

RFB NO. 318057



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. 318057
ATIP OFFICE REMODEL
DANE COUNTY COURTHOUSE
215 S HAMILTON ST
MADISON, WISCONSIN**

Due Date / Time: **TUESDAY, FEBRUARY 19, 2019 / 2:00 PM**

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:

ERIC URTEGAS, AIA, PROJECT MANAGER
TELEPHONE NO.: 608/266-4798
FAX NO.: 608/267-1533
E-MAIL: URTEGAS.ERIC@COUNTYOFDANE.COM

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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 PM, TUESDAY, FEBRUARY 19, 2019

RFB NO. 318057

ATIP OFFICE REMODEL

DANE COUNTY COURTHOUSE

215 S HAMILTON ST

MADISON, WI

Dane County is inviting bids for construction services to remodel the ATIP (Alternatives to Incarceration Program) office in the Dane County Courthouse.

Request for Bids document may be obtained after **2:00 PM on Tuesday, January 22, 2019** by downloading it from bids-pwht.countyofdane.com. Please call Eric Urtes, AIA, Project Manager, at 608/266-4798, or our office at 608/266-4018, for any questions or additional information.

All Bidders must be pre-qualified as a Best Value Contractor before award of Contract. Complete Pre-qualification Application for Contractors at countyofdane.com/pwht/BVC_Application.aspx or obtain one by calling 608/266-4029.

All employees working on-site will be required to complete a background screening prior to beginning work.

A pre-bid tour will be held Tuesday, February 5, 2019 at 10:00 AM at the Dane County Courthouse, starting in front of Courtroom C on the 5th floor after going through weapons screening. Bidders are strongly encouraged to attend this tour.

PUBLISH: JANUARY 22 & JANUARY 29, 2019 - WISCONSIN STATE JOURNAL
JANUARY 22 & JANUARY 29, 2019 - THE DAILY REPORTER



DANE COUNTY DEPARTMENT of PUBLIC WORKS, HIGHWAY and TRANSPORTATION

County Executive
Joseph T. Parisi

1919 Alliant Energy Center Way • Madison, Wisconsin 53713
Phone: (608) 266-4018 • FAX: (608) 267-1533

Commissioner / Director
Gerald J. Mandli

BEST VALUE CONTRACTING APPLICATION

CONTRACTORS / LICENSURE APPLICANTS

The Dane County Department of Public Works requires all contractors to be pre-qualified as a best value contractor with the County prior to being awarded a contract. In addition, the County pre-qualifies potential contractors and sub-contractors who wish to work on County contracts. Subcontractors must become pre-qualified ten (10) days prior to commencing work under any Dane County Public Works Contract. Potential subcontractors are urged to become pre-qualified as early as possible. 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 pre-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 pre-qualification application. Failure to do so could result in suspension, revocation of the contractor's pre-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: dwd.wisconsin.gov/apprenticeship/.

EXEMPTIONS

- Contractors who employ less than five (5) apprenticeable trade workers are not required to pre-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 possess 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, pre-qualified subcontractors?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
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: <input type="checkbox"/> No: <input type="checkbox"/>
3	Will your firm meet all bonding requirements as required by applicable law or contract specifications?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
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: <input type="checkbox"/> No: <input type="checkbox"/>
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: <input type="checkbox"/> No: <input type="checkbox"/>
6	Does your firm acknowledge that it must pay all craft employees on public works projects the wage rates and benefits required under Section 66.0903 of the Wisconsin Statutes?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
7	Will your firm fully abide by the equal opportunity and affirmative action requirements of all applicable laws, including County ordinances?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
8	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: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
9	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: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
10	In the past three (3) years, has your firm been debarred by any federal, state or local government agency?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
11	In the past three (3) years, has your firm defaulted or failed to complete any contract?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
12	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: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
13	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: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
14	Is your firm Executive Order 108 precertified with the State of Wisconsin?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
15	Is your firm an active Wisconsin Trade Trainer as determined by the Wisconsin Bureau of Apprenticeship Standards?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
16	Is your firm exempt from being pre-qualified with Dane County?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach reason for exemption.
17	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 pre-qualified with the County or become so ten days prior to commencing work?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
18	Contractor has been in business less than one year?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
19	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: <input type="checkbox"/> No: <input type="checkbox"/>
20	Not applicable. My firm does not intend to work on Best Value Contracts. Note: Best Value Contracting is required to bid on most Public Works Contracts (if unclear, please call Jan Neitzel Knox 608-266-4029).	Yes: <input type="checkbox"/> No: <input type="checkbox"/>

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

Date

Printed or Typed Name and Title

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

REMEMBER!

Return all to forms and attachments, or questions to:

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

OFFICE: (608) 266-4018

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

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 February 5, 2019 at 10:00 AM at Dane County Courthouse, 215 S Hamilton St, Madison, in front of Courtroom C on the 5th floor after going through weapons screening.. Attendance by all bidders is optional, however bidders and subcontractors are strongly encouraged to attend.
- D. Visits at other times can also be arranged. Coordinate site access activities with Kerry Widish, 608/266-4288.
- E. 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 Contract, 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 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.
- B. County's Public Works Project Engineer 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 Engineer or designee all such information and data for this purpose as County's Public Works Project Engineer 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 Officer 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 Officer
City-County Building, Room 421
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703
608/266-5623
- 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 Officer 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 Officer 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. Bidder shall carefully read requests for Alternate Bids, and thoroughly examine Drawings and Specifications to determine extent various changes and conditions will affect Bid.
- B. Space is provided in Bid Form for requested Alternate Bids. Failure to submit bid for any requested Alternate Bids may result in rejection of entire Bid.
- C. Bidder shall state amount to be added / subtracted to Base Bid for providing alternates, including all incidentals, omissions, additions, and adjustments as may be necessary or required by such changes. If there is no difference in price, Bidder shall state, "No Change".
- D. Descriptions of requested Alternate Bids are as set forth in Construction Documents.

16. INFORMATIONAL BIDS

- A. Bidder shall state amount that is included in Base Bid for all equipment, materials and labor required to complete the Work described. Informational bids are amounts requested for accounting purposes and for allocation of funds only. It is not intended to omit any of the Work described or related items from this project.
- B. Description of requested Informational Bids, if any, is as set forth in Construction Documents.

17. UNIT PRICES

- A. Provide unit prices where requested on Bid Form. Unit prices will include all costs for materials, labor, insurance, taxes, overhead and profit necessary to perform specified work.

Estimated quantities are approximate only. Payment will be based upon actual quantities placed, provided or installed. Failure to provide requested unit prices may result in rejection of entire Bid.

- B. Owner reserves right to accept or reject any unit prices as given in Bid.
- C. Bidder shall refer to Bid Form and applicable specification section to determine basis of unit measure and detailed information related to each unit price item requested.

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

Page ___ of ___

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

Page ___ of ___

**DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CONTACTS**

(Copy this Form as necessary to provide complete information)

COMPANY NAME: _____

PROJECT NAME: _____

BID NO.: _____ BID DUE DATE: _____

	<u>ESB FIRM NAME CONTACTED</u>	<u>DATE</u>	<u>PERSON CONTACTED</u>	<u>DID ESB BID?</u>	<u>ACC- EPT BID?</u>	<u>REASON FOR REJECTION</u>
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: _____

BID FORM

BID NO. 318057

**PROJECT: ATIP OFFICE REMODEL
DANE COUNTY COURTHOUSE**

**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 to remodel the ATIP (Alternatives to Incarceration Program) office in the Dane County Courthouse. 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 Administration must have this project completed by October 28, 2019. Assuming this Work can be started by April 2, 2019, 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 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

BIDDERS SHOULD BE AWARE OF THE FOLLOWING:

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?

DANE COUNTY BEST VALUE CONTRACTING PRE-QUALIFICATION

Contractors must be pre-qualified as a Best Value Contractor with the Dane County Public Works Engineering Division before the award of contract. Obtain a *Best Value Contracting Application* by calling 608/266-4018 or complete one online at:
countyofdane.com/pwht/BVC_Application.aspx

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.nlr.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.

COUNTY OF DANE

PUBLIC WORKS CONSTRUCTION CONTRACT

Contract No. _____ Bid No. 318057

Authority: 2018 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

WITNESSETH:

WHEREAS, COUNTY, whose address is c/o Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide ATIP Office Remodel at the Dane County Courthouse ("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 _____ (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. NOT USED.

4. CONTRACTOR shall file an Affirmative Action Plan with the Dane County Contract Compliance Officer 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 Contract Compliance Office, 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 Officer 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 must be pre-qualified as a Best Value Contractor with Dane County Public Works Engineering Division before award of Contract. Subcontractors must be pre-qualified ten (10) business days prior to commencing 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 Assistant 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 _____

_____	<i>(Contractor as Principal)</i>	_____	<i>(Seal)</i>
<i>(Witness)</i>	_____	_____	<i>(Title)</i>
_____	<i>(Surety)</i>	_____	<i>(Seal)</i>
<i>(Witness)</i>	_____	_____	<i>(Title)</i>

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

Performance 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 16

CONTRACTOR AS PRINCIPAL

Company: _____
(Corporate Seal)

SURETY

Company: _____
(Corporate Seal)

Signature: _____

Name _____
and Title: _____

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

Signature: _____

Name _____
and Title: _____

(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 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:

Sample

(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: _____

Name and Title: _____

Address _____

Signature: _____

Name and Title: _____

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)

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 18

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name _____
and Title: _____

Signature: _____

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:)

§ 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

Company: _____

(Corporate Seal)

SURETY

Company: _____

(Corporate Seal)

Signature: _____

Name and Title: _____

Address _____

Signature: _____

Name and Title: _____

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.

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 shall pay all Sales, Consumer, Use and other similar taxes required by law.
- 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.
- 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. Use "Dane County, Wisconsin Contractor Wage Affidavit" form included in Supplementary Conditions.

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 (5th) 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. PUBLIC WORKS 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. ARCHITECT / ENGINEER’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 warranties 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 not 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. Not Used.

48. CLAIMS

- A. No claim may be made until Department's Assistant 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 Assistant 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 than \$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 sub-contractors' 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.

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 Public Works Project Manager for approval.



Document G702™ – 1992

Application and Certificate for Payment

TO OWNER:	PROJECT:	APPLICATION NO:	Distribution to:
FROM CONTRACTOR:	VIA ARCHITECT:	PERIOD TO:	OWNER <input type="checkbox"/>
		CONTRACT FOR:	ARCHITECT <input type="checkbox"/>
		CONTRACT DATE:	CONTRACTOR <input type="checkbox"/>
		PROJECT NOS:	FIELD <input type="checkbox"/>
			OTHER <input type="checkbox"/>

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: _____ Date: _____

By: _____

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: _____ Date: _____

By: _____

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.

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010711A2044

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 ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED <i>(Not in D or E)</i>	G TOTAL COMPLETED AND STORED TO DATE <i>(D+E-F)</i>	H BALANCE TO FINISH <i>(C-G)</i>	I RETAINAGE <i>(if variable rate)</i>
			FROM PREVIOUS APPLICATION <i>(D-E)</i>	THIS PERIOD				
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.

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2. COURTHOUSE ACCESS

- A. The Background Check Form on the following page must be filled out before work can begin in the Dane County Courthouse. The Background Check Form is not required to be completed for the pre-bid site tour.
- B. Submit Background Check Forms (one form per worker) to Eric Urtes by scanning & emailing them to urtes.eric@countyofdane.com.
- C. In order to be considered & cleared, submit all forms following award of project..
- E. Winning bidder shall submit Background Check Forms for every worker needing access to the site.
- F. Procedures and Protocols for movement of materials and tools by the General Contractor to the Fifth Floor will be established with Courthouse Staff.



ATIP OFFICE REMODEL - DANE COUNTY COURTHOUSE
MADISON, WISCONSIN

BACKGROUND CHECK FORM

THIS FORM IS DUE FOLLOWING AWARD OF PROJECT. DO NOT INCLUDE WITH BID.

PLEASE TYPE OR PRINT LEGIBLY

TO BE FILLED OUT FOR EACH TOUR & MEETING PARTICIPANT:

This form is mandatory for each individual working on the project. Winning bidder will be required to obtain security clearance for each individual working on-site. A full criminal background check will be performed. A government issued photo identification is required to enter the facilities.

First Name _____

Middle Name _____

Last Name _____

Other Names Used _____

Date of Birth _____ Sex _____ Race _____

Driver's License No. _____ State Issued _____

Current Full Address _____

Cities & States Lived In, Past 10 Years _____

Felony Convictions? (Yes or No) _____

If yes, when? _____

Misdemeanor Convictions? (Yes or No) _____

If yes, when? _____

Today's Date _____ Bidding Company Name _____

Please allow 7 full business days for the background process to be completed. Thank you.

OFFICE USE ONLY

- D.O.T.
- C.I.B.
- F.B.I.
- CCAP
- WARRANTS
- TICKETS
- JAIL RECORDS
- LOCAL COMPUTER CONTACTS

Date Criminal History Run _____

Submit to: _____

SECTION 01 00 00
BASIC REQUIREMENTS

PART 1 GENERAL

1.1 SECTION SUMMARY

- A. Section Includes:
1. Section 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.
- B. Work by Owner: Not applicable.
- C. Permits: Not applicable.
- D. Permits: Prior to commencement of the Work, Contractor to secure any and all necessary permits for completion of the Work and facility occupancy.
- E. 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 others and work by Owner.
- B. Limit use of premises to allow work by Contractors or Subcontractors and access by Owner.
- C. 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. Change Order Forms: Dane County Contract Change Order, Form 014-32-20 (latest issue).
- B. 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 Applicable.

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 Engineer 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 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 week during progress of the Work.
- B. 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 not be available at the Work site.
- B. 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. All construction material and salvage material shall be removed from facility or secured at day's end.
- B. Smoking is prohibited on Dane County property.
- C. Owner reserves right at any time to dismiss from premises any Contractor or construction personnel that do not uphold requirements of this Section.
- D. 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.
- E. Areas of existing facility will be occupied during period when the Work is in progress. Work may be done during normal business hours (8:00 am to 4:30 pm), 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.
- F. 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.
- G. Contractor shall, at all times, provide approved, safe walkways and facility entrances for use by Owner, employees and public.
- H. Contractor shall provide adequate protection for all parts of facility, its contents and occupants wherever the Work under this Contract is to be performed.
- I. Each Contractor shall arrange with Owner to make necessary alterations, do new work, make connections to all utilities, etc., 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.
- J. 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.

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

1.27 PROTECTION

- A. Contractor shall protect from damage / injury all trees, shrubs, hedges, plantings, grass, mechanical, electrical & plumbing equipment, walks and driveways and pay for any damage to same resulting from insufficient or improper protection.
- B. Contractor shall provide and maintain barricades & signage to prohibit public access to construction site.
- C. Contractor shall provide and maintain guard lights at all barricades, railings, obstructions in streets, roads or sidewalks and at all trenches adjacent to public walks or roads.

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 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 maybe 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 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 Public Works Project Manager 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.
- C. Architect / Engineer shall furnish Public Works Project Manager with Record Drawings as detailed in Professional Services Agreement.

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 - Basic 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 may 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 may 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 Rathack 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	Name: _____
		_____ Landfilled	_____ Other	
Wood	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Wood Pallets	_____ units	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
PVC Plastic	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Asphalt & Concrete	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Bricks & Masonry	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Vinyl Siding	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Cardboard	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Metals	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Unpainted Gypsum / Drywall	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Shingles	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Fluorescent Lamps	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Foam Insulation	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Carpet Padding	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Barrels & Drums	_____ units	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	

WASTE MANAGEMENT PLAN FORM

Glass	_____ cu. yds. _____ tons	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ 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 door hardware for reinstallation as indicated on drawings.
 7. Salvage existing carpet for reuse as indicated on drawings.
 8. Salvage brick for reuse 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

1 SECTION 06 10 00

2
3 ROUGH CARPENTRY

4
5 PART 1 - GENERAL

6
7 1.01 RELATED DOCUMENTS

- 8
9 A. Conditions of the Contract and portions of Division One of this Project Manual apply to this
10 Section as though repeated herein.

11
12 1.02 SCOPE

- 13
14 A. Perform all Work required to complete the Rough Carpentry indicated by the Construction
15 Documents, and furnish all items necessary for its proper installation.

16
17 1.03 RELATED WORK

- 18
19 A. Plastic Laminate Casework, Section 06 41 16.
20 B. Solid Surface, Section 06 61 18.

21
22 1.04 SUBMITTALS

- 23
24 A. Submit in accordance to the General Conditions of the contract.
25
26 B. Material certificates for dimensional lumber specified to comply with minimum allowable unit
27 stresses indicated on the documents. Indicate species and grade selected for each use, and
28 design values approved by American Lumber Standards Committee.
29
30 C. Framing plan indicating field verified dimensions, structural performances, ratings,
31 compliance with resilient flooring manufacturers' substrate requirements and shop fabricated
32 architectural woodwork requirements for Owner and A/E approval and coordination of Owner
33 provided electrical.
34
35 D. Schedule for completion of rough framing for coordination of templating for shop fabrication
36 of architectural woodwork.
37
38 E. Wood treatment data as follows, including chemical treatment manufacturer's warranty and
39 instructions for handling, storing, installing, and finishing treated materials:
40
41 1. For each type of preservative-treated wood product, include certification by treating plant
42 stating type of preservative solution and pressure process used, net amount of
43 preservative retained, and compliance with applicable standard.
44

45 1.05 REFERENCES

- 46
47 A. American Institute of Timber (AITC)
48 1. AITC, Timber Construction Manual
49
50 B. American Forest and Paper Association (AFPA)
51 1. AFPA, National Design Specification for Wood Construction.
52 2. AFPA, Design Values for Wood Construction, NDS Supplement.
53
54 C. American Plywood Association (APA)
55 1. APA, Plywood Design Specification.

- 1
2 D. American National Standards Institute (ANSI)
3 1. ANSI A190.1, Structural Glued Laminated Wood.
4 2. ANSI A208.1, Material Formed Wood Particle Board.
5
6 E. American Society for Testing and Materials (ASTM)
7 1. ASTM E84, Test for Surface Burning Characteristics of Building Materials.
8
9 F. American Wood Preservers Association (AWPA)
10 1. AWPA C-20, Structural Lumber - Fire Retardant Treatment by Pressure Processes.
11
12 G. American Wood Preservers Bureau (AWPB)
13 1. AWPB LP-2, Pressure Treatment with Water-Borne Preservatives.
14
15 H. National Bureau of Standards (NBS)
16 1. NBS PS 1, Voluntary Product Standard for Construction and Industrial Plywood.
17 2. NBS PS 20, Voluntary Product Standard for Lumber.
18

19 1.06 DELIVERY, STORAGE AND HANDLING

- 20
21 A. Deliver materials to the site dry and store above ground on level wood blocking, cover from
22 rain, allowing drainage of water from all parts. Handle with care to avoid damage.
23

24 1.07 COORDINATION

- 25
26 A. Correlate location of all framing, furring, blocking, grounds and similar items with all trades
27 including electrical by Owner.
28
29 B. Verify all dimensions and shop drawing requirements prior to proceeding with work.
30
31 C. Avoid delay of work of other trades dependent on or affected by carpentry work.
32

33 1.08 ENVIRONMENTAL REQUIREMENTS

- 34
35 A. Low-Emitting Materials, Adhesives, and Sealants: Materials used on the interior of the
36 building (defined as inside the weatherproofing system and applied on site) must not exceed
37 the following requirements.
38 1. Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management
39 (SCAQMD) Rule # 1168, requirements in effect on July 1, 2005, and rule amendment
40 date January 7, 2005.
41 2. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36,
42 requirements in effect on October 19, 2000.
43
44 B. Low- Emitting Materials, Composite Wood & Agrifiber Products: Composite wood and
45 agrifiber products used inside the weatherproofing system shall contain no added urea-
46 formaldehyde resins.
47 1. Laminating Adhesives used to fabricate on-site and shop applied composite wood and
48 agrifiber assemblies shall contain no added urea-formaldehyde resins.
49

50 PART 2 - PRODUCTS

51
52 2.01 MATERIALS
53

- 1 A. Wood for nailers, blocking, furring, sleepers and other miscellaneous boards: Construction
2 grade, S4S, dried, 19 percent maximum moisture content. Pressure preservative treat items in
3 contact with flashing, waterproofing, masonry, concrete or the ground.
4
- 5 B. Plywood sheathing shall be 5/8 inch thick, 5-ply, CDX APA Rated, un-sanded with a
6 minimum 24/0 span rating. Sheathing shall be by 48 inches wide by 96 inches long.
7
- 8 C. Fire-retardant treated wood products shall be pressure-impregnate wood materials to comply
9 with ASTM E84, Class A and with AWWA C-20 and C-27. Each piece shall bear UL label
10 "FR-S" for 25 maximum flame spread. Moisture content after treatment shall be 19 percent
11 for lumber and 15 percent for plywood.
12 1. Treated materials shall be "Dricon" as manufactured by Koppers Company, Inc.
13
- 14 D. Rough hardware shall include all nails, spikes, screws, bolts and similar items of types and
15 sizes sufficient to draw and rigidly secure members for which they are used. Fasteners shall
16 be galvanized plated at exterior locations and at all treated wood applications.
17
- 18 E. Adhesive shall be of proper design and characteristics to rigidly secure materials for which
19 they are used. Adhesive shall be "Titebond VOC-Compliant Heavy Duty Construction
20 Adhesive" conforming with ASTM C557, as manufactured by Franklin International; or
21 approved equal.
22 1. Provide construction adhesive with a VOC content of less than 70 g/l.
23

24 PART 3 - EXECUTION

25 3.01 PREPARATION

- 26 A. Examine all adjoining work, verify all governing dimensions, and report any unsatisfactory
27 conditions.
28
- 29 B. Provide temporary enclosures, partitions, or stairs to properly protect and facilitate the work.
30
31
32

33 3.02 GENERAL INSTALLATION

- 34 A. Install materials and systems in accordance with manufacturer's published instructions and
35 requirements. Install materials with uniform appearance and in proper relation with adjacent
36 construction.
37
38
- 39 B. Cut and frame all lumber into the respective locations, true to line, grade, plumb and level.
40 Form nailers, blockings and bucks to the shape and dimension indicated. Cut and frame all
41 rough carpentry work required by the other sections.
42
- 43 C. Use only sound, thoroughly seasoned materials of longest practical lengths and sizes to
44 minimize jointing. Use materials free from warp which cannot be easily corrected by
45 anchoring and attachment.
46
- 47 D. Treat all wood nailers, sleepers, blocking, furring, other wood in contact with concrete,
48 masonry adjacent to grade or exterior which shall be inaccessible in finished work.
49
- 50 E. Provide blocking, bucks and framing for all trades as required.
51
- 52 1. Blocking to be provided at the following locations:
53 a. All wall hung casework, shelving, cabinetry, countertop.
54 b. All wall hung/mounted equipment including monitors.
55 c. And as indicated on drawings.

- 1
2 F. Include 2 inch nominal blocking in metal stud partitions required for backing of all
3 accessories, cabinetry, and other surface or recessed items, including Audio/Visual.
4
5 G. Where finish trim is applied directly to framing members or blocking, such members shall be
6 perfectly straight, clear and well seasoned. Warp or other poor characteristics not allowed.
7
8 H. Provide solid surfaces at least 1 1/2 inches wide in both directions at all corners for securing
9 finishes.

10
11 3.03 HARDWARE

- 12
13 A. Secure permanently and in proper position all materials with the necessary fastenings to
14 provide the strength and rigidity required to complete the work. Provide washers under bolt
15 heads and nuts in contact with wood.
16
17 B. Bolt nailers and blocking to steel, masonry or concrete members with bolts of proportionate
18 strength of members attached, length required, spaced 2 feet 0 inches on center and 4 inches
19 from each end, except as otherwise indicated. Unless otherwise indicated, anchor bolts shall
20 be 3/8 inch diameter by length required or comparable power actuated fasteners.
21
22 C. Nail plywood in accord with APA recommendations.

23
24 3.04 WALL SHEATHING

- 25
26 A. Place sheathing with all joints over supports. Provide 1 1/2 inch framing at all joints not over
27 supports where blocked joints are noted on Drawings.
28
29 B. Stagger end joints so that joint between adjacent panels occurs over different supports. Allow
30 1/8 inch spacing between panels on all sides.
31
32 C. Fasten with 8d ring-shank nails at 6 inch on center at all edges and 12 inch on center at all
33 intermediate supports, unless noted otherwise. Sheathing may be stapled with 1 1/2 inch long
34 15 gauge staples at 4 inch on center at all edges and 12 inch on center at all intermediate
35 supports, unless noted otherwise.
36
37 D. Install in accord with recommendations of APA.

38
39 3.05 TEMPORARY ENCLOSURES

- 40
41 A. The contractor shall furnish, erect, keep in good repair and remove all temporary enclosures.
42 Protect the existing garden from damage with a plywood enclosure to avoid prevent walking
43 on the garden. Remove plywood enclosure after completion of work and restore garden where
44 damaged by work.

45
46 3.06 CLEANING

- 47
48 A. Remove from the site all debris resulting from the Work of this Section.
49

50
END OF SECTION 06 10 00

SECTION 06 41 16

PLASTIC LAMINATE CLAD CASEWORK

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. Base, Wall and Custom Storage Cabinets and associated Partitions and Shelving.
- B. Hardware.

