separate 20 ampere, 120 volt dedicated branch circuit labeled as FIRE ALARM.
2. The Control Panel Cabinet shall be grounded securely using a copper grounding conductor.
3. Conduit shall enter the Fire Alarm Control panel backbox only at those areas of the back box which have factory conduit knockouts.
4. All field wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules, or any open circuits in the field wiring: an audible and visual trouble signal will be activated until system and its associated field wiring are restored to normal condition.

C. Cables must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.

D. SLC loops shall be loaded to no more than 75% of their capacity.

E. Install wiring in accordance with Section 26 05 00 and shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer. See Article 3.06 FREE AIR CABLING for further requirements.

1. SLC loop shall be 2 #16 shielded FPLR or FPLP cable as required.
2. Signal circuit wiring shall be 2 conductor #14 or 2 conductor #12 FPLR or FPLP cable as required. 2#14 or 2#12 THHN is acceptable if signal circuits are enclosed in listed raceway. Synchronization modules shall be utilized to provide audio and visual synchronization over 2 conductors. Consult loading chart for proper wire gauge and wire length to insure against excessive DC voltage drop. A minimum of 20.5V DC must be available at the last signal of a NAC under full alarm condition.
3. Provide 2 #14 from control panel or door holder power supply to door holders.

F. Provide all fire alarm system wiring drops to devices within raceways and junction boxes. Where existing conditions prohibit fishing existing walls, to avoid excessive cutting and restoration metallic wiremold finished to match existing wall surface shall be permitted where allowed by OWNER/ENGINEER, routing subject to OWNER/ENGINEER approval. Install conduit in accordance with Section 16001 and as shown on Drawings.

G. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.

H. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage. Ref: NFPA 72, 1999 2-3.6.1.3.

I. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas if approved by Owner/Engineer before installation. All system junction boxes shall be as manufactured by system supplier or painted red and stenciled with fire alarm system designation.

J. All fire detection and alarm system devices shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas if approved by Owner/Engineer before installation.

K. All conductor identification shall be labeled in accordance with 26 05 00 at all accessible locations including at control panel, junction boxes and at devices for future tracing and maintenance.

L. Provide concealed 3/4" conduit and wire to telephone terminal board from main fire alarm control panel.

M. Coordinate connections with supplier of central station network system.

N. Provide concealed ¾” conduit and wire to security panel for monitoring of trouble, supervisory and system alarm.

3.03 ADJUSTMENT AND CLEANING

A. Clean system equipment and enclosure of dirt and debris.

3.04 FIELD QUALITY CONTROL

A. Provide the service of a NICET certified, Level II minimum, factory-trained technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and test for the system.

B. System shall test free from grounds, opens, and short circuits.

C. Upon completion of installation of fire alarm equipment, CONTRACTOR shall provide ENGINEER with signed written statement substantially in form as follows.

D. "The undersigned having been engaged as the CONTRACTOR on the "DANE COUNTY NORTHPORT BUILDING**"** confirms the fire alarm equipment was installed in accordance with wiring diagrams, instructions, and directions provided to us by the manufacturer."

3.05 WARRANTY

A. All work performed, and all material and equipment furnished under this contract shall be from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one-year period shall be included in the submittal bid.

3.06 FREE AIR WIRING

A. All wiring shall be run "free-air", in conduit or in surface raceway. "Free-air" wiring is allowed where it can be completely concealed. If wiring cannot be concealed, it shall be installed in wiremold in finished areas and in conduit in unfinished areas.

B. Where installed "free-air", comply with the following:

1. Cable shall run at right angles and be kept clear of other trades work.
2. Cables shall be supported according to code utilizing bridle rings anchored to ceiling concrete, piping supports or structural steel beams. Rings shall be designed to maintain cables bend to larger than the minimum bend radius (typically 4 x cable diameter).
3. Supports shall be spaced at a maximum 4-foot interval unless limited by building construction. If cable "sag" at mid-span exceeds 12-inches, another support shall be used.
4. Cable shall never be laid directly on the ceiling grid.
5. Cables shall not be attached to or supported by, existing cabling, plumbing or steam piping, ductwork, ceiling supports or electrical or communications conduit.
6. A coil of 2 feet in each cable shall be placed in the ceiling at each "free-air" wired fire alarm device. These "service loops" shall be secured at the last cable support before the cable reaches the device and shall be coiled from 100% to 200% of the cable recommended minimum bend radius.
7. Devices wired with conduit shall be provided with an 8-inch wire tail at each device box and 36-inch wire tails at the FACP and FAAP.
8. To reduce or eliminate EMI, the following minimum separation distances from ≤480V Power lines shall be adhered to:
    a. Twelve (12) inches from power lines of <5-kVa.
    b. Eighteen (18) inches from high voltage lighting (including fluorescent).
    c. Thirty-nine (39) inches from power lines of 5-kVa or greater.
    d. Thirty-nine (39) inches from transformers and motors.
9. All cable shall be free of tension at both ends. In cases where the cable must bear some stress, Kellem grips shall be used to spread the strain over a longer length of cable.

10. Manufacturers minimum bend radius specifications shall be observed in all instances. Care should be taken in the use of cable ties to secure and anchor the station cabling. Ties should not be over tightened as to compress the cable jacket. No sharp burrs should remain where excess length of the cable tie has been cut.

11. All vertical cable extensions to fire alarm devices located below the finished ceiling shall be in conduit.

C. Contractor shall furnish all required installation tools to facilitate cable pulling without damage to the cable jacket. Such equipment is to include, but not limited to, sheaves, winches, cable reels, cable reel jacks, duct entrance tunnels, pulling tension gauge and similar devices. All equipment shall be of substantial construction to allow steady progress once pulling has begun. Makeshift devices, which may move or wear in a manner to pose a hazard to the cable, shall not be used.

D. All cable shall be pulled by hand unless installation conditions require mechanical assistance. Where mechanical assistance is used, care shall be taken to insure that the maximum tensile load for the cable as defined by the manufacturer is not exceeded. This may be in the form of continuous monitoring of pulling tension, use of a "break-away" or other approved method.

3.07 DEPARTMENT OF COMMERCE SUBMITTALS

A. This Contractor is responsible for making required Department of Commerce or City of Madison Fire Department submittals.

B. Pay any Department of Commerce or City of Madison Fire Department fees for reviewing submittal. These fees should be included in the contractors bid.

C. Make submittal after engineering review has been obtained for shop drawings.

D. Incorporate any Department of Commerce or City of Madison Fire Department comments into shop drawings and as-builts.

END OF SECTION 28 31 00

INDEX OF DRAWINGS

GENERAL

G200 ABBREVIATIONS, SYMBOLS AND ACCESSIBLE ROUTES.

ARCHITECTURAL

D200 GROUND FLOOR DEMOLITION PLAN

D202 SECOND FLOOR DEMOLITION PLAN

D203 THIRD FLOOR DEMOLITION PLAN

A200 GROUND FLOOR PLAN

A202 SECOND FLOOR PLAN

A203 THIRD FLOOR PLAN

A700 DOOR SCHEDULE

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT
A.F.F.	ABOVE FINISHED FLOOR
AL	ALUMINUM
AP	ACCESS PANEL
CG	CORNER GUARD
CJ	CONTROL JOINT
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CPT	CARPET
CT	CERAMIC TILE
CUH	CABINET UNIT HEATER
EJ	EXPANSION JOINT
EWC	ELECTRIC WATER COOLER
FD	FLOOR DRAIN
FO	FOUNDATION DRAIN SYSTEM FLUSHOUT
FRT	FIRE TREATED
FX–#	FIRE EXTINGUISHER AND TYPE
GWB	GYPSUM WALL BOARD
HM	HOLLOW METAL
MB	MARKER BOARD
TB	TACK BOARD
BB	BULLETIN BOARD
M.O.	MASONRY OPENING
N.I.C.	NOT IN CONTRACT
O.F.C.I.	OWNER FURNISHED CONTRACTOR INSTALLED
O.F.O.I.	OWNER FURNISHED OWNER INSTALLED
OPP	OPPOSITE
P.LAM.	PLASTIC LAMINATE
REV	REVERSE
R.O.	ROUGH OPENING
S.S.	STAINLESS STEEL
TZO	TERRAZZO
U.N.O.	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITION TILE
WD	WOOD
WP	WATER PROOFING
WPT	WORK POINT

ARCHITECTURAL SYMBOLS AND LEGEND

X/XXX — DETAIL REFERENCE; SHEET REFERENCE; DETAIL NUMBER

X/XXX — WALL SECTION REFERENCE; SHEET REFERENCE; DETAIL NUMBER

X; XXXXX — WALL SECTION REFERENCE; SHEET REFERENCE; DETAIL NUMBER

X; X A10 X; X — ELEVATION REFERENCE

X — PARTITION TYPE REF.

NEW WALLS

X — WINDOW TYPE REF.

1 HOUR FIRE RATED WALL

2 HOUR FIRE RATED WALL

100 — DOOR SWING w/NUMBER. SEE A700

100 — EXISTING DOOR SWING w/NUMBER. SEE A700

REVISIONS

FX–1 — RECESSED FIRE EXTINGUISHER

FX–2 — SURFACE MOUNT FIRE EXTINGUISHER

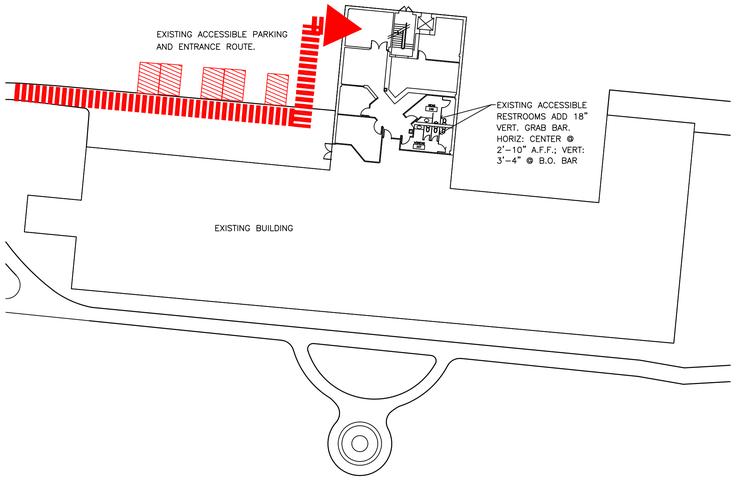
x70–1 — SPOT ELEVATION (FEET–INCHES)

x70.83 — SPOT ELEVATION (FEET.DECIMAL)

OFFICE 012 — ROOM NAME & NUMBER

2 PROJECT LOCATION
N.T.S.

PLAN NORTH



1 EXISTING ACCESSIBLE ROUTE
N.T.S.

PLAN NORTH

BUILDING CODE INFORMATION

AREA, PROJECT:
547 GSF

OCCUPANCY:
B

CONSTRUCTION TYPE:
IB

FULLY SPRINKLERED

DORSCHNER ASSOCIATES
849 East Washington Avenue, Suite 112
Madison, WI 53703
608 / 204 0777
608 / 204 0778 fax

Project:

Northport IT Upgrade
1202 Northport Drive
Madison Wisconsin

Sheet Title: ABBREVIATIONS, SYMBOLS AND ACCESSIBLE ROUTES.

Revisions:

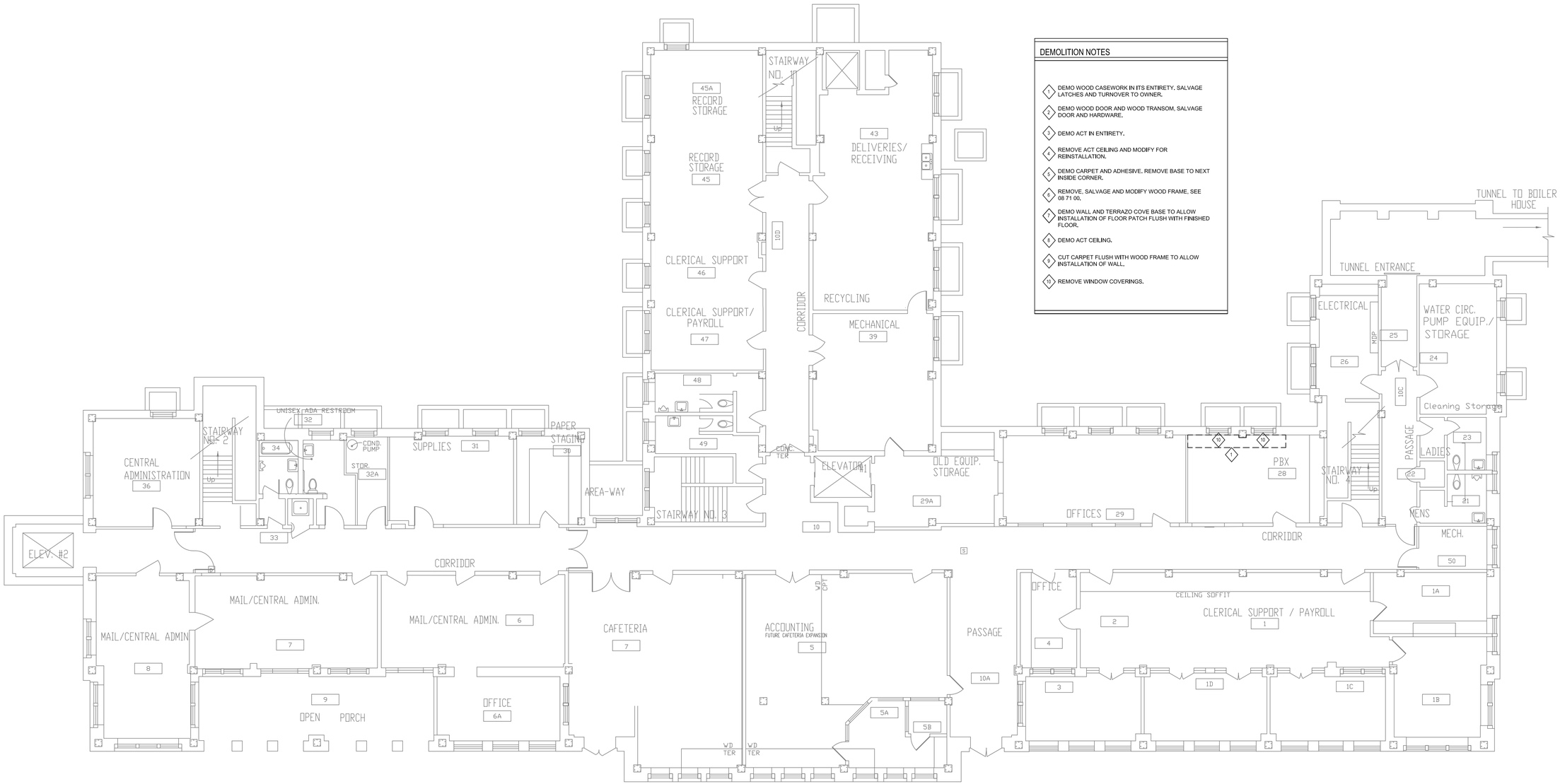
Drawn By: CZE	Checked By: AMC	Project No. 319018	Date: April 14, 2020

2018-9068.00

GRAEF
One Honey Creek Corporate Center
125 South 84th Street, Suite 401
Milwaukee, WI 53214-1470
414 / 259 1500
414 / 259 0037 fax

Sheet No.

G200



DEMOLITION NOTES

1. DEMO WOOD CASEWORK IN ITS ENTIRETY. SALVAGE LATCHES AND TURNOVER TO OWNER.
2. DEMO WOOD DOOR AND WOOD TRANSOM. SALVAGE DOOR AND HARDWARE.
3. DEMO ACT IN ENTIRETY.
4. REMOVE ACT CEILING AND MODIFY FOR REINSTALLATION.
5. DEMO CARPET AND ADHESIVE. REMOVE BASE TO NEXT INSIDE CORNER.
6. REMOVE, SALVAGE AND MODIFY WOOD FRAME, SEE 08 71 00.
7. DEMO WALL AND TERRAZO COVE BASE TO ALLOW INSTALLATION OF FLOOR PATCH FLUSH WITH FINISHED FLOOR.
8. DEMO ACT CEILING.
9. CUT CARPET FLUSH WITH WOOD FRAME TO ALLOW INSTALLATION OF WALL.
10. REMOVE WINDOW COVERINGS.

1 GROUND FLOOR DEMOLITION PLAN
1/8"=1'-0"

PLAN NORTH

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Project:
Northport IT Upgrade
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Madison Wisconsin

Sheet Title: GROUND FLOOR DEMOLITION PLAN

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Sheet No.
D200

DEMOLITION NOTES

1. DEMO WOOD CASEWORK IN ITS ENTIRETY. SALVAGE LATCHES AND TURNOVER TO OWNER.
2. DEMO WOOD DOOR AND WOOD TRANSOM. SALVAGE DOOR AND HARDWARE.
3. DEMO ACT IN ENTIRETY.
4. REMOVE ACT CEILING AND MODIFY FOR REINSTALLATION.
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10. REMOVE WINDOW COVERINGS.

1 SECOND FLOOR DEMOLITION PLAN
1/8"=1'-0"

PLAN NORTH

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Sheet Title: SECOND FLOOR DEMOLITION PLAN

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Sheet No.

D202

DEMOLITION NOTES

1. DEMO WOOD CASEWORK IN ITS ENTIRETY. SALVAGE LATCHES AND TURNOVER TO OWNER.
2. DEMO WOOD DOOR AND WOOD TRANSOM. SALVAGE DOOR AND HARDWARE.
3. DEMO ACT IN ENTIRETY.
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5. DEMO CARPET AND ADHESIVE. REMOVE BASE TO NEXT INSIDE CORNER.
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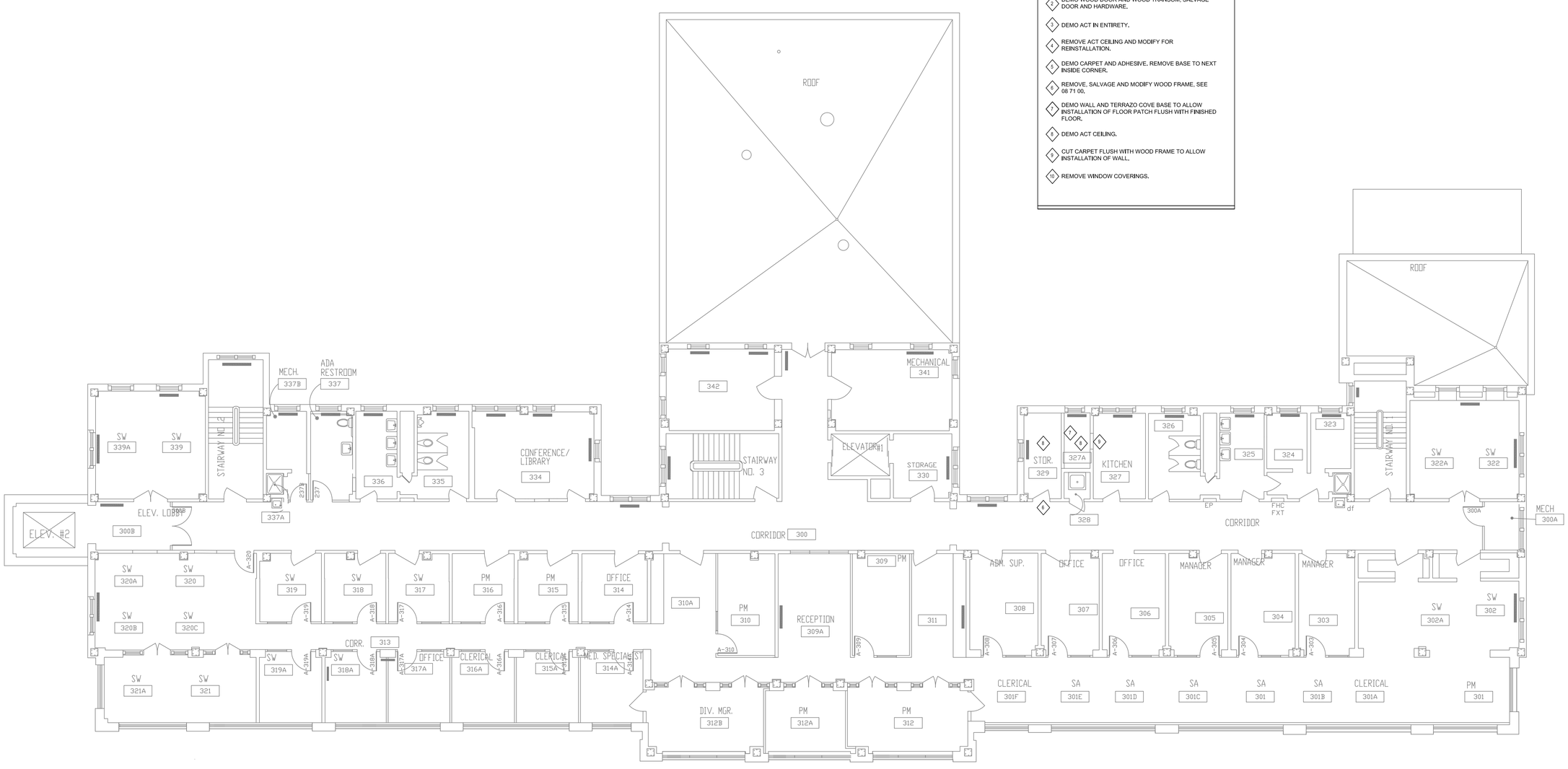
9. CUT CARPET FLUSH WITH WOOD FRAME TO ALLOW INSTALLATION OF WALL.
10. REMOVE WINDOW COVERINGS.



1 THIRD FLOOR DEMOLITION PLAN
1/8"=1'-0"

PLAN NORTH

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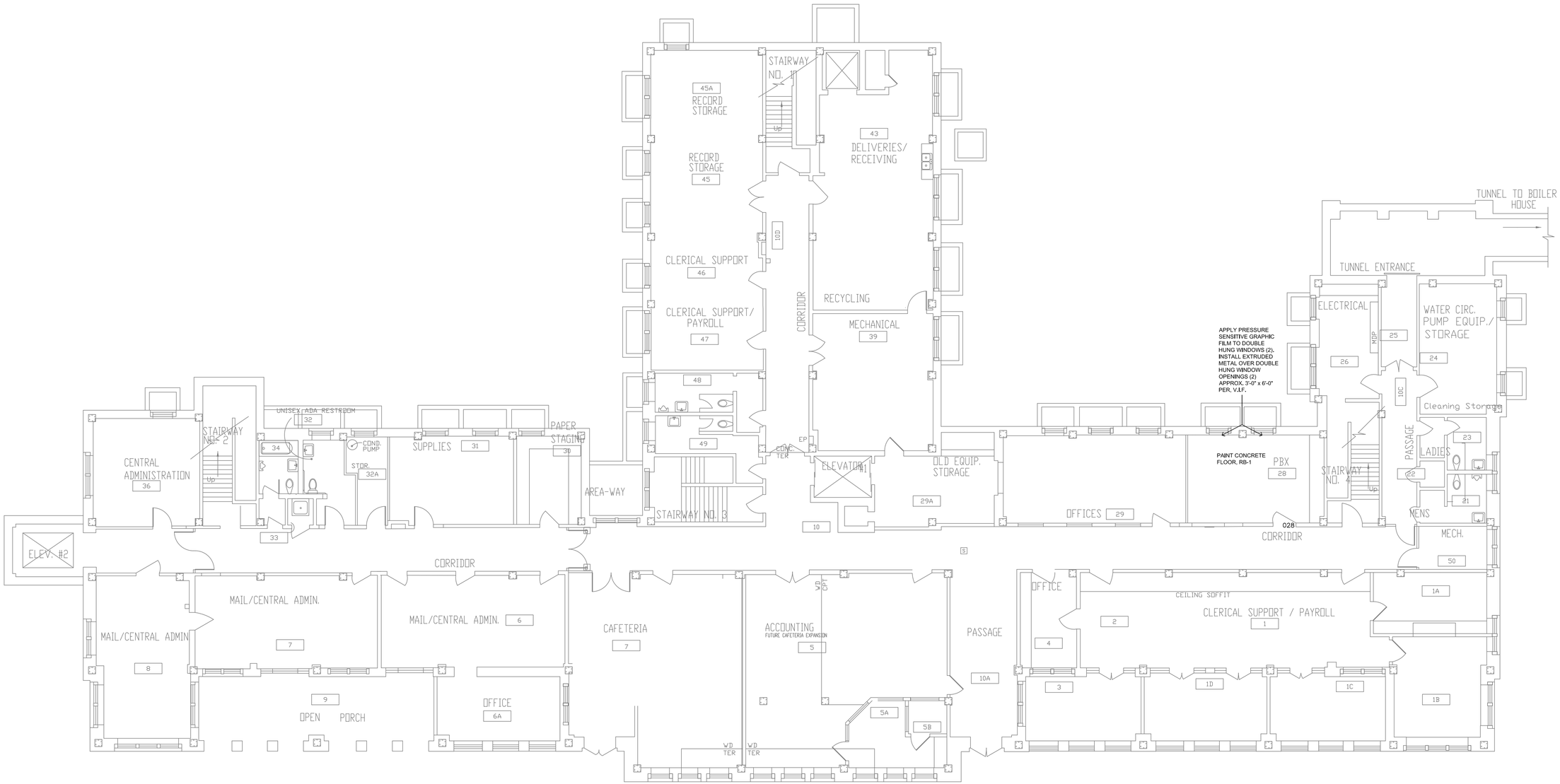

1 GROUND FLOOR PLAN
1/8"=1'-0"

PLAN NORTH

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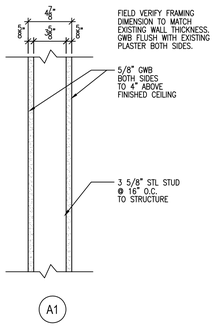

2 PARTITION TYPES
1 1/2"=1'-0"

1 SECOND FLOOR PLAN
1/8"=1'-0"

PLAN NORTH

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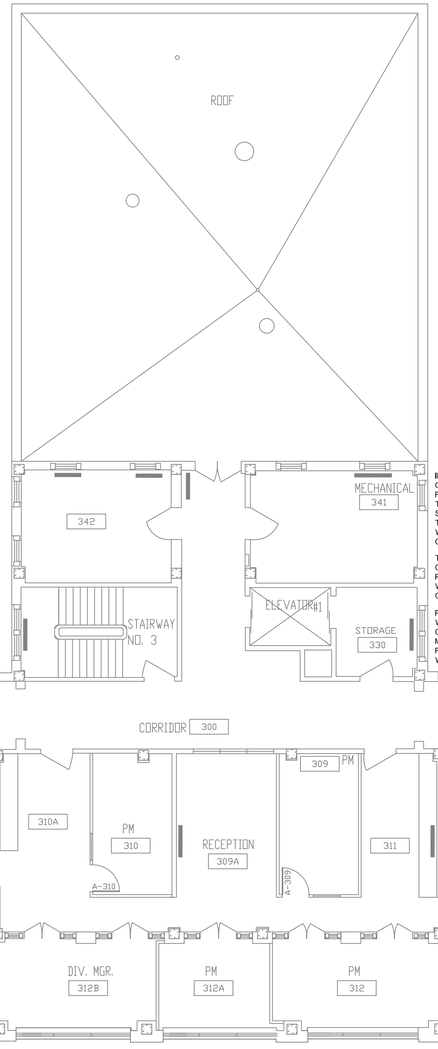
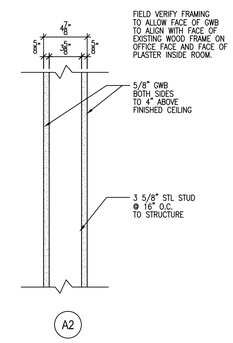


1 THIRD FLOOR PLAN
1/8"=1'-0"

PLAN NORTH



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1 1/2"=1'-0"

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DOOR AND FRAME SCHEDULE

DOOR NO.	QNTY	DOOR SIZE W	SIZE H	SIZE T	DOOR MATERIAL	DOOR ELEV	DOOR GLASS	DOOR LOUVER OR UNDERCUT	FRAME MATL	FRAME ELEV	FRAME DETAILS HEAD	FRAME DETAILS JAMB	FRAME DETAILS SILL	FIRE LABEL	HDWR GROUP	REMARKS
209A	1	3-0	7-0	-	EX WD	-	-	-	EX WD	-	-	-	-	-	1	1. CARD READER
329	1	3-0	7-0	-	EX WD	-	-	-	EX WD	-	-	-	-	-	1	1. CARD READER

GENERAL NOTES:

1. FIELD VERIFY EXISTING OPENINGS
2.
3.

LEGEND

AL	ALUMINUM
HM	HOLLOW METAL
WD	WOOD
UC	UNDERCUT

REMARKS:

1. MODIFY AND REINSTALL EXISTING WOOD FRAME FOR ADDITION OF CARD READER.

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Sheet No.

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ABBREVIATIONS

A	COMPRESSED AIR
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
ADJ	ADJUSTABLE
A/E	ARCHITECT/ENGINEER
AF	AIR FOIL
AFF	ABOVE FINISHED FLOOR
AFMS	AIR FLOW MEASURING STATION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMP	AMPERE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ASC	ABOVE SUSPENDED CEILING
AUTO	AUTOMATIC
B	BOILER
BB	BASEBOARD
BC	BOOSTER COIL
BCU	BLOWER COIL UNIT
BDD	BACK DRAFT DAMPER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BI	BACKWARD INCLINED
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STRUCTURE
BR	BRINE RETURN
BRG	BEARING
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
C	CONVECTOR
CA	COMBUSTION AIR
CAB	CABINET
CCC	COOLING COIL CONDENSATE
CD	CEILING DIFFUSER
CF	CEILING (DESTRATIFICATION) FAN
CFM	CUBIC FEET PER MINUTE
CL	CENTERLINE
CLG	CEILING
CMU	CONCRETE MASONARY UNIT
COMB	COMBINATION OR COMBUSTION
CONC	CONCRETE
COND	CONDENSATE
CONTR	CONTRACTOR
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CRU	COMPUTER ROOM UNIT
CR	CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
CU	COPPER
CUH	CABINET UNIT HEATER
CW	COLD WATER
D	DRAIN
DB	DRY BULB
DC	DRY COOLER
DCO	DOOR CUTOFF BY GC
DDC	DIRECT DIGITAL CONTROL
DEPT	DEPARTMENT
DG	DOOR GRILLE BY GC
DIA	DIAMETER
DN	DOWN
DSA	DUCT SOUND ATTENUATOR
DSF	DESTRATIFICATION FAN
DWD	DUAL WALL DUCTWORK
DWDI	DOUBLE WIDTH DOUBLE INLET
DWG	DRAWING
E	EXISTING
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EER	ENERGY EFFICIENCY RATIO
EG	EXHAUST GRILLE
EL	ELEVATION
ELEC	ELECTRICAL
EQUIP	EQUIPMENT
ER	EXHAUST REGISTER
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWH	ELECTRIC WALL HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXT	EXTERIOR OR EXTERNAL
F	FURNACE
°F	DEGREES FAHRENHEIT
F&T	FLOAT & THERMOSTAT TRAP
FA	FREE AREA
FC	FORWARD CURVED
FCU	FAN COIL UNIT
FD	FLOOR DRAIN OR FIRE DAMPER
FFA	FROM FLOOR ABOVE
FFB	FROM FLOOR BELOW
FILL	FILL LINE
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FM	FLOW METER
FPC	FIRE PROTECTION CONTRACTOR
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FT	FOOT OR FEET
G	GAS
GA	GAUGE
GAL	GALLON
GC	GENERAL CONTRACTOR
GLYR	GLYCOL RETURN
GLYS	GLYCOL SUPPLY
GPM	GALLONS PER MINUTE
GUH	GAS FIRED UNIT HEATER
H	HUMIDIFIER
HB	HOSE BIBB
HC	HEATING CONTRACTOR
HD	HUB DRAIN
HDT	HORIZONTAL DRAW THRU
HG	MERCURY
HGT	HEIGHT
HP	HORSEPOWER
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HPU	HEAT PUMP UNIT
HPWR	HEAT PUMP WATER RETURN
HPWS	HEAT PUMP WATER SUPPLY
HR	HOUR
HVAC	HEATING VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWY	HIGHWAY
HX	HEAT EXCHANGER
HZ	HERTZ
IH	INTAKE HOOD
IN	INCH
INV	INVERT
IPLV	INTEGRATED PART LOAD VALUE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LD	LINEAR DIFFUSER
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LWT	LEAVING WATER TEMPERATURE
M	MOTOR OPERATED DAMPER
MAT	MIXED AIR TEMPERATURE
MA	MIXED AIR
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MBH	1000 BRITISH THERMAL UNITS/HOUR
MCA	MINIMUM CIRCUIT AMPS
MECH	MECHANICAL
MEZZ	MEZZANINE
MH	MANHOLE
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MUA	MAKE-UP AIR UNIT
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NPLV	NOMINAL PART LOAD VALUE
NTS	NOT TO SCALE
O	OXYGEN
OA	OUTDOOR AIR
OAT	OUTDOOR AIR TEMPERATURE
OC	ON CENTER
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PUMP DISCHARGE
PLBG	PLUMBING
PRE	POWER ROOF EXHAUST FAN
PRELIM	PRELIMINARY
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSD	PUMP SUCTION DIFFUSER
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
R	REFRIGERANT
RA	RETURN AIR
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REQD	REQUIRED
RF	RETURN FAN
RG	RETURN GRILLE
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
S	SUPPLY
SA	SUPPLY AIR
SCR	SILICONE CONTROLLED RECTIFIERS
SD	SLOT DIFFUSER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SEG	SECURITY EXHAUST GRILLE
SF	SUPPLY FAN
SG	SUPPLY GRILLE
SM	SHEET METAL
SQ FT	SQUARE FEET
SR	SUPPLY REGISTER
SRG	SECURITY RETURN GRILLE
SRV	SAFETY RELIEF VALVE
SS	STAINLESS STEEL
SSG	SECURITY SUPPLY GRILLE
STG	SECURITY TRANSFER GRILLE
SWD	SINGLE WALL DUCTWORK
SWSI	SINGLE WIDTH SINGLE INLET
T	THERMOSTAT/TEMPERATURE SENSOR
TA	THROWAWAY
TCAC	TEMPERATURE CONTROL AIR COMPRESSOR
TCC	TEMPERATURE CONTROL CONTRACTOR
TCP	TEMPERATURE CONTROL PANEL
TCV	TEMPERATURE CONTROL VALVE
TEMP	TEMPORARY
TF	TRANSFER FAN
TFA	TO FLOOR ABOVE
TFB	TO FLOOR BELOW
TG	TRANSFER GRILLE
TO	TEST OPENINGS
TS	TIP SPEED
TYP	TYPICAL
UH	UNIT HEATER
UNEX	UNEXCAVATED
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VSC	VARIABLE SPEED CONTROL
W TO W	WALL TO WALL
WB	WET BULB
WC	WATER COLUMN
WF	WALL FIN
WP	WEATHER PROOF
WPD	WATER PRESSURE DROP