1.03 RELATED WORK

- A. Rough Carpentry: Section 06 10 00.
- B. Joint Sealers: Section 07 92 00.
- C. Solid Surface: Section 06 61 18 including bolt down fixed column supports.
- D. Plumbing (Sinks, pipe, fittings, final connections, etc.): Division 22.

1.04 REFERENCES

- A. Plastic Laminate: National Electrical Manufacturers Association (NEMA) Publication No. LD3-1991.
- B. Fiberboard Core: ANSI A208.2.

1.05 SUBMITTALS

- A. Submit in accordance with the General Conditions of the Contract.
 - 1. Product Data: Manufacturer's catalog information edited to indicate specific products and related accessories to be provided for this Project.
 - 2. Shop Drawings: Show layout of casework, typical details of construction, and finish selections.
 - a. Locate rough-in for services required and show methods of compensating for minor variations in actual job conditions within specified tolerances.
 - b. Include details of fastening to all other work, countertop layout for each location, details of countertop construction including backsplash, endsplash, and edge details, plastic laminate selections previously made by Architect/Engineer and type of core substrate material.
 - c. Field measure for all countertops.
 - d. Indicate all hardware and keying schedule.

1.06 QUALITY ASSURANCE

- A. Quality Standards: Perform work in accordance with Architectural Woodwork Quality Standards (current edition), Guide Specification and Quality Control Program as set forth by the Architectural Woodwork Institute (AWI).

- B. ANSI/BHMA A156.9 – Cabinet Hardware.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver casework items only when proper storage conditions will be available. Store casework in protected area until ready for installation.
- B. Maintain optimum humidity and temperature conditions after receipt of materials.
- C. Store in manner to allow free circulation of air around all items.
- D. Maintain temperature of casework storage areas between 50 to 75 degrees Fahrenheit.

PART 2 - PRODUCTS

2.01 CASEWORK

- A. AWI Section 400, Custom grade.

2.02 MANUFACTURERS

- A. The following casework manufacturers are acceptable as long as they meet or exceed this specification.
 1. A.J. Pietsch Company, (414) 342-0531.
 2. Carley Wood Associates, Inc. (608) 249-7444.
 3. Central Wisconsin Woodworking, (715) 675-4491.
 4. Creative Laminates, Inc., (800) 441-5885.
 5. Diversified Woodcrafts Inc., (920) 842-2136.
 6. Glenn Rieder, Inc., (414) 449-2888.
 7. Hillcraft Ltd., (608) 221-3220.
 8. Lange Brothers Woodwork Co, Inc., (414) 466-2226.
 9. Stück Wood Works Inc., (414) 351-5595.
 10. T. J. Hale Company, (262) 255-5555.
 11. Techline, (608) 238-6868.
 12. Wood Design Inc., (920) 563-4833.
 13. Woodmill Products, Inc., (262) 754-4641.
 14. Or approved equal.
- B. Hardware manufacturers.
 1. Doug Mockett & Co. (800) 523-1269.
 2. A&M Hardware (888) 647-0200
 3. Or approved equal.

2.03 BASE AND CUSTOM STORAGE CABINETS

- A. Bottoms, Sides and Sub-top: 3/4-inch 45-47 pound density particle board.
 1. Finish where not exposed: 8 to 11 mil melamine resin overlay.
- B. Back Panel: 3/8-inch 45-47 pound density particle board.
 1. Finish: 8 to 11 mil melamine resin overlay to match cabinet interior.
 2. Non-Exposed Side Finish: 8 to 11 mil melamine resin overlay to match.
 3. If back exposed, provide 3/4-inch material, finished to match.
- C. Top of Base, Custom Storage Cabinet: Full framed wood. Provide full sub-top and 6 inch spreaders between all drawers and door/drawer.

- D. Back panels rabbeted into sides top and bottom. Secure with hot melt glue or glue and mechanical fasteners.
- E. Provide finished end panels at all exposed end locations. Ends adjacent to appliances shall be considered as exposed ends.

2.04 DOOR/DRAWER CONSTRUCTION AND EDGING

- A. Door/Drawer Fronts: 3/4-inch thick core.
- B. Exposed Edges, Endsplashes:
 - 1. Finished to match exposed face.
- C. Laminate face/balancer to core with PVA rigid adhesives, under pressure, nor natural setting process. Heat process or contact adhesive not allowed.
- D. Door/Drawer/Cabinet Body Edges: 1 mm PVC thru-color, acid resistant hot melt applied.

2.05 PLASTIC LAMINATE SURFACING

- A. Manufacturers: Wilsonart , Arpa, Formica, Lamin-Art, Nevamar, or approved equal.
- B. Exposed Exterior Surfaces (except countertops): NEMA GP28, 0.028 inch thick, standard vertical grade.
- C. Interior Surfaces/Backing Sheets: NEMA CL20, 0.020 inch thick, standard cabinet liner grade if applicable.
- D. Colors:
 - 1. Horizontal Surface Plastic Laminate color to be selected from manufacturer's full range.
 - 2. Vertical Surface Plastic Laminate color to be selected from manufacturer's full range.
- E. Contrasting text where indicated on drawings.

2.06 DRAWERS

- A. Backs, Sides, Fronts: 1/2-inch thick, medium density fiberboard with melamine overlay.
- B. Dovetail/dado fronts and backs, secure with glue.
- C. Bottoms: 3/8-inch thick.
- D. Rabbet bottoms into sides, front and back; staple and glue.
- E. Drawer fronts screwed on from drawer inside.
- F. Reinforcement: 1/2 inch thick under-bottom stiffeners, one at 24 inch drawers, two at 36 inch drawers, four at 48 inch drawers.

2.07 SHELVES

- A. Shelves under 27 inches long: 3/4-inch thick 45-47 pound density particle board.

- B. Shelves over 27 inches long: 1 inch thick 45-47 pound density particle board. Provide additional bracket supports at long space shelving.
- C. Finish: Finished to match faces.
- D. Edging: Material to match the shelf.

2.08 BASES

- A. Two, continuous, 4 inch high by 1-1/2 inch thick lumber, or 4 inch high by 3/4 inch exterior grade plywood, 2 foot on center. See drawings for base dimension.
- B. Provide two positioning strips to cabinet bottom for concealed fastening.

2.09 HARDWARE

- A. Pulls:
 - 1. Doug Mockett & Company DP211B – Straight Edge Drawer Pull Medium
- B. Self-Closing Hinges: Blum Model 71.6530 with 175L8100 base plate.
- C. Drawer Slides: Accuride or approved equal.
- D. Locks:
 - 1. Cabinet Locks: Keyed to match, five pin. All casework to be lockable. Key casework alike per area.
- E. Steel Brackets
 - 1. For work surfaces: Hafele, Hebggo bracket, approved equal by A&M Hardware or approved equal.
 - 2. Provide painted steel concealed brackets at solid surface shelf A&M Hardware, Inc. 12” float shelf and hidden shelf brackets or approved equal.
 - a. Color: To be selected by Architect from full line of powder coat finishes.
- F. Hardware finish: 626 (US26D) Brushed Chrome or Brushed Satin Aluminum.

2.010 WORKMANSHIP

- A. Cabinet parts shall be accurately machined utilizing hardwood dowels for premium quality grade joinery construction. Glue and mechanically fasten all joints for maximum rigidity.
- B. All cases shall be square, plumb, true and self-supporting.
- C. Provide removable back panels and closure panels for plumbing access where shown on Project Drawings.

PART 3 - EXECUTION

3.01 DELIVERY

- A. Store and install in a ventilated building not exposed to extreme temperature and/or humidity.

3.02 INSTALLATION

- A. Installation shall be by the manufacturer's authorized representatives using factory trained personnel experienced in the installation of this type of equipment.

- B. Uncrate, set up, place, level, scribe and anchor all cabinets according to manufacturer's recommendations.
- C. Remove and replace tops, backs, panels, shelves and other items necessary to allow other Sections to complete their work of connecting services.
- D. Do all cutting, boring, patching required for the installation of work of other Sections.
- E. Provide all necessary fillers, panels, end panels, scribes required to make complete installation as detailed.
- F. Where casework meets wall surfaces, set with uniform space not to exceed 1/8-inch. Seal all joints with silicone sealant to a slightly concave joint, using backer rod where required. Apply sealant in accord with Section 07 92 00.
- G. Cabinets with surfaces having machine or tool marks will be rejected.
- H. All finishes must be smooth, uniform in color and match approved sample.
- I. Prior to final inspection, examine installation of the work of this Section. Repair or replace all defects found. Leave installation clean, undamaged and ready for use.

3.02 FINISH SCHEDULE

PLam Vertical Surfaes Formica Terril 2297-58 Matte Finish to be confirmed by Architect.

END OF SECTION 06 41 16

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SECTION 06 61 18

SOLID SURFACE

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. Solid surface countertop, sills, top cap at partial height walls.

1.03 RELATED WORK

- A. Gypsum Wall Board Section 09 29 00.

1.04 SUBMITTALS

- A. Submit in accord with the General Conditions of the Contract.
 - 1. Product Data: Manufacturer's catalog information edited to indicate products to be provided for this Project.
 - a. Joint adhesives or mastics, color matched.
 - b. Joint sealants.
 - c. Fastening adhesive
 - 2. Samples:
 - a. Product Data.
 - b. Solid surface sheet material.
 - c. Include color chart showing full range of available colors for sheet

1.05 QUALITY ASSURANCE

- A. Fabricator/Installer Qualifications: Minimum three years experience in fabrication and installation of solid surface materials or certification by Distributor.
 - 1. Qualifications: Proof of fabricator qualifications.
 - 2. Certificates: Copies of ISO certifications.
 - 3. Test Reports:
 - a. Flammability test reports.
 - b. Food preparation zone use test reports.
 - 4. Manufacturer's Fabrication and Installation Manual.
 - 5. Manufacturer's Fabrication and Installation Check List.

- B. Shop Drawings: Provide plans, sections, and large-scale details. Include attachment provisions and fabrication methods.

1.06 WARRANTY

- A. Provide manufacturer's standard 10 year warranty against defects in workmanship.

1.07 MAINTENANCE

- A. Extra Materials: Provide for future repair use by Owner.

1 1. Minimum 4 sf per 50 lf of each countertop color.

2
3 1.08 SPECIAL INSTRUCTIONS

4
5 A. Do not deliver components to project site until spaces are ready for installation.

6
7 1.09 ENVIRONMENTAL CONDITIONS

8
9 A. Installation spaces must be maintained at normal occupancy temperature and humidity levels for
10 minimum 72 hours prior to and continuously following installation.

11
12 1.010 ENVIRONMENTAL REQUIREMENTS

13
14 A. Recycled content: Provide products manufactured from recycled content as specified, to be measured
15 and documented according to the LEED Green Building Rating System.

16 1. Solid surface: Minimum 50% post-consumer recycled content.

17
18 B. Low-Emitting Materials, Field applied Paints and Coatings: Interior paints and coatings applied on-
19 site must meet the limitations and restrictions concerning chemical components set by the following
20 standards:

21 1. "All Other Architectural Coatings, Primers and Undercoats: South Coast Air Quality
22 Management District (SCAQMD) Rule #1113, Architectural Coatings", rules in effect on
23 January 1, 2004.

24
25 C. Low-Emitting Materials, Adhesives, and Sealants: Materials used on the interior of the building
26 (defined as inside the weatherproofing system and applied on site) must not exceed the following
27 requirements.

28 1. Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management (SCAQMD)
29 Rule # 1168, requirements in effect on July 1, 2005, and rule amendment date January 7,
30 2005.

31 2. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36, requirements in
32 effect on October 19, 2000.

33
34 PART 2 - PRODUCTS

35
36 2.01 MATERIALS

37
38 A. Solid Surface

39 1. Solid Surface

40 a. Formica Solid Surfacing

41 b. Or approved equal by: Dupont, Corian; Wilsonart, Solid Surfacing.

42
43 B. No cracked, chipped, broken, stained, or defective material will be accepted.

44 1. Materials fabricated to thickness and size shown on drawings.

45 a. All sizes to be field verified.

46
47 C. Color Match Differences: Minimal.

48
49 D. Adhesives: Use manufacturer's recommended adhesives, and installation instructions. See product
50 fabrication manuals for application techniques and surface preparation.

51
52 2.02 FABRICATION

53
54 A. Field verify measurements.

1 B. Finished Surfaces: Uniform as chosen by A/E from full range with all edge profiles as shown on
2 drawings. Square edge.

3
4 C. Color and finish: Solid Surface to be selected from manufacturer's full line including but not limited
5 to Formica Lava Rock or Corian Rain Cloud.

6
7 PART 3 - EXECUTION

8
9 3.01 EXAMINATION

10
11 A. Examine cabinets upon which countertops will be installed. Coordinate with cabinet specification
12 section to assure that cabinets are set to the following tolerance or better.

- 13 1. Verify that cabinets are level to 1/8 in. in 10 ft .
14 2. Review manufacturer's Fabrication and Installation Check List.

15
16 B. Examine walls upon which sill will be installed.
17 1. Verify wall is flat and acceptable for base application.
18 2. Review manufacturer's Fabrication and Installation Check List.

19
20 C. Coordinate with responsible entity to correct unsatisfactory conditions.

21
22 D. Commencement of work by installer is acceptance of conditions.

23
24 3.02 INSTALLATION

25
26 A. Install fabricated items according to material manufacturers printed instructions.

27
28 B. Set all items square and true with edges of face joints smooth, even, neat and tight against other
29 materials.

30
31 3.03 PROTECTION, REPAIRING AND CLEANING

32
33 A. Replace damaged and defective work.

34
35 B. Clean according to manufacturer's directions. Use no acids or harsh abrasives.

36
37
38

END OF SECTION 06 61 18

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SECTION 07 92 00

JOINT SEALANTS

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. Miscellaneous Joints.

1.03 RELATED WORK

- A. Hollow Metal Doors and Frames Section 08 11 13.

1.04 SUBMITTALS

- A. Submit in accord with the General Conditions of the Contract.
 - 1. Samples: Color range of material for selection.
 - 2. Manufacturer's Recommendations including performance requirements, recommendations and application instructions for approval of materials used.

1.05 PROJECT CONDITIONS

- A. Examine the joint surfaces and backing, and their anchorage to the structure, and the conditions under which the joint sealer work is to be performed. Do not proceed with the joint sealer work until unsatisfactory conditions have been corrected.
- B. Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength. Wherever joint width is affected by ambient temperature variations, install sealants only when temperatures are in the lower third of manufacturer's recommended installation temperature range.

PART 2 - PRODUCTS

2.01 SEALANT

- A. Sealant for Locations Except as Specified in the Subsequent Paragraphs: PECORA Dynatrol I-XL, Degussa Sonneborn Sonolastic NP-1, TREMCO Dymonic, or other acceptable, one part polyurethane.
 - 1. Comparable means both quality and color options.
 - 2. VOC content limit: 100 g/L, less water and less exempt compounds.
- B. Horizontal Joint Sealant: PECORA NR-200 Urexpam, Sonolastic SL2, TREMCO THC-900, or other acceptable 2-part self-leveling polyurethane.
 - 1. Comparable means both quality and color options.

2.02 SEALANT ACCESSORIES

- A. Primer: When required, as recommended by the Sealant Manufacturer.
- B. Closed Cell Back-up (Backer Rod): Tremco "Closed Cell Backer Rod", Sonneborne "Sonofoam" or W.R. Meadows "Kool-Rod".

PART 3 - EXECUTION

3.01 JOINT PREPARATION

- A. Clean joint surfaces immediately before installation of sealant. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond of sealant. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous or glazed joint surfaces as recommended by sealant manufacturer.
- B. Prime or seal the joint surfaces wherever shown or recommended by the sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

3.02 SEALANT APPLICATION, GENERAL

- A. Set joint filler units at proper depth or position in the joint to coordinate with other work, including the installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between the ends of joint filler units.
- B. Install bond breaker tape wherever shown and wherever required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- C. Apply compound with a gun having proper size nozzle or with a knife, as required. Use sufficient pressure to fill all voids and joints solid. Remove excess sealant and leave surfaces smooth, neat and clean. Upon completion sealant shall have a smooth, even finish and all joints shall be weathertight. All work shall be in accordance with manufacturer's printed instructions.
- D. Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

3.03 PROTECTION

- A. Cure sealants in compliance with manufacturer's instructions and recommendations. Advise the Contractor of procedures required for the cure and protection of joint sealers during the construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at the time of Substantial Completion.

END OF SECTION 07 92 00

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

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. Steel Frames.

1.03 RELATED WORK

- A. Joint Sealers: Section 07 92 00.
- B. Door Hardware: Section 08 71 00.
- C. Painting: Section 09 90 00.

1.04 REFERENCES

- A. Comply with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.
- B. Fire-Rated Doors: Comply with NFPA 80 "Standard for Fire Doors and Windows." and have been tested, listed, and labeled in accordance with ASTM E 152 "Standard Methods of Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.
- C. ANSI A250.3 Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames.
- D. ANSI A250.4 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.
- E. ANSI A250.5 Accelerated Physical Endurance Test Procedure for Steel Doors, Frames, and Frame Anchors.
- F. ANSI A250.8 Nomenclature for Standard Steel Doors and Steel Door Frames.
- G. ANSI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- H. ANSI/DHI A115 Specifications for Hardware Preparations in Standard Steel Doors and Frames.
- I. ANSI/DHI A115.1G Installation Guide for Doors and Hardware.
- J. SDI-105-92 Recommended Erection Instructions for Steel Frames.
- K. SDI-106 Recommended Standard Door Type Nomenclature.

- L. SDI-111 Recommended Standard Details Steel Doors and Frames.
- M. SDI-117-93 Manufacturing Tolerances Standard Steel Doors and Frames.
- N. SDI-122-90 Installation and Troubleshooting Guide for Standard Doors and Frames.
- O. ASTM E119 Methods for Fire Tests of Building Construction and Materials.
- P. ASTM A240/A240M Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel.
- Q. ASTM A366 Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
- R. ASTM A568 Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements.
- S. ASTM A569 Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality.
- T. ASTM A620 Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Drawing Quality, Special Killed.
- U. NFPA-101-94: Life Safety Code.
- V. NFPA 251: Fire Tests of Building Construction and Materials.
- W. NFPA 252: Fire Tests of Door Assemblies.
- X. UL 9: Fire Tests of Door Assemblies.
- Y. UL 10B: Fire Tests of Door Assemblies.
- Z. UL 263: Fire Tests of Building Construction and Materials.

1.05 SUBMITTALS

- A. Submit in accordance with the General Requirements of the Contract.
 1. Manufacturer's technical product data substantiating that products comply with requirements.
 2. Shop Drawings for fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
 - a. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.
 - b. Indicate coordination of glazing frames and stops with glass and glazing requirements.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of Steel Door Institute Standard SDI-100, "Recommended Specifications for Standard Steel Door and Frames", U.S. Department of Commerce Standard PS4-66, relative to manufacture of 1-314 inch thick flush steel doors, and applicable requirements of ANSI A115.

- B. Factory machine frames for hardware requiring routing and mortising.
- C. Fire-Rated Door Assemblies: Label, testing and installation of opening protectives shall be in accordance with Wisconsin Building Code Section 715.
 - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- D. Smoke-Control Door Assemblies: Comply with NFPA 105 or UL 1784.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work in cartons or crates to provide protection during transit and job storage.
- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to AE; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4 inch high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create a humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4 inch spaces between stacked doors to promote air circulation.

1.08 PROJECT CONDITIONS

- A. Examine the openings and conditions under which hollow metal work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Amweld Building Products
- B. Benchmark Commercial Doors
- C. Ceco Door Products
- D. Curries Company
- E. Deansteel Manufacturing Co.
- F. Fenestra, Inc.
- G. Kewaunee Corporation
- H. Krieger Steel Products
- I. Mesker Door , Inc.
- J. Pioneer Industries, Inc.

- K. Precision Metals, Inc.
- L. Republic Builder Products
- M. Security Metal Products Corp.
- N. Steelcraft
- O. Trussbuilt, Inc.
- P. Williamsburg Steel Products Co
- Q. Or approved equal.

2.02 MATERIALS

- A. Steel: Commercial quality, level, cold-rolled steel conforming to ASTM A366, free of scale and surface defects. Commercial quality hot rolled and pickled steel conforming to ASTM A569 may be used as option for interior frames. Gauges are as follows:
 - 1. Interior Frames: 16-gage.
 - 2. Rough Bucks and Stiffeners: 12-gage.
 - 3. Miscellaneous Trim: 16 gage.

2.03 FABRICATION, GENERAL

- A. Make hardware mortises and reinforcements according to templates. Provide hinge, lock, door holder and closer hardware reinforcements. Mortise, drill tap for hardware; fabricate grooves, rabbets as necessary for weatherstripping.
- B. Provide proper Underwriters' Laboratory (UL) labels. Labeled doors shall have equal labeled frames.
- C. Clearances
 - 1. Edge clearances shall be provided as follows:
 - a. Between doors and frame, at head and jambs - 1/8 inch.
 - b. At door sills:
 - 1) Where no threshold is used - 3/8 minimum.
 - 2) Where threshold is used - 1/4 inch maximum between door & threshold.

2.04 HOLLOW METAL FRAME FABRICATION

- A. Provide metal frames of the types and styles indicated on the drawings or schedules and complying with SDI 100 for materials and construction requirements.
- B. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, as shown on drawings.
- C. All frames shall have mitered corners, be internally welded and ground smooth and provided with floor anchors.
- D. Provide one removable and one fixed stop at perimeter of openings for glazed frames. Removable stop on secure side.

- E. Provide closed metal covers over all hardware cutouts to protect against mortar.
- F. Provide integral channel frames, sub-frames and stiffeners to structure where indicated or required for fastening and stiffening frames.
- G. Provide steel spreader temporarily attached to feet of both jambs for welded frames.
- H. Provide three factory installed silencers on single door frames at strike jamb.
- I. Completely clean all frames by degreasing process, followed by one coat rust inhibitive primer equal to withstand a salt spray test (5% solution) of 70 hours. Thoroughly prime all surfaces without runs, smears, or bare spots, and under and inside all removable stops.
- J. Where required frames to be prepped for electric strike.
- K. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install steel frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Comply with provisions of SDI-105 "Recommended Erection Instructions for Steel Frames", unless otherwise indicated.
 - 1. Except for frames located at in-place concrete or masonry and at drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
 - 2. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with self-tapping screws.
 - 3. Fill heads of fasteners with body putty, grind smooth and touch-up prime.
- C. Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable glazing stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

- g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.

3.02 ADJUSTING

- A. Immediately after erection sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Check and readjust operating finish hardware items, leaving steel frames undamaged and in complete and proper operating condition.

END OF SECTION 08 11 13

SECTION 08 14 16
FLUSH WOOD DOORS

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. Wood Doors

1.03 RELATED WORK

- A. Hollow Metal Doors and Frames: Section 08 11 13.
- B. Door Hardware: Section 08 71 00.
- C. Glass and Glazing: Section 08 80 00.
- D. Painting: Section 09 90 00, for re-finishing of planed and cut surfaces.

1.04 REFERENCES

- A. Reference Standards: Section 1300 of the Architectural Woodwork Institute (AWI). Door types specified in Part 2 below are AWI reference designations.
- B. Doors: Obtained from a single manufacturer.

1.05 SUBMITTALS

- A. Submit in accordance with the General Conditions of the Contract
 1. Manufacturer's product data, specifications and installation instructions for each type of wood door.
 - a. Including information on recycled content.
 2. Color charts of wood finishes for initial selection.
 3. (2) 10" x 10" wood samples with finish for final selection.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with the "on-site care" recommendations of National Wood Window and Door Association (WDMA) pamphlet "Care and Finishing Wood Doors" and with manufacturer's instructions.
 1. Provide protective coverings for doors at the factory prior to shipping. Use heavy paper cartons or poly bags and mark with identification required for proper installation.
- B. Deliver and store within enclosed building only after humidity contributing work is completed and relative humidity is less than 50%. Stack doors laid flat, level and off floor, in dry, clean, well ventilated space.
- C. Do not drag doors across one another.

1.07 WARRANTY

- A. Submit in duplicate manufacturer's written warranty per NWWDA Standard Door warranty but extending for life of installation for interior solid core doors, including refinishing and re-hanging costs for replacement doors.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Algoma Hardwoods, Inc.; Algoma, Wisconsin; (920) 487-5221.
- B. Eggers Industries; Two Rivers, Wisconsin: (920) 793-1351.
- C. Graham Division, Assa Abloy Door Group LLC; Mason City, Iowa: (641) 423-2444.
- D. Mohawk Flush Doors, Inc.; South Bend, Indiana: (574) 288-4464.
- E. Marshfield Door Systems; Marshfield, Wisconsin: (800) 869-3667.
- F. Oshkosh Architectural Door Company; Oshkosh, Wisconsin: (920) 233-6161.
- G. VT Industries; Holstein, Iowa; (800) 827-1615.