PIPING SYSTEMS

- GENERAL SHUTOFF VALVE SEE SPECIFICATIONS FOR TYPE
- BALL VALVE
- GAUGE VALVE
- BUTTERFLY VALVE
- PLUG VALVE (GAS)
- CALIBRATED BALANCE/SHUTOFF VALVE (FLOW MEASURING)
- 2-WAY TEMPERATURE CONTROL VALVE (PNEUMATIC OR ELECTRIC)
- 3-WAY TEMPERATURE CONTROL VALVE (PNEUMATIC OR ELECTRIC)
- CHECK VALVE
- DRAIN VALVE (W/ HOSE CONNECTION & BRASS CAP)
- PRESSURE REDUCING VALVE
- RELIEF (R) OR SAFETY (S) VALVE
- SOLENOID VALVE
- TRIPLE DUTY VALVE
- BLIND FLANGE
- CAP
- CONNECTION, BOTTOM
- CONNECTION, TOP
- ELBOW, TURNED UP
- ELBOW, TURNED DOWN

- AIR VENT
- VACUUM BREAKER
- AIR SEPARATOR
- FLEXIBLE CONNECTOR
- STEAM TRAP
- FLOW METER
- FLOW SWITCH
- TEMPERATURE SENSOR
- PITCH OF PIPE
- PRESSURE GAUGE AND COCK
- PRESSURE SWITCH
- PUMP
- STRAINER
- THERMOMETER
- THERMOMETER WELL, ONLY
- PETES PLUG
- FLOW DIRECTION IN PIPES
- UNION
- PIPE FLANGE

- HPS — HIGH-PRESSURE STEAM
- LPS — LOW-PRESSURE STEAM
- HPC — HIGH-PRESSURE CONDENSATE
- LPC — LOW-PRESSURE CONDENSATE
- PD — PUMP DISCHARGE CONDENSATE
- COND — CONDENSATE
- CW — COLD WATER (DOMESTIC)
- MU — MAKEUP WATER
- G — GAS
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- RHG — REFRIGERANT HOT GAS
- RS — REFRIGERANT SUCTION
- RL — REFRIGERANT LIQUID
- CS — CONDENSER WATER SUPPLY
- CR — CONDENSER WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- H — HUMIDIFICATION LINE
- D — DRAIN

DUCTWORK SYSTEMS

- 20/12 — DUCT SIZE, (FIRST FIGURE IS SIDE SHOWN)
- 12" Ø — ROUND DUCT
- UP/DN — CHANGE OF ELEVATION IN DIRECTION OF AIR FLOW
- AD — ACCESS DOOR, VERTICAL OR HORIZONTAL
- ACOUSTICAL DUCT LINER
- FLEXIBLE CONNECTION
- DUCT TRANSITION (DOUBLE LINE)
- DUCT TRANSITION (RECT. TO ROUND)
- DUCT TRANSITION (SINGLE LINE)
- HIDDEN DUCTWORK
- DUCT HEATER, ELECTRIC
- M — MOTOR OPERATED DAMPER
- MANUAL VOLUME DAMPER
- S — SMOKE DETECTOR

- NEW / EXISTING — FIRE DAMPER
- NEW / EXISTING — COMBINATION FIRE/SMOKE DAMPER
- STANDARD BRANCH, SUPPLY, RETURN, OR EXHAUST, NO SPLITTER
- ROOF VENTILATOR OR HOOD ON ROOF ABOVE
- ROOF VENTILATOR OR HOOD ON ROOF
- DUCT CAP
- END OF DUCT
- EXISTING / EXISTING / NEW / NEW — POSITIVE PRESSURE DUCT SECTION
- EXISTING / EXISTING / NEW / NEW — NEGATIVE PRESSURE DUCT SECTION
- FLEXIBLE DUCT DIFFUSER CONNECTION
- OR — SIDEWALL AIR DEVICE
- EXHAUST, RETURN, OR TRANSFER AIR DEVICE
- SUPPLY AIR DEVICE
- SIZE — TRANSFER GRILLE ASSEMBLY

- LOUVER AND BIRD SCREEN
- DG / X.X @FA — DOOR GRILLE
- DCO — 3/4" DOOR CUTOFF (UNDERCUT) BY GC
- ELBOW WITH TURNING VANES
- TERMINAL UNIT, MIXING
- TERMINAL UNIT, VARIABLE VOLUME WITH REHEAT
- TERMINAL UNIT, VARIABLE VOLUME WITH REHEAT
- BOOSTER COIL
- UNIT HEATER
- AIR FLOW
- EXISTING / NEW — POINT OF NEW CONNECTION (PIPE OR DUCT)
- SQUARE FEET
- ELEVATION SYMBOL

GENERAL SYMBOLS

- T — THERMOSTAT OR TEMPERATURE SENSOR
- T — THERMOSTAT OR TEMPERATURE SENSOR WITH SECURITY COVER
- H — HUMIDISTAT OR HUMIDITY SENSOR
- H — HUMIDISTAT OR HUMIDITY SENSOR WITH SECURITY COVER
- MOTOR STARTER
- S — SPEED CONTROLLER
- $ — START/STOP SWITCH
- CO2 — CARBON DIOXIDE SENSOR
- EXISTING TO REMAIN (DUCTWORK, PIPING, & EQUIPMENT)
- EXISTING TO BE REMOVED (DUCTWORK, PIPING, & EQUIPMENT)
- NEW DUCTWORK/PIPING
- NEW EQUIPMENT

HVAC SHEET INDEX

M000	ABBREVIATIONS AND SYMBOLS - HVAC
M101	GROUND FLOOR DEMOLITION - HVAC
M102	SECOND FLOOR DEMOLITION - HVAC
M103	THIRD FLOOR DEMOLITION - HVAC
M201	GROUND FLOOR NEW WORK - HVAC
M202	SECOND FLOOR NEW WORK - HVAC
M203	THIRD FLOOR NEW WORK - HVAC
M800	DETAILS AND SCHEDULES - HVAC

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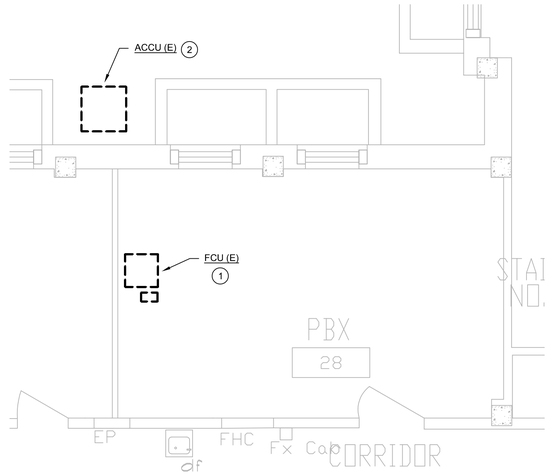
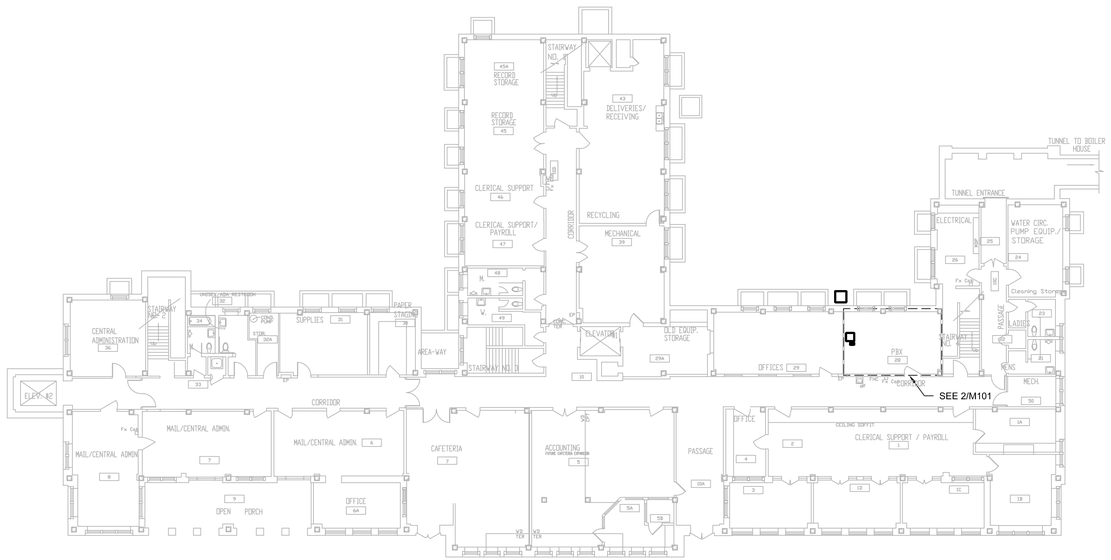
M000



2 M101 ROOM 28 DEMOLITION PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH



1 M101 GROUND FLOOR DEMOLITION PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS BEFORE COMMENCING WORK. REPORT ANY DISCREPANCIES TO THE A/E IMMEDIATELY.
2. THE BUILDING IS TO REMAIN OCCUPIED DURING CONSTRUCTION.
3. COORDINATE ALL INTERRUPTIONS WITH DANE COUNTY FACILITIES MANAGEMENT (DCFM) PRIOR TO STARTING WORK.
4. ALL DUCTWORK, PIPING, EQUIPMENT, ETC. NOTED FOR DEMOLITION SHALL BE REMOVED COMPLETE.
5. ALL EXISTING ABANDONED DUCTWORK, PIPING, EQUIPMENT, ETC. IN THE CEILING SHALL BE REMOVED COMPLETE.
6. PIPING NOTED FOR DEMOLITION SHALL BE REMOVED BACK TO THE POINT REQUIRED TO REMAIN ACTIVE AND CAPPED.
7. ANY DUCTWORK CONNECTIONS NOT TO BE REUSED SHALL BE SHEETMETAL PATCHED, SEALED, AND INSULATED WITH COMPLETE VAPOR BARRIER.
8. ANY EXISTING TO REMAIN GRILLES, REGISTERS, DIFFUSERS, CONVECTORS, ETC. SHALL BE PROTECTED DURING CONSTRUCTION.
9. SEE REFLECTED CEILING PLANS FOR AREAS WHERE EXISTING CEILINGS WILL BE REMOVED BY THE GC AND NEW CEILING WILL BE INSTALLED (BY GC), THE HC IS RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ALL OTHER CEILING REQUIRED TO PERFORM HVAC WORK.
10. ALL WORK ON THIS DRAWING SHALL BE INCLUDED AS PART OF ALTERNATE BID 'A'.

KEYED NOTES:

1. DEMOLISH EXISTING FAN COIL UNIT AND CONDENSATE PUMP COMPLETE. DEMOLISH ALL ASSOCIATED REFRIGERANT PIPING AND TEMPERATURE CONTROLS COMPLETE. PROTECT EXISTING CONDENSATE PIPING FOR REUSE.
2. DEMOLISH EXISTING ACCU AND CONTROL WIRING COMPLETE. EXISTING BASE SHALL BE REUSED FOR NEW ACCU.

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2018-9068.00

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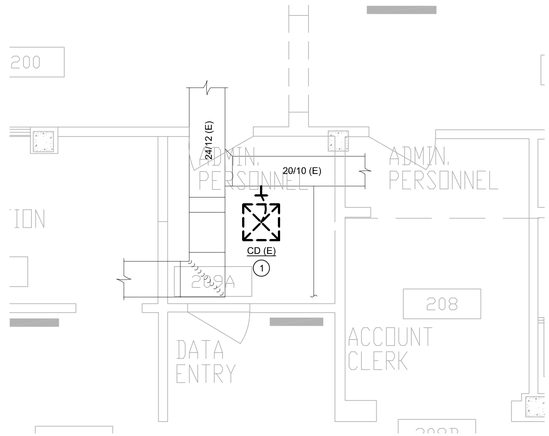
Sheet No.

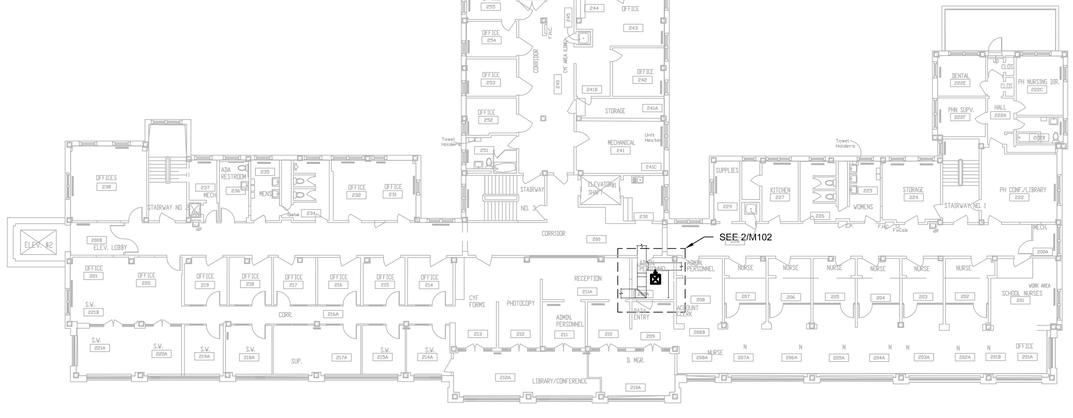
M101



2 M102 ROOM 209 DEMOLITION PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH



1 M102 SECOND FLOOR DEMOLITION PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS BEFORE COMMENCING WORK. REPORT ANY DISCREPANCIES TO THE A/E IMMEDIATELY.
2. THE BUILDING IS TO REMAIN OCCUPIED DURING CONSTRUCTION.
3. COORDINATE ALL INTERRUPTIONS WITH DANE COUNTY FACILITIES MANAGEMENT (DCFM) PRIOR TO STARTING WORK.
4. ALL DUCTWORK, PIPING, EQUIPMENT, ETC. NOTED FOR DEMOLITION SHALL BE REMOVED COMPLETE.
5. ALL EXISTING ABANDONED DUCTWORK, PIPING, EQUIPMENT, ETC. IN THE CEILING SHALL BE REMOVED COMPLETE.
6. PIPING NOTED FOR DEMOLITION SHALL BE REMOVED BACK TO THE POINT REQUIRED TO REMAIN ACTIVE AND CAPPED.
7. ANY DUCTWORK CONNECTIONS NOT TO BE REUSED SHALL BE SHEETMETAL PATCHED, SEALED, AND INSULATED WITH COMPLETE VAPOR BARRIER.
8. ANY EXISTING TO REMAIN GRILLES, REGISTERS, DIFFUSERS, CONVECTORS, ETC. SHALL BE PROTECTED DURING CONSTRUCTION.
9. SEE REFLECTED CEILING PLANS FOR AREAS WHERE EXISTING CEILINGS WILL BE REMOVED BY THE GC AND NEW CEILING WILL BE INSTALLED (BY GC), THE HC IS RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ALL OTHER CEILING REQUIRED TO PERFORM HVAC WORK.

KEYED NOTES:

1. DEMOLISH EXISTING CEILING DIFFUSER AND BRANCH DUCT. CAP BRANCH DUCT AT MAIN AND SEAL AIRTIGHT. PROVIDE INSULATION (0.75# DENSITY, 1-1/2" FLEXIBLE FIBERGLASS WITH FSK JACKET) OVER CAP.

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Project:

Northport IT Upgrade
1202 Northport Drive
Madison Wisconsin

Sheet Title: SECOND FLOOR DEMOLITION - HVAC

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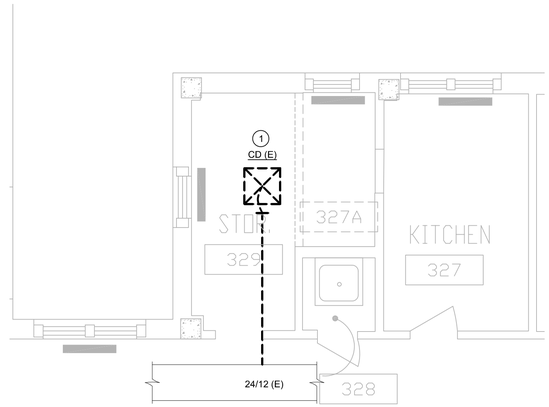
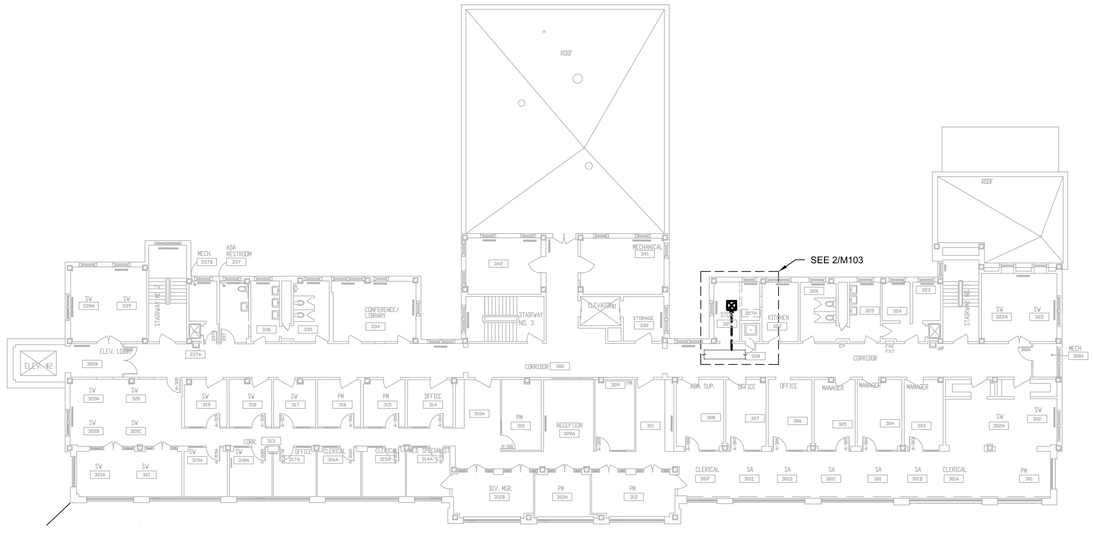


2 M103 ROOM 329 DEMOLITION PLAN - HVAC
SCALE: 1/16"=1'-0"

NORTH



1 M103 THIRD FLOOR DEMOLITION PLAN - HVAC
SCALE: 1/16"=1'-0"

NORTH

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS BEFORE COMMENCING WORK. REPORT ANY DISCREPANCIES TO THE A/E IMMEDIATELY.
2. THE BUILDING IS TO REMAIN OCCUPIED DURING CONSTRUCTION.
3. COORDINATE ALL INTERRUPTIONS WITH DANE COUNTY FACILITIES MANAGEMENT (DCFM) PRIOR TO STARTING WORK.
4. ALL DUCTWORK, PIPING, EQUIPMENT, ETC. NOTED FOR DEMOLITION SHALL BE REMOVED COMPLETE.
5. ALL EXISTING ABANDONED DUCTWORK, PIPING, EQUIPMENT, ETC. IN THE CEILING SHALL BE REMOVED COMPLETE.
6. PIPING NOTED FOR DEMOLITION SHALL BE REMOVED BACK TO THE POINT REQUIRED TO REMAIN ACTIVE AND CAPPED.
7. ANY DUCTWORK CONNECTIONS NOT TO BE REUSED SHALL BE SHEETMETAL PATCHED, SEALED, AND INSULATED WITH COMPLETE VAPOR BARRIER.
8. ANY EXISTING TO REMAIN GRILLES, REGISTERS, DIFFUSERS, CONVECTORS, ETC. SHALL BE PROTECTED DURING CONSTRUCTION.
9. SEE REFLECTED CEILING PLANS FOR AREAS WHERE EXISTING CEILINGS WILL BE REMOVED BY THE GC AND NEW CEILING WILL BE INSTALLED (BY GC), THE HC IS RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ALL OTHER CEILING REQUIRED TO PERFORM HVAC WORK.

KEYED NOTES:

1. DEMOLISH EXISTING CEILING DIFFUSER AND BRANCH DUCT. CAP BRANCH DUCT AT MAIN AND SEAL AIRTIGHT. PROVIDE INSULATION (0.75# DENSITY, 1-1/2" FLEXIBLE FIBERGLASS WITH FSK JACKET) OVER CAP.

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Project:

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Sheet Title: THIRD FLOOR DEMOLITION - HVAC

Revisions:

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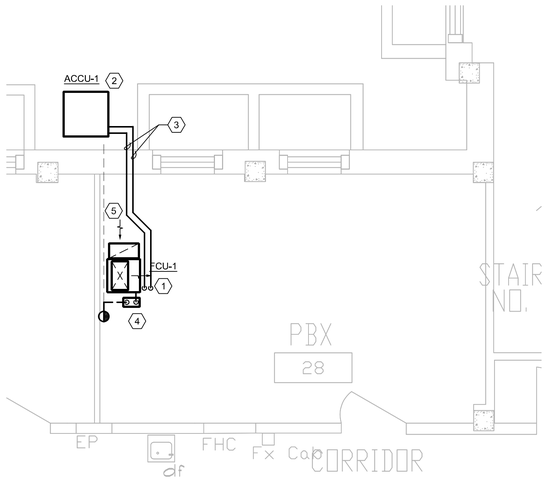
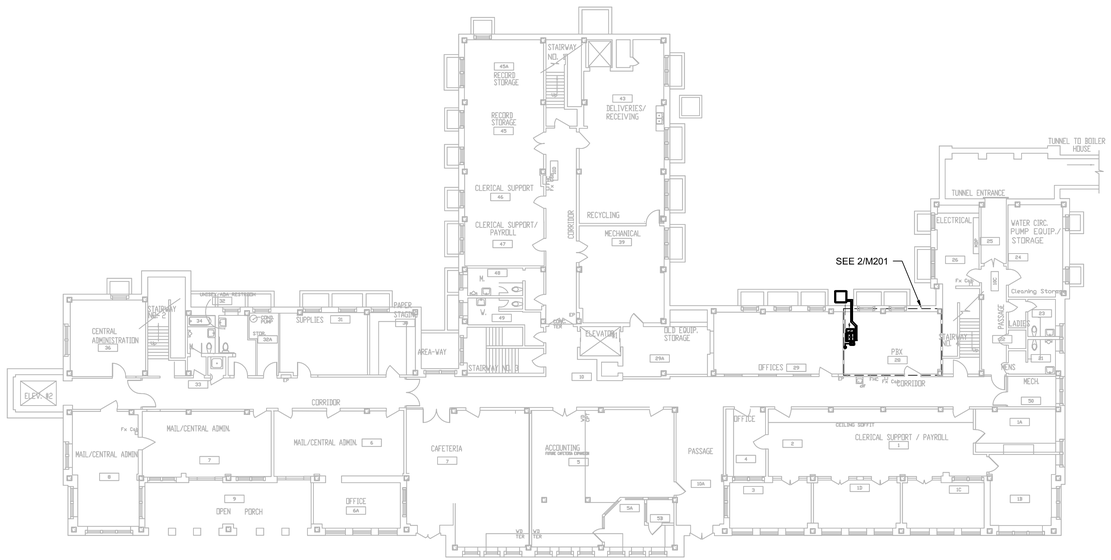


2 M201 ROOM 28 NEW WORK PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH



1 M201 GROUND FLOOR NEW WORK PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS BEFORE COMMENCING WORK. REPORT ANY DISCREPANCIES TO THE A/E IMMEDIATELY.
2. THE BUILDING IS TO REMAIN OCCUPIED DURING CONSTRUCTION.
3. COORDINATE ALL INTERRUPTIONS WITH DANE COUNTY FACILITIES MANAGEMENT (DCFM) PRIOR TO STARTING WORK.
4. ALL EXISTING ABANDONED DUCTWORK, PIPING, EQUIPMENT, ETC. IN THE CEILING SHALL BE REMOVED COMPLETE.
5. ANY DUCTWORK CONNECTIONS NOT TO BE REUSED SHALL BE SHEETMETAL PATCHED, SEALED, AND INSULATED WITH COMPLETE VAPOR BARRIER.
6. SEE REFLECTED CEILING PLANS FOR AREAS WHERE EXISTING CEILINGS WILL BE REMOVED BY THE GC AND NEW CEILING WILL BE INSTALLED (BY GC). THE HC IS RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ALL OTHER CEILING REQUIRED TO PERFORM HVAC WORK.
7. SEE SCHEDULE AND DETAILS ON M800 FOR ADDITIONAL INFORMATION.
8. ALL WORK ON THIS DRAWING SHALL BE INCLUDED AS PART OF ALTERNATE BID 'A'.

KEYED NOTES:

1. INSTALL NEW FCU-1 IN SAME LOCATION AS REMOVED UNIT. USE EXISTING WALL PENETRATIONS TO ROUTE NEW REFRIGERANT PIPING TO NEW ACCU-1 ON GRADE. HC SHALL PATCH AND SEAL WALL PENETRATIONS WEATHER TIGHT.
2. INSTALL NEW ACCU-1 IN SAME LOCATION AS REMOVED UNIT. SET ON EXISTING BASE.
3. HC SHALL VERIFY AND COORDINATE REFRIGERANT PIPE SIZES PER MANUFACTURERS REQUIREMENTS.
4. HC SHALL PROVIDE CONDENSATE PUMP AT FCU-1 EQUAL TO LITTLE GIANT MODEL VCMA-15 SERIES WITH 120V 6' POWER CORD AND OVERFLOW DETECTION SWITCH. ROUTE PUMP DISCHARGE FROM PUMP AND RECONNECT TO EXISTING PIPING AT WALL.
5. HC SHALL PROVIDE RETURN AIR SHEETMETAL PLENUM BELOW UNIT WITH 20/10 RETURN AIR DUCT AT THE SIDE OF THE UNIT WITH INTAKE GRILLE MOUNTED MINIMUM 12" AFF. HC SHALL PROVIDE 20/12 DISCHARGE DUCT AT TOP OF UNIT WITH SUPPLY AIR GRILLE MOUNTED TO DUCT.

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Sheet Title: GROUND FLOOR NEW WORK - HVAC

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M201

GENERAL NOTES:

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3. COORDINATE ALL INTERRUPTIONS WITH DANE COUNTY FACILITIES MANAGEMENT (DCFM) PRIOR TO STARTING WORK.
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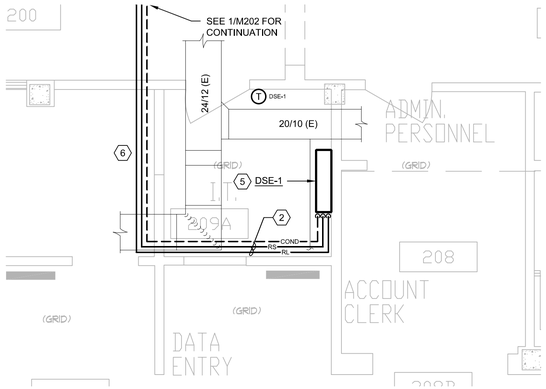
5. ANY DUCTWORK CONNECTIONS NOT TO BE REUSED SHALL BE SHEETMETAL PATCHED, SEALED, AND INSULATED WITH COMPLETE VAPOR BARRIER.
6. SEE REFLECTED CEILING PLANS FOR AREAS WHERE EXISTING CEILINGS WILL BE REMOVED BY THE GC AND NEW CEILING WILL BE INSTALLED (BY GC). THE HC IS RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ALL OTHER CEILING REQUIRED TO PERFORM HVAC WORK.
7. SEE SCHEDULE AND DETAILS ON M800 FOR ADDITIONAL INFORMATION.

KEYED NOTES:

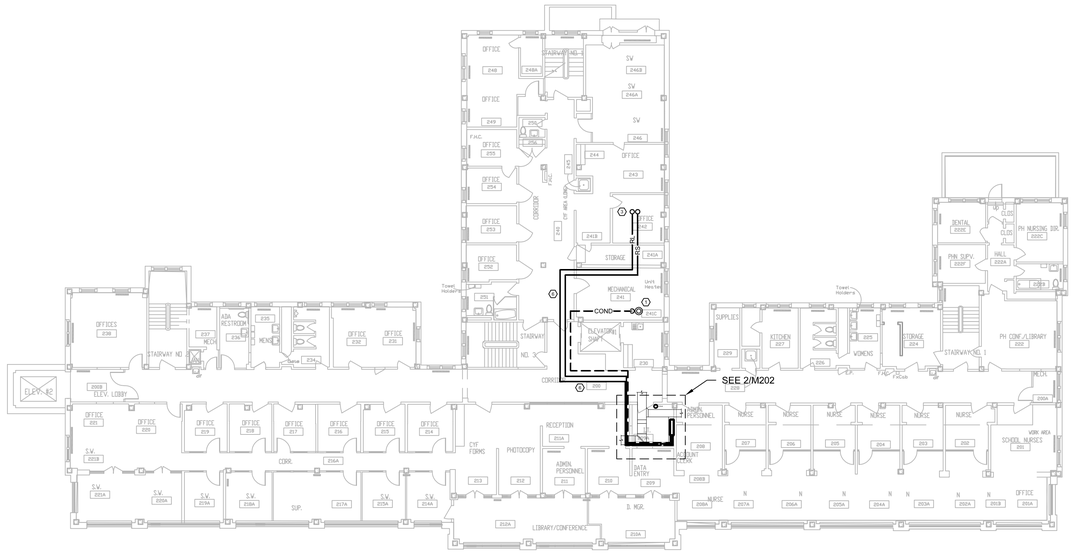
1. ROUTE CONDENSATE TO EXISTING FLOOR DRAIN LOCATED IN MECHANICAL ROOM #241, VERIFY EXACT LOCATION.
2. HC SHALL VERIFY AND COORDINATE REFRIGERANT PIPE SIZES PER MANUFACTURERS REQUIREMENTS.
3. ROUTE REFRIGERANT PIPING TO ROOF ABOVE. SEE M203 FOR CONTINUATION.
4. NEW ACCU ON ROOF. HC TO PROVIDE STEEL STAND AND PIPE ROOF FLASHING. HC SHALL BE RESPONSIBLE FOR ANY ROOF PATCHING AND SEALING.
5. PROVIDE CONDENSATE PUMP FOR DSE-1.
6. CEILING TILE REMOVAL AND REINSTALL SHALL BE BY HC. HC SHALL REPLACE ANY DAMAGED CEILING TILE WITH SAME STYLE TILE.



2 / M202 ROOM 209 NEW WORK PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH



1 / M202 SECOND FLOOR NEW WORK PLAN - HVAC

SCALE: 1/16"=1'-0"

NORTH

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Project:

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Sheet Title: SECOND FLOOR NEW WORK - HVAC

Revisions:

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GENERAL NOTES:

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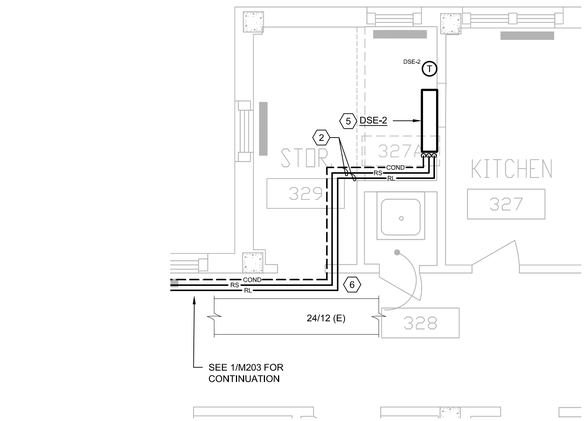
7. SEE SCHEDULE AND DETAILS ON M800 FOR ADDITIONAL INFORMATION.

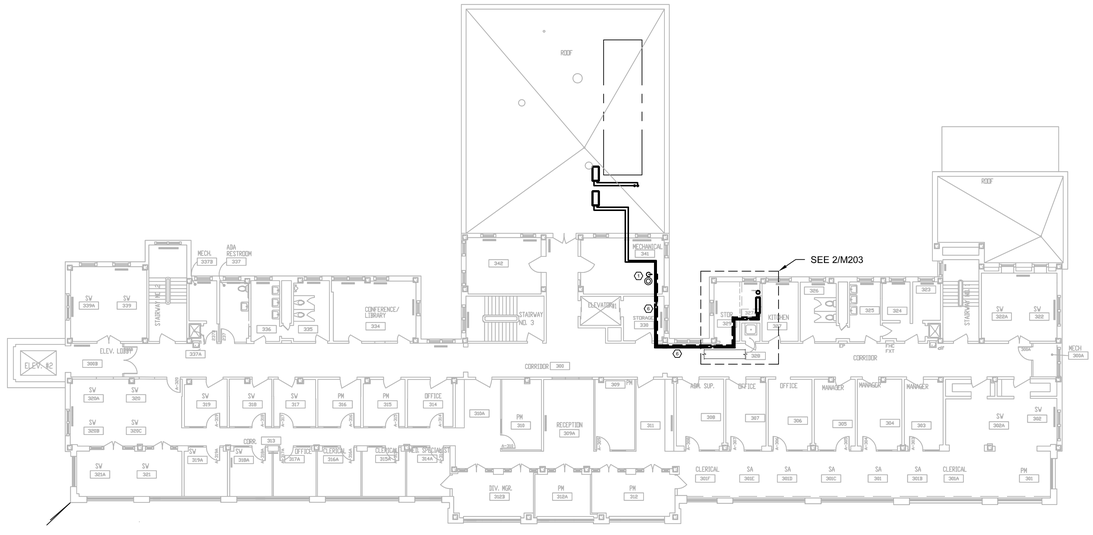
KEYED NOTES:

1. ROUTE CONDENSATE TO EXISTING FLOOR DRAIN LOCATED IN MECHANICAL ROOM #241, VERIFY EXACT LOCATION.
2. HC SHALL VERIFY AND COORDINATE REFRIGERANT PIPE SIZES PER MANUFACTURERS REQUIREMENTS.
3. ROUTE REFRIGERANT PIPING TO ROOF ABOVE. SEE M203 FOR CONTINUATION.
4. NEW ACCU ON ROOF. HC TO PROVIDE STEEL STAND AND PIPE ROOF FLASHING. HC SHALL BE RESPONSIBLE FOR ANY ROOF PATCHING AND SEALING.
5. PROVIDE CONDENSATE PUMP FOR DSE-1.
6. CEILING TILE REMOVAL AND REINSTALL SHALL BE BY HC. HC SHALL REPLACE ANY DAMAGED CEILING TILE WITH SAME STYLE TILE.



2 M203 ROOM 329 NEW WORK PLAN - HVAC
SCALE: 1/16"=1'-0"

NORTH



1 M203 THIRD FLOOR NEW WORK PLAN - HVAC
SCALE: 1/16"=1'-0"

NORTH

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Project:
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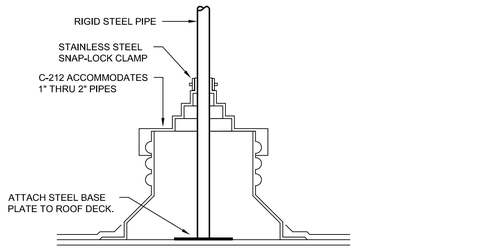
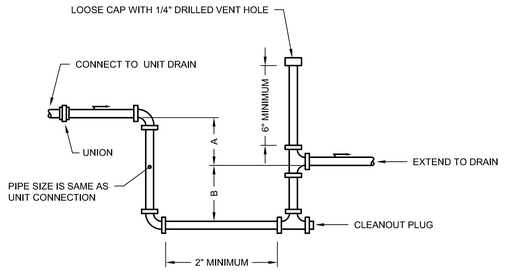


NOTE: ALL STEEL EXPOSED TO THE WEATHER SHALL BE HOT DIPPED GALVANIZED STEEL.