2.02 MANUFACTURED UNITS

- A. Non-labeled Interior Wood Veneer Solid Core Doors: AWI type PC-5/7, Custom Grade.
 - 1. Core: Particleboard or agri-fiber with minimum 40% post-industrial, recycled content as certified by an independent, third party certification agency.
 - 2. Veneer: Book matched, Red Oak, Rift Cut.
 - 3. Species of stiles to match face veneer.
 - 4. Transparent Finish: Factory finish to AWI section 1500, Custom standards.
 - a. Water-based stain with ultra-violet (UV) cured topcoats.
 - b. Sheen: Satin.
 - 5. Color: Finish to match stain finish of existing wood doors, as approved by A/E.
- B. Labeled Interior Wood Veneer Solid Core Doors: AWI FD.
 - 1. Edge Banding: Laminated.
 - 2. Veneer: Same as non-labeled doors.
 - 3. Species of stiles to match face veneer.
 - 4. Transparent Finish: Factory finish to AWI section 1500, Custom standards.
 - a. Water-based stain with ultra-violet (UV) cured topcoats.
 - b. Sheen: Satin.
 - 5. Color: Finish to match stain finish of existing wood doors, Algoma custom stain RA-17257 or LaForce Masonite Custom Color 256052C, as approved by A/E.
 - 6. Provide mineral core blocking at closers.
- C. Hardware location per manufacturer's recommendations to meet ADA requirements.
- D. Glazed Openings
 - 1. Provide factory glazed units.
 - 2. Cut openings.
 - 3. At non-labeled doors, provide detailed stops of same species as wood veneer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that door frames are of type required for door and are installed as required for proper installation of doors.
- B. Do not install doors in frames which would hinder the operation of the doors.

3.02 INSTALLATION

- A. Do not install in improperly installed frames.
- B. Fit for width by planing. For height, saw, first from bottom, then not over 1/2 inch from top. Bevel lock and hinges edge 1/8 inch in 2 inches.
- C. Provide 3/32 inch clearance between door and frame and 3/8 inch clearance between bottom of door and finish flooring.
- D. Seal all job site cut surfaces with stain to match existing and two coats of varnish.

3.03 ADJUST AND CLEAN

- A. Replace or re-hang doors which are hingebound and do not swing or operate properly.
- B. Refinish or replace job finished doors damaged prior to Substantial Completion.

END OF SECTION 08 14 00

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SECTION 08 31 13

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED WORK

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

1.02 SUMMARY

- A. This section includes the following:
 - 1. Access doors and frames.
 - 2. Fire resistive rated access doors and frames. Maintain existing fire resistive rating of existing plumbing chase.
- B. Related sections include the following:
 - 1. Division 23 Section "Duct Accessories" for duct access doors.

1.03 SUBMITTALS

- A. Submit in accord with the General Conditions of the Contract.
 - 1. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items with concealed framing, suspension systems, piping, ductwork, and other construction. Show the following
 - a. Method of attaching door frames to surrounding construction.
 - b. Ceiling-mounted items including access doors and frames, lighting fixtures, diffusers, grilles, and special trim.
 - c. Underwriters Laboratories, Inc. (UL) UL10B-2008, Fire Tests of Door Assemblies.

1.04 QUALITY ASSURANCE

- A. Source Limitations: Obtain doors and frames through one source from a single manufacturer.
- B. Size Variations: Obtain Architect's acceptance of manufacturer's standard-size units, which may vary slightly from sizes indicated.
- C. Wherever a fire-resistance classification is required, provided access assembly with panel, frame, hinge and latch from manufacturer listed in the Intertek Listed Products Directory.
 - 1. Provide Intertek Warnock Hersey Label on each fire-rated access panel.

1.05 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. 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.
 - 2. "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

1
2 2.01 MANUFACTURERS
3

- 4 A. Manufacturers: Subject to compliance with requirements, provide products by one of the
5 following:
6 1. Access Doors:
7 a. Bar-Co, Inc. Div.; Alfab, Inc.
8 b. Cesco Products.
9 c. J. L. Industries, Inc.
10 d. Karp Associates, Inc.
11 e. Milcor Limited Partnership.
12

13 2.02 MATERIALS
14

- 15 A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale,
16 pitting, and surface defects; pickled and oiled; with minimum thickness indicated representing
17 specified nominal thickness according to ASTM A 568/A 568M.
18
19 B. Cold-Rolled Steel Sheets: ASTM A 366/A 366M, Commercial Steel (CS), or
20 ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness; with
21 minimum thickness indicated representing specified nominal thickness according to
22 ASTM A 568/A 568M. Electrolytic zinc-coated steel sheet, complying with
23 ASTM A 591/A 591M, Class C coating, may be substituted at fabricator's option.
24
25 C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B, with A60
26 zinc-iron-alloy (galvannealed); stretcher-leveled standard of flatness; with minimum thickness
27 indicated representing specified thickness according to ASTM A 924/A 924M.
28
29 D. Drywall Beads: Edge trim formed from 0.0299-inch zinc-coated steel sheet formed to receive
30 joint compound and in size to suit thickness of gypsum board.
31

32 2.03 PAINT
33

- 34 A. Shop Primers: Provide primers that comply with Division 9 Section "Painting."
35
36 B. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd
37 primer complying with performance requirements in FS TT-P-664; selected for good resistance
38 to normal atmospheric corrosion, compatibility with finish paint systems indicated, and
39 capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
40
41 C. Shop Primer for Metallic-Coated Steel: Organic zinc-rich primer complying with SSPC-
42 Paint 20 and compatible with topcoat.
43
44 D. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in steel,
45 complying with SSPC-Paint 20.
46

47 2.04 ACCESS DOORS AND FRAMES
48

- 49 A. Flush Access Doors and Trimless Frames: Fabricated from metallic-coated steel sheet.
50 1. Locations: Various locations and surfaces, assembly to be manufactured for specific
51 applications.
52 2. Sizes: 18" x 18", as shown in drawings or to match existing openings.
53 3. Door: Sheet metal, gauged to door size, minimum 20 gauge metal set flush with
54 surrounding finish surfaces.
55 4. Frame: To be manufactured specifically for the surrounding material for flush/integral
56 installation, minimum 16 gauge metal flange.

- 1 a. Drywall bead for gypsum board.
2 b. Other as needed.
3
4 5. Hinges:
5 a. Spring-loaded concealed pin type.
6
7 6. Latch:
8 a. Screwdriver-operated cam latch.
9 b. Key operated security lock.
10 c. Or self latching at rated conditions.
11

12 2.05 FABRICATION

- 13
14 A. General: Provide access door assemblies manufactured as integral units ready for installation.
15
16 B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials
17 with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam
18 marks, roller marks, rolled trade names, or roughness.
19
20 C. Steel Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces.
21 Furnish attachment devices and fasteners of type required to secure access panels to types of
22 supports indicated.
23
24 D. For trimless frames with drywall bead for installation in gypsum board assembly, provide edge
25 trim for gypsum board securely attached to perimeter of frames.
26
27 E. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when
28 closed.
29
30 F. All access doors to be fabricated and properly installed in such a manner as to maintain the fire
31 rating of the assembly into which it is placed.
32
33 G. Fire-Rated Access Panels and Frames: Units complying with NFPA 80 that are identical to
34 access panel and frame assemblies tested for fire-test-response characteristics according to the
35 following test method, and that are listed and labeled by UL or another testing and inspecting
36 agency acceptable to authorities having jurisdiction.
37

38 2.06 FINISHES, GENERAL

- 39
40 A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for
41 recommendations for applying and designating finishes.
42
43 B. Finish metal fabrications after assembly.
44

45 2.07 METALLIC-COATED STEEL FINISHES

- 46
47 A. Galvanizing of Steel Shapes and Plates: Hot-dip galvanize items indicated to comply with
48 applicable standard listed below:
49 1. ASTM A 123/A 123M, for galvanizing steel and iron products.
50 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
51
52 B. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and
53 other contaminants. For galvanized surfaces, apply, after cleaning, a conversion coating suited
54 to the organic coating to be applied over it. For metallic-coated surfaces, clean welds,
55 mechanical connections, and abraded areas, and apply galvanizing repair paint specified below
56 to comply with ASTM A 780.

SECTION 08 41 26

ALL-GLASS ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. All-glass storefronts.
- B. Related Sections:
 - 1. Division 8 Section "Glazing" for general glass requirements.
 - 2. Division 9 Section "Gypsum Board" for overhead bracing and support of system.

1.03 DEFINITIONS

- A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

1.04 PERFORMANCE REQUIREMENTS

- A. General Performance: All-glass systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Structural Performance: All-glass systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.
 - 1. Deflection Limits: Deflection normal to glazing plane is limited to 1/175 of clear span or 3/4 inch, whichever is smaller.
- C. Delegated Design: Design all-glass systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1.05 SUBMITTALS

- A. Submit in accordance with the General Conditions of the Contract.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for all-glass system.
- C. Shop Drawings: Show fabrication and installation details, including the following:
 - 1. Plans, elevations, and sections.
 - 2. Details of fittings and glazing, including isometric drawings of rail fittings.
 - 3. Anchoring.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

- 1 1. Metal Finishes: 6-inch- long sections of rail fittings.
2
3 E. Qualification Data: For qualified Installer.
4
5 F. Maintenance Data: For all-glass systems to include in maintenance manuals.
6
7 G. Warranty: Sample of special warranty.
8
9 1.06 QUALITY ASSURANCE
10
11 A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved
12 for installation of units required for this Project.
13
14 B. Engineering Responsibility: Prepare data for all-glass systems, including Shop Drawings, based
15 on testing and engineering analysis of manufacturer's standard units in systems similar to those
16 indicated for this Project.
17
18 C. Source Limitations: Obtain all-glass systems from single source from single manufacturer.
19
20 1.07 PROJECT CONDITIONS
21
22 A. Field Measurements: Verify actual locations of walls and other construction contiguous with
23 all-glass systems by field measurements before fabrication and indicate measurements on Shop
24 Drawings.
25
26 1.08 WARRANTY
27
28 A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or
29 replace components of all-glass systems that do not comply with requirements or that fail in
30 materials or workmanship within specified warranty period.
31 1. Failures include, but are not limited to, the following:
32 a. Structural failures including excessive deflection.
33 b. Deterioration of metals, metal finishes, and other materials beyond normal
34 weathering.
35 c. Failure of operating components.
36 2. Warranty Period: Two years from date of Substantial Completion.
37
38 PART 2 - PRODUCTS
39
40 2.01 MANUFACTURERS
41
42 A. Basis-of-Design Product: Subject to compliance with requirements, provide Avanti Systems
43 USA full height single glazed partition system or comparable product by one of the following:
44 1. Infinium butt-glazed Quantum.
45 2. ACI Distribution; a division of Vitro America, Inc.
46 3. Alpha Door & Rail, Inc.
47 4. Arch Aluminum & Glass Co., Inc.
48 5. Oldcastle Glass, Inc.
49 6. Virginia Glass Products Corporation; a subsidiary of Virginia Mirror Company.
50 7. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company.
51 8. Or submit approved equal components and design for a complete installation with
52 Blumcraft or C.R. Lawrence all glass entrance system narrow header and accessories.
53
54 2.02 MATERIALS: ALL GLASS ENTRANCES AND STOREFRONTS
55

- 1 A. Glass: Refer to 08 80 00. Thickness of laminated glass to be verified by manufacturer and
- 2 installer for configurations indicated in drawings.
- 3 B. Butt Glaze, dry vertical joints. Submit translucent H sections if required for stability.
- 4 C. Head and Sill Channels: Extruded 1" profile, 2 piece glazing channels with brush seals. Finish
- 5 to be selected from Anodized Aluminum Satin Finish or powder coated steel RAL color selected
- 6 by Architect from manufacturer's full line. No sill channel at pass thru transaction counters.
- 7 D. Provide end covers, channel end caps and hardware and accessories for complete installation.

8
9 2.03 METAL COMPONENTS

- 10 A. Fitting Configuration:
- 11 1. Fixed panels with openings as indicated on drawings. Manufacturer to provide
- 12 acceptable panel opening proportion.
- 13
- 14 B. Rail Fittings:
- 15 1. Material: Aluminum extrusions.
- 16 a. ASTM B 221, 6063-T6 alloy and temper.
- 17
- 18 2. Height:
- 19 a. Top Rail: 1 inch height.
- 20 b. Bottom Rail: 1 inch height.
- 21
- 22 3. Profile: Square.
- 23 4. End Caps: Manufacturer's standard precision-fit end caps for rail fittings.
- 24 5. Accessory Fittings: Match rail-fitting metal and finish.
- 25 C. Anchors and Fastenings: Concealed.

26
27 2.04 FABRICATION

- 28
- 29 A. Provide holes and cutouts in glass to receive hardware, fittings, and accessory fittings before
- 30 tempering glass. Do not cut, drill, or make other alterations to glass after tempering.
- 31 1. Fully temper glass using horizontal (roller-hearth) process, and fabricate so that when
- 32 glass is installed, roll-wave distortion is parallel with bottom edge of door or lite.
- 33
- 34 B. Factory assemble components and factory install hardware and fittings to greatest extent
- 35 possible.

36
37 2.05 ACCESSORIES

- 38
- 39 A. Glazing Gaskets: ASTM C 864, neoprene or EPDM, or ASTM C 1115, silicone or thermoplastic
- 40 polyolefin rubber, molded or extruded shape to fit glazing channel retaining slot.

41
42 PART 3 - EXECUTION

43
44 3.01 EXAMINATION

- 45
- 46 A. Examine areas and conditions, with Installer present, for compliance with requirements for
- 47 installation tolerances and other conditions affecting performance of the Work.
- 48
- 49 B. Proceed with installation only after unsatisfactory conditions have been corrected.

50
51 3.02 INSTALLATION

- 52
- 53 A. Install all-glass systems and associated components according to manufacturer's written
- 54 instructions.

55

- 1 B. Set units level, plumb, and true to line, with uniform joints.
- 2
- 3 C. Maintain uniform clearances between adjacent components.
- 4
- 5 D. Install joint sealants as specified in Division 7 Section "Joint Sealants".
- 6
- 7 3.03 ADJUSTING AND CLEANING
- 8
- 9 A. Adjust all-glass entrance doors and hardware to produce tight fit at contact points and weather
- 10 stripping.
- 11
- 12 B. Remove excess sealant and glazing compounds and dirt from surfaces.
- 13
- 14 C. Protect installed products until completion of the project.
- 15
- 16 D. Clean all framing and glass surfaces after installation.
- 17
- 18
- 19
- 20

END OF SECTION 08 41 26

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

1.03 RELATED SECTIONS

- A. Hollow Metal Doors and Frames: Section 08 11 13.
- B. Flush Wood Doors: Section 08 14 16.

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. Reinstalled salvaged hardware is included in the scope of the work.
 - 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 approval 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 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. Install closers on the room side of corridor doors, stair side of stairways, and interior side of exterior doors.
- F. Deliver one complete set of installation and adjustment instructions, and tools with the hardware.
- G. Coordinate security system electrical requirements at doors indicated to have such system.
- H. Coordinate all Owner Furnished Contractor Installed hardware.

3.02 ADJUSTING

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

3.03 CLEANING

- A. Clean all hardware to restore the original finish.

3.04 PROTECTION

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

3.05 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
 - Model 4010/4110 LCN
 - a. Approved Equals: No Substitutions
 - 4. Exit Devices
 - 99 Series VON
 - a. Approved Equals: No Substitutions
 - 5. Kickplate
 - Rockwood Mfg. Co. ROC
 - 6. Biometric Hand Readers
 - Schlage Recognition Systems SCH
 - 7. Electric Strikes
 - Von Duprin VON
 - a. Approved Equals: HES
Folger Adams
 - 8. Door Position Switch
 - SENTROL LCK
 - 8. Clothes Hook
 - Bobrick BBK

B. Hardware Sets:

SET 1A

EA	HINGES	BB1279 NRP	652 HAG
1 EA	STOREROOM LOCK	93K D x 14D	626 BES
1 EA	WALL STOP	WS407	630 IVE
1 EA	KICKPLATE	10" x 2" LDW	630 IVE
1 EA	ELECTRIC STRIKE	6211	630 VON
1 EA	REMOTE RELEASE	660-PB	WHITE SCH

SET 1B

EA	HINGES	BB1279	652 HAG
1 EA	STOREROOM LOCK	93K D x 14D	626 BES
1 EA	CLOSER	4010 ST1544	689 LCN
1 EA	OVERHEAD STOP	100S	630 GLY
1 EA	KICKPLATE	10" x 2" LDW	630 IVE
1 EA	ELECTRIC STRIKE	6211	630 VON

CARD READER BY DIV 28

SET 1C

EA	HINGES	BB1279	652 HAG
1 EA	STOREROOM LOCK	93K D x 14D	626 BES
1 EA	CLOSER	4010/4110	689 LCN
1 EA	WALL STOP	WS407	630 IVE
1 EA	KICKPLATE	10" x 2" LDW	630 IVE
1 EA	ELECTRIC STRIKE	6211	630 VON

CARD READER BY DIV 28

SET 2A

EA	HINGES	BB1279 NRP	652 HAG
1 EA	PRIVACY LATCH	93K L x 14D	626 BES
1 EA	WALL STOP	WS407	630 IVE
1 EA	KICKPLATE	10" x 2" LDW	630 IVE

SET 3A

EA	HINGES	BB1279 NRP	652 HAG
1 EA	OFFICE LOCK	93K AB x 14D	626 BES
1 EA	WALL STOP	WS407	630 IVE
1 EA	KICKPLATE	10" x 2" LDW	630 IVE

END OF SECTION 08 71 00

SECTION 08 80 00

GLAZING

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. Glass in Wood Doors and HM frames
- B. Glass in All Glass Storefront

1.03 RELATED WORK

- A. Hollow Metal Doors and Frames: Section 08 11 13.
- B. Flush Wood Doors: Section 08 14 16.

1.04 REFERENCES

- A. Reference Specification: "Glazing Manual", by Flat Glass Marketing Association.
- B. Materials: Conform in all respects to the "Safety Standard for Architectural Glazing Materials", 16CFR 1201, issued by the Consumer Product Safety Commission.
- C. AMA WSG.1 Window Selection Guide.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- D. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

- 1 E. All materials used for this project shall be from the same batch run and manufacturer.
2
3 F. Sound Transmission Resistance; Sound Transmission Class (STC) for typical application to be
4 minimum of 32; AS tested by ASTM E4134.
5
6 G. Fenestration must comply with a minimum testing performance requirements for an
7 AAMA/NWWDA 101/1.S.2 HC-40 rating. The recognized standard for performance ratings of
8 windows is AAMA/NWWDA 101/1.S.2.
9
10 H. All performance testing must be conducted by an independent, impartial, third party, AAMA
11 certified testing laboratory.
12

13 1.06 PERFORMANCE REQUIREMENTS
14

- 15 A. General: Installed glazing systems shall withstand normal thermal movement and wind and
16 impact loads (where applicable) without failure, including loss or glass breakage attributable to
17 the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to
18 remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
19

20 1.07 SUBMITTALS
21

- 22 A. Submit in accordance with the General Conditions of the Contract
23 1. Manufacturer's product data.
24 a. Provide data for visible light transmittance, reflectance, U-value, shading
25 coefficient, solar heat gain coefficient and light to solar gain.
26 2. Two samples of each type glass specified.
27

28 1.08 DELIVERY, STORAGE AND HANDLING
29

- 30 A. Package, handle, deliver and store to avoid damage. Scratched glass will be rejected.
31

32 1.09 PROJECT CONDITIONS
33

- 34 A. Do not proceed with installation of liquid sealants under adverse weather conditions, or when
35 temperatures are below or above manufacturer's recommended limitations for installation.
36

37 1.010 ENVIRONMENTAL REQUIREMENTS
38

- 39 A. Low-Emitting Materials, Adhesives, and Sealants: Materials used on the interior of the building
40 (defined as inside the weatherproofing system and applied on site) must not exceed the following
41 requirements.
42 1. Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management
43 (SCAQMD) Rule # 1168, requirements in effect on July 1, 2005, and rule amendment
44 date January 7, 2005.
45 2. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36, requirements
46 in effect on October 19, 2000.
47

48 PART 2 - PRODUCTS
49

50 2.01 GLASS PRODUCTS, GENERAL
51

- 52 A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in
53 thicknesses as needed to comply with requirements indicated.
54

- 1 B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float
2 glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements"
3 Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or
4 Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article.
5 Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.
6
7 1. Provide safety glazing labeling.
8
9 C. Thermal and Optical Performance Properties: Provide glass with performance properties
10 specified, as indicated in manufacturer's published test data, based on procedures indicated
11 below:
12
13 1. For monolithic-glass lites, properties are based on units with lites of thickness indicated.
14 2. For laminated-glass lites, properties are based on products of construction indicated.
15 3. For insulating-glass units, properties are based on units of thickness indicated for overall
16 unit and for each lite.
17 4. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's
18 WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
19 5. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values,
20 according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
21 6. Visible Reflectance: Center-of-glazing values, according to NFRC 300.
22
23 2.02 GLASS PRODUCTS
24
25 A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class 1 (clear) unless otherwise indicated.
26
27 B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise
28 indicated; of kind and condition indicated.
29 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion
30 parallel to bottom edge of glass as installed unless otherwise indicated and free of tong
31 marks.
32 2. For uncoated glass, comply with requirements for Condition A.
33 3. For coated vision glass, comply with requirements for Condition C (other coated glass).
34 4. Comply with requirements for safety glass in the International Building Code.
35
36 C. Uncoated Tinted Float Glass: Class 2, complying with other requirements specified.
37
38 2.03 GLASS TYPE SCHEDULE
39
40 A. Glass Products indicated below are based on proprietary products of Viracon, PPG, SAFTI FIRST
41 Serious Materials and Bendheim. Products from any of the above listed manufacturers that meet the
42 design criteria of the glass specified below are acceptable.
43
44 1. GLT 4: Tempered, clear float glass.
45 a. Thickness: 1/4".
46
47 2. GLT 4A: 1/2" minimum laminated glass, clear, FS DD-G-451, Grade B, Style 1, Type I,
48 class 1, quality q3, free of tong marks, ANSI Z97.1: minimum 1/4" glass, minimum 0.030"
49 thick, translucent PVB interlayer, minimum 1/4" glass. ASTM C 1172, meeting Category II
50 material testing requirements per 16 CFR 1201, with polyvinyl butyral interlayer. Glazing
51 thickness to meet code requirement per application, refer to drawings for configuration.
52
53 2.04 GLAZING ACCESSORIES
54

- 1 A. Glazing Sealant: One-part silicone similar to Pecora 860, Sonneborn Omniplus or Tremco
2 Spectrum 2.
- 3 1. Comparable means both quality and color options.
4
- 5 B. Setting Blocks: 70-90 Shore "A" durometer, sized to accommodate size of glass used, compatible
6 with glazing sealant.
7
- 8 C. Spacers: Compatible with sealant used.
9

10
11 PART 3 - EXECUTION

12
13 3.01 EXAMINATION

- 14 A. Check that glazing channels are free of burrs, irregularities, and debris.
- 15 B. Check that glass is free of edge damage or face imperfections.
- 16 C. Do not proceed with installation until conditions are satisfactory.

17
18
19
20
21 3.02 PREPARATION

- 22 A. Field Measurement
- 23 1. Measure size of frame to receive glass.
- 24 2. Compute actual glass size, allowing for edge clearances.
- 25 B. Preparation of Surfaces
- 26 1. Remove protective coatings from surfaces to be glazed.
- 27 2. Clean glass and glazing surfaces to remove dust, oil and contaminants.

28
29
30
31 3.03 INSTALLATION

- 32 A. Install glass in accordance with glass manufacturer's recommended instructions.

33
34
35 3.04 CLEANING

- 36 A. Remove excess glazing compound from installed glass.
- 37 B. Remove labels from glass surface as soon as installed.
- 38 C. Wash and polish both faces of glass.
- 39 D. Remove debris from work site.

40
41
42
43
44
45 3.05 PROTECTION

- 46 A. Attach crossed streamers away from glass face.
- 47 B. Do not apply markers to glass surface.
- 48 C. Replace damaged glass.

49
50
51
52
53
END OF SECTION 08 80 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.

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 30 00

TILING

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. Wall Tile

B. Floor Tile

C. Base Tile

D. Transition Strips

1.03 RELATED WORK

- A. Gypsum Board, Section 09 29 00.

1.04 REFERENCES

- A. The following specifications and standards are incorporated by reference:
1. Tile Council of America, Inc. - "Handbook for Ceramic Tile Installation".

1.05 SUBMITTALS

- A. Submit in accordance with the General Conditions of the Contract.
1. Samples for colors on 12 inch by 12 inch panels in duplicate for tile specified.
2. Samples in duplicate for each different trim piece required.
3. Grout samples in duplicate indicating color range anticipated, texture.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, handle, deliver and store at the job site in original unbroken containers in a manner that will avoid damage or contamination.
B. All containers shall bear grade seals, manufacturer's name, size, color and quantities.

1.07 PROJECT CONDITIONS

- A. Set and grout tile when ambient temperature is at least 50 degrees F. and rising.

1.08 EXTRA MATERIALS

- A. Deliver stock of extra materials to Owner. Furnish extra materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
1. Furnish one box for each type, color, pattern and size installed.

1 PART 2 - PRODUCTS

2
3 2.01 TILE

4
5 A. Wall tile.

6 1. WT-1: Porcelain Tile

- 7 a. Dal-Tile Colorbody Imagica
8 b. Color: Cosmo Unpolished
9 c. Sizes: 12"x24"
10 d. Installation: Random staggered brickwork pattern.