4 M800 ACCU SUPPORT STEEL AT ROOF

SCALE: NONE

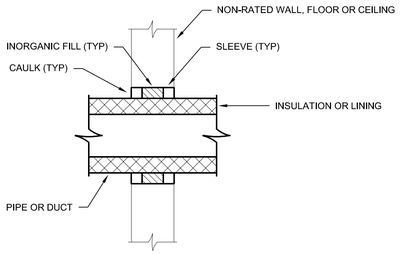


BLOW-THRU
A = MINIMUM (1/2)(B)
B = FAN TOTAL SP + 1"

DRAW-THRU
A = FAN NEGATIVE SP + 1"
B = MINIMUM (1/2)(A)

1 M800 LOOP SEAL FOR COOLING COIL CONDENSATE DRAIN

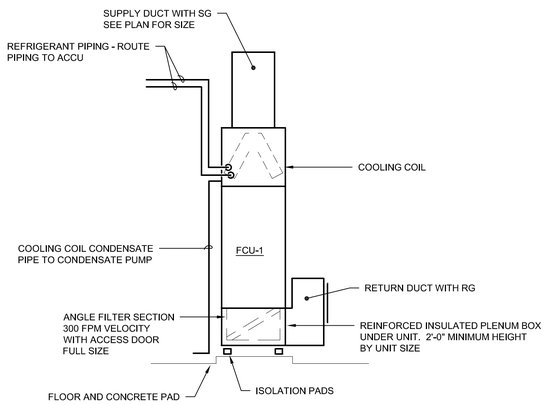
SCALE: NONE



NOTE: CAULKING SHALL BE 1/2" DEEP BUTYL RUBBER.

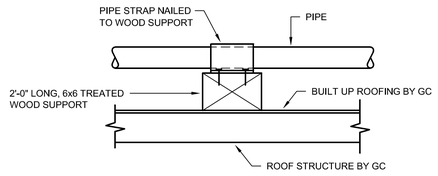
5 M800 PIPE SLEEVE DETAIL

SCALE: NONE



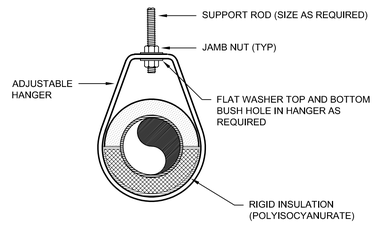
6 M800 FAN COIL UNIT DETAIL (ALT. BID 'A')

SCALE: NONE



2 M800 PIPE SUPPORT DETAIL

SCALE: NONE



3 M800 TYPICAL PIPE SUPPORT DETAIL

SCALE: NONE

FAN COIL UNIT SCHEDULE

UNIT NO.		FCU-1				
LOCATION		SEE PLANS				
MANUFACTURER		CARRIER				
MODEL NO.		FB4CN9030				
EVAPORATOR TYPE		-				
SUPPLY (CFM)		1,000				
OUTSIDE AIR (CFM)		-				
FILTER TYPE		1" TA				
FAN MOTOR	VOLTS	208				
	PHASE	1				
	HP	1/3				
	DRIVE	ECM				
	NO. OF SPEEDS	-				
AIR COOLED CONDENSING UNIT (OUTDOOR UNIT)						
UNIT NO.		ACCU-1				
MANUFACTURER		CARRIER				
MODEL NO.		A24ABB330A				
COOLING CAPACITY (BTU / HR)		27.1				
REFRIGERANT		R410A				
SEER		13.5				
UNIT ELECTRICAL DATA	VOLTS	208/230				
	PHASE	1				
	MCA	16.6				
	MOCP	25				
SERVES		FCU-1				
REMARKS						

KEYED NOTES

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

UNIT NO.		DSE-1	DSE-2		
LOCATION		209A - IT	329 - IT		
MANUFACTURER		CARRIER	CARRIER		
MODEL		40MPHAQ12XA3	40MPHAQ12XA3		
TYPE		HIGH SIDE WALL	HIGH SIDE WALL		
SUPPLY CFM (LOW TO HIGH)		170 - 360	170 - 360		
FILTER TYPE		CLEANABLE	CLEANABLE		
VOLTAGE / PHASE		208-230	208-230		
MCA		0.3	0.3		
AIR COOLED CONDENSING UNIT (OUTDOOR UNIT)					
UNIT NO.		ACCU-2	ACCU-3		
LOCATION		ROOF	ROOF		
MANUFACTURER		CARRIER	CARRIER		
MODEL		38MPRAQ12AA3	38MPRAQ12AA3		
NOMINAL CAPACITY (MBH)		12.0	12.0		
SEER		MIN PER CODE	MIN PER CODE		
UNIT ELECTRICAL DATA	VOLTS	208-230	208-230		
	PHASE	1	1		
	MCA	15	15		
	MOCP	20	20		
SERVES		SERVER ROOM	SERVER ROOM		
REMARKS		1, 2	1, 2		

KEYED NOTES

1. LOCATE ACCU-1 AND ACCU-2 ON ROOF WITH STEEL STAND.
2. ACCU-2 AND ACCU-3 SHALL START AND OPERATE DOWN TO -22°F.
3. PROVIDE INTEGRAL CONDENSATE PUMP AT DSE-1 AND DSE-2.

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Sheet Title: DETAILS AND SCHEDULES - HVAC

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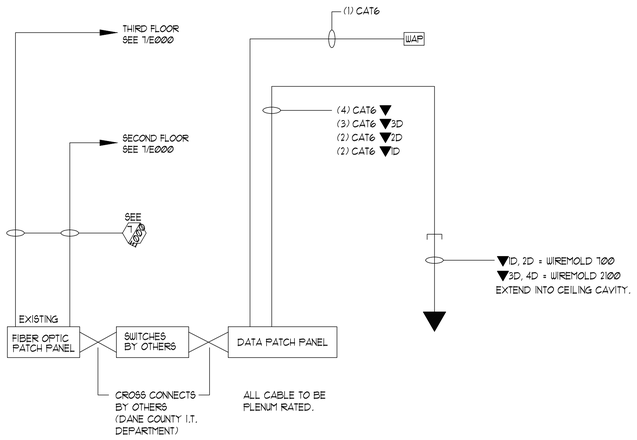
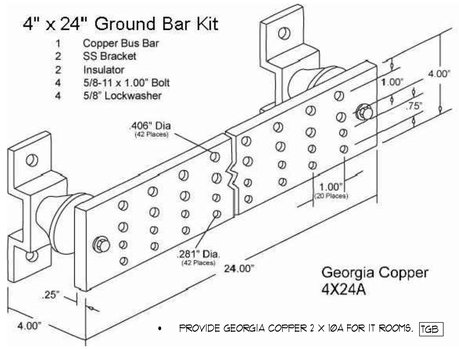


1 E000 DATA RISER DIAGRAM - CATEGORY 6 PERFORMANCE
NOT TO SCALE



- PROVIDE GEORGIA COPPER 2 X 10A FOR IT ROOMS. TGB

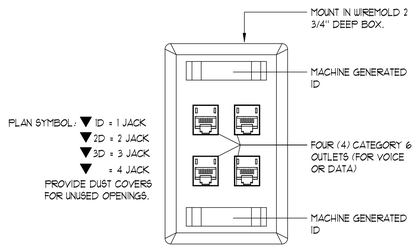
4 E000 DETAIL: MGB
NOT TO SCALE

ELECTRICAL SYMBOLS

- (*) (*) SWITCH AND DUPLEX RECEPTACLE - DOUBLE GANG BOX - MOUNT 48" ABOVE FLOOR TO TOP OF BOX - (3) THREE WAY - (4) FOUR WAY - (OS) OCCUPANCY SENSOR (AUTO OFF / AUTO FULL ON) - (VS) VACANCY SENSOR (AUTO OFF / MANUAL ON) - (GFI) GROUND FAULT CIRCUIT INTERRUPTER
- (*) DUPLEX RECEPTACLE - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX OR HEIGHT AS INDICATED - (GFI) GROUND FAULT CIRCUIT INTERRUPTER - (WP) WEATHER PROOF
- DOUBLE DUPLEX RECEPTACLE - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX OR HEIGHT AS INDICATED
- JUNCTION BOX
- ELECTRICAL PANEL
- VOICE/DATA OUTLET - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX (C) ABOVE COUNTER OR HEIGHT AS INDICATED
- DATA OUTLET - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX (C) ABOVE COUNTER OR HEIGHT AS INDICATED
- WAP WIRELESS ACCESS POINT
- DETAIL NUMBER / NOTE OR DETAIL SYMBOL / SHEET LOCATION
- INTELLIGENT PHOTOELECTRIC SMOKE DETECTOR
- EXISTING INTELLIGENT PHOTOELECTRIC SMOKE DETECTOR
- A PROVIDE LITHONIA ZLNL48 3000LM F5T-MVOLT-35K-80CRI-WH-HC36 OR EQUIVALENT BY PHILIPS OR COOPER - CHAIN MOUNTED
- (*) SINGLE POLE TOGGLE SWITCH - MOUNT 48" ABOVE FLOOR TO TOP OF BOX - (3) THREE WAY - (4) FOUR WAY - (K) KEY - (P) PILOT LIGHT -(OS) OCCUPANCY SENSOR (AUTO OFF / AUTO FULL ON) - (VS) VACANCY SENSOR (AUTO OFF / MANUAL ON)
- DIGITAL CAMERA - OWNER FURNISHED AND OWNER INSTALLED. COIL 20 FEET OF CAT6 CABLE ABOVE CEILING NEAR OUTSIDE WALL AND LABEL. TERMINATE ON RJ45 PLUG.
- CR CARD READER - SEE 28 13 00.
- ES ELECTRIC STRIKE - SEE HARDWARE SECTION.
- MGB MAIN GROUND BAR

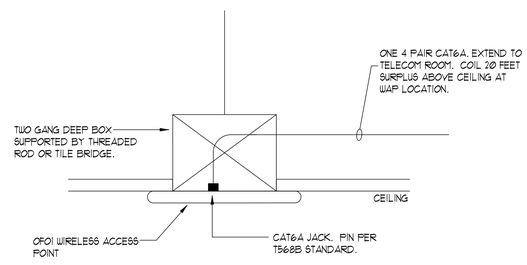
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BFG	BELOW FINAL GRADE
BOL	BUILT-IN OVERLOAD
C	CONDUIT
CKT	CIRCUIT
CB	COMBINATION STARTER
D	DEDICATED
DD	DOUBLE DUPLEX
EC	ELECTRICAL CONTRACTOR
EWC	ELECTRIC WATER COOLER
ER	EXISTING TO BE REMOVED
ERL	EXISTING RELOCATED (NEW LOCATION)
ETL	EXISTING TO BE RELOCATED (OLD LOCATION)
EX	EXISTING TO REMAIN
FACP	FIRE ALARM CONTROL PANEL
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
HV	HEATING AND VENTILATION CONTRACTOR
IG	ISOLATED GROUND
IR	IN ROOM
IU	IN UNIT
MAN	MANUAL STARTER
MAG	MAGNETIC STARTER
MCA	MINIMUM CIRCUIT AMPACITY
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NU	NEAR UNIT
OFOI	OWNER FURNISHED, OWNER INSTALLED
PB	PUSHBUTTON
PC	PLUMBING CONTRACTOR
PW	PRE-WIRED
RV	REDUCED VOLTAGE STARTER
RAI	REMAIN AS IS
SC	SEPARATE CIRCUIT
SS	SPEED SWITCH
SW	SWITCH
TC	TIMECLOCK
TS	THERMOSTAT
UM	UNIT MANUFACTURER
WP	WEATHERPROOF

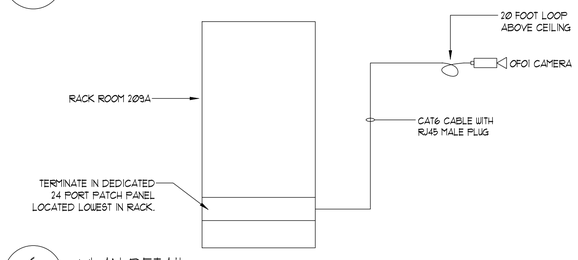


2 E000 ▼TYPICAL WORKSTATION DATA OUTLET DETAIL
NOT TO SCALE

5 E000 GROUNDING RISER
NOT TO SCALE



3 E300 WIRELESS ACCESS POINT WAP - REQUIRES CAT6A CABLE
NOT TO SCALE



6 E000 VLAN DETAIL
NOT TO SCALE

7 E000 TELECOM RISER
NOT TO SCALE

ELECTRICAL SHEET INDEX

SHEET NUMBER	SHEET NAME
E000	ELECTRICAL SYMBOLS, ABBREVIATIONS AND SYMBOLS
E100	GROUND FLOOR DEMOLITION SYSTEMS PLAN
E101	FIRST FLOOR DEMOLITION SYSTEMS PLAN
E102	SECOND FLOOR DEMOLITION SYSTEMS PLAN
E103	THIRD FLOOR DEMOLITION SYSTEMS PLAN
E104	FOURTH FLOOR DEMOLITION SYSTEMS PLAN
E200	GROUND FLOOR SYSTEMS PLAN
E201	FIRST FLOOR SYSTEMS PLAN
E202	SECOND FLOOR SYSTEMS PLAN
E203	THIRD FLOOR SYSTEMS PLAN
E204	FOURTH FLOOR SYSTEMS PLAN
E300	TELECOM RACK DETAILS
E301	ELECTRICAL SCHEDULES

Project:

Northport IT Upgrade
1202 Northport Drive
Madison Wisconsin

Sheet Title: ELECTRICAL SYMBOLS, ABBREVIATIONS AND DETAILS

Revisions:

Drawn By: CZE	Checked By: AMC	Project No. 319018	Date: April 14, 2020

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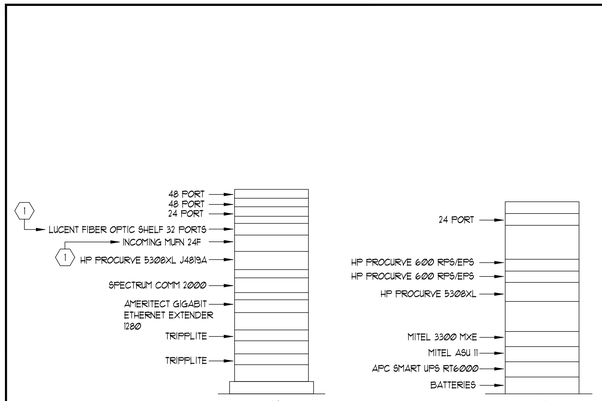
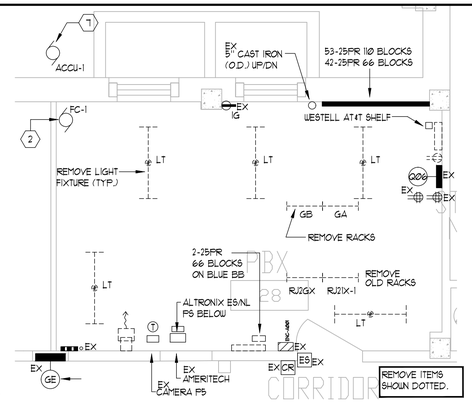
E000





ENLARGED PLAN - PBX 28

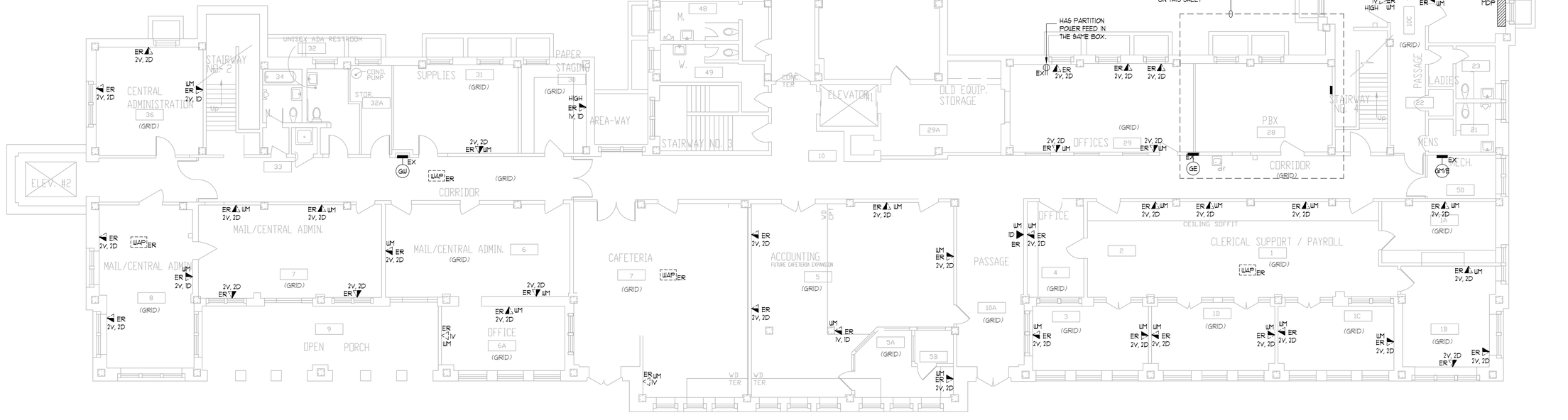
scale: 1/4"-1"-0"

GENERAL NOTES:

1. REMOVE CABLES BACK TO SOURCE.
2. REMOVE WIREMOLD AND BOXES AT OUTLETS BEING DEMO'D.
3. DANE COUNTY IT WILL REMOVE ACTIVE ELECTRONICS FROM RM. 28.

KEYED NOTES:

1. REMOVE FIBER OPTIC SHELF AND INCOMING MUFN24F WITHOUT DISCONNECTING FIBER. REINSTALL IN NEW RACK.
2. UNDER ALTERNATE BID, DISCONNECT AND RECONNECT AIR CONDITIONING UNIT AND ASSOCIATED OUTDOOR CONDENSING UNIT.
3. INSTALL THREE (3) 30A, 2P BREAKERS IN EXISTING PANEL FOR SPECIAL OUTLETS "UPS-3", "UPS-4" & "UPS-5" LOCATED IN PBX ROOM 28.



GROUND FLOOR DEMOLITION SYSTEMS PLAN

scale: 1/8"-1"-0"

Project:

Northport IT Upgrade
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Sheet Title: GROUND FLOOR DEMOLITION SYSTEMS PLAN

Revisions:

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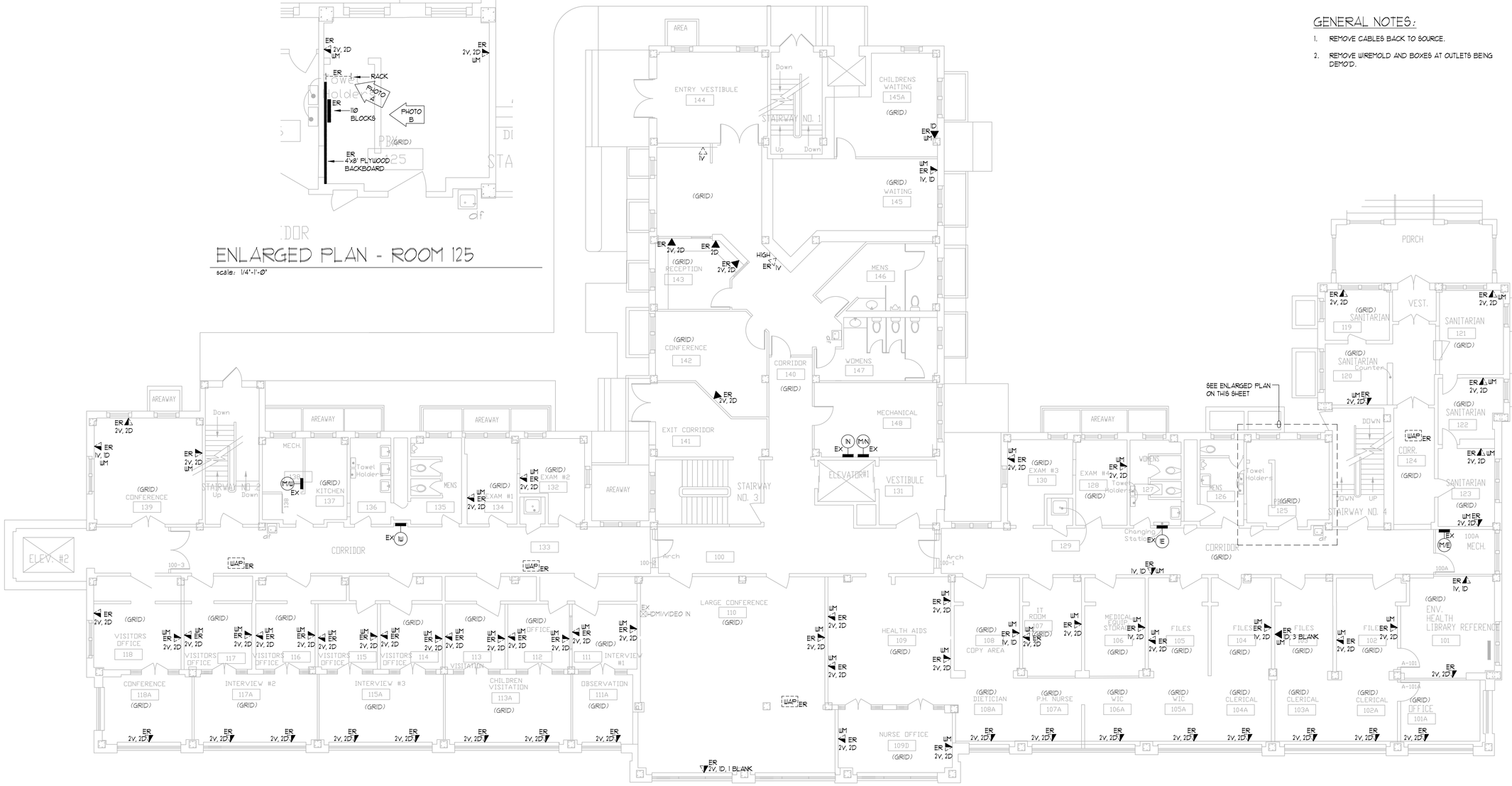
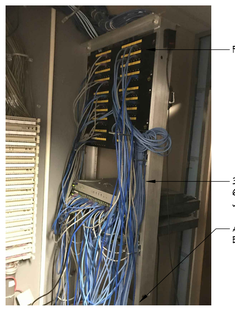
ENLARGED PLAN - ROOM 125

scale: 1/4"-1'-0"

GENERAL NOTES:

1. REMOVE CABLES BACK TO SOURCE.
2. REMOVE WIREMOLD AND BOXES AT OUTLETS BEING DEMO'D.





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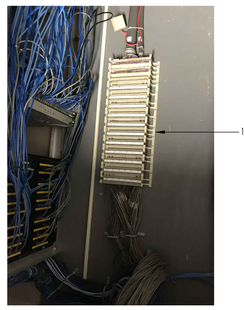

PHOTO "B"

FIRST FLOOR DEMOLITION SYSTEMS PLAN

scale: 1/8"-1'-0"

Project:

Northport IT Upgrade
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Sheet Title: FIRST FLOOR PLAN DEMOLITION SYSTEMS PLAN

Revisions:

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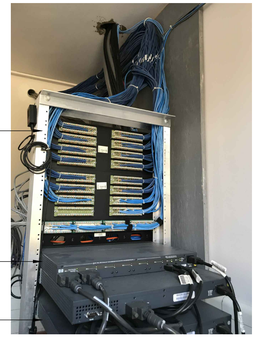
E101



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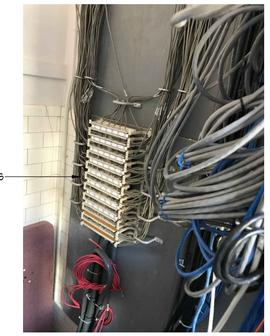
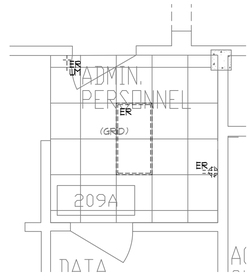


PHOTO "B"

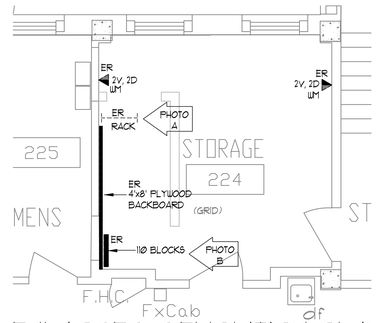
GENERAL NOTES:

1. REMOVE CABLES BACK TO SOURCE.
2. REMOVE WIREMOLD AND BOXES AT OUTLETS BEING DEMO'D.



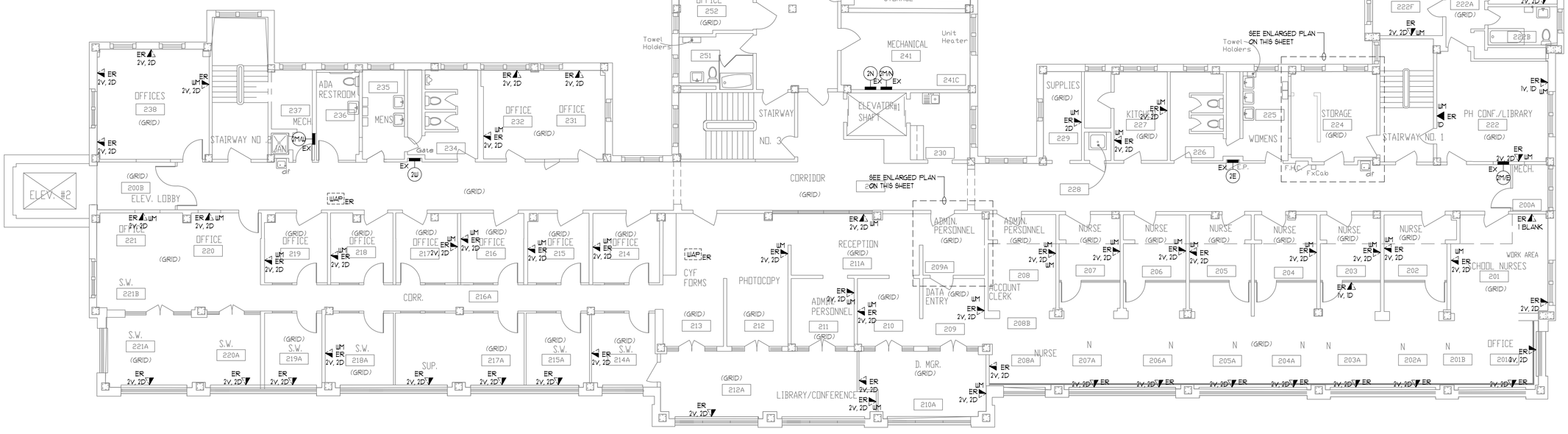
ENLARGED DEMOLITION PLAN
OFFICE 209A

scale: 1/4"-1'-Ø"



ENLARGED DEMOLITION PLAN
STORAGE 224

scale: 1/4"-1'-Ø"



SECOND FLOOR DEMOLITION SYSTEMS PLAN

scale: 1/8"-1'-Ø"

Project:

Northport IT Upgrade
1202 Northport Drive
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Sheet Title: SECOND FLOOR DEMOLITION SYSTEMS PLAN

Revisions:

Drawn By: CZE	Checked By: AMC	Project No. 319018	Date: April 14, 2020

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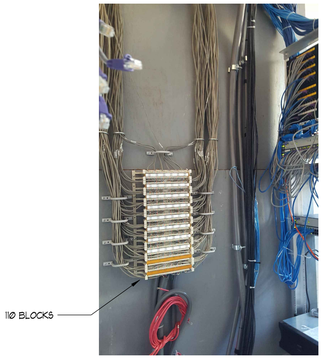
E102



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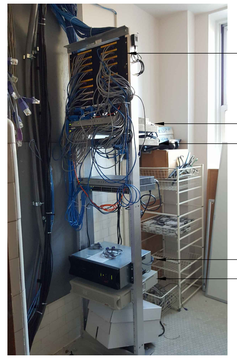


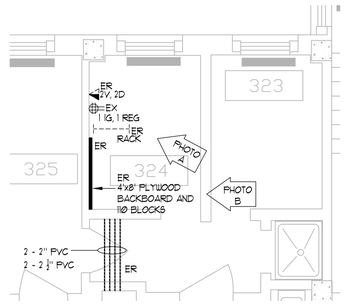
PHOTO "B"

GENERAL NOTES:

1. REMOVE CABLES BACK TO SOURCE.
2. REMOVE WIREMOLD AND BOXES AT OUTLETS BEING DEMO'D.

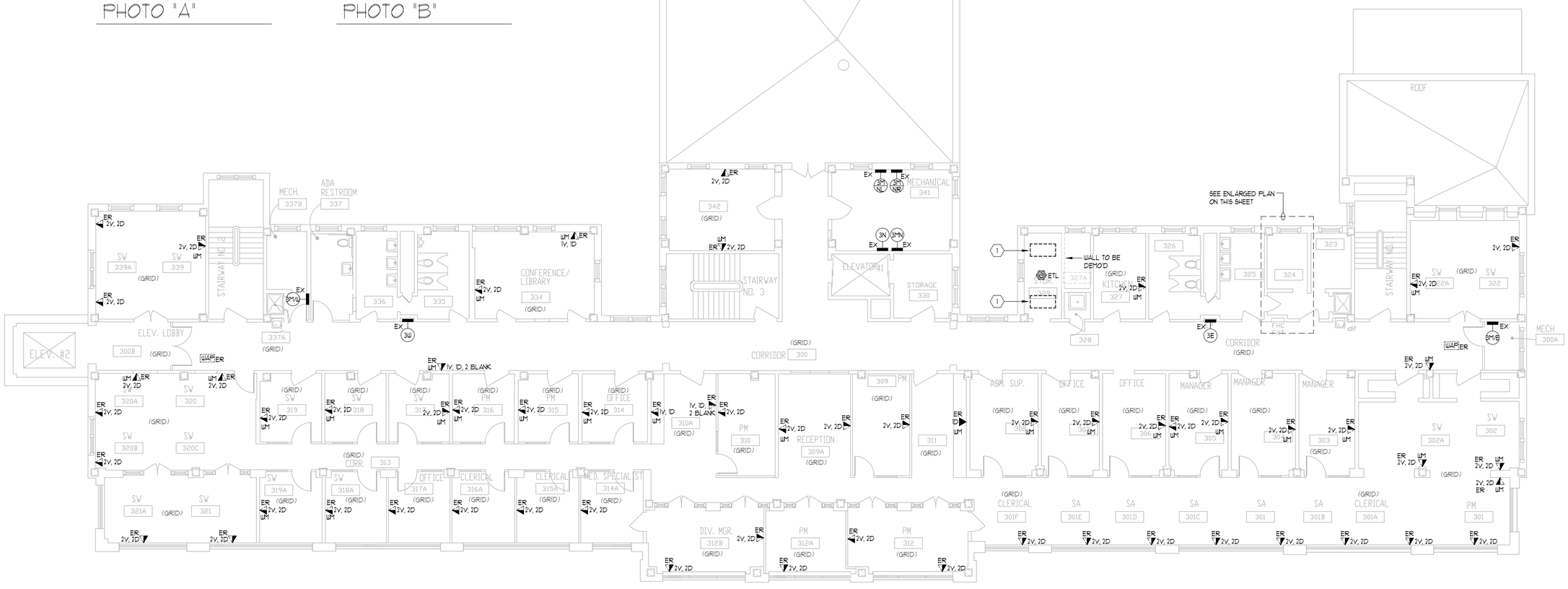
KEYED NOTES:

(1) REMOVE FIXTURE. TURN OVER TO OWNER.



ENLARGED PLAN - STORAGE 324

scale: 1/4"-1'-0"



THIRD FLOOR DEMOLITION SYSTEMS PLAN

scale: 1/8"-1'-0"

Project:

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Sheet Title: THIRD FLOOR DEMOLITION SYSTEMS PLAN

Revisions:

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E103

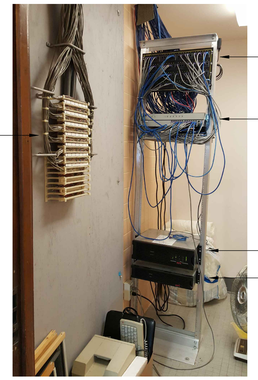
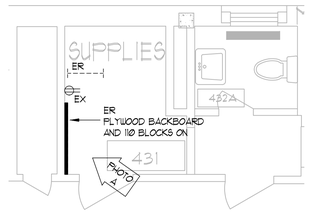


PHOTO "A"

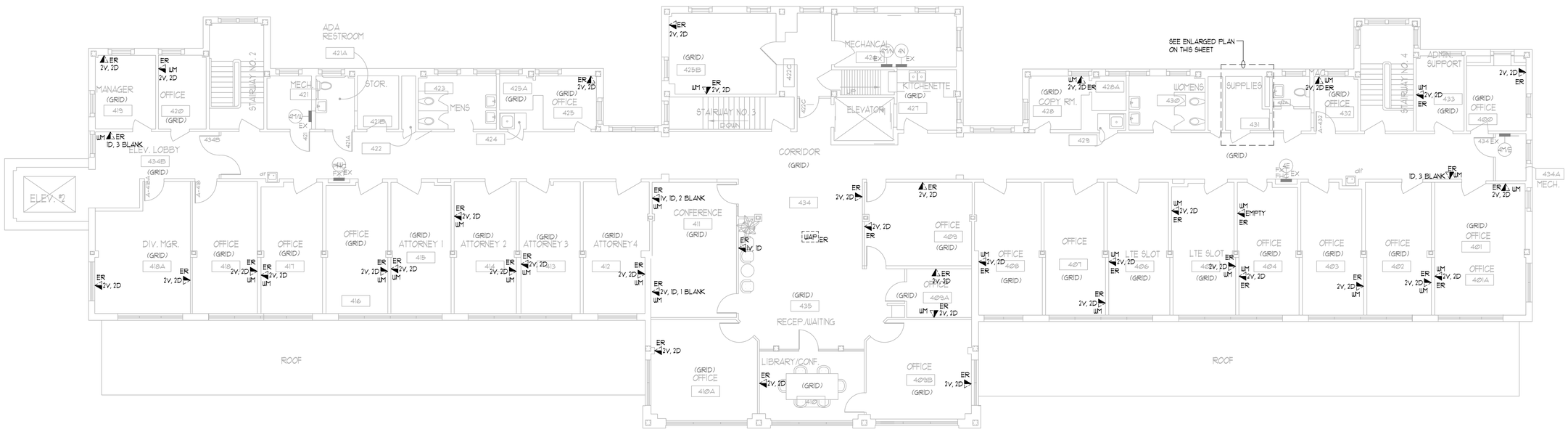
GENERAL NOTES:

1. REMOVE CABLES BACK TO SOURCE.
2. REMOVE WIREMOLD AND BOXES AT OUTLETS BEING DEMO'D.



ENLARGED PLAN - SUPPLIES 431

scale: 1/4"-1'-0"



FOURTH FLOOR DEMOLITION SYSTEMS PLAN

scale: 1/8"-1'-0"

Project:

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Sheet Title: FOURTH FLOOR DEMOLITION SYSTEMS PLAN