11
12 B. Wall tile.

13 1. WT-2: Porcelain Tile

- 14 a. United States Ceramic Tile Color Collection
15 b. Color: to be selected from manufacture's full range of Color Group 1.
16 c. 3"x 6"

17
18 C. Floor tile.

19 1. FT-1: Porcelain Tile

- 20 a. Dal-Tile Colorbody Imagica
21 b. Color: Cosmo Unpolished
22 c. Sizes 12"x24"
23 d. Installation: Random staggered brickwork pattern.

24
25 D. Base tile.

26 1. BT-1: Porcelain Tile

- 27 a. Dal-Tile Colorbody Imagica
28 b. Color: Cosmo Unpolished
29 c. Size: 4"

30
31 E. Dal-Tile or United States Ceramic Tile are used as the basis of design. Approved equal by Atlas Concorde,
32 Ceasar Ceramics USA or approved equal.

33
34 2.02 SETTING MATERIALS

35
36 A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:

- 37 1. Prepackaged dry-mortar mix containing dry, re-dispersible, ethylene vinyl acetate additive to which
38 only water must be added at Project site.
39 2. Prepackaged dry-mortar mix combined with acrylic resin liquid-latex additive.
40 a. For wall applications, provide non-sagging mortar that complies with Paragraph F-4.6.1 in
41 addition to the other requirements in ANSI A118.4.

42
43 2.03 ACCESSORIES

44
45 A. Portland Cement: ASTM C 150, type 1.

46
47 B. Sand: ASTM C-144.

48
49 C. Water: Clean and potable.

50
51 D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces,
52 specifically approved for materials and installations indicated by tile and grout manufacturers.

53
54 E. Grout:

- 1
2
3 1. Selection to meet per tile manufacturer's recommendation.
4 a. Bostik "Hydroment Vivid" premium grade, stain resistant cementitious grout or approved
5 equal.
6 b. Color: To be selected by AE from manufacturer's full range of colors.
7
8 F. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation
9 provided or approved by manufacturer of tile-setting materials for installations indicated.
10
11 G. Provide other materials not specifically described but required for a complete and proper installation. Provide
12 Schluter Schiene at cut tile edges. Review on site with architect.
13
14 H. Transition Strips:
15
16 1. Tile to sealed concrete
17 a. Manufacturer: Schluter
18 b. Profile: Schluter Schiene and Reno-V
19 c. Material: Aluminum
20 d. Size according to materials used with approval of A/E.
21
22 2. Or approved equal.

23 PART 3 - EXECUTION

24
25 3.01 EXAMINATION

- 26
27 A. Examine surfaces where tile is to be applied and notify the Contractor of any defects.
28

29 3.02 INSTALLATION

30
31 A. General

- 32 1. Provide all proper installation methods for freezing climate.
33 2. Installation and workmanship shall be in accordance with ANSI A108.1 and as specified herein. The
34 printed instructions of the tile manufacturer and the manufacturer of proprietary mortars and grouts
35 shall be followed where applicable.
36 3. Before commencing work, establish field pattern and border line locations.
37 4. Center the work symmetrically so that no tile need be cut to less than half size.
38 5. Joints in wall tile shall be aligned vertically and horizontally; staggered joints will not be accepted.
39 6. Align joints when adjoining tiles on floor, base and trim are the same size.
40 7. Rub exposed edges smooth.

- 41
42 B. Interior Wall Tile Setting Bed: TCA W202/Tile backer board substrates - acrylic modified latex-cement
43 mortar.
44

- 45 C. Handle, store, mix and apply proprietary setting and grouting materials in compliance with the manufacturer's
46 instructions.
47

- 48 D. Extend tile work into recesses and under equipment and fixtures to form a complete covering without
49 interruptions, except as otherwise shown.
50

- 51 E. Terminate work neatly at obstructions, edges, and corners without disruption of pattern or joint alignments.
52

- 53 F. Comply with manufacturer's instructions for mixing and installation of proprietary materials.
54

- 1 G. Neutralize and seal substrates in accordance with setting bed manufacturer's instructions, where required.
2
3 H. Jointing Pattern: Grid pattern.
4
5 I. Expansion, Control Joints
6 1. Extend completely through tile mortar bed. Insert preformed back-up material to provide correct
7 cavity depth for sealant.
8 2. Width of expansion, control joints: Same as tile joints.
9 3. Prior to grouting, keep expansion and control joints open and clean.
10 4. After tile is grouted and completely dry, remove temporary filler material. Brush joints clean, fill
11 expansion and control joints.
12
13 J. Seal as per manufacturers requirements.
14
15 3.03 CLEANING
16
17 A. After completion, clean all work, point open joints and replace defective work.
18
19 3.04 PROTECTION
20
21 A. Close off work spaces to traffic during installation and at least 48 hours after completion of work.
22
23 B. Tiled vertical outside corners shall be protected with board corner strips in areas used as passageways.
24
25

26 END OF SECTION 09 30 00
27

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. Acoustical Board.
- 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 and installation instructions for each acoustical ceiling material and suspension system required, including certified laboratory test reports.

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.
- C. Store cartons open at each end to stabilize moisture content and temperature.

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. In accord with General Conditions of the Contract, deliver extra materials equal to a minimum of 50 square feet of each type of acoustical material supplied.
- B. All cartons shall be new, unopened, packaged with protective covering for storage, and identified with appropriate labels.

PART 2 - PRODUCTS

2.01 BOARD TYPE 1

- A. Lightly textured nodular lay-in panels, 3/4" thick x 2' x 2', Reveal edge (tegular), White. UL Classified Noise Reduction Coefficient (NRC) .60, Ceiling Attenuation Class (CAC) 35, Light Reflection Coefficient .82, "BioShield", 15 year warranty against sag, 82% recycled content.
- B. Celotex Brand, "Cashmere".
- C. Or approved equal by Armstrong World Industries, Ecophon Certainteed, or USG.

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.
 - 5. Provide tegular edge at walls, other abutting vertical surfaces.
 - 6. Field paint cut edges to match surface color and sheen.
- 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. Resilient Flooring.
- C. Accessories.
- D. Subfloor Preparation.

1.03 RELATED WORK

- A. Selective Structure Demolition: Section 02 41 19.
- B. Carpet (vinyl and metal reducers): Section 09 68 00.

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.
 - 3. Submit samples of metal edge strips.
 - 4. Two copies of manufacturer's recommended maintenance practices for each type of resilient flooring and accessory 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. Do not install resilient flooring over concrete slabs until they have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturer's recommended bond and moisture test.
- E. Close areas to traffic and to other work until flooring is firmly set. Tile shall have 72 hours with no traffic.
- F. 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 EXTRA MATERIALS

- A. Deliver stock of extra materials to Owner. Furnish extra materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
 - 1. Furnish one box for each type, color, pattern and size installed.

1.010 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 FLOOR

- A. Johnsonite is used as the basis of design. Armstrong, or approved equal.
- B. RF-1 Product:
 - 1. Style Name/Number: Grain + Pigment
 - 2. Color: to be selected from manufacturer's full range. See installation pattern note below.
 - 3. Construction: High Performance Luxury Vinyl Tile.
 - 4. Direct glue down
 - 5. Overall Thickness: 2.5mm.
 - 6. 20 mil wear layer.
 - 7. Nominal Dimensions: 7"x48"
 - 8. 10 year limited commercial wear warranty and 10 year under bed warranty.
 - 9. Class III printed film vinyl plank
 - 10. Added antimicrobial: Flor Sept™
 - 11. Finish: ExoGuard™
 - 12. Backing Class: Commercial Grade.
 - 13. Slip Resistance/ASTM D2047: >0.65 (wet/dry).
 - 14. Static Load Limit/(Modified ASTM F970: 1500 psi.
 - 15. Passes ASTM F1914 Residual Indentation <8%
 - 16. Passes ASTM F137 Flexibility
 - 17. Passes ASTM G21 0: Fungi free.
 - 18. Passes ASTM F 1514 Resistance to Heat.
 - 19. Passes ASTM F 1515 Resistance to Light.
 - 20. Passes ASTM F 925 Resistance to Chemicals.
 - 21. Passes ASTM 648, Radiant Flux, > 0.45 watts/cm² NFPA Class 1
 - 22. Passes ASTM E662, Smoke Density, < 450.
- C. Installation pattern to be provided by Architect with a pattern containing (4) materials/colors. Random, graduated color pattern.

2.02 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.

2.03 ACCESSORIES

- A. Adhesives: As recommended by Johnsonite to meet site conditions.
 - 1. Rubber Floor Tile
 - a. Johnsonite #965 Flooring and Tread Adhesive
 - b. Johnsonite #975 Two-Part Urethane Adhesive
 - c. Johnsonite #996 Two-Part Epoxy Adhesive
 - d. Refer to manufacturer's installation instructions

- B. 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.
- C. Concrete Slab Primer: Non-staining, low-VOC type, equal to W.F. Taylor Co. “Envirotec Healthguard” #2006, as approved by flooring and underlayment manufacturers.
- D. 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.
 - 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.
- E. Metal Edge Strip: Similar to Ceramic Tile Company CTC1132CTA.

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.
 - 1. Rough up smooth epoxy surfaces to accommodate resilient flooring manufacturer’s installation requirements.
- 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.
- E. Perform mat bond tests in each major area (1 per ~1,000 sq. ft.) This should consist of the proposed subfloor preparation, mitigation and leveling or smoothing products. Do not proceed with installation until all the results of the bond test are acceptable.
- F. Prime the subfloor prior to using a suitable leveler, as approved by the resilient flooring manufacturer.
- G. Vacuum floors immediately prior to installing the flooring to remove all loose particles. If required, only use water based sweeping compounds. Do not use any wax or oil based compounds that leave behind a residue that may interfere with the adhesive bond.

- H. Perform moisture tests on concrete subfloors to determine if surfaces are sufficiently cured and dry as well as to ascertain presence of curing compound. Do not use curing compounds on concrete subfloors.
- I. Do not allow resilient flooring work to proceed until subfloor surfaces are satisfactory. Indicate adverse conditions of any type by letter.

3.02 PREPARATION

- A. Comply with ASTM F 710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring, and manufacturer's recommendations for surface preparation. Remove substances incompatible with resilient flooring adhesive by method acceptable to manufacturer.
 - 1. Concrete floors with steel troweled (slick) finish shall be properly roughened (sanded) to ensure suitable adhesion.
 - 2. Concrete floors with curing, hardening and/or breaking compounds shall be abraded with mechanical methods only to remove compounds.
 - a. Do not use chemicals for removal.
 - b. Do not use wax or oil based sweeping compounds.
- B. Sand or grind subfloors to remove mortar, paint, other surface irregularities.
- C. 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.
- D. Remove all debris, sand, and other materials which would result in lack of adhesion and/or star cracking.

3.03 INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient tile flooring.
- B. Resilient Rubber Floor Tile:
 - a. Install with Johnsonite adhesive specified for the site conditions and follow adhesive label for proper use.
 - b. Do not Quarter Turn tile.
 - c. Roll the flooring in both directions using a 100 pound three-section roller.
- C. Install resilient flooring, including but not limited to the following, in accordance with the manufacturer's installation instructions.
 - 1. Do not mix manufacturing batches of a color within the same area.
 - 2. Do not install resilient flooring over building expansion joints.
 - 3. Do not install defective or damaged resilient flooring.
 - 4. Layout resilient flooring to provide ~equal size at perimeter. Adjust layout as necessary to reduce the amount of resilient flooring which is cut to less than half full width.
 - 5. Lay resilient flooring with arrows in the same direction (excluding borders).
 - 6. Install resilient flooring without voids at seams. Lay seams together without stress.
 - 7. Cut/scribe resilient flooring neatly at perimeter and obstructions.
 - 8. Extend resilient flooring into reveals, closets, and similar openings.
 - 9. Remove excess adhesive immediately.
- D. Install reducer strips at exposed edges.

3.04 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.
- 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.

3.05 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.
- D. No traffic for 24 hours after installation.
- E. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
- F. Wait 72 hours after installation before performing initial cleaning.

3.06 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 68 00

CARPET

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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. Standard Commercial Carpet.
- B. Floor Filler.
- C. Adhesives.

1.03 RELATED WORK

- A. Related Sections include the following:
 - 1. Section 09 65 00 Resilient Flooring for transition strips and base.

1.04 REFERENCES

- A. Carpet shall be in strict accord with Wisconsin Enrolled Commercial Building Code, Chapter 11 - "Accessibility".
- B. Carpet and Rug Institute (CRI).

1.05 SUBMITTALS

- A. Submit in accordance with the General Conditions of the Contract.
 - 1. Product Data: For the following, including installation recommendations for each type of substrate:
 - a. Carpet: For each type indicated. Include manufacturer's written data on physical characteristics, durability, fade resistance and printed statement of VOC content.
 - 2. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - a. Carpet: 24-inch square, (2) Samples.
 - b. Exposed Edge, Transition, and other Accessory Stripping: 6-inch long, (2) Samples.
 - 3. Maintenance Data: For carpet to include in maintenance manuals. Include the following:
 - a. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - b. Precautions for cleaning materials and methods that could be detrimental to carpet.
 - 4. Warranties: Special warranties specified in this Section.

1 5. Comply with requirements for materials and products of this Section.

2
3 1.06 QUALITY ASSURANCE

- 4
5 A. Installer Qualifications: An experienced installer who is certified by the Floor Covering
6 Installation Board or who can demonstrate compliance with its certification program
7 requirements.

8
9 1.07 DELIVERY, STORAGE, AND HANDLING

- 10
11 A. Comply with CRI 104, Section 5, "Storage and Handling."

12
13 1.08 PROJECT CONDITIONS

- 14
15 A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and
16 Section 7.12, "Ventilation."

- 17
18 B. Environmental Limitations: Do not install carpet until wet work in spaces is complete and
19 dry, and ambient temperature and humidity conditions are maintained at the levels indicated
20 for Project when occupied for its intended use.

- 21
22 C. Do not install carpet over concrete slabs until slabs have cured, are sufficiently dry to bond
23 with adhesive, and have pH range recommended by carpet manufacturer.

- 24 1. Test concrete sub-floors for acceptable moisture and alkalinity levels prior to
25 installation of carpet systems in accordance with manufacturer's recommendations.

- 26
27 D. Floors must be free of dust, oils, grease, or other foreign matter.

- 28
29 E. Where items are indicated for installation on top of carpet, install carpet before installing
30 these items.

- 31
32 F. Allow installation to cure for a minimum of 24 hours before subjecting it to any traffic,
33 moving of furniture, or other heavy equipment.

34
35 1.09 WARRANTY

- 36
37 A. Special Warranty for Carpet: Manufacturer's standard form in which manufacturer agrees to
38 repair or replace components of carpet installation that fail in materials or workmanship
39 within specified warranty period.

- 40 1. Warranty does not include deterioration or failure of carpet due to unusual traffic,
41 failure of substrate, vandalism, or abuse.
42 2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge
43 raveling, snags, runs, and delamination.
44 3. Warranty Period: Lifetime.

45
46 1.010 EXTRA MATERIALS

- 47
48 A. Furnish extra materials described below, before installation begins, that match products
49 installed and that are packaged with protective covering for storage and identified with
50 labels describing contents.

- 51 1. Carpet: Full-sized Tiles equal to 5 percent of amount installed for each type
52 indicated, but not less than 10 sq. yd.

53
54 1.011 ENVIRONMENTAL REQUIREMENTS

- 55
56 A. Recycled content: Provide products manufactured from recycled content as specified.

- 1 1. Carpet 1: Minimum 10% post-consumer, 38% pre-consumer.
2
3 B. Low-Emitting Materials, Adhesives, and Sealants: Materials used on the interior of the
4 building (defined as inside the weatherproofing system and applied on site) must not exceed
5 the following requirements.
6 1. Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management
7 (SCAQMD) Rule # 1168, requirements in effect on July 1, 2005, and rule
8 amendment date January 7, 2005.
9 2. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36,
10 requirements in effect on October 19, 2000.
11
12 C. Low-Emitting Materials, Flooring Systems: All flooring must comply with the following
13 as applicable.
14 1. Carpet and carpet cushion must meet the requirements of the Carpet and Rug
15 Institute Green Label Plus Program.
16

17
18 PART 2 - PRODUCTS

19
20 2.01 STANDARD COMMERCIAL CARPET TILES

- 21
22 A. Products: Subject to compliance with requirements, provide one of the following:
23 1. Carpet, CPT-1:
24 a. Carpet Tile
25 1) Manufacturer: Shaw
26 2) Collection: Unearthed
27 3) Style: Jasper Tile, 5T016
28 4) Color: Smoky Quartz 14761
29 5) Backing: Synthetic, Ecoworx tile.
30
31 b. Or
32 1) Approved Manufacturer meeting the specification, general appearance
33 (design) and color of the above noted product.
34 a) Mohawk
35 b) Masland
36 c) Karastan
37
38 B. Characteristics: All carpet shall be same mill run throughout.
39

40 2.02 INSTALLATION ACCESSORIES

- 41
42 A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based
43 formulation provided or recommended by carpet manufacturer.
44
45 B. Adhesives: Water-resistant, mildew-resistant, non-staining pressure sensitive type to suit
46 products and subfloor conditions indicated, that complies with flammability requirements
47 for installed carpet and is recommended or provided by carpet manufacturer.
48 1. VOC Limits: Provide adhesives that comply with the following limits for VOC
49 content when calculated according to 40CFR 59, Subpart D (EPA Method 24).
50

51 PART 3 - EXECUTION

52
53 3.01 EXAMINATION

- 54
55 A. Examine substrates, areas, and conditions, with Installer present, for compliance with
56 requirements for maximum moisture content, alkalinity range, installation tolerances, and

1 other conditions affecting carpet performance. Examine carpet for type, color, pattern, and
2 potential defects.

3
4 B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the
5 following:

- 6 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other
7 materials that may interfere with adhesive bond.
 - 8 a. Determine adhesion and dryness characteristics by performing bond and
9 moisture tests recommended by carpet manufacturer.
- 10 2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

11
12 C. Proceed with installation only after unsatisfactory conditions have been corrected.

13 14 3.02 PREPARATION

15
16 A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with
17 carpet manufacturer's written installation instructions for preparing substrates.

18
19 B. Use trowelable leveling and patching compounds, according to manufacturer's written
20 instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level
21 cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch,
22 unless more stringent requirements are required by manufacturer's written instructions.

23
24 C. Remove coatings, including curing compounds, and other substances that are incompatible
25 with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use
26 mechanical methods recommended in writing by carpet manufacturer.

27
28 D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

29 30 3.03 INSTALLATION

31
32 A. Comply with CRI 104 and carpet manufacturer's written installation instructions for the
33 following:

- 34 1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-
35 Down Installation."

36
37 B. Maintain uniformity of carpet direction and lay of pile. At doorways, center seams under
38 the door in closed position.

- 39 1. It door openings install adapters/transitions/reducers to be covered by door when in
40 the closed position.
- 41 2. Level adjoining border edges.

42
43 C. Do not bridge building expansion joints with carpet.

44
45 D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in
46 furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal
47 cut edges as recommended by carpet manufacturer.

48 E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable
49 flanges, alcoves, and similar openings.

50
51 F. Maintain reference markers, holes, and openings that are in place or marked for future
52 cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, non-
53 staining marking device.

54
55 G. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned
56 Carpet Installations" and with carpet manufacturer's written recommendations.

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- H. All selvages shall be trimmed to ensure good side seams. All seams shall receive an 1/8" continuous bead of seam adhesive at the point the face yarn enters the back.
 - 1. Fit edges together with an invisible seam and bond with appropriate adhesive.

3.04 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing carpet:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
 - 2. Remove yarns that protrude from carpet surface.
 - 3. Vacuum carpet using commercial machine with face-beater element.
- B. Protect installed carpet to comply with CRI 104, Section 16, "Protection of Indoor Installations."
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and carpet adhesive manufacturer.

END OF SECTION 09 68 00

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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. 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.
- B. 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.

- 1 2. If manufacturer to be used is different from that of color chips furnished, prepare and submit
2 two approximately 6 inch square, properly labeled samples of each color and sheen required
3 on properly prepared paint-out cards or hardboard.
4
- 5 3. Prepare and repaint an area of each designated interior surface to requirements specified
6 herein, with specified paint or coating showing selected color, gloss/sheen, texture and
7 workmanship to MPI Repainting Manual standards for review and approval by Owner and
8 A/E. When approved, interior surface shall become acceptable standard of finish quality and
9 workmanship for similar on-site repainting work.

10
11 1.05 QUALITY ASSURANCE

- 12
13 A. Master Painters Institute (MPI) Standards:
14 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products
15 List."
16
17 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting
18 Specification Manual" for products and paint systems indicated.
19 a. For areas to be renovated, comply with requirements in "MPI Maintenance
20 Repainting Manual".
21

22 1.06 DELIVERY, STORAGE AND HANDLING

- 23
24 A. Do not deliver materials to site until having received all written approvals of submitted information
25 and samples.
26
27 B. Deliver materials to job site in original, new and unopened packages and containers bearing
28 manufacturer's name and label.
29
30 C. Store materials not in actual use in tightly covered containers.
31
32 D. Take all precautions to ensure that workers and work areas are adequately protected from fire
33 hazards and health hazards resulting from handling, mixing and application of paints.
34
35 E. Remove rags and waste from storage areas daily.
36

37 1.07 PROJECT CONDITIONS

- 38
39 A. Apply water-base paints only when temperatures of surfaces to be painted and surrounding air
40 temperatures are between 50 and 95 degrees F.
41
42 B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air
43 temperatures are between 45 degrees F. and 95 degrees F.
44
45 C. Do not apply paint when relative humidity exceeds 85%; at temperatures less than 5 degrees F.
46 above the dew point; or to damp or wet surfaces.
47

48 1.08 SEQUENCING AND SCHEDULING

- 49
50 A. Schedule cleaning and painting so that contaminants from cleaning process will not fall onto
51 newly-painted surfaces.
52

53 1.09 EXTRA MATERIALS

1 A. Furnish extra materials described below that are from same production run (batch mix) as materials
2 applied and that are packaged for storage and identified with labels describing contents.

3
4 1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. of each material and color
5 applied.

6
7 1.010 ENVIRONMENTAL REQUIREMENTS

8
9 A. Low-Emitting Materials, Field applied Paints and Coatings: Interior paints and coatings applied on-
10 site must meet the limitations and restrictions concerning chemical components set by the following
11 standards:

12 1. Topcoat Paints, Green Seal Standard GS-11, Paints: First Edition, May 20, 1993.

13 2. Anti-Corrosive and Anti-Rust Paints: Green Seal Standard GS-03, Anti-Corrosive Paints",
14 Second Edition, January 7, 1997. For applications on ferrous metal substrates.

15 3. "All Other Architectural Coatings, Primers and Undercoats: South Coast Air Quality
16 Management District (SCAQMD) Rule #1113, Architectural Coatings", rules in effect on
17 January 1, 2004.

18
19 PART 2 - PRODUCTS

20
21 2.01 MANUFACTURERS

22
23 A. AFM Safecoat.

24
25 B. Benjamin Moore & Co.

26
27 C. Cabot.

28
29 D. ICI/Dulux.

30
31 E. PPG Architectural Finishes, Inc.

32
33 F. Sherwin Williams Company.

34
35 G. U-C Coatings Corp.

36
37 H. Target Coatings

38
39 I. Diamond Vogel Paint

40
41 J. Or approved equal.

42
43 2.02 MATERIALS

44
45 A. Use the materials of the same manufacturer for each system.

46
47 B. Sherwin Williams systems are called out in the system schedules to establish quality and dry mil
48 thickness of finished installation for all systems. A different manufacturer may be used for color
49 selection. Any manufacturer noted above may be used as long as quality and color requirements are
50 met.

51
52 1. Proprietary names used to designate colors or materials are not intended to imply that
53 products of named manufacturers are required to exclusion of equivalent products of other
54 manufacturers.