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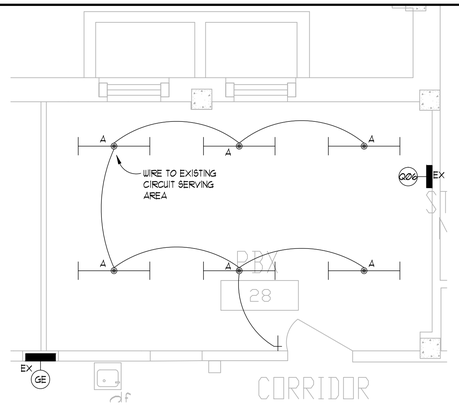
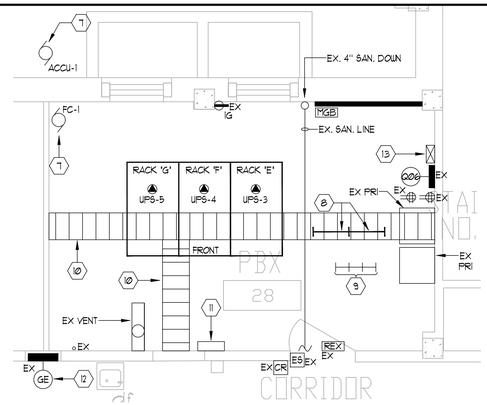


LIGHTING PLAN - ROOM 28

scale: 1/4"-1"-0"



COMMUNICATIONS PLAN - ROOM 28

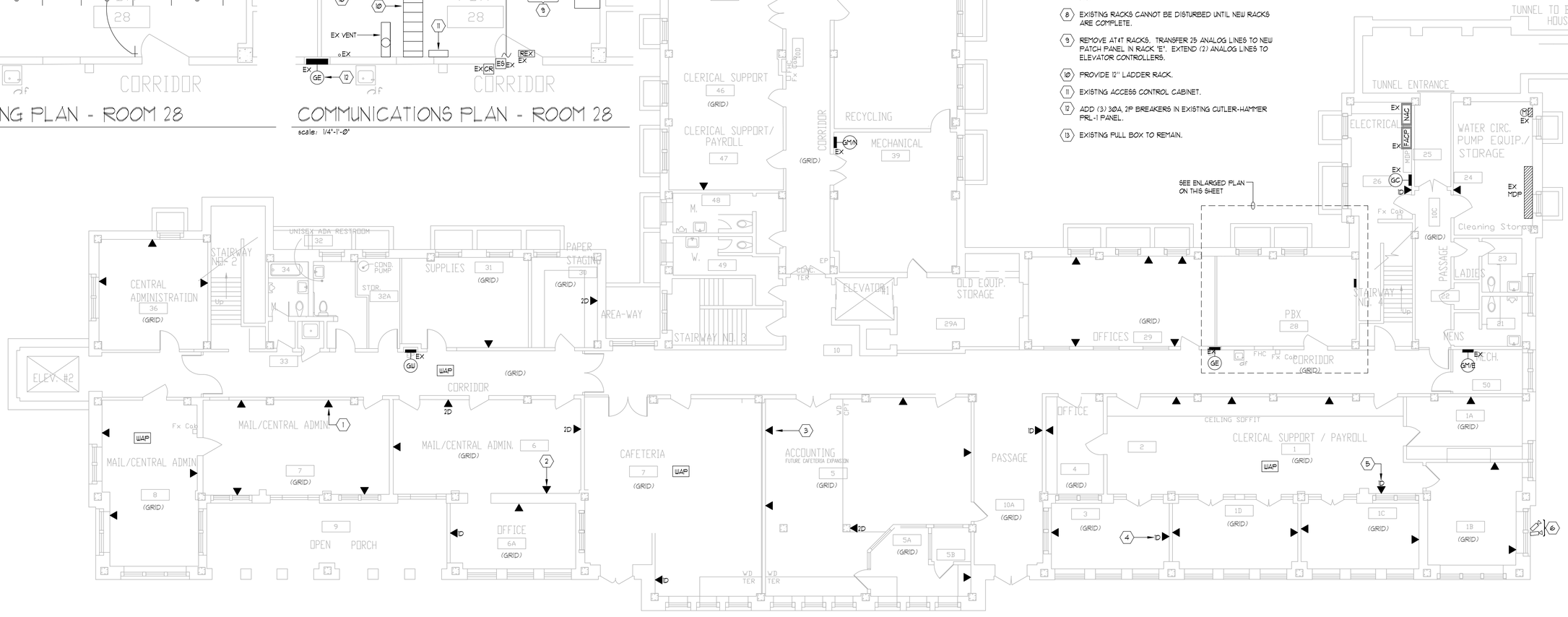
scale: 1/4"-1"-0"

KEYED NOTES:

1. PROVIDE ONE ANALOG LINE FOR FAX MACHINE GV11 PLUS (4) DATA JACKS.
2. PROVIDE ONE ANALOG LINE FOR FAX MACHINE GV26 PLUS (4) DATA JACKS.
3. PROVIDE ONE ANALOG LINE FOR FAX MACHINE GV39 PLUS (4) DATA JACKS.
4. PROVIDE ONE ANALOG LINE FOR FAX MACHINE GV63.
5. PROVIDE ONE ANALOG LINE FOR NP0001-HP4345 MFP GV15.
6. WIRE TELECOM ROOM 209A.
7. DISCONNECT OLD AC UNIT AND CONDENSING UNIT AND RECONNECT NEW UNITS TO SAME CIRCUIT UNDER ALTERNATE BID.
8. EXISTING RACKS CANNOT BE DISTURBED UNTIL NEW RACKS ARE COMPLETE.
9. REMOVE AT&T RACKS. TRANSFER 25 ANALOG LINES TO NEW PATCH PANEL IN RACK 'E'. EXTEND (2) ANALOG LINES TO ELEVATOR CONTROLLERS.
10. PROVIDE 12" LADDER RACK.
11. EXISTING ACCESS CONTROL CABINET.
12. ADD (3) 30A, 2P BREAKERS IN EXISTING CUTLER-HAMMER PRL-1 PANEL.
13. EXISTING PULL BOX TO REMAIN.

GENERAL NOTES:

1. ALL TELECOM OUTLET SHALL BE 4D UNLESS NOTED OTHERWISE.
2. PROVIDE NEW WIREMOLD AND BOXES FOR ALL TELECOM OUTLETS.



GROUND FLOOR SYSTEMS PLAN

scale: 1/8"-1"-0"

Project:

Northport IT Upgrade
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Madison Wisconsin

Sheet Title: GROUND FLOOR SYSTEMS PLAN

Revisions:

Drawn By: CJE	Checked By: AMC	Project No. 319018	Date: April 14, 2020

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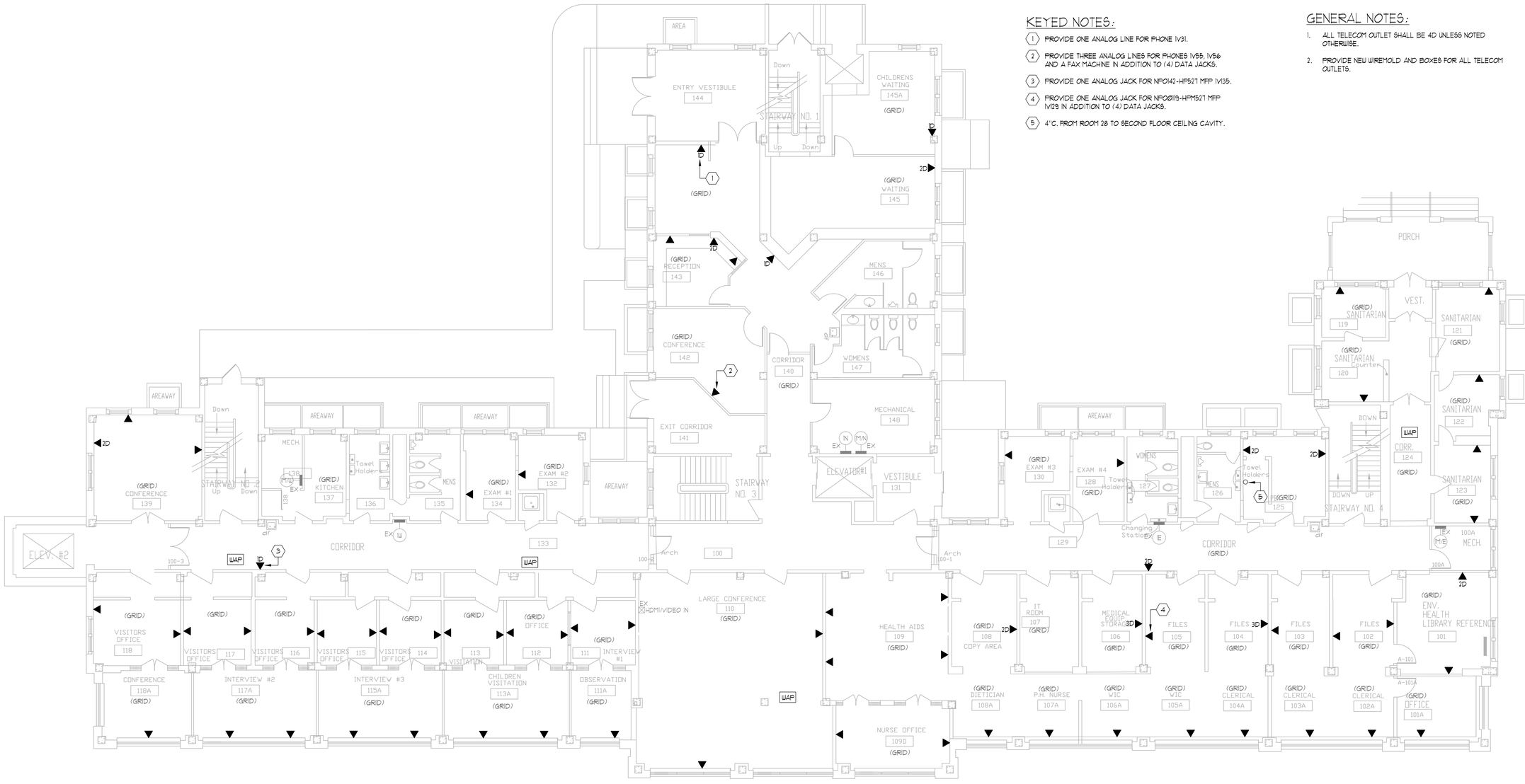

KEYED NOTES:

1. PROVIDE ONE ANALOG LINE FOR PHONE IV31.
2. PROVIDE THREE ANALOG LINES FOR PHONES IV55, IV56 AND A FAX MACHINE IN ADDITION TO (4) DATA JACKS.
3. PROVIDE ONE ANALOG JACK FOR NPO142-HP527 MFP IV135.
4. PROVIDE ONE ANALOG JACK FOR NPO0119-HPM527 MFP IV129 IN ADDITION TO (4) DATA JACKS.
5. 4"C. FROM ROOM 28 TO SECOND FLOOR CEILING CAVITY.

GENERAL NOTES:

1. ALL TELECOM OUTLET SHALL BE 4D UNLESS NOTED OTHERWISE.
2. PROVIDE NEW WIREMOLD AND BOXES FOR ALL TELECOM OUTLETS.

FIRST FLOOR SYSTEMS PLAN

scale: 1/8"-1'-0"

Project:

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Sheet Title: FIRST FLOOR PLAN - POWER/SYSTEMS

Revisions:

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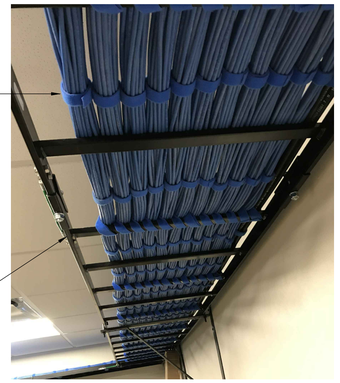
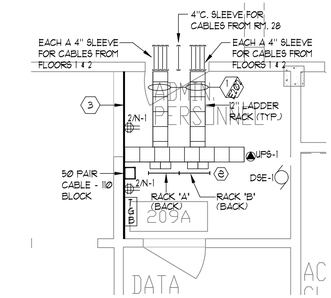


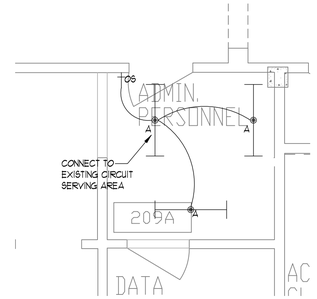
1 E2Ø CABLE MANAGEMENT DETAIL

scale: 1/4"-1'-Ø"



COMMUNICATIONS PLAN - IT ROOM 209A

scale: 1/4"-1'-Ø"



LIGHTING PLAN - IT ROOM 209A

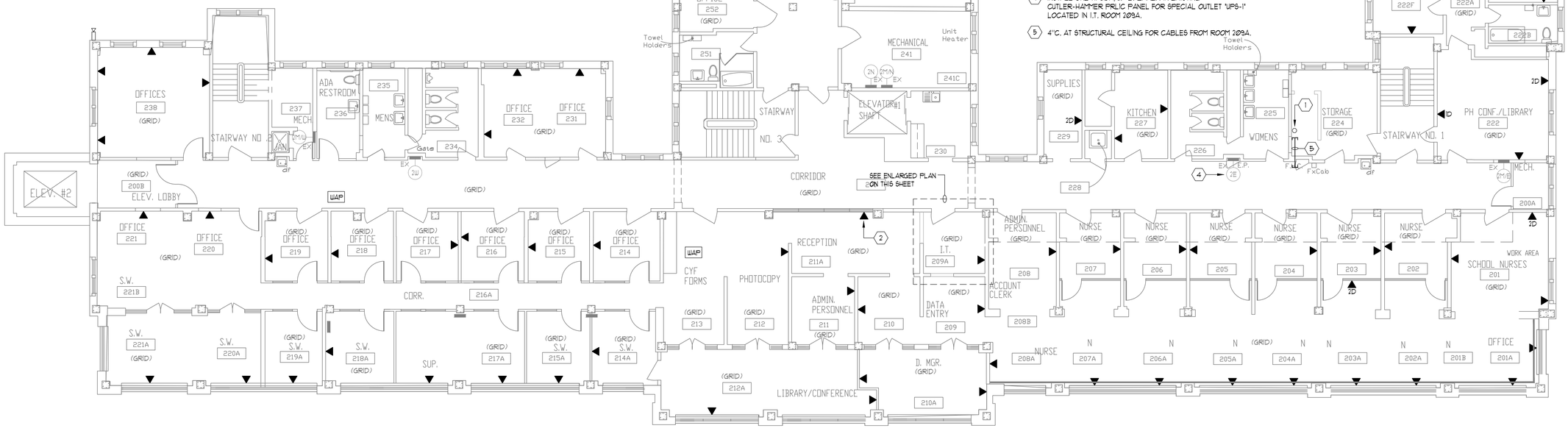
scale: 1/4"-1'-Ø"

GENERAL NOTE:

1. ALL DATA JACKS SHOWN ARE 4D UNLESS NOTED OTHERWISE.

KEYED NOTES:

1. 4"C. DOWN FROM THIRD FLOOR.
2. PROVIDE ONE ANALOG JACK FOR NP0211-HP31Z MFP 2V00T PLUS (4) DATA JACKS.
3. ¾" A-C PLYWOOD TO 8'-Ø" AFF. MOUNT A-SIDE OUT. PAINT GRAY - TWO COATS.
4. INSTALL ONE (1) 30A, 2P BREAKER IN EXISTING CUTLER-HAMMER PRLC PANEL FOR SPECIAL OUTLET 'UPS-1' LOCATED IN I.T. ROOM 209A.
5. 4"C. AT STRUCTURAL CEILING FOR CABLES FROM ROOM 209A.