55

1 C. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint
2 materials manufacturers.

3
4 D. Material Compatibility:

- 5
6 1. Provide materials for use within each paint system that are compatible with one another and
7 substrates indicated, under conditions of service and application as demonstrated by
8 manufacturer, based on testing and field experience.
9
10 2. For each coat in a paint system, provide products recommended in writing by manufacturers
11 of topcoat for use in paint system and on substrate indicated.
12

13 E. Chemical Components of Field-Applied Interior Paints and Coatings: Provide products that comply
14 with the following limits for VOC content, exclusive of colorants added to a tint base, when
15 calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical
16 restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or
17 finishing shop:
18

- 19 1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
20 2. Non-flat Paints and Coatings: VOC content of not more than 150 g/L.
21 3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight
22 of total aromatic compounds (hydrocarbon compounds containing one or more benzene
23 rings).
24 4. Restricted Components: Paints and coatings shall not contain any of the following:
25
26 a. Acrolein.
27 b. Acrylonitrile.
28 c. Antimony.
29 d. Benzene.
30 e. Butyl benzyl phthalate.
31 f. Cadmium.
32 g. Di (2-ethylhexyl) phthalate.
33 h. Di-n-butyl phthalate.
34 i. Di-n-octyl phthalate.
35 j. 1,2-dichlorobenzene.
36 k. Diethyl phthalate.
37 l. Dimethyl phthalate.
38 m. Ethylbenzene.
39 n. Formaldehyde.
40 o. Hexavalent chromium.
41 p. Isophorone.
42 q. Lead.
43 r. Mercury.
44 s. Methyl ethyl ketone.
45 t. Methyl isobutyl ketone.
46 u. Methylene chloride.
47 v. Naphthalene.
48 w. Toluene (methylbenzene).
49 x. 1,1,1-trichloroethane.
50 y. Vinyl chloride.
51

52 F. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.
53

54 2.03 PRIMERS/SEALERS
55

- 1 A. Interior Latex Primer/Sealer: MPI #50.
2
3 2.04 METAL PRIMERS
4
5 A. Rust-Inhibitive Primer (Water Based): MPI #107.
6
7 2.05 LATEX PAINTS
8
9 A. Institutional Low-Odor/VOC Latex (Flat): MPI #143 (Gloss Level 1).
10
11 B. Institutional Low-Odor/VOC Latex (Low Sheen): MPI #144 (Gloss Level 2).
12
13 C. Institutional Low-Odor/VOC Latex (Eggshell): MPI #145 (Gloss Level 3).
14
15 D. Institutional Low-Odor/VOC Latex (Semigloss): MPI #147 (Gloss Level 5).
16
17 2.06 EQUIPMENT
18
19 A. Provide all brushes, rollers, ladders, scaffolding, and other equipment of any kind to properly
20 execute each type of work.
21
22 PART 3 - EXECUTION
23
24 3.01 EXAMINATION
25
26 A. Examine substrates and conditions, with Applicator present, for compliance with requirements for
27 maximum moisture content and other conditions affecting performance of work.
28
29 B. Maximum Moisture Content of Substrates:
30 1. Gypsum Board: 12 percent.
31 2. Concrete: Must be cured a minimum of 45 days.
32
33 C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes
34 and primers.
35
36 D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are
37 dry.
38 1. Beginning coating application constitutes Contractor's acceptance of substrates and
39 conditions.
40
41 3.02 PREPARATION
42
43 A. Perform preparation and cleaning procedures in accord with paint manufacturer's instructions and as
44 specified for each particular substrate condition.
45 1. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and
46 similar items in place and not to be finish-painted, or provide surface-applied protection prior
47 to surface preparation and painting operations.
48 a. After completing painting operations, use workers skilled in the trades involved to
49 reinstall items that were removed. Remove surface-applied protection if any.
50 b. Do not paint over labels of independent testing agencies or equipment name,
51 identification, performance rating, or nomenclature plates.
52
53 2. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and
54 grease prior to mechanical cleaning.

1 3. Remove dirt, rust, scale, moisture, scuffed surfaces, or conditions otherwise detrimental to
2 formation of a durable paint film.

3
4 B. Gypsum Board: Fill minor irregularities with patching material and sand to smooth level surfaces
5 taking care not to raise nap of paper.

6
7 C. Existing Ferrous Metal

8
9 1. Spot remove failed, damaged or rough existing paint to bare metal by means of stripping as
10 indicated above. If existing metal surface is not smooth, sand or wire brush.

11 a. Sand edges of existing paint to a feather edge.

12 2. Remove dirt and grease with mineral spirits or solvent recommended by paint manufacturer
13 and clean cloths.

14
15 D. Ferrous Metal

16
17 1. Remove dirt and grease with mineral spirits or solvent recommended by paint manufacturer
18 and clean cloths.

19 2. Where not galvanized, shop coat of primer will exist on surface. If prime coat is not smooth,
20 sand to bare metal and re-prime.

21
22 3.03 APPLICATION

23
24 A. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse
25 humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases.

26
27 B. Do work under adequate illumination and dust-free conditions.

28
29 C. Apply paints according to manufacturer's written instructions.

30 1. Use applicators and techniques suited for paint and substrate indicated.

31 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
32 Before final installation, paint surfaces behind permanently fixed equipment or furniture with
33 prime coat only.

34 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged
35 items to match exposed surfaces.

36
37 D. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same
38 material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient
39 difference in shade of undercoats to distinguish each separate coat.

40
41 E. Materials

42 1. Do not open containers until required for use.

43 2. Stir materials thoroughly and keep at uniform consistency during application.

44
45 F. Coats

46 1. Number specified is minimum.

47 2. Touch up suction spots between coats.

48 3. If undercoats or other conditions show through topcoat, apply additional coats until cured
49 film has a uniform paint finish, color, and appearance.

50 4. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush
51 marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines
52 and color breaks.

53 5. Refinish surfaces affected by refitting work.

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55 3.04 COLOR SEPARATION

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- 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.

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. Accessibility Signage.

1.03 REFERENCES

- A. All signage 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 Literature: Graphics with text, materials description, colors, and application instructions.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Provide protective coverings for identifying devices prior to shipping.
- B. Handle and store to prevent damage and soiling.

PART 2:PRODUCTS

2.01 ADA REQUIRED ACCESSIBILITY SIGNAGE

- A. All interior signage must have tactile/Braille lettering and raised pictograms. Braille must be integral to the sign. Taped on Braille is not acceptable.
 - 1. All Braille to be located at the bottom of the sign.
 - 2. When the word "accessible" is used on a sign or when the symbol for accessibility is used, the word accessible must be included in the Braille text.
- B. Signs
 - 1. All Braille to be located at the bottom of the sign.
 - 2. When the word "accessible" is used on a sign or when the symbol for accessibility is used, the word accessible must be included in the Braille text.
 - 3. Size: Approximately 6" x 10". Plastic: 2 background colors.
 - 4. Color: As selected by Architect from manufacturer's full range.
- C. Manufacturers
 - 1. ASI Sign Systems.
 - 2. Poblocki Sign Company
 - 3. Best Sign Systems Inc.
 - 4. 2/90 Sign Systems
 - 5. Or approved equal.

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- D. Provide proper gender symbol at each door leading to a room designed for handicap use (i.e., toilet rooms with grab bars, etc.).

PART 3:EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer's specifications and recommendations for the installation of identification devices.
- C. Install devices plumb, level and true to line.
- D. Install room and door identification signs at 5 feet from centerline of signs to finished floor.
 - 1. When used in conjunction with accessibility symbol, mount below symbol.

3.02CLEANING

- A. Clean surfaces of identifying devices, dedication plaque and surrounding surfaces.
- B. Remove protective coatings, if any.

3.03SIGNAGE SCHEDULE

- A. ADA Signage to be provided at the restroom.

END OF SECTION 10 14 00

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

- 1 B. Toilet Tissue (Roll) Dispenser:
- 2 1. O.F.C.I at water closet.
- 3
- 4 C. Soap Dispenser:
- 5 1. O.F.C.I. wall mounted adjacent to each lav faucet.
- 6 2. County to provide prior to lav rough in.
- 7
- 8 D. Sharps disposal – O.F.O.I.
- 9
- 10 E. Sanitary Napkin Disposal
- 11 1. O.F.O.I at water closet.
- 12
- 13 F. Paper Towel Dispenser:
- 14 1. O.F.O.I. at lab and breakroom sink.
- 15 2. Waste receptacle O.F.O.I.
- 16
- 17 G. Clothes Hook
- 18 1. B-6727 SS Bobrick
- 19 2. Or approved equal
- 20 3. See drawings for locations.
- 21 4. Install (4) near Lab 5052C: (1) at 4'-0" AFF, remainder at 5'-6" AFF, 12" on center.
- 22 Confirm locations with architect.
- 23 5. Also provide (1) on the back of each office door, refer to 08 71 00.
- 24
- 25 H. Mirror, provide in front of water closet.
- 26 1. Bradley Model 740
- 27 1. Or approved equal
- 28 2. Tilt type
- 29 3. Stainless steel framed
- 30 Size: 18" x 36".
- 31
- 32 I. Stainless steel shelf, provide at water closet in an accessible location.
- 33 1. American Specialties 0692-548 5"x48"
- 34 2. Or approved equal.
- 35 3. 18 gauge stainless steel, stain finish.
- 36
- 37 2.02 SEALANT
- 38
- 39 A. "G-E silicone sealant", General Electric Company.
- 40
- 41 B. "Dow Corning 780", Dow Corning Corporation.
- 42
- 43 C. "Pecora 826", Pecora Chemical Corporation.
- 44
- 45 2.03 FASTENERS
- 46
- 47 A. Provide all fastening devices including screws, bolts, anchors, and backplates.
- 48
- 49 B. Exposed fasteners shall match finish of accessories.
- 50
- 51 2.04 FABRICATION
- 52
- 53 A. Fabricate all toilet and bath accessories of type 302 or 304 stainless steel with satin finish, unless
- 54 otherwise specified or approved.
- 55
- 56 B. All accessories shall be by one manufacturer unless otherwise specified or approved.
- 57
- 58 C. Manufacturer's labels or imprinted name shall not be visible.
- 59

1 PART 3 - EXECUTION

2

3 3.01 EXAMINATION

4

5 A. Examine surfaces and recesses to receive toilet and bath accessories for dimensions, plumbness,
6 blocking, and other conditions that affect installation.

7

8 B. Do not proceed until conditions are acceptable.

9

10 3.02 INSTALLATION

11

12 A. Install toilet and bath accessories according to manufacturer's direction.

13

14 B. All accessories in any one space shall be of matching design and finish. If discrepancies are found,
15 secure Architect's approval before proceeding.

16

17 C. Set all recessed and semi-recessed accessories with continuous seal of sealant, around entire
18 perimeter of all accessories to prevent moisture from reaching substrate.

19

20 3.03 ADJUSTING AND CLEANING

21

22 A. Adjust accessories for proper operation.

23

24 B. Replace damaged or defective items.

25

26 C. Clean and polish accessories after removing labels and protective wrapping.

27

28 D. Delivery accessory keys, service, and parts manual in accordance with the General Conditions of the
29 Contract Closeout.

30

31 3.04 SCHEDULE

32

33 A. Provide accessories as indicated on the drawings or specification.

34

35

END OF SECTION

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**SECTION 21 05 00
COMMON WORK RESULTS FOR FIRE SUPPRESSION**

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PART 1 - GENERAL

5

SCOPE

This section includes information common to two or more technical fire protection specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

9

PART 1 - GENERAL

10

Scope

11

Related Work Reference

12

Reference Standards

13

Quality Assurance

14

Continuity of Existing Services

15

Protection of Finished Surfaces

16

Sleeves and Openings

17

Sealing and Fire Stopping

18

Off Site Storage

19

Codes

20

Design Criteria

21

Certificates and Inspections

22

Submittals

23

Operating and Maintenance Instructions

24

Training of Owner Personnel

25

Record Drawings

26

PART 2 - PRODUCTS

27

Access Panels and Doors

28

Identification

29

Sealing and Fire Stopping

30

PART 3 - EXECUTION

31

Cutting and Patching

32

Building Access

33

Equipment Access

34

Coordination

35

Identification

36

Sleeves and Openings

37

Sealing and Fire Stopping

38

39

RELATED WORK

40

This section applies to all Division 21 sections of fire suppression.

41

42

REFERENCE

43

Applicable provisions of Division 1 govern work under this section.

44

45

REFERENCE STANDARDS

46

Abbreviations of standards organizations referenced in this and other sections are as follows:

47

48

AGA American Gas Association

49

ANSI American National Standards Institute

50

ASME American Society of Mechanical Engineers

51

ASPE American society of Plumbing Engineers

52

ASTM American Society for Testing and Materials

53

AWWA American Water Works Association

54

AWS American Welding Society

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Common Work Results for Fire Suppression

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1	CGA	Compressed Gas Association
2	CS	Commercial Standards, Products Standards Sections, Office of Engineering Standards Service, NBS
3	EPA	Environmental Protection Agency
4	FM	FM Global
5	FS	Federal Specifications, Superintendent of Documents, U.S. Government Printing Office
6	IAPMO	International Association of Plumbing & Mechanical Officials
7	IEEE	Institute of Electrical and Electronics Engineers
8	ISA	Instrument Society of America
9	DSPS	State of Wisconsin Dept. of Safety and Professional Services
10	MCA	Mechanical Contractors Association
11	MICA	Midwest Insulation Contractors Association
12	MSS	Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
13	NBS	National Bureau of Standards
14	NEC	National Electric Code
15	NEMA	National Electrical Manufacturers Association
16	NFPA	National Fire Protection Association
17	STI	Steel Tank Institute
18	UL	Underwriters Laboratories Inc.

19

20 **QUALITY ASSURANCE**

21 Substitution of Materials: Refer to Section GC - General Conditions of the Contract, Equals and Substitutions.

22

23 All products and materials used are to be new, undamaged, clean and in good condition. Existing products and
24 materials are not to be reused unless specifically indicated.

25

26 Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or
27 engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs
28 involved in integrating the equipment or accessories into the system and for obtaining the intended performance
29 from the system into which these items are placed.

30

31 **PROTECTION OF FINISHED SURFACES**

32 Refer to Division 1, General Requirements, Protection of Finished Surfaces.

33

34 **SLEEVES AND OPENINGS**

35 Refer to Division 1, General Requirements, Sleeves and Openings.

36

37 **SEALING AND FIRESTOPPING**

38 Sealing and firestopping of sleeves/openings between piping, etc. and the sleeve or structural opening shall be the
39 responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals
40 skilled in such work to do the sealing and fireproofing. Provide all fire stopping of fire rated penetrations and
41 sealing of smoke rated penetrations in compliance with section 07 84 00 Fire Stopping.

42

43 **OFF SITE STORAGE**

44 Prior approval by DFD and the A/E will be needed. The contractor shall submit Storage Agreement Form AD-BDC-
45 74 to DFD for consideration of off site materials storage. Generally, sleeves, pipe/pipe fittings and similar rough-in
46 material will not be accepted for off site storage. No material will be accepted for off site storage unless shop
47 drawings for the material have been approved.

48

49 **CODES**

50 Comply with requirements of Wisconsin Administrative Code, Dept. of Safety and Professional Services, NFPA
51 Standards and local Fire Chief or Fire Marshal (AHJ, Authority Having Jurisdiction) regarding design, materials and
52 installation.

53

54 **DESIGN CRITERIA**

2

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Common Work Results for Fire Suppression

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1

1 Design fire protection systems in accordance with codes, standards and regulations noted above.

2

3 The automatic sprinkler system for office areas, conference/meeting rooms, toilet rooms, lobby corridors and similar
4 spaces shall be designed to provide a minimum density of 0.10 gpm/sq. ft. over the hydraulically most remote 1,500
5 sq. ft. using ½", 165 degree F. rated quick response sprinklers, while allowing a 250 gpm hose stream allowance.

6

7 The automatic sprinkler system for mechanical rooms, storage rooms, laundry rooms and similar spaces shall be
8 designed to provide a minimum density of 0.15 gpm/sq. ft. over the hydraulically most remote 1,500 sq. ft. using
9 ½", 225 degree F. rated quick response sprinklers, while allowing a 250 gpm hose stream allowance.

10

11

12

13 **CERTIFICATES AND INSPECTIONS**

14 Refer also to Division 1, General Conditions, Permits, Regulations, Utilities and Taxes.

15

16 Obtain and pay for all required State or local installation inspections except those provided by the
17 Architect/Engineer . Deliver originals of NFPA test certificates and DFD test reports to the Division's construction
18 representative. Include copies of the certificates and reports in the Operating and Maintenance Instructions.

19

20 **SUBMITTALS**

21 Refer to Division 1.

22

23 Not more than two weeks after award of contract but before any shop drawings are submitted, contractor to submit
24 the following fire protection system data sheet. List piping material types, ASTM number, schedule or pressure
25 class, joint type, manufacturer and model number where appropriate. List valves, specialties and equipment with
26 manufacturer model number. The approved fire protection system data sheet(s) will be made available to the
27 Owners project representative for their use on this project.

28

29 **FIRE PROTECTION SYSTEM DATA SHEET**

30 <u>Item</u>	<u>Pipe Service/Sizes</u>	<u>Manufacturer/Model No.</u>	<u>Remarks</u>
----------------	---------------------------	-------------------------------	----------------

31 Pipe

32 Fittings

33 Hangers & Supports

34 Sprinkler Heads

35 Valves

36

37

38 Shop drawing submittals are to be bound, labeled, contain the project manual cover page and a material index list
39 page showing item designation, manufacturer and additional items supplied with the installation. Submit for all
40 equipment and systems as indicated in the respective specification sections, marking each submittal with that
41 specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted
42 and proper identification of equipment by name and/or number, as indicated in the contract documents. Include
43 wiring diagrams of electrically powered equipment.

44

45 Submittals shall be sent to the local Fire Chief or Fire Marshal for review prior to the Architect/Engineer. Include
46 copy of all review/approval letters in submission to Architect/Engineer.

47

48 Submit plans indicating water supply location and size, piping layout and size, sprinkler locations and type, hanger
49 locations and type, equipment locations and type, valve locations and type, occupancy classes, hydraulic reference
50 points, design areas and discharge densities.

51

52 Submit hydraulic calculations for water supply and sprinkler systems. Include summary sheet and detailed work
53 sheets. Describe characteristics of water supply and location of effective point used in calculations. Include graph
54 illustration of water supply, hose demand, sprinkler demand and in-rack sprinkler demand.

2

1

1

2 Submit sufficient quantities of data sheets and shop drawings to allow the following distribution:

- 3 1* Operating and Maintenance Manuals
- 4 2* Dane County Public Works 1 copy
- 5 3* Dane County Facilities Management 1 copy
- 6 4* Architect/Engineer 1 copy
- 7 5* Local Fire Chief or Marshal 1 copy

8

9 **OPERATING AND MAINTENANCE INSTRUCTIONS**

10 All operations and maintenance data shall comply with the submission and content requirements specified under
11 section GENERAL REQUIREMENTS.

12 In addition to the general content specified under GENERAL REQUIREMENTS supply the following additional
14 documentation:

- 15 6* Copies of all approved submittals along with approval letters.
- 16 7* Manufacturer's wiring diagrams for electrically powered equipment.
- 17 8* Records of tests performed to certify compliance with system requirements.
- 18 9* Certificates of inspection by regulatory agencies.
- 19 10* Parts lists for equipment and specialties.
- 20 11* Manufacturers installation, operation and maintenance recommendations for equipment and specialties.
- 21 12* Valve schedules
- 22 13* Warranties
- 23 14* Additional information as indicated in the technical specification sections

24

25 **TRAINING OF OWNER PERSONNEL**

26 Instruct Owner's personnel in the proper operation, maintenance and testing of systems and equipment provided as
27 part of this project. Include not less than 2 hours of instruction, using the Operating and Maintenance manuals and
28 record drawings during this instruction. Demonstrate testing, startup and shutdown procedures for all equipment.
29 All training to be during normal working hours. Video record all instructions and provide Owner with copy.

30

31 **RECORD DOCUMENTS**

32 Refer to Division 1, General Requirements, Record Documents.

33

34 In addition to the data indicated in the General Requirements, maintain fire protection layout record drawings and
35 hydraulic calculations on originals prepared by the installing contractor/subcontractor. Include copies of these
36 record drawings and calculations with the Operating and Maintenance manuals.

37

38 **PART 2 - PRODUCTS**

39

40 **ACCESS PANELS AND DOORS**

41

42 LAY-IN CEILINGS:

43 Removable lay-in ceiling tiles in 2 X 2 foot or 2 X 4 foot configuration provided under Division 09 are sufficient; no
44 additional access provisions are required unless specifically indicated.

45

46 CONCEALED SPLINE CEILINGS:

47 Removable sections of ceiling tile held in position with metal slats or tabs compatible with the ceiling system used
48 will be provided under Division 09.

49

50 METAL PAN CEILINGS:

51 Removable sections of ceiling tile held in position by a pressure fit will be provided under Division 09.

52

53 PLASTER WALLS AND CEILINGS:

54 16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general applications,
55 stainless steel for use in toilets, showers, and similar wet areas, concealed hinges, screwdriver operated cam latch for

2

4

1 general applications, key lock for use in public areas, UL listed for use in fire rated partitions if required by the
 2 application. Use the largest size access opening possible, consistent with the space and the equipment needing
 3 service; minimum size is 12" by 12".

4 **IDENTIFICATION**

5 **STENCILS:**

6 Not less than 1/2" high letters for pipe sizes 1" through 2-1/2" and 1 inch high letters/numbers for pipe sizes 3" and
 7 above for marking pipe and equipment. Apply flow arrows to piping.
 8

9 **ADHESIVE LABELS:**

10 Pressure-sensitive, adhesive backed, vinyl pipe markers with applicable labeling, 3/4" min. size for lettering and
 11 surrounding tape on both ends. With flow arrows on piping. Conforming to ANSI, ANSI and NFPA standards. Seton
 12 Opti-Code, MSI, Brady or approved equal. Clean piping before application.
 13

14 **SNAP-AROUND MARKERS:**

15 One-piece, pre-formed, vinyl construction, snap-around or strap-around pipe markers with applicable labeling, 3/4"
 16 min. size for lettering. Provide nylon ties on each end of pipe marker. Seton Setmark or approved equal.
 17

18 **SIGNS:**

19 Metal construction, baked porcelain enamel finish signs, sizes conforming to NFPA no. 13 and 7-1.2, with holes and
 20 s-hooks/chains for hanging or securing. With applicable labeling. MSI, Seton, W.H. Brady or equal.
 21

22 **ENGRAVED NAME PLATES:**

23 White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting, Setonply
 24 Style 2060 by Seton Name Plate Company or Emedolite Style EIP by EMED Co., or equal by W. H. Brady.
 25

26 **VALVE TAGS:**

27 Round brass tags with 1/2 inch numbers, 1/4 inch system identification abbreviation, 1-1/4 inch minimum diameter,
 28 with brass jack chains with brass "S" hooks or one piece nylon ties around the valve stem, available from EMED
 29 Co., Seton Name Plate Company, MSI or W. H. Brady.
 30

31 **SEALING AND FIRE STOPPING**

32 **FIRE AND/OR SMOKE RATED PENETRATIONS:**

33 Manufacturers: 3M, Hilti, STI/SpeSeal, Tremco, or approved equal.
 34

35 All fire stopping systems shall be provided by the same manufacturer.
 36

37 Fire stop systems shall be UL listed or tested by an independent testing laboratory approved by the Department of
 38 Industry, Labor, and Human Relations/Dept. of Commerce.
 39

40 Submittals: Contractor shall submit product data for each firestop system. Submittals shall include product
 41 characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for
 42 each method of installation applicable to this project. For non-standard conditions where no UL tested system
 43 exists, submit manufacturer's drawings for UL system with known performance for which an engineering judgement
 44 can be based upon.
 45

46 Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference architectural
 47 drawings for identification of fire and/or smoke rated walls and floors.
 48

49 Use firestop putty, caulk sealant, intumescent wrapstrips, intumescent firestop collars, firestop mortar, or a
 50 combination of these products to provide a UL listed system for each application required for this project. Provide
 51 mineral wood backing where specified in manufacturer's application detail.
 52

53 **NON-RATED PENETRATIONS:**

54 **Pipe Penetrations:**

1

1 At pipe penetrations of non-rated interior partitions, floors and exterior walls above grade, use urethane caulk in
2 annular space between pipe insulation and sleeve. For non-rated drywall, plaster or wood partitions where sleeve is
3 not required, use urethane caulk in annular space between pipe insulation and wall material.

4

5

6

PART 3 - EXECUTION

7

CUTTING AND PATCHING

8 Refer to Division 1, General Requirements, Cutting and Patching.

9

10

11

BUILDING ACCESS

12 Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the building
13 access was not previously arranged and must be provided by this contractor, restore any opening to its original
14 condition after the apparatus has been brought into the building.

15

16

EQUIPMENT ACCESS

17 Install all piping, conduit and accessories to permit access to equipment for maintenance and service. Coordinate
18 the exact location of wall and ceiling access panels and doors with the General Prime Contractor, making sure that
19 access is available for all equipment and specialties. Access doors in general construction are to be furnished by the
20 Fire Protection Contractor and installed by the General Prime Contractor.

21

22 Provide color coded thumb tacks or screws, depending on the surface, for use in accessible ceilings which do not
23 require access panels.

24

25

COORDINATION

26 Coordinate all work with other contractors prior to installation. Any work that is not coordinated and that interferes
27 with other contractor's work shall be removed or relocated at the installing contractor's expense.

28

29 Verify that all devices are compatible for the type of construction and surfaces on which they will be used.

30

31

IDENTIFICATION

32 Identify equipment in mechanical equipment rooms by stenciling equipment number and service with one coat of
33 black enamel against a light background or white enamel against a dark background. Use a primer where necessary
34 for proper paint adhesion.

35

36 Where stenciling is not appropriate for equipment identification, engraved name plates may be used.

37

38 Identify interior piping mains not less than once every 25 feet, not less than once in each room, adjacent to each
39 access door or panel, and on both sides of the partition where exposed piping passes through walls or floors. Place
40 flow directional arrows at each pipe identification location. Use one coat of black enamel against a light background
41 or white enamel against a dark background, or approved pipe marking label systems, or provide snap-around type
42 pipe markers as specified in Part 2 – Products.