SECOND FLOOR SYSTEMS PLAN

scale: 1/8"-1'-Ø"

Project:

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Sheet Title: SECOND FLOOR SYSTEMS PLAN

Revisions:

Drawn By: CZE	Checked By: AMC	Project No. 319018	Date: April 14, 2020

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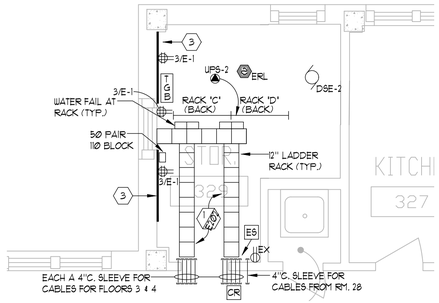
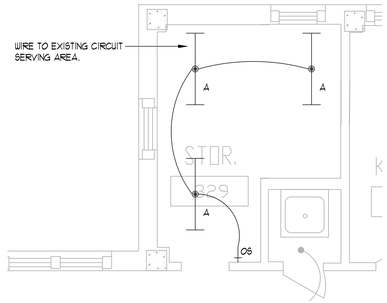


COMMUNICATIONS PLAN - STORAGE 329

scale: 1/4"-1"-Ø"



LIGHTING PLAN - STORAGE 329

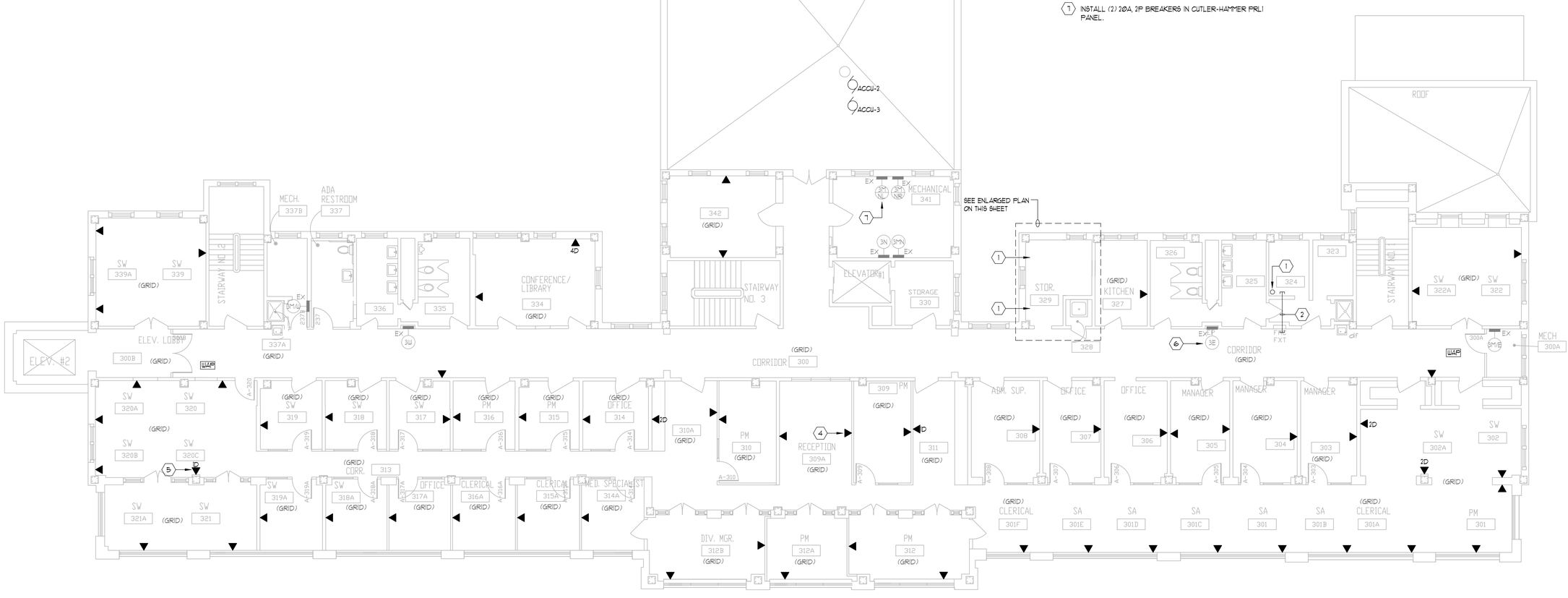
scale: 1/4"-1"-Ø"

GENERAL NOTES:

1. ALL DATA JACKS SHOW SHALL BE 4D UNLESS NOTED OTHERWISE.

KEYED NOTES:

1. 4"C. FROM STRUCTURAL CEILING TO ROOM 28.
2. 4"C. AT STRUCTURAL CEILING FOR CABLES FROM ROOM 329.
3. 3/4" A-C PLYWOOD FLOOR TO 8'-Ø" AFF. MOUNT A-SIDE OUT. PAINT GRAY - TWO COATS.
4. PROVIDE ONE ANALOG LINE FOR NPØ3Ø8-HP4345 MFP 3VIØ1 PLUS (4) DATA JACKS.
5. PROVIDE ONE ANALOG LINE FOR NPØ6ØØ-HP63Ø MFP 3VØ13.
6. INSTALL ONE (1) 3ØA, 2P BREAKER IN EXISTING CUTLER-HAMMER PRLIC PANEL FOR SPECIAL OUTLET "UPS-2" LOCATED IN STORAGE ROOM 329.
7. INSTALL (2) 2ØA, 2P BREAKERS IN CUTLER-HAMMER PRL1 PANEL.



THIRD FLOOR SYSTEMS PLAN

scale: 1/8"-1"-Ø"

Project:

Northport IT Upgrade
1202 Northport Drive
Madison Wisconsin

Sheet Title: THIRD FLOOR SYSTEMS PLAN

Revisions:

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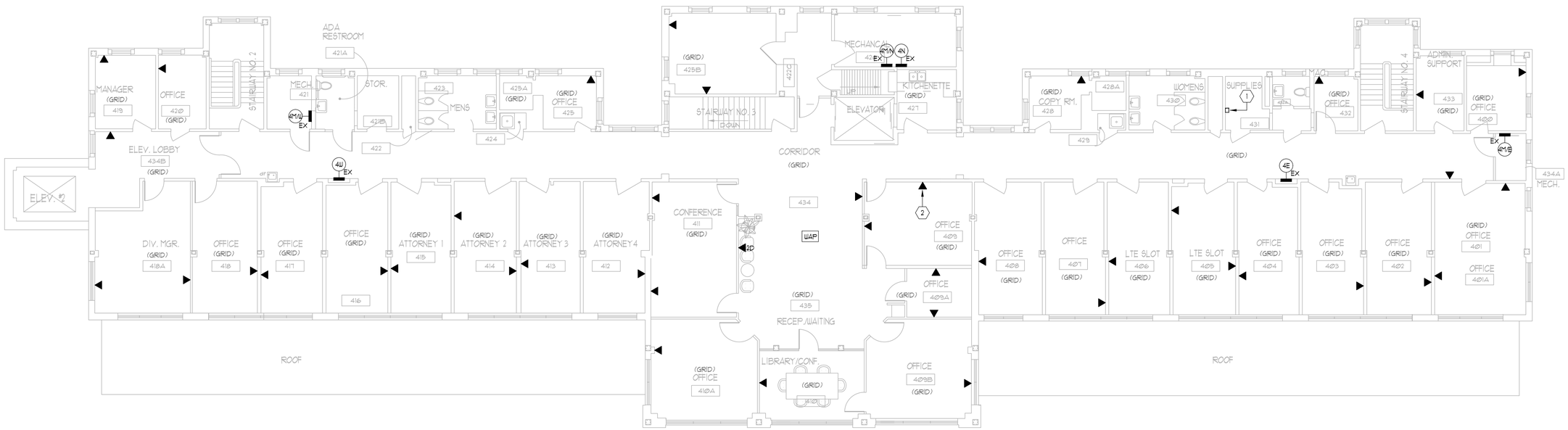
E203

KEYED NOTES:

1. EXTEND NEW ANALOG ELEVATOR LINE FROM PBX ROOM 28 TO ELEVATOR 2 VIA TERMINAL BLOCK IN SUPPLIES 431.
2. PROVIDE ONE ANALOG JACK FOR NP0408-HP4345 MFP 4V41 PLUS (4) DATA JACKS.



FOURTH FLOOR SYSTEMS PLAN

scale: 1/8"-1'-0"

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Sheet Title: FOURTH FLOOR SYSTEMS PLAN

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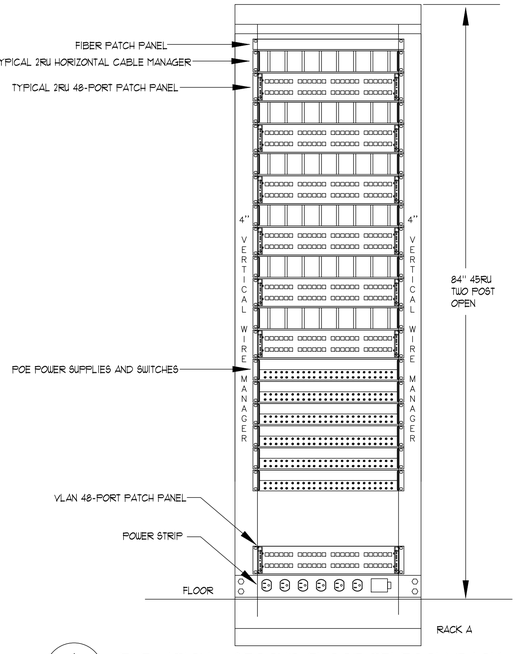
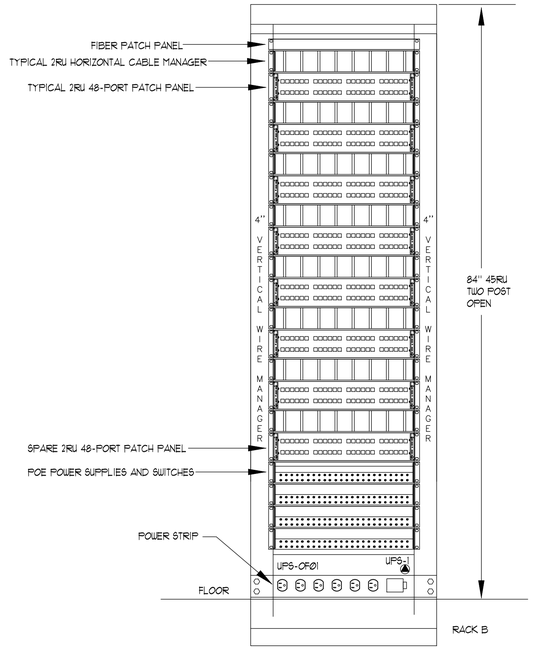
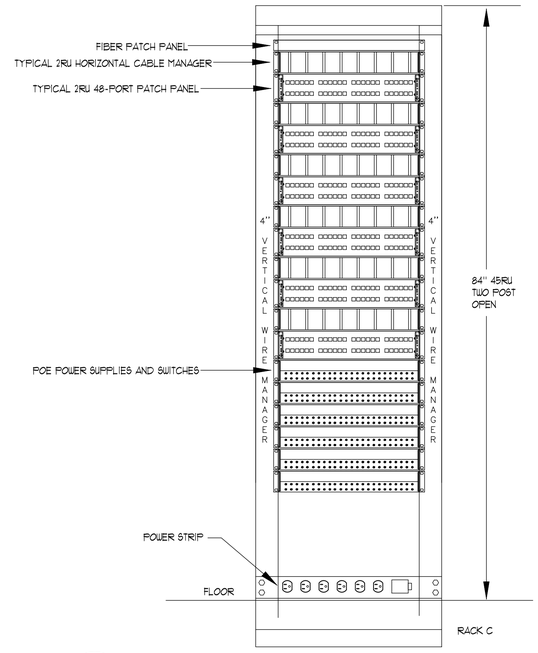
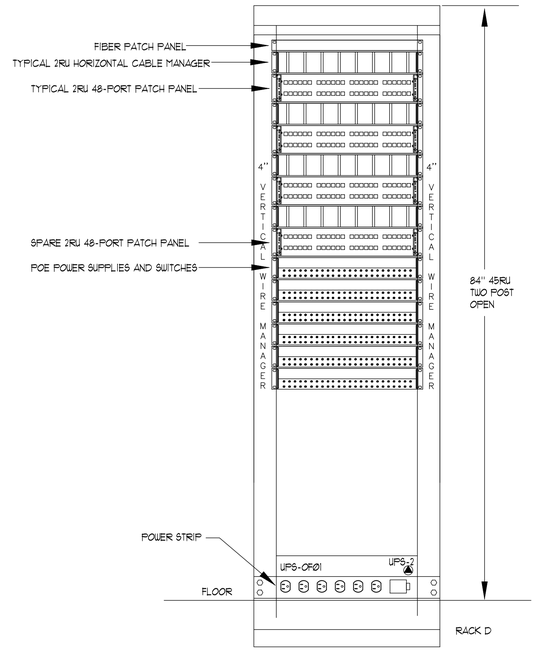


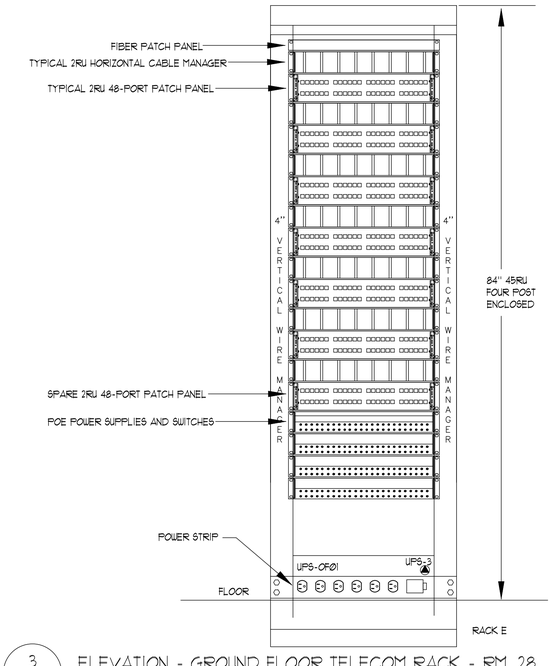


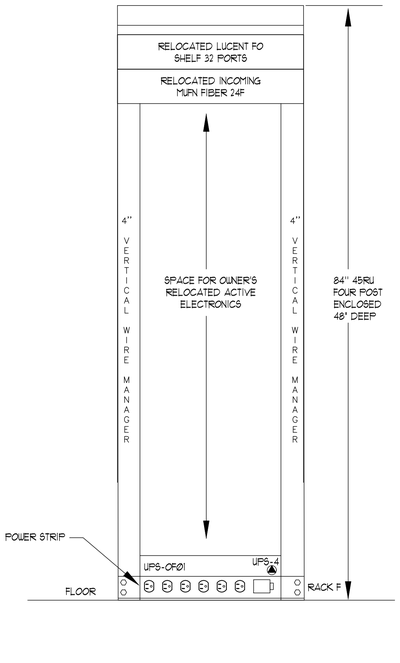
1 E300 ELEVATION - SECOND FLOOR TELECOM RACK - RM. 209A
NOT TO SCALE

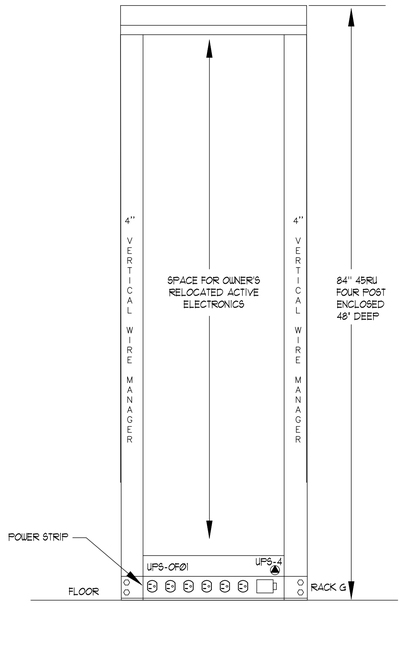




2 E300 ELEVATION - THIRD FLOOR TELECOM RACK - RM. 329
NOT TO SCALE







3 E300 ELEVATION - GROUND FLOOR TELECOM RACK - RM. 28
NOT TO SCALE

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MOTOR WIRING SCHEDULE

TAG	DRIVING	LOC.	POWER			FEED FROM		BREAKER		BRANCH WIRING			STARTER					DISCONNECT					SEE
			HP	VOLT	PH	PANEL	CIRCUIT	SIZE	POLE	NO	SIZE	COND.	FURN.	INST.	WIRED	LOC.	TYPE	FURN.	INST.	WIRED	LOC.	TYPE	NOTE
FC-1	FAN COIL UNIT	SEE PLAN	1/3 HP	208	1	EX	EX	EX	EX														1
DSE-1	DUCTLESS SPLIT-1	SEE PLAN		208	1	SEE	NOTE	20	2	2+G	12	1/2"	HV	HV	EC	IU	MAG	EC	EC	EC	NU	FD	2
DSE-2	DUCTLESS SPLIT-2	SEE PLAN		208	1	SEE	NOTE	20	2	2+G	12	1/2"	HV	HV	EC	IU	MAG	EC	EC	EC	NU	FD	2
ACCU-1	AIR COOLED CONDENSING UNIT-1	SEE PLAN	16.6 MCA	208	1	EX	EX	EX	EX														1
ACCU-2	AIR COOLED CONDENSING UNIT-2	SEE PLAN		208	1	3MNL	1,3	20	2	2+G	12	1/2"	HV	HV	EC	IU	MAG	EC	EC	EC	NU	FD	
ACCU-3	AIR COOLED CONDENSING UNIT-3	SEE PLAN		208	1	3MNL	2,4	20	2	2+G	12	1/2"	HV	HV	EC	IU	MAG	EC	EC	EC	NU	FD	

ABBREVIATIONS:

- 2SP = 2 SPEED MAGNETIC STARTER
- BOL = BUILT-IN OVERLOAD
- CS = COMBINATION STARTER
- EC = ELECTRICAL CONTRACTOR
- ECP = ELEVATOR CONTROL PANEL
- EV = ELEVATOR CONTRACTOR
- FD = FUSIBLE DISCONNECT
- HV = HVAC CONTRACTOR
- IU = IN UNIT
- LMRS = LOCKABLE MOTOR RATED SWITCH
- MAN = MANUAL STARTER
- MAG = MAGNETIC STARTER
- MC = MECHANICAL CONTRACTOR
- MCC = MOTOR CONTROL CENTER
- HOA = HAND-OFF-AUTO
- MCA = MINIMUM CIRCUIT AMPS
- MFR = MANUFACTURER
- NFD = NON-FUSIBLE DISCONNECT
- NU = NEAR UNIT
- OU = ON UNIT
- PC = PLUMBING CONTRACTOR
- PL = PILOT LIGHT
- RVS = REDUCED VOLTAGE STARTER
- TCP = TEMPERATURE CONTROL PANEL
- T-STAT = THERMOSTAT
- VFD = VARIABLE FREQUENCY DRIVE
- WP = WEATHERPROOF
- STST = START/STOP

NOTES:

1. RECONNECT TO ORIGINAL CIRCUIT.
2. WIRE FROM ASSOCIATED CONDENSING UNIT.

SPECIAL OUTLET SCHEDULE

TAG	DRIVING	LOC.	FEED FROM		BREAKER		BRANCH WIRING			POWER			SEE
			PANEL	CIRCUIT	SIZE	POLE	NO	SIZE	COND.	VOLT	PH	LOAD	NOTE
UPS-1	DATA RACK UPS	209A	2E	1,3	30	2	3	10	3/4"	208	1		1
UPS-2	DATA RACK UPS	329	3E	1,3	30	2	3	10	3/4"	208	1		1
UPS-3	DATA RACK UPS	28	GE	1,3	30	2	3	10	3/4"	208	1		1
UPS-4	DATA RACK UPS	28	GE	5,7	30	2	3	10	3/4"	208	1		1
UPS-5	DATA RACK UPS	28	GE	2,4	30	2	3	10	3/4"	208	1		1

NOTES:

1. TERMINATE ON RECEPTACLE COMPATIBLE WITH EXISTING UPS.

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