43

44 Identify valves with signs per NFPA rulings.

45

46 Provide hydraulic design information sign of permanently marked weatherproof metal or engraved nameplate
47 material. Secure to alarm valve with brass chain. Information to include location of the design areas, discharge
48 densities, required flow and residual pressure at the base of riser, hose stream demand and sprinkler demand.

49

50

SLEEVES AND OPENINGS

51 Provide galvanized sheet metal sleeves for fire rated pipe penetrations through interior and exterior walls to provide
52 a backing for sealant or firestopping. Patch wall around sleeve to match adjacent wall construction and finish.
53 Grout area around sleeve in masonry construction. In finished spaces where pipe penetration through wall is
54 exposed to view, sheet metal sleeve shall be installed flush with face of wall. In existing poured concrete walls
55 where penetration is core drilled, pipe sleeve is not required. Grout holes directly around steel pipe.

56

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1

1 Pipe sleeves are not required in interior non-rated drywall, plaster, or wood partitions and sleeves are not required in
2 existing poured concrete walls where penetrations are core drilled.

3

4 Pipe sleeves in new poured concrete construction shall be Schedule 40 steel pipe (size to allow insulated pipe to run
5 thru sleeve), cast in place.

6

7 In all piping floor penetrations, fire rated and non-fire rated top of sleeve shall extend 1 inch above the adjacent
8 finished floor. In existing floor penetrations, core drill sleeve opening large enough to insert schedule 40 sleeve and
9 grout area around sleeve with hydraulic setting, non-shrink grout. If the pipe penetrating the sleeve is supported by
10 a pipe clamp resting on the sleeve, weld a collar or struts to the sleeve that will transfer the weight to existing floor
11 structure.

12

13 **SEALING AND FIRE STOPPING**

14 **FIRE AND/OR SMOKE RATED PENETRATIONS:**

15 Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with
16 section 07 84 00 Fire Stopping.

17

18 **NON-RATED PARTITIONS:**

19 At all interior partitions and exterior walls, pipe penetrations are required to be sealed. Apply sealant to both sides of
20 the penetration in such a manner that the annular space between the pipe sleeve or cored opening and the pipe or
21 insulation is completely blocked.

22

23

24

END OF SECTION

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4

Common Work Results for Fire Suppression

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1
2 Fasteners depending on soft lead for holding power or requiring explosive powder actuation will not be accepted.

3
4 Support apparatus and material under all conditions of operation, variations in installed and operating weight of
5 equipment and piping, to prevent excess stress, and allow for proper expansion and contraction.

6
7 **SHOP DRAWINGS**

8 Schedule all hanger and support devices indicating attachment method and type of device for each pipe size and type
9 of service. Provide details on the working drawings submitted for approval with all pertinent information listed.

10
11 **DESIGN CRITERIA**

12 Materials and application of pipe hangers and supports shall be in accordance with MSS SP-58 Pipe Hangers and
13 Supports – Materials, Design, Manufacture, Selection, Application and Installation unless noted otherwise.

14 Materials and application of pipe hangers and supports shall be in accordance with NFPA rulings and be UL/FM
15 listed and approved.

16
17 Piping connected to pumps, compressors, or other rotating or reciprocating equipment is to have vibration isolation
18 supports for a distance of one hundred pipe diameters or three supports away from the equipment, whichever is
19 greater. Standard pipe hangers/supports as specified in this section are required beyond the 100 pipe diameter/3
20 support distance.

21
22
23 **PART 2 - PRODUCTS**

24
25 **MANUFACTURERS**

26 B-Line, Anvil, Erico, Tolco, Afcon, Roof Products & Systems or approved equal.

27
28 **STRUCTURAL SUPPORTS**

29 Provide all supporting steel required for the installation of mechanical equipment and materials, including angles,
30 channels, beams, etc. to suspended or floor supported tanks and equipment. All of this steel may not be specifically
31 indicated on the drawings.

32
33 **PIPE HANGERS AND SUPPORTS**

34 **HANGERS FOR PIPE SIZES 1/2" THROUGH 4":**

35 Carbon steel, adjustable swivel ring with 3/8" min. UL/FM approved hanger rods. B-Line B3170NF, Anvil 69 or 70.

36 Carbon steel, adjustable clevis, standard, with UL/FM approved size hanger rods. B-Line B3100, Anvil 260.

37
38 **HANGERS FOR PIPE SIZES 4" THROUGH 8":**

39 Carbon steel adjustable swivel ring with 1/2" min. UL/FM approved hanger rods. B-Line B3170NF, Anvil 69 or 70.

40 Carbon steel, adjustable clevis, standard with UL/FM approved size hanger rods. B-Line B3100, Anvil 260.

41
42 **HANGERS FOR PIPE SIZES 10" and UP**

43 Carbon steel, adjustable clevis, standard with UL/FM approved size hanger rods. B-Line B3100, Anvil 260.

44
45 **MULTIPLE OR TRAPEZE HANGERS:**

46 Manufactured steel channel system with manufacturers slotted interlocking pipe clamps with screw/nut securing and
47 threaded hanger rods or steel channels with welded spacers and threaded hanger rods.

48
49 **WALL SUPPORT:**

50 Carbon steel welded bracket with hanger. B-Line 3060 Series, Anvil 190 Series.

51 Steel channels with pipe clamps.

52
53 **VERTICAL SUPPORT:**

54 Carbon steel riser clamp. B-Line B3373, Anvil 261 for above floor use.

1 Bid No. 318057

Supports and Anchors

21 05 29-2

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FLOOR SUPPORT:

Carbon steel pipe saddle, stand and bolted floor flange. B-Line B3088T/B3093.

COPPER PIPE SUPPORTS:

All supports, fasteners, clamps, etc. directly connected to copper piping shall be copper plated or polyvinylchloride coated. Where steel channels are used, provide flexible elastomeric/thermoplastic isolation cushion material to completely encircle the piping and avoid contact with the channel or clamp, equal to B-Line B1999 Vibra Cushion or provide manufacturers clamp and cushion assemblies, B-Line BVT series, Grinnell PS 1400 series.

PIPE HANGER RODS

STEEL HANGER RODS:

Threaded both ends, threaded one end, or continuous threaded, complete with adjusting and lock nuts.

Size rods for individual hangers and trapeze support as indicated in the following schedule.

<u>Pipe Size</u>	<u>Diam. Of Rod</u>
Up to and Including 4"	3/8" or 9.5mm min.
5",6" and 8"	1/2" or 12.7mm min.
10" and 12"	5/8" or 15.9mm min.

BEAM CLAMPS

MSS SP-58 Types 19 & 23 malleable black iron clamp for attachment to beam flange to 0.62 inches thick with a retaining ring and threaded rod of 3/8, 1/2, and 5/8 inch diameter. Furnish with a hardened steel cup point set screw. B-Line B3036L/B3034, Anvil 86/92.

MSS SP-58 Type 28 or Type 29 forged steel jaw type clamp with a tie rod to lock clamp in place, suitable for rod sizes to 1-1/2 inch diameter. B-Line B3054, Anvil 228.

CONCRETE INSERTS

POURED IN PLACE:

MSS SP-58 Type 18 wedge type to be constructed of a black carbon steel body with a removable malleable iron nut that accepts threaded rod to 7/8 inch diameter. Wedge design to allow the insert to be held by concrete in compression to maximize the load carrying capacity. B-Line B2505, Anvil 281.

MSS SP-58 Type 18 universal type to be constructed of black malleable iron body with a removable malleable iron nut that accepts threaded rod to 7/8 inch diameter. B-Line B3014N, Anvil 282.

DRILLED FASTENERS:

CONCRETE CONSTRUCTION

Carbon steel expansion anchors, vibration resistant, with ASTM B633 zinc plating. Use drill bit of same manufacturer as anchor. Hilti, Rawl, Redhead.

WOOD CONSTRUCTION

Side or bottom mount lag thread by rod thread one piece hanger attachment installed per the Manufacturers standard and carrying capacity limit. Powers Fastener Vertigo, Erico Hangermate or equal.

ANCHORS

Use welding steel shapes, plates, and bars to secure piping to the structure.

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4 **PART 3 - EXECUTION**

5 **INSTALLATION**

6 Size, apply and install supports and anchors in compliance with manufacturers recommendations.

7 Install supports to provide for free expansion of the piping system. Support all piping from the structure using
8 concrete inserts, beam clamps, ceiling plates, wall brackets, or floor stands. Fasten ceiling plates and wall brackets
9 securely to the structure and test to demonstrate the adequacy of the fastening.

10
11 Coordinate hanger and support installation to properly group piping of all trades.

12
13 Where piping can be conveniently grouped to allow the use of trapeze type supports, use standard structural shapes
14 or continuous insert channels for the supporting steel. Where continuous insert channels are used, pipe supporting
15 devices made specifically for use with the channels may be substituted for the specified supporting devices provided
16 that similar types are used and all data is submitted for prior approval.

17
18 Perform welding in accordance with standards of the American Welding Society.

19
20 **HANGER AND SUPPORT SPACING**

21
22 Use hangers with minimum vertical adjustment.

23
24 Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.

25
26 Support riser piping independently of connected horizontal piping.

27
28 Adjust hangers to obtain the slope specified in the piping section of these specifications.

29
30 Space hangers for pipe as follows:

<u>Pipe Material</u>	<u>Pipe Size</u>	<u>Max. Horiz. Spacing</u>	<u>Max. Vert. Spacing</u>
Copper	3/4" through 1"	8'-0"	10'-0"
Copper	1-1/4" through 1-1/2"	10'-0"	10'-0"
Copper	2" through 3"	12'-0"	10'-0"
Copper	3-1/2" through 8"	15'-0"	10'-0"
Steel	1" through 1-1/4"	12'-0"	15'-0"
Steel	1-1/2" through 8"	15'-0"	15'-0"

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38
39 Unsupported length from the last hanger and an end sprinkler for steel piping systems shall be as follows:

1" piping	Not greater than 36"
1-1/4" piping	Not greater than 48"
1-1/2" piping	Not greater than 60"
or larger.	

40
41
42
43
44
45 **RISER CLAMPS**

46 Support vertical piping with clamps secured to the piping and resting on the building structure or secured to the
47 building structure below at each floor. Use method of securing the vertical risers to the building structure below in
48 stairwell locations.

49
50 **ANCHORS**

51 Install where indicated on the drawings and details. Where not specifically indicated, install anchors at ends of
52 principal pipe runs and at intermediate points in pipe runs. Make provisions for preset of anchors as required to
53 accommodate both expansion and contraction of piping.

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END OF SECTION

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SECTION 21 10 00
WATER BASED FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

SCOPE

This section contains specifications for fire suppression pipe and pipe fittings for this project. Included are the following topics:

PART 1 - GENERAL

- Scope
- Related Work
- Reference
- Reference Standards
- Shop Drawings
- Quality Assurance
- Delivery, Storage, and Handling
- Design Criteria
- Welder Qualifications

PART 2 - PRODUCTS

- Fire suppression Piping
- Unions and Flanges
- Mechanical Grooved Pipe Connections
- Sprinkler Heads
- Flexible Sprinkler Drop Fittings

- Pressure Gauges
- Valves

PART 3 – EXECUTION

- General
- Preparation
- Erection
- Copper Pipe Joints
- Welded Pipe Joints
- Threaded Pipe Joints
- Mechanical Grooved Pipe Connections
- Unions and Flanges
- Piping System Leak Tests

- Installation

RELATED WORK

- Section 21 05 00 – Common Work Results for Fire Suppression
- Section 21 05 29 – Hangers and Supports for Fire Suppression Piping and Equipment

REFERENCE

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Applicable provisions of Division 1 govern work under this section.

1 **REFERENCE STANDARDS**

- 2 ANSI A21.4
- 3 ANSI A21.11
- 4 ANSI A21.51
- 5 ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings
- 6 ANSI B16.3 Malleable and Ductile Iron Threaded Fittings
- 7 ANSI B16.4 Cast Iron Threaded Fittings
- 8 ANSI B16.5 Pipe Flanges and Flanged Fittings
- 9 ANSI B16.9 Factory Made Wrought Steel Butt Weld Fittings
- 10 ANSI B16.11 Forged Steel Fittings, Socket Welded and Threaded
- 11 ANSI B16.18 Cast Bronze Solder Joint Pressure Fittings
- 12 ANSI B16.22 Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
- 13 ANSI B16.29 Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV
- 14 ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
- 15 ASTM A105 Forgings, Carbon Steel, for Piping Components
- 16 ASTM A126 Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings
- 17 ASTM A135 Electric Resistance Welded Steel Pipe
- 18 ASTM A181 Forgings, Carbon Steel for General Purpose Piping
- 19 ASTM A234 Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
- 20 ASTM A536 Ductile Iron Castings
- 21 ASTM A795 Black and Hot Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use
- 22
- 23 ASTM B88 Seamless Copper Water Tube
- 24 AWS A5.8 Brazing Filler Metal
- 25 AWS D10.9 Qualification of Welding Procedures and Welders for Piping and Tubing, Level AR3
- 26 NFPA 13 Installation of Sprinkler Systems. (Latest prevailing edition)
- 27 NFPA 14 Installation of Standpipe and Hose Systems. (Latest prevailing edition)
- 28 UL Underwriters' Laboratories Listing
- 29 FM Factory Mutual Approval

30
31 **SHOP DRAWINGS**

32 Schedule from the contractor indicating the ANSI/ASTM specification number of the pipe being proposed along
33 with its type and grade, if known at the time of submittal, and sufficient information to indicate the type and rating
34 of fittings for each service.

35
36 **QUALITY ASSURANCE**

37
38 Substitution of Materials: Refer to Section GC – General Conditions of the Contract, Equals and Substitutions.
39 Order steel pipe with each length marked with the name or trademark of the manufacturer and type of pipe; with
40 each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of
41 supplier.

42
43 Any installed material not meeting the specification requirements must be replaced with material that meets these
44 specifications without additional cost to the Owner.

45
46 **DELIVERY, STORAGE, AND HANDLING**

47 Promptly inspect shipments to ensure that the material is undamaged and complies with specifications.

48
49 Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not
50 store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are
51 provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage
52 inside or by durable, waterproof, above ground packaging.

53
54 Offsite storage agreements will not relieve the contractor from using proper storage techniques.

55

1 Storage and protection methods must allow inspection to verify products.

2

3 **DESIGN CRITERIA**

4 Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM specifications as
5 listed in this specification.

6

7 Construct all piping systems for the highest pressures and temperatures in the respective system but not less than
8 175 psig.

9

10 Where weld fittings are used, use only long radius elbows having a centerline radius of 1.5 pipe diameters.

11

12 Where mechanical grooved fittings are used, use only ASTM standard radius fittings, short radius grooved fittings
13 are not allowed.

14

15 Where ASTM A53 or A795 type F pipe is specified, grade A type E or S, or grade B type E or S may be substituted
16 at Contractor's option. Where ASTM A135 grade A pipe is specified, grade B pipe may be substituted at
17 Contractor's option. Where the grade or type is not specified, Contractor may choose from those commercially
18 available.

19

20 Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper
21 copper tubing may be substituted at Contractor's option.

22

23 **WELDER QUALIFICATIONS**

24 Welding procedures, welders, and welding operators for all building service piping to be in accordance with certified
25 welding procedures of the National Certified Pipe Welding Bureau and Section 927.5 of ASME B31.9 Building
26 Services Piping or AWS 10.9 Qualification of Welding Procedures and Welders for Piping and Tubing. Before any
27 metallic welding is performed, Contractor to submit his Standard Welding Procedure Specification together with the
28 Procedure Qualification Record as required by Section 927.6 of ASME B31.9 Building Services Piping.

29

30

31 The Architect or Engineer reserves the right to test the work of any welder employed on the project, at the Owner's
32 expense. If the work of the welder is found to be unsatisfactory, the welder shall be prevented from doing further
33 welding on the project and all defective welds replaced.

34

35

36 **PART 2 - PRODUCTS**

37

38 **FIRE SUPPRESSION PIPING**

39 STEEL PIPE:

40 Black steel pipe welded and seamless, Type F, Grade A, ASTM A53; black welded and seamless steel pipe for fire
41 protection use, Type F, ASTM A795; electric resistance welded steel pipe, Grade A, ASTM A135.

42

43 Pipe wall Thickness:

44 Threaded pipe shall have a minimum wall thickness of schedule 40.

45 All other pipe shall have a minimum wall thickness of schedule 10.

46 Piping 2" and under shall be minimum schedule 40 unless stated otherwise herein.

47

48

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49

50 Fittings: Cast iron threaded fittings, Class 125 or 250, ASTM A126/ANSI B16.4. Malleable and ductile iron
51 threaded fittings, Class 150 or 300, ASTM A197/ANSI B16.3. Standard weight seamless carbon steel weld fittings,
52 ASTM A234 grade, ANSI B16.9. Mechanical grooved fittings with EPDM gaskets, ASTM A536 ductile iron,
53 ASTM A47 malleable iron or ASTM A53 fabricated steel. For wet pipe systems mechanical tee fittings with full iron
54 back equal to Grinnell Figure 730 will be allowed only as needed for connection to existing systems. Outlets for

1

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5

1 drypipe and preaction systems shall be mechanical tees. Mechanical tees with U-bolt back or other fastening means
2 are not allowed.

3
4
5 Welding Materials: Comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials.

6
7 Finish: Hot dipped zinc coated (galvanized) finish on piping and fittings shall be used in drypipe and pre-action
8 systems, piping exposed to weather and piping exposed to corrosive environments where indicated. Thread or
9 grooved hot dipped zinc coated pipe ends for fitting connections. Indoor dry standpipe systems supplied by a Fire
10 Dept. connection only may be black steel piping and fittings.

11
12 No exposed CPVC piping material is allowed.

13
14 Plastic pipe and fittings will not be allowed for this project.

15
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18
19
20 **UNIONS AND FLANGES**

21 **2" AND SMALLER STEEL:**

22 ASTM A197/ANSI B16.3 malleable iron unions with brass seats. Use black malleable iron on black steel piping and
23 galvanized malleable iron on galvanized steel piping. Grooved couplings may be used in lieu of unions.

24
25 **2" AND SMALLER COPPER:**

26 ANSI B16.18 cast bronze union coupling or ANSI B15.24 Class 150 cast bronze flanges.

27
28 **2-1/2" AND LARGER:**

29 ASTM A181 or A105, Class 150, grade 1 hot forged steel flanges of threaded, welding neck, or slip-on pattern on
30 black steel and threaded only on galvanized steel. ANSI B16.1 or ANSI B16.5, Class 150 cast iron threaded flanges.
31 Use raised face flanges ANSI B16.5 for mating with other raised face flanges or equipment with flat ring or full face
32 gaskets. Use ANSI B16.1 flat face flanges with full face gaskets for mating with other flat face flanges on
33 equipment.

34
35 **2-1/2" AND LARGER COPPER:**

36 ANSI B16.24, Class 150 cast bronze flanges with raised face.

37
38 **MECHANICAL GROOVED PIPE CONNECTIONS**

39 Mechanical grooved pipe couplings and fittings, ASTM F1476, as manufactured by Victaulic, Anvil, or Grinnell
40 may be used with steel pipe. Mechanical grooved components and assemblies to be rated for minimum 175 psi
41 working pressure unless noted otherwise.

42
43 All mechanical grooved pipe material including gaskets, couplings, fittings and flange adapters shall be from the
44 same manufacturer.

45
46 Couplings and fittings to be malleable iron, ASTM A47, or ductile iron A536 with painted finish. Fittings used on
47 galvanized steel pipe to have galvanized finish, ASTM A153.

48
49 Gaskets to be EPDM, ASTM D2000. Gaskets for dry systems to be flush seal design. Heat treated carbon steel oval
50 neck track bolts and nuts, ASTM A-183, with zinc electroplated finish.

51
52 Flange adapters to be ductile iron, ASTM A536; except at lug type butterfly valves where standard threaded flanges
53 shall be used.

1 Credit for the inherent flexibility of mechanical grooved pipe connections when used for expansion joints or flexible
2 connectors may be allowed upon specific application by the Contractor. Three flexible couplings at first three
3 connection points both upstream and downstream of pumps may be used in lieu of flexible connectors. Request for
4 expansion joints shall be made in writing and shall include service, location, line size, proposed application and
5 supporting calculations for the intended service.

6 7 **SPRINKLER HEADS**

8 Manufacturer: Sprinkler head model numbers establish type and style of head. Products of the following
9 manufacturers determined to be equal by the Architect/Engineer will be accepted: Tyco, Reliable, Victaulic, Viking
10 and Globe.

11
12 Standard coverage sprinkler heads are to be the basis for design unless noted otherwise on the plans or within these
13 specifications.

14
15
16
17 Fusible link or glass bulb type, cast brass or bronze construction. Provide heads with nominal 1/2" or 17/32"
18 discharge orifice except where greater than normal density requires large orifice.

19
20 Select fusible link or glass bulb temperature rating to not exceed maximum ambient temperature rating allowed
21 under normal conditions at installed location. Provide ordinary temperature (155 to 165 degree) fusible link or glass
22 bulb type except at skylights, sealed display windows, unventilated attics and roof spaces, over cooking equipment,
23 adjacent to diffusers, unit heaters, uninsulated heating pipes or ducts, mechanical rooms, storage rooms, or where
24 otherwise indicated.

25
26 Provide quantity of spare heads as noted below and 1 wrench for each type of head and each temperature range
27 installed. Provide 6 spare heads per 300 or less installed heads, 12 per 1000 or less and 24 for more than 1000.
28 Provide steel cabinet for storage of heads and wrenches. Provide an equal number of concealed cover plates and/or
29 sprinkler escutcheons for each spare sprinkler head.

30
31
32
33 Quick Response Upright: Viking Microfast M (QR), brass finish.

34
35 Quick Response Vertical Sidewall: Viking Microfast M, chrome finish.

36
37 Quick Response Pendant: Viking Microfast M, chrome plated finish and escutcheon.

38
39 Quick Response Sidewall: Viking Microfast M, chrome plated finish and escutcheon.

40
41 Dry Pendant (Self-contained type): Viking Model C, brass finish with brass escutcheon.

42
43 Dry Pendant (Self-contained type): Viking Model M (Quick Response), adjustable, recessed, with chrome
44 escutcheon.

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46 Dry Horizontal Sidewall (Self-contained type): Viking Model M (Quick response), adjustable, recessed, with
47 chrome escutcheon.

48
49 Concealed sprinkler: Viking Mirage (Quick Response), with adjustable concealed cover plate. Cover plate finish to
50 be selected by the Architect/Engineer from the manufacturer's standard finish selections.

51
52 Pendant Security: Tyco Raven, Security pendent shall not have an exposed heat sensing element.

53
54 Horizontal Sidewall Security: Tyco Raven, with sleeve, centering grommet and retainer flange. Security sidewall
55 shall not have an exposed heat sensing element.

1
2 **FLEXIBLE SPRINKLER DROP FITTINGS**

3 Manufacturers: FlexHead Industries, Victaulic or Viking.
4

5 Corrugated Type 304 stainless steel hose with braided Type 304 stainless steel exterior cover, welded stainless steel
6 or zinc plated steel inlet and outlet threaded fittings with EPDM seals. 175 PSI pressure rating. 225 °F temperature
7 rating, 1” minimum internal hose diameter. 40” maximum hose length, straight or angle outlet configuration.

8 Galvanized steel ceiling support bar and brackets selected to match project ceiling support system requirements. UL
9 Listed and FM approved.
10

11 Flexible drops are only allowed for use above fully accessible ACT ceilings.
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17 **PRESSURE GAUGES**

18 Manufacturer: Ametek/U. S. Gauge Division, Ashcroft, Marsh, Taylor, H. O. Trerice, Weiss, Weksler.
19

20 Cast aluminum, stainless steel, brass, polycarbonate or ABS case of not less than 3.5 inches in diameter, double
21 strength glass window, black lettering on a white background, phosphor bronze bourdon tube with bronze bushings,
22 recalibration from the front of the dial, 99% accuracy over the middle half of the scale, 98.5% accuracy over the
23 remainder of the scale. Include bronze 3-way globe valve with plugged outlet for Fire Inspector's test gauge.
24

25 **VALVES**

26 Manufacturers: Kennedy, Milwaukee, Nibco, Stockham, Victaulic, or Watts.
27

28 **BALL VALVES:**

29 2" and smaller: Bronze, 2-piece, threaded or sweat ends, standard port, blowout proof stem, chrome plated ball,
30 glass reinforced seats, UL approved @ 250 psi. Watts No. B-6000 UL.
31

32 **GATE VALVES:**

33 2" and smaller: Outside screw and yoke gate valves, 175 psig, bronze body, bronze mounted, screwed bonnet, rising
34 stem, solid wedge, with normally open tamper switch with double wire leads.
35

36 2-1/2" and larger: Outside screw and yoke gate valves, 175 psig, cast iron body, bronze mounted, bolted bonnet,
37 rising stem, solid wedge, with normally open tamper switch with double wire leads.
38
39
40

41 **SUPERVISORY/TAMPER SWITCHES:**

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44 For O S & Y valve or butterfly valve installations, UL/FM listed/approved, to monitor position of valve, tamper
45 resistant cover screws, single or double SPDT switch contacts, corrosion resistant, for indoor or outdoor use, NEMA
46 4 & 6P enclosures.
47
48
49
50
51
52

53 **GENERALPART 3 - EXECUTION**
54
55

1 Install pipe fittings, and other fire suppression system components in accordance with reference standards,
2 manufacturers recommendations and recognized industry practices.
3

4 **PREPARATION**

5 Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each
6 section of pipe and fitting prior to assembly.
7

8 **ERECTION**

9 Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a
10 window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as
11 required to clear such interferences. Coordinate locations of fire protection piping with piping, ductwork, conduit
12 and equipment of other trades to allow sufficient clearances. In all cases, consult drawings for exact location of pipe
13 spaces, ceiling heights, ceiling grid layout, light fixtures and grilles before installing piping.
14

15 Where copper or steel piping is embedded in masonry or concrete, provide protective sleeve covering of elastomeric
16 pipe insulation.
17

18 Provide 3/32" min. thickness steel nailing plates behind or on either side of piping where the possibility of
19 penetration from nails or drywall screws exists.
20

21 Maintain piping in clean condition internally during construction.
22

23 Provide clearance for access to valves and piping specialties.
24

25 Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract
26 without damage to itself, equipment, or building.
27

28 Install piping so that system can be drained. Where possible, slope to main drain valve. Slope dry pipe and pre-
29 action systems subject to freezing at minimum 1/4"/10' on mains and 1/2"/10' on branches. Where piping not
30 susceptible to freezing cannot be fully drained, install nipple and cap for drainage of less than 5 gallons or ball valve
31 with hose thread outlet and cap for drainage over 5 gallons. Pipe main drain valve to grade or to air gap sewer
32 receptor.
33

34 Mitered ells, notched tees, and orange peel reducers are not acceptable. On threaded piping, bushings are not
35 acceptable.
36

37 Do not route piping within exterior walls.
38

39 Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the
40 required service space for this equipment, unless the piping is serving this equipment.
41

42
43 Install all valves and piping specialties, including items furnished by others, as specified and/or detailed. Provide
44 access to valves and specialties for maintenance. Make connections to all equipment, fixtures and systems installed
45 by others where same requires the piping services indicated in this section.
46

47 **COPPER PIPE JOINTS**

48 Remove all slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces. Clean
49 fitting and tube with metal brush, emery cloth or sandpaper. Remove residue from the cleaning operation and
50 assemble joint to socket stop. Apply flame to fitting until brazing alloy melts when placed at joint. Wipe excess alloy
51 from joint.
52
53
54

1 Make all welded joints by fusion welding in accordance with ASME Codes, ANSI B31, and State Codes where
2 applicable. "Weldolets" and "Threadolets" may be used up to following sizes:

3	Maximum	
4	Weldolet/	Main
5	Threadolet	Pipe
6	<u>Diameter</u>	<u>Diameter</u>
7	3/4"	1 1/4"
8	1"	1 1/2"
9	1 1/4"	2"
10	1 1/2"	2 1/2"
11	2"	3"
12	3"	4"
13	4"	6"
14	6"	8"

15
16
17 **THREADED PIPE JOINTS**

18 Use a thread lubricant or teflon tape when making joints; no hard setting pipe thread cement or caulking will be
19 allowed.

20
21 **MECHANICAL GROOVED PIPE CONNECTIONS**

22 Use pipe factory grooved in accordance with the coupling manufacturer's specifications or field grooved pipe in
23 accordance with the same specifications using specially designed tools available for the application. Lubricate pipe
24 and coupling gasket, align pipe, and secure joint in accordance with the coupling manufacturer's specifications.

25
26 **UNIONS AND FLANGES**

27 Install a union, flange or grooved coupling combination at each connection to each piece of equipment and at other
28 items which may require removal for maintenance, repair, or replacement. Where a valve is located at a piece of
29 equipment, locate the flange or union or grooved coupling combination connections on the equipment side of the
30 valve. Concealed unions, flanges or couplings are not acceptable.

31
32 **FLEXIBLE SPRINKLER DROP FITTINGS**

33 Install in accordance with manufacturer's installation instructions following minimum bend radii, maximum number
34 of bends and bend distance from end requirements.

35
36 **PIPING SYSTEM LEAK TESTS**

37 Conduct pressure test with test medium of water. If leaks are found, repair the area with new materials and repeat the
38 test; caulking will not be acceptable.

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40 Test piping in sections or entire system as required by sequence of construction. Do not conceal pipe until it has
41 been successfully tested. If required for the additional pressure load under test, provide temporary restraints at
42 fittings or expansion joints. Entire test must be witnessed by the Division's representative.

43
44 Use clean water and remove air from the piping being tested where possible. Measure and record test pressure at the
45 high point in the system.

46
47 Test system at 200 psi for 2 hours showing no leakage. Where system design is in excess of 150 psig, test at a
48 pressure 50 psig above system design pressure.

49
50 All pressure tests are to be documented on NFPA Contractor's Material and Test Certificate forms.

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INSTALLATION

Install fire protection system components in accordance with NFPA rulings, listings and manufacturers recommendations. Locate where accessible for servicing and replacement.

Sprinkler Heads: Locate sprinkler heads as indicated on fire protection plan and reflected ceiling plan maintaining minimum clearances from obstructions, ceilings and walls. Install sprinkler heads level in locations not subject to spray pattern interference. Provide fire sprinkler head installations below ductwork, soffits, etc. Sprinkler heads shall be located in the center of ceiling tiles, a one inch tolerance will be acceptable

Switches: Locate flow and pressure switches where indicated and where required to obtain specified zoning to isolate floors and major areas of floors. Provide valved test connection for flow switch adjacent to flow switch. Pipe to floor drain. Test flow switch to verify proper operation.

Gauges: Provide a valved pressure gauge in main fire protection riser, at the top of each piping riser, at inlet and outlet of pump and elsewhere as indicated.

Valves: Properly align piping before installation of valves. Do not support weight of piping system on valve ends. Mount valves in locations which allow access for operation, servicing and replacement. Install all valves with the stem in the upright or horizontal position. Valves installed with the stems down will not be accepted. Provide a riser shutoff valve and a capped hose thread drain valve at the bottom of each riser. Provide capped hose thread drain valves to allow draining of each portion of piping.

END OF SECTION

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- 1 MICA Midwest Insulation Contractors Association
- 2 MSS Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
- 3 NBS National Bureau of Standards
- 4 NEC National Electric Code
- 5 NEMA National Electrical Manufacturers Association
- 6 NFPA National Fire Protection Association
- 7 NSF National Sanitation Foundation
- 8 PDI Plumbing and Drainage Institute
- 9 UL Underwriters Laboratories Inc.

10

11 Standards referenced in this section:

- 12 ACI 614 Recommended Practice for Measuring, Mixing and Placing of Concrete
- 13 ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops
- 14 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- 15 D.O.T. Standard Specifications for Road and Bridge Construction, State of Wisconsin, Dept. of
16 Transportation
- 17 UL1479 Fire Tests of Through-Penetration Firestops
- 18 UL723 Surface Burning Characteristics of Building Materials

19

20 **QUALITY ASSURANCE**

21 Substitution of Materials: Refer to Division 1 - Basic Requirements

22

23 All products and materials used are to be new, undamaged, clean and in good condition. Existing products and
24 materials are not to be reused unless specifically indicated.

25

26 Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or
27 engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs
28 involved in integrating the equipment or accessories into the system and for obtaining the intended performance
29 from the system into which these items are placed.

30

31 **CONTINUITY OF EXISTING SERVICES**

32 Do not interrupt or change existing services without prior written approval from the Owner's Project Representative.
33 When interruption is required, coordinate scheduling of down-time with the Owner to minimize disruption to his
34 activities.

35

36 **CODES**

37 Comply with requirements of Wisconsin Administrative Code.

38

39 **CERTIFICATES AND INSPECTIONS**

40 Refer also to Division 1.

41

42 Obtain and pay for all required City of Madison or State of Wisconsin installation inspections except those provided
43 by the Architect/Engineer in accordance with Wis. Admin. Code Section ILHR 50.12. Deliver originals of these
44 certificates to the Owner's Project Representative. Include copies of the certificates in the Operating and
45 Maintenance Instructions.

46

47 **SUBMITTALS**

48 Refer to Division 1.

49

50 Not more than two weeks after award of contract but before any shop drawings are submitted, contractor to submit
51 the following plumbing system data sheet. List piping material type for each piping service on the project, ASTM
52 number, schedule or pressure class, joint type, manufacturer and model number where appropriate. List valves and
53 specialties for each piping service, fixture and equipment with manufacturer and model number. The approved

1 plumbing system data sheet(s) will be made available to the Owner's Project Representative for their use on this
2 project.

3

4 **PLUMBING SYSTEM DATA SHEET**

5 Item Pipe Service/Sizes Manufacturer/Model No. Remarks

6 Pipe

7 Fittings

8 Unions

9 Valves:

10 Ball

11 Check

12 Pipe Specialties:

13 Thermometers

14 Plumbing Specialties:

15 Floor Drains & Cleanouts

16 Hose Bibb

17 Water Hammer Arrestors

18 Backflow Preventers

19 Hangers & Supports

20 Insulation

21 Plbg. Equipment

22

23 Shop drawing submittals are to be bound, labeled, contain the project manual cover page and a material index list
24 page showing item designation, manufacturer and additional items supplied with the installation. Submit for all
25 equipment and systems as indicated in the respective specification sections, marking each submittal with that
26 specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted
27 and proper identification of equipment by name and/or number, as indicated in the construction documents. Include
28 wiring diagrams of electrically powered equipment.

29

30 Submit sufficient quantities of equipment data sheets and shop drawings to allow the following distribution:

31 Insertion into Operating and Maintenance Manuals 2 copies

32 Dane County Public Works - record copy 1 copy

33 Engineers - record copies 2 copies

34

35 **OPERATION AND MAINTENANCE DATA**

36 All operations and maintenance data shall comply with the submission and content requirements specified under
37 Division I - Basic Requirements.

38

39 Two copies of Operations and Maintenance Manuals shall be provided for the following distribution:

40 Dane County Public Works 1 copy

41 Dane County Facilities Management 1 copy

42

43 In addition to the general content specified under - Basic Requirements supply the following additional
44 documentation:

45 1. Records of tests performed a to certify compliance with system requirements

46 2. Manufacturer's wiring diagrams for electrically powered equipment

47 3. Certificates of inspection by regulatory agencies

48 4. Valve schedules

49 5. Lubrication instructions, including list/frequency of lubrication

50 6. Parts lists for fixtures, equipment, valves and specialties.

51 7. Manufacturers installation, operation and maintenance recommendations for fixtures, equipment, valves
52 and specialties.

53 8. Additional information as indicated in the technical specification sections

54

55 **TRAINING OF OWNER PERSONNEL**

1 Instruct owner personnel in the proper operation and maintenance of systems and equipment provided as part of this
2 project. Include not less than 2 hours of instruction, using the Operating and Maintenance manuals during this
3 instruction. Demonstrate startup, operation and shutdown procedures for all equipment. All training to be during
4 normal working hours. Videotape all instructions and provide owner with copy.

5
6 **RECORD DRAWINGS**

7 Refer to Division 1. - Basic Requirements, As Built and Record Drawings and Specifications.

8
9 **PART 2 - PRODUCTS**

10
11 **IDENTIFICATION**

12 **STENCILS:**

13 Not less than 1 inch high letters/numbers for marking pipe and equipment.

14
15 **ENGRAVED NAME PLATES:**

16 White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting, Setonply
17 Style 2060 by Seton Name Plate Company or Emedolite Style EIP by EMED Co., or equal by W. H. Brady.

18
19 **SNAP-AROUND PIPE MARKERS:**

20 One-piece, preformed, vinyl construction, snap-around or strap-around pipe markers with applicable labeling and
21 flow direction arrows, 3/4" min. size for lettering. Provide nylon ties on each end of pipe markers. Equal to Seton
22 Setmark.

23
24 **VALVE TAGS:**

25 Round brass tags with 1/2 inch numbers, 1/4 inch system identification abbreviation, 1-1/4 inch minimum diameter,
26 with brass jack chains, brass "S" hooks or one piece nylon ties around the valve stem, available from EMED Co.,
27 Seton Name Plate Company, or W. H. Brady.

28
29 **SEALING AND FIRESTOPPING**

30
31 **FIRE AND/OR SMOKE RATED PENETRATIONS:**

32
33 Manufacturers: 3M, Hilti, Rectorseal, STI/SpecSeal, Tremco, or approved equal.

34
35 All firestopping systems shall be provided by the same manufacturer.

36
37 Fire stop systems shall be UL listed or tested by an independent testing laboratory approved by the Department of
38 Commerce.

39
40 Submittals: Contractor shall submit product data for each firestop system. Submittals shall include product
41 characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for
42 each method of installation applicable to this project. For non-standard conditions where no UL tested system
43 exists, submit manufacturer's drawings for UL system with known performance for which an engineering
44 judgement can be based upon.

45
46 Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference architectural
47 drawings for identification of fire and/or smoke rated walls and floors.

48
49 Use firestop putty, caulk sealant, intumescent wrapstrips, intumescent firestop collars, firestop blocks, firestop
50 mortar or a combination of these products to provide a UL listed system for each application required for this
51 project. Provide mineral wool backing where specified in manufacturer's application detail.

52
53 **NON-RATED PENETRATIONS:**

1 In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic
2 rubber links shaped to continuously fill the annular space between the uninsulated pipe and the cored opening or a
3 water-stop type wall sleeve. The operating bolts of the mechanical type seal shall be accessible from the interior of
4 the building.

5
6 At pipe penetrations of non-rated interior partitions, floors and exterior walls, use urethane caulk in annular space
7 between pipe insulation and sleeve. For non-rated drywall, plaster or wood partitions where sleeve is not required
8 use urethane caulk in annular space between pipe insulation and wall material

10 **PART 3 - EXECUTION**

11 **DEMOLITION**

12
13 Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to be
14 performed adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize
15 the amount of contamination of the occupied space. Where pipe is removed and not reconnected with new work,
16 cap ends of existing services as if they were new work. Coordinate work with the Owner to minimize disruption to
17 the existing building occupants.

18
19 All pipe, fixtures, equipment, wiring and associated conduit, insulation and similar items demolished, abandoned, or
20 deactivated are to be removed from the site by the Contractor except as specifically noted otherwise. Maintain the
21 condition of material and/or equipment that is indicated to be reused equal to that existing before work began.

22 **CUTTING AND PATCHING**

23 Provide required Cutting and Patching to complete the work. Refer to Division 1 – Basic Requirements.

24 **BUILDING ACCESS**

25 Arrange for the necessary openings in the building to allow for admittance or removal of all apparatus. When the
26 building access was not previously arranged and must be provided by this contractor, restore any opening to its
27 original condition after the apparatus has been brought into the building.

28 When access to the work area is through occupied areas coordinate building access times with the Owner's Project
29 Representative.

30 **EQUIPMENT ACCESS**

31 Install all piping, conduit and accessories to permit access to equipment for maintenance and service.

32 **COORDINATION**

33 Coordinate all work with other contractors prior to installation. Any work that is not coordinated and that interferes
34 with other contractor's work shall be removed or relocated at the installing contractor's expense.

35 Verify that all devices are compatible for the type of construction and surfaces on which they will be used.

36 **IDENTIFICATION**

37 Identify equipment in mechanical equipment rooms by stenciling equipment number and service with one coat of
38 black enamel against a light background or white enamel against a dark background. Use a primer where necessary
39 for proper paint adhesion.

40 Where stenciling is not appropriate for equipment identification, engraved name plates may be used.

41 Identify all new interior piping. Place flow directional arrows at each pipe identification location. Use one coat of
42 black enamel against a light background or white enamel against a dark background.

1 Identify valves with brass tags bearing a system identification and a valve sequence number. Valve tags are not
2 required at a terminal device unless the valves are greater than ten feet from the device, located in another room or
3 not visible from device. Provide a typewritten valve schedule and pipe identification schedule indicating the valve
4 number and the equipment or areas supplied by each valve and the symbols used for pipe identification; locate
5 schedules in mechanical room and in each Operating and Maintenance manual. Schedule in mechanical room to be
6 framed under clear plastic.

7

8 **LUBRICATION**

9 Lubricate all bearings with lubricant as recommended by the manufacturer before the equipment is operated for any
10 reason. Once the equipment has been run, maintain lubrication in accordance with the manufacturer's instructions
11 until the work is accepted by the Owner. Maintain a log of all lubricants used and frequency of lubrication; include
12 this information in the Operating and Maintenance Manuals at the completion of the project.

13

14 **TRAINING**

15 Contractor to provide factory authorized representative and/or field personnel knowledgeable with the operations,
16 maintenance and troubleshooting of the system and/or components defined within this section for a minimum period
17 of 2 hours. Session may be videotaped.

18

19

20

21

END OF SECTION

1
2
3 **PART 2 - PRODUCTS**

4 **WATER SYSTEM VALVES**

5 All water system valves to be rated at not less than 125 water working pressure at 240 degrees F unless noted
6 otherwise.

7 **BALL VALVES:**

8 2-1/2" and smaller: Two or three piece bronze body; full-port sweat ends, stainless steel ball and stem; glass filled
9 teflon seat; teflon packing and threaded packing nut; blowout-proof stem; 600 psig WOG. Provide valve stem
10 extensions for valves installed in all piping with insulation. Equal to Apollo 77C-140-04 and 77C-240-04. Products
11 by Nibco, Milwaukee, and Watts are considered equal.

12
13 **SWING CHECK VALVES:**

14 3" and smaller: Bronze body, sweat ends, Y-pattern, regrindable bronze seat, renewable bronze disc, Class 125,
15 suitable for installation in a horizontal or vertical line with flow upward. Crane 1342, Hammond IB941, Nibco
16 S413B, Watts CVYS, Jomar, Apollo and Milwaukee equals.

17
18 **BALANCE VALVES:**

19 Bronze body globe or ball valve with calibrated brass orifice, integral pointer and calibrated scale to register degree
20 of valve opening, memory stop, drain tapping, sweat or threaded ends, with or without integral unions, pressure taps
21 with integral check valves and seals, adjustable memory stop, suitable for 125 psig water working pressure at 240
22 degrees F. Flowset AccuSetter, Armstrong CBV, Bell & Gossett Circuit Setter Plus, Illinois 6000 series, Tapco
23 Circuit Setter, tour and Anderson.

24
25 **DRAIN VALVES:**

26 3/4 inch ball valve with integral threaded hose adapter, sweat or threaded inlet connections, with threaded cap and
27 chain on hose threads, Watts B-6000-CC/B-6001-CC series.

28
29
30 **PART 3 - EXECUTION**

31
32 **GENERAL**

33 Properly align piping before installation of valves. Install and test valves in strict accordance with valve
34 manufacturer's installation recommendations. Do not support weight of piping system on valve ends.

35
36 Mount valves in locations which allow access for operation, servicing and replacement.

37
38 Provide valve handle extensions for all valves installed in insulated piping.

39
40 Install all valves with the stem in the upright or horizontal position. If possible, install butterfly valves with the stem
41 in the horizontal position. Valves installed with the stems down will not be accepted.

42
43 Prior to flushing of piping systems, place all valves in the full-open position.

44
45 **SHUT-OFF VALVES**

46 Install shut-off valves at each piece of equipment, at each branch take-off from mains for isolation or repair and
47 elsewhere as indicated.

48
49 **BALANCING VALVES**

50 Install where indicated on the drawings and details for balancing of flow in pumped hot water recirculation piping
51 systems.

52 Upon project completion, adjust each valve and set position stop. Balance system to minimum flow in return piping
53 branches needed to maintain even supply water temperature throughout building.

1 **DRAIN VALVES**

2 Provide drain valves for complete drainage of all systems. Locations of drain valves include low points of piping
3 systems, downstream of riser isolation valves, equipment locations specified or detailed, other locations required for
4 drainage of systems and elsewhere as indicated.

5

6

END OF SECTION

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1 Support apparatus and material under all conditions of operation, variations in installed and operating weight of
2 equipment and piping, to prevent excess stress, and allow for proper expansion and contraction.

3
4 Protect insulation at all hanger points; see Related Work above.

5
6 **SHOP DRAWINGS**

7 Schedule of all hanger and support devices indicating attachment methods and type of device for each pipe size and
8 type of service.

9
10 All submittals are to comply with submission and content requirements specified Division 1 - Basic Requirements.

11
12 **DESIGN CRITERIA**

13 Materials and application of pipe hangers and supports shall be in accordance with MSS Standard Practice SP-58
14 and SP-69 unless noted otherwise.

15
16
17 **PART 2 - PRODUCTS**

18
19 **MANUFACTURERS**

20 Anvil, B-Line, Pate, Piping Technology or approved equal.

21
22 **STRUCTURAL SUPPORTS**

23 Provide all supporting steel required for the installation of mechanical equipment and materials, including angles,
24 channels, beams, etc. to suspended or floor supported tanks and equipment. All of this steel may not be specifically
25 indicated on the drawings.

26
27 **PIPE HANGERS AND SUPPORTS**

28 **HANGERS FOR PIPE SIZES 1/2" THROUGH 2":**

29 Carbon steel, adjustable swivel ring. B-Line B3170NF, Anvil 69 or 70.

30 Carbon steel, adjustable clevis, standard. B-Line B3100, Anvil 260.

31
32 **HANGERS FOR PIPE SIZES 2" AND LARGER:**

33 Carbon steel, adjustable clevis, standard. B-Line B3100, Anvil 260.

34
35 **MULTIPLE OR TRAPEZE HANGERS:**

36 Steel channels with welded spacers and hanger rods.

37
38 **WALL SUPPORT:**

39 Carbon steel welded bracket with hanger. B-Line 3068 Series, Anvil 194 Series.

40
41 Perforated, epoxy painted finish, 16-12 gauge, min., steel channels securely anchored to wall structure, with
42 interlocking, split-type, bolt secured, galvanized pipe/tubing clamps. B-Line type S channel with B-2000 series
43 clamps, Anvil type PS 200 H with PS 1200 clamps. When copper piping is being supported, provide flexible
44 elastomeric/thermoplastic isolation cushion material to completely encircle the piping and avoid contact with the
45 channel or clamp, equal to B-Line B1999 Vibra Cushion or provide manufacturers clamp and cushion assemblies, B-
46 Line BVT series, and Anvil PS 1400 series.

47
48 **VERTICAL SUPPORT:**

49 Carbon steel riser clamp. B-Line B3373, Anvil 261 for above floor use.

50
51 **FLOOR SUPPORT:**

52 Carbon steel pipe saddle, stand and bolted floor flange. B-Line B3088T/B3093.

53
54 **COPPER PIPE SUPPORTS:**

1 All supports, fasteners, clamps, etc. directly connected to copper piping shall be copper plated or polyvinylchloride
2 coated. Where steel channels are used, provide isolation collar between supports/clamps/fasteners and copper piping.

3
4 **PIPE HANGER RODS**

5 STEEL HANGER RODS:

6 Threaded both ends, threaded one end, or continuous threaded, complete with adjusting and lock nuts.

7
8 Size rods for individual hangers and trapeze support as indicated in the following schedule.

9
10 Total weight of equipment, including valves, fittings, pipe, pipe content, and insulation, are not to exceed the limits
11 indicated.

12	Maximum Load (Lbs.)	Rod Diameter
13	<u>(650°F Maximum Temp.)</u>	<u>(inches)</u>
14	610	3/8
15	1130	1/2
16	1810	5/8
17	2710	3/4
18	3770	7/8
19	4960	1
20	8000	1-1/4

21
22 **BEAM CLAMPS**

23 MSS SP-69 Types 19 & 23 malleable black iron clamp for attachment to beam flange to 0.62 inches thick with a
24 retaining ring and threaded rod of 3/8, 1/2, and 5/8 inch diameter. Furnish with a hardened steel cup point set screw.
25 B-Line B3036L/B3034, Anvil 86/92.

26
27 MSS SP-69 Type 28 or Type 29 forged steel jaw type clamp with a tie rod to lock clamp in place, suitable for rod
28 sizes to 1-1/2 inch diameter. B-Line B3054, Anvil 228.

29
30 **CONCRETE INSERTS**

31 **POURED IN PLACE:**

32 MSS SP-69 Type 18 wedge type to be constructed of a black carbon steel body with a removable malleable iron nut
33 that accepts threaded rod to 7/8 inch diameter. Wedge design to allow the insert to be held by concrete in
34 compression to maximize the load carrying capacity. B-Line B2505, Anvil 281.

35
36 MSS SP-69 Type 18 universal type to be constructed of black malleable iron body with a removable malleable iron
37 nut that accepts threaded rod to 7/8 inch diameter. B-Line B3014N, Anvil 282.

38
39 **DRILLED FASTENERS:**

40 Carbon steel expansion anchors, vibration resistant, with ASTM B633 zinc plating. Use drill bit of same
41 manufacturer as anchor. Hilti, Rawl, Redhead.

42
43 **ANCHORS**

44 Use welding steel shapes, plates, and bars to secure piping to the structure.

45
46
47 **PART 3 - EXECUTION**

48
49 **INSTALLATION**

50 Size, apply and install supports and anchors in compliance with manufacturers recommendations.

51
52 Install supports to provide for free expansion of the piping system. Support all piping from the structure using
53 concrete inserts, beam clamps, ceiling plates, wall brackets, or floor stands. Fasten ceiling plates and wall brackets
54 securely to the structure and test to demonstrate the adequacy of the fastening.

1
2 Coordinate hanger and support installation to properly group piping of all trades.
3

4 Where piping can be conveniently grouped to allow the use of trapeze type supports, use standard structural shapes
5 or continuous insert channels for the supporting steel. Where continuous insert channels are used, pipe supporting
6 devices made specifically for use with the channels may be substituted for the specified supporting devices provided
7 that similar types are used and all data is submitted for prior approval.
8

9 Size and install hangers and supports, except for riser clamps, for installation on the exterior of piping insulation.
10 Where a vapor barrier is not required, hangers may be installed either on the exterior of pipe insulation or directly on
11 piping.
12

13 Perform welding in accordance with standards of the American Welding Society.
14

15 **HANGER AND SUPPORT SPACING**

16 Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
17

18 Place a hanger within 12 inches of each horizontal elbow, valve, strainer, or similar piping specialty item.
19

20 Use hangers with 1-1/2 inch minimum vertical adjustment.
21

22 Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.
23

24 Support riser piping independently of connected horizontal piping.
25

26 Adjust hangers to obtain the slope specified in the piping section of these specifications.
27

28 Space hangers for pipe as follows:

<u>Pipe Material</u>	<u>Pipe Size</u>	<u>Max. Horiz. Spacing</u>	<u>Max. Vert. Spacing</u>
Copper	1/2" through 3/4"	5'-0"	10'-0"
Copper	1" through 1-1/4"	6'-0"	10'-0"
Copper	1-1/2" through 2-1/2"	8'-0"	10'-0"
Steel	1/2" through 1-1/4"	7'-0"	15'-0"
Steel	1-1/2" through 6"	10'-0"	15'-0"
Plastic	Drain & Vent	5'-0"	15'-0"

37 **RISER CLAMPS**

38 Support vertical piping with clamps secured to the piping and resting on the building structure or secured to the
39 building structure below at each floor.
40

41 **CONCRETE INSERTS**

42 Select size based on the manufacturer's stated load capacity and weight of material that will be supported. Use
43 inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams. Provide
44 hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inch size. Where concrete slabs form
45 finished ceiling, provide inserts that are flush with the slab surface.
46

47 **ANCHORS**

48 Install where indicated on the drawings and details. Where not specifically indicated, install anchors at ends of
49 principal pipe runs and at intermediate points in pipe runs between expansion loops. Make provisions for preset of
50 anchors as required to accommodate both expansion and contraction of piping.
51

52 **END OF SECTION**
53

1

1 **SECTION 22 07 00**
2 **PLUMBING INSULATION**

3
4 **PART 1 - GENERAL**

5
6 **SCOPE**

7 This section includes insulation specifications for plumbing piping and equipment. Included are the following
8 topics:

9 **PART 1 - GENERAL**

10 Scope
11 Related Work
12 Reference
13 Reference Standards
14 Quality Assurance
15 Description
16 Definitions
17 Shop Drawings
18 Operation and Maintenance Data

19 **PART 2 - PRODUCTS**

20 Materials
21 Insulation & Jackets
22 Insulation Inserts and Pipe Shields
23 Accessories

24 **PART 3 - EXECUTION**

25 Installation
26 Piping, Valve and Fitting Insulation
27 Construction Verification Items
28

29 **RELATED WORK**

30 Section 22 05 00 - Common Work Results for Plumbing
31 Section 22 11 00 - Facility Water Distribution
32
33

34 **REFERENCE**

35 Applicable provisions of Division 1 govern work under this section.
36

37 **REFERENCE STANDARDS**

38 ASTM B209 Aluminum and Aluminum Alloy Sheet and Plate
39 ASTM C165 Test Method for Compressive Properties of Thermal Insulations
40 ASTM C177 Heat Flux and Thermal Transmission Properties
41 ASTM C195 Mineral Fiber Thermal Insulation Cement
42 ASTM C302 Density of Preformed Pipe Insulation
43 ASTM C449 Mineral Fiber Hydraulic Setting Thermal Insulation Cement
44 ASTM C518 Heat Flux and Thermal Transmission Properties
45 ASTM C547 Mineral Fiber Preformed Pipe Insulation
46 ASTM C553 Mineral Fiber Blanket and Felt Insulation
47 ASTM C612 Mineral Fiber Block and Board Thermal Insulation
48 ASTM C921 Properties of Jacketing Materials for Thermal Insulation
49 ASTM C1136 Flexible Low Permeance Vapor Retarders for Thermal Insulation
50 ASTM E84 Surface Burning Characteristics of Building Materials
51 MICA National Commercial & Industrial Insulation Standards
52 NFPA 225 Surface Burning Characteristics of Building Materials
53 UL 723 Surface Burning Characteristics of Building Materials
54

1

1 **QUALITY ASSURANCE**

2 Substitution of Materials: Refer to Division 1 - Basic Requirements.

3

4 Label all insulating products delivered to the construction site with the manufacturer's name and description of
5 materials.

6

7 **DESCRIPTION**

8 Furnish and install all insulating materials and accessories as specified or as required for a complete installation.

9 The following types of insulation are specified in this section:

10 1* Pipe Insulation

11

12 Install all insulation in accordance with the latest edition of MICA (Midwest Insulation Contractors Association)
13 Standard and manufacturer's installation instructions. Exceptions to these standards will only be accepted where
14 specifically modified in these specifications, or where prior written approval has been obtained from the Project
15 Representative.

16

17 **DEFINITIONS**

18 Concealed: shafts, furred spaces, space above finished ceilings, utility tunnels and crawl spaces. All other areas,
19 including walk-through tunnels, shall be considered as exposed.

20

21 **SHOP DRAWINGS**

22 Submit a schedule of all insulating materials to be used on the project, including adhesives, fastening methods,
23 fitting materials along with material safety data sheets and intended use of each material. Include manufacturer's
24 technical data sheets indicating density, thermal characteristics, jacket type, and manufacturer's installation
25 instructions.

26

27 **OPERATION AND MAINTENANCE DATA**

28 All operations and maintenance data shall comply with the submission and content requirements specified under
29 Division 1 - Basic Requirements.

30

31

32 **PART 2 - PRODUCTS**

33

34 **MATERIALS**

35 Materials or accessories containing asbestos will not be accepted.

36

37 Use composite insulation systems (insulation, jackets, sealants, mastics, and adhesives) that have a flame spread
38 rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions:

39

40 Insulation which is not located in an air plenum may have a flame spread rating not over 25 and a smoke
41 developed rating no higher than 150.

42

43 **INSULATION AND JACKETS**

44 Manufacturers: Armstrong, Certainteed Manson, Childers, Dow, Extol, Halstead, H.B. Fuller, Imcoa, Knauf,
45 Owens-Corning, Pittsburgh Corning, Rubatex, Johns-Mansville, or approved equal.

46

47 Insulating materials shall be fire retardant, moisture and mildew resistant, and vermin proof. Insulation shall be
48 suitable to receive jackets, adhesives and coatings as indicated.

49

50 **RIGID FIBERGLASS INSULATION:**

51 Minimum nominal density of 3 lbs. per cu. ft., and thermal conductivity of not more than 0.23 at 75 degrees F,
52 minimum compressive strength of 25 PSF at 10% deformation, rated for service to 450 degrees F.

53

1

1 White kraft reinforced foil vapor barrier all service jacket, factory applied to insulation with a self-sealing pressure
2 sensitive adhesive lap, maximum permeance of .02 perms and minimum beach puncture resistance of 50 units.

3

4 **SEMI-RIGID FIBERGLASS INSULATION:**

5 Minimum nominal density of 3 lbs. per cu. ft., thermal conductivity of not more than 0.28 at 75 degrees F, minimum
6 compressive strength of 125 PSF at 10% deformation, rated for service to 450 degrees F. Insulation fibers
7 perpendicular to jacket and scored for wrapping cylindrical surfaces.

8

9 White kraft reinforced foil vapor barrier all service jacket, factory applied to insulation with a maximum permeance
10 of .02 perms and minimum beach puncture resistance of 50 units.

11

12 **FIREPROOFING INSULATION:**

13 Mineral fiber with nominal density of 8 lbs. per cu. ft., flame spread index of 15, fuel contribution index of 0, and
14 smoke developed index of 0, thermal conductivity of not more than 0.23 at 75 degrees F.

15

16 Jacket material shall be the same as jacket for adjacent insulation.

17

18 **METAL JACKETS:**

19 .016 inch thick aluminum or .010 inch thick stainless steel with safety edge.

20

21 **INSULATION INSERTS AND PIPE SHIELDS**

22 Manufacturers: B-Line, Pipe Shields, Value Engineered Products

23

24 Construct inserts with calcium silicate, minimum 140 psi compressive strength. Piping 12" and larger, supplement
25 with high density 600 psi structural calcium silicate insert. Provide galvanized steel shield. Insert and shield to be
26 minimum 180 degree coverage on bottom of supported piping and full 360 degree coverage on clamped piping. On
27 roller mounted piping and piping designed to slide on support, provide additional load distribution steel plate.

28

29 Where contractor proposes shop/site fabricated inserts and shields, submit schedule of materials, thicknesses, gauges
30 and lengths for each pipe size to demonstrate equivalency to pre-engineered pre-manufactured product described
31 above. On low temperature systems, extruded polystyrene may be substituted for calcium silicate provided insert
32 and shield length and gauge are increased to compensate for lower insulation compressive strength.

33

34 Precompressed 20# density molded fiberglass blocks, Hamfab or equal, of same thickness as adjacent insulation
35 may be substituted for calcium silicate inserts with one 1"x 6" block for piping through 2-1/2" and three 1" x 6"
36 blocks for piping through 4". Submit shield schedule to demonstrate equivalency to pre-engineered/pre-
37 manufactured product described above.

38

39 Wood blocks will not be accepted.

40

41 **ACCESSORIES**

42 All products shall be compatible with surfaces and materials on which they are applied, and be suitable for use at
43 operating temperatures of the systems to which they are applied.

44

45 Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for applications
46 specified.

47

48 Insulation bands to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be .015 inch
49 for aluminum and .010 inch for stainless steel.

50

51 Tack fasteners to be stainless steel ring grooved shank tacks.

52

53 Staples to be clinch style.

54

1

1 Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.

2

3 Finishing cement to be ASTM C449.

4

5 Fibrous glass or canvas fabric reinforcing shall have a minimum untreated weight of 6 oz./sq. yd.

6

7 Bedding compounds to be non-shrinking and permanently flexible.

8

9 Vapor barrier coatings to be non-flammable, fire resistant, polymeric resin.

10

11 Fungicidal water base coating (Foster 40-20 or equal) to be compatible with vapor barrier coating.

12

13

14

PART 3 - EXECUTION

15

INSTALLATION

17 Install insulation, jackets and accessories in accordance with manufacturers instructions and under ambient temperatures and conditions recommended by manufacturer. Surfaces to be insulated must be clean and dry.

18

19 Do not insulate systems or equipment which are specified to be pressure tested or inspected, until testing, inspection and any necessary repairs have been successfully completed.

20

21 Install insulation with smooth and even surfaces. Poorly fitted joints or use of filler in voids will not be accepted. Cover and seal exposed fiberglass insulation when insulation is terminated, no raw fiberglass insulation is allowed. Provide neat and coated terminations at all nameplates, uninsulated fittings, or at other locations where insulation terminates. Install with longitudinal joints facing wall or ceiling.

22

23 Install fabric reinforcing without wrinkles. Overlap seams a minimum of 2 inches.

24

25 Use full-length material (as delivered from manufacturer) wherever possible. Scrap piecing of insulation or pieces cut undersize and stretched to fit will not be accepted.

26

27 Insulation shall be continuous through sleeves and openings. Vapor barriers shall be maintained continuous through all penetrations.

28

29 Provide a complete vapor barrier for insulation on the following systems:

30

2* Cold water

31

PIPING, VALVE, AND FITTING INSULATION

32

33 GENERAL:
34 Install insulation with butt joints and longitudinal seams closed tightly. Provide minimum 2" lap on jacket seams and 2" tape on butt joints, firmly cemented with lap adhesive. Additionally secure with staples along seams and butt joints. Coat staples with vapor barrier mastic on systems requiring vapor barrier.

35

36 Water supply piping insulation shall be continuous throughout the building and installed adjacent to and within building walls to a point directly behind the fixture that is being supplied.

37

38 Install insulation continuous through pipe hangers and supports with hangers and supports on the exterior of insulation. Where a vapor barrier is not required, hangers and supports may be attached directly to piping with insulation completely covering hanger or support and jacket sealed at support rod penetration. Where riser clamps are required to be attached directly to piping requiring vapor barrier, extend insulation and vapor barrier jacketing/coating around riser clamp.

39

40 INSULATION INSERTS AND PIPE SHIELDS:

41

1

1 Provide insulation inserts and pipe shields at all hanger and support locations. Inserts may be omitted on 3/4" and
2 smaller copper piping provided 12" long 22 gauge pipe shields are used.

3

4 **FITTINGS AND VALVES:**

5 Fittings, valves, unions, flanges, couplings and specialties may be insulated with factory molded or built up
6 insulation of the same thickness as adjoining insulation. Cover insulation with fabric reinforcing and mastic or
7 where temperatures do not exceed 150 degrees, PVC fitting covers. Secure PVC fitting covers with tack fasteners
8 and 1-1/2" band of mastic over ends, throat, seams or penetrations. On systems requiring vapor barrier, use vapor
9 barrier mastic.

10

11 **PIPE INSULATION SCHEDULE:**

12 Provide insulation on new and existing remodeled piping as indicated in the following schedule:

13

14

15 Service	16 Insulation 17 Types	18 Insulation Thickness by Pipe Size				
		19 1" and 20 smaller	21 1-1/4" 22 to 2"	23 2-1/2" 24 to 4"	25 5" to 6"	26 8" and larger
18 Hot Water Supply & 19 Tempered Water	Rigid Fiberglass	1.5"	1.5"	1.5"	1.5"	1.5"
21 Hot Water Circulating	Rigid Fiberglass	1"	1"	1.5"		
23 Cold Water	Rigid Fiberglass	0.5"	0.5"	1"	1"	1"

24

25

26

END OF SECTION

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SECTION 22 11 00
FACILITY WATER DISTRIBUTION

PART 1 - GENERAL

SCOPE

This section contains specifications for plumbing pipe and pipe fittings for this project. Included are the following topics:

PART 1 - GENERAL

- Scope
- Related
- Reference
- Reference Standards
- Shop Drawings
- Quality Assurance
- Delivery, Storage, and Handling
- Design Criteria

PART 2 - PRODUCTS

- Domestic Water
- Dielectric Unions and Flanges
- Unions and Flanges
- Domestic Hot Water Temperature Maintenance System

PART 3 - EXECUTION

- General
- Preparation
- Erection
- Copper Pipe Joints
- Threaded Pipe Joints
- Water Hammer Arrestors
- Domestic Hot Water Temperature Maintenance System
- Sterilization of Water Distribution System
- Dielectric Unions and Flanges
- Unions and Flanges
- Piping System Leak Tests

RELATED WORK

- 22 05 00 – Common Work Results for Plumbing
- 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
- 22 07 00 – Plumbing Insulation

REFERENCE

Applicable provisions of Division 1 govern work under this section.

REFERENCE STANDARDS

- ANSI A21.4
- ANSI A21.11
- ANSI A21.51
- ANSI B16.3 Malleable Iron Threaded Fittings
- ANSI B16.4 Cast Iron Threaded Fittings
- ANSI B16.5 Pipe Flanges and Flanged Fittings
- ANSI B16.22 Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
- ANSI B16.29 Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV
- ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
- ASTM A105 Forgings, Carbon Steel, for Piping Components
- ASTM A126 Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings

- 1 ASTM A234 Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
- 2 ASTM B32 Solder Metal
- 3 ASTM B88 Seamless Copper Water Tube
- 4 ASTM B280 Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
- 5 ASTM B813 Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube
- 6 AWS A5.8 Brazing Filler Metal
- 7 AWWA C104 Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
- 8 AWWA C105 Polyethylene Encasement for Ductile Iron Piping for Water
- 9 AWWA C110 Ductile Iron and Gray Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids
- 10 AWWA C111 Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
- 11 AWWA C151 Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other
- 12 Liquids
- 13 AWWA C153 Ductile Iron Compact Fittings, 3 In. Through 48 In., for Water and Other Liquids
- 14 AWWA C600 Installation of Ductile Iron Water Mains and Their Appurtenances
- 15 AWWA C651 Disinfecting Water Mains

16
17 **SHOP DRAWINGS**

18 Schedule from the contractor indicating the ASTM, AWWA or CISPI specification number of the pipe being
19 proposed along with its type and grade if known at the time of submittal, and sufficient information to indicate the
20 type and rating of fittings for each service.

21
22 Statement from manufacturer on his letterhead that pipe furnished meets the ASTM, AWWA or CISPI specification
23 contained in this section.

24
25 **QUALITY ASSURANCE**

26 Substitution of Materials: Refer to Division 1 - Basic Requirements.

27
28 Order all copper, cast iron and steel with each length marked with the name or trademark of the manufacturer and
29 type of pipe; with each shipping unit marked with the purchase order number, metal or alloy designation, temper,
30 size, and name of supplier.

31
32 Any installed material not meeting the specification requirements must be replaced with material that meets these
33 specifications without additional cost to the Owner.

34
35 **DELIVERY, STORAGE, AND HANDLING**

36 Promptly inspect shipments to insure that the material is undamaged and complies with specifications.

37
38 Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not
39 store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are
40 provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage
41 inside or by durable, waterproof, above ground packaging.

42
43 Storage and protection methods must allow inspection to verify products.

44
45 **DESIGN CRITERIA**

46 Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, AWWA or CISPI
47 specifications as listed in this specification.

48
49 Construct all piping for the highest pressures and temperatures in the respective system.

50
51 Non-metallic piping will be acceptable only for the services indicated. It will not be acceptable in ventilation
52 plenum spaces, including plenum ceilings.

53

1 Where weld fittings or mechanical grooved fittings are used, use only long radius elbows having a centerline radius
2 of 1.5 pipe diameters.

3
4 Where ASTM A53 type F pipe is specified, grade A type E or S, or grade B type E or S may be substituted at
5 Contractor's option. Where the grade or type is not specified, Contractor may choose from those commercially
6 available.

7
8 Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper
9 copper tubing may be substituted at Contractor's option.

11 12 **PART 2 - PRODUCTS**

13 14 **DOMESTIC WATER**

15 **ABOVE GROUND:**

16 Type L copper water tube, H (drawn) temper, ASTM B88; wrought copper pressure fittings, ANSI B16.22; lead free
17 (<.2%) solder, ASTM B32; flux, ASTM B813; copper phosphorous brazing alloy, AWS A5.8 BCuP. Copper
18 mechanical grooved fittings and couplings on roll grooved pipe may be used in lieu of soldered fittings.

19 Mechanically formed brazed tee connections may be used in lieu of specified tee fittings for branch takeoffs up to
20 one-half (1/2) the diameter of the main.

21
22
23 Galvanized steel, Schedule 40, Grade A, ASTM A53; with cast iron threaded fittings, Class 125, ANSI B16.4; forged
24 steel threaded fittings, ANSI 16.11; mechanical cut groove couplings and fittings; galvanize coat all fittings, ASTM
25 A123.

26
27 Fittings 4" and larger may be cast iron, flanged, galvanized, 125 psi, ANSI standard B16.1 with neoprene gasket.

28 29 **DIELECTRIC UNIONS AND FLANGES**

30 Watts Regulator Company, Lochinvar, Wilkins or EPCO Sales, Inc., dielectric unions 2" and smaller; dielectric
31 flanges 2" and larger; with iron female pipe thread to copper solder joint or brass female pipe thread end
32 connections, non-asbestos gaskets, having a pressure rating of not less than 175 psig at 180 degrees.

33 34 **DOMESTIC HOT WATER TEMPERATURE MAINTENANCE SYSTEM**

35 Provide and install a hot water temperature Maintenance system equal to Raychem Corporation model HWAT-Plus
36 Y2 (105 degrees F) on the above ceiling hot water piping. The heater shall operate on a line voltage of 208 volts,
37 240 volts without the use of transformers or thermostats. The circuit shall be protected with a GFI. Power
38 connection, end seal, splice and tee components shall be applied in the field. Include "Rayclic"-PC power connector
39 and, "Rayclic"-T tee connector. Circuit breakersk conduit, power wiring, and junction boxes shall be specified in
40 Section 16.

41 **CONTROLLER**

42 Provide temperature controller equal to Tyco thermal controls (Raychem) catalog HWAT-ECO. Temperature set
43 points adjustable between 105 degrees F and 140 degrees F. Include provisions to connect to a building
44 management system (BMS). Unit shall have nine (9) pre-defined programs that can be customized by the user.

45 46 **UNIONS AND FLANGES**

47 Unions, flanges and gasket materials to have a pressure rating of not less than 150 psig at 180 degrees. Gasket
48 material for flanges and flanged fittings shall be teflon type. Treated paper gaskets are not acceptable.

49 50 **2" AND SMALLER STEEL:**

51 ASTM A197/ANSI B16.3 malleable iron unions with brass seats. Use black malleable iron on black steel piping and
52 galvanized malleable iron on galvanized steel piping.

53 54 **2" AND SMALLER COPPER:**

1 ANSI B16.18 cast bronze union coupling or ANSI B15.24 Class 150 cast bronze flanges.

2
3 2-1/2" AND LARGER STEEL:

4 ASTM A181 or A105, grade 1 hot forged steel flanges of threaded, welding neck, or slip-on pattern on black steel
5 and threaded only on galvanized steel. Use raised face flanges ANSI B16.5 for mating with other raised face flanges
6 or equipment with flat ring or full face gaskets. Use ANSI B16.1 flat face flanges with full face teflon gaskets for
7 mating with other flat face flanges on equipment. Gaskets shall be teflon type.

8
9 2-1/2" AND LARGER COPPER:

10 ANSI B15.24 Class 150 cast bronze flanges with full face teflon gaskets.
11
12
13

14 **PART 3 - EXECUTION**

15 16 17 **GENERAL**

18 Install pipe and fittings in accordance with reference standards, manufacturers recommendations and recognized
19 industry practices.
20

21 **PREPARATION**

22 Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each
23 section of pipe and fitting prior to assembly.
24

25 Piping shall be pitched to drain entire system; install drain vales at low points. Provide unions at piping connections
26 to all equipment, control valves etc. Provide offsets and transition fittings are required.
27

28 No water piping shall be installed in exterior walls above grade unless specifically approved by A/E and unless
29 adequately protected from freezing. Two inch insulation shall be installed on back and sides of chase, front shall be
30 open to rom heat, covered only by finished wall material.
31

32 Where copper or steel piping is embedded in masonry or concrete, provide protective sleeve covering of elastomeric
33 pipe insulation.
34

35 Use dielectric unions for connecting copper and steel piping.
36

37 **ERECTION**

38 Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a
39 window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as
40 required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit and
41 equipment of other trades to allow sufficient clearances. In all cases, consult drawings for exact location of pipe
42 spaces, ceiling heights, door and window openings, or other architectural details before installing piping.
43

44 Maintain piping in clean condition internally during construction.
45

46 Provide clearance for installation of insulation, access to valves and piping specialties.
47

48 Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract
49 without damage to itself, equipment, or building.
50

51 Do not route piping through transformer vaults or above transformers, elevator equipment rooms, panelboards, or
52 switchboards, including the required service space for this equipment, unless the piping is serving this equipment
53

1 Install all valves and piping specialties, including items furnished by others, as specified and/or detailed. Provide
2 access to valves and specialties for maintenance. Make connections to all equipment, fixtures and systems installed
3 by others where same requires the piping services indicated in this section.

4
5 Use dielectric unions for connecting copper and steel piping.

6
7 Provide necessary backflow devices as required by code.

8
9 Extend hot and cold water piping and connect to all fixtures and equipment as required.

10
11 Hot water, and cold water lines shall be kept at least six (6) inches apart whenever possible.

12 13 **COPPER PIPE JOINTS**

14 Remove all slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces. Clean
15 fitting and tube with metal brush, emery cloth or sandpaper. Remove residue from the cleaning operation, apply flux
16 and assemble joint to socket stop. Apply flame to fitting until solder melts when placed at joint. Remove flame and
17 feed solder into joint until full penetration of cup and ring of solder appears. Wipe excess solder and flux from joint.

18 19 **THREADED PIPE JOINTS**

20 Use a thread lubricant or teflon tape when making joints; no hard setting pipe thread cement or caulking will be
21 allowed.

22 23 **WATER HAMMER ARRESTORS**

24 Water supply piping serving fixtures, appliance, and equipment with quick closing devices shall be provided with
25 water hammer suppressors.

26
27 Shock absorbing devices shall be mechanical suppressors as required and approved by the Plumbing code.
28 Mechanical suppressors shall be installed in accordance with hydraulic design of system and PDI Std. WH201.

29 30 **DOMESTIC HOT WATER TEMPERATURE MAINTENANCE SYSTEM**

31 Install self-regulating heater and components on the domestic hot water piping as indicated on the plans and
32 specifications after the piping has been pressure tested, but before the thermal insulation is applied. Secure the
33 heater to piping with Raychem GT-66 fiberglass tape.

34 Apply "electric traced" signs to the outside of thermal insulation. Test heater using a 1000 VDC megger.
35 Insulation resistance should be between 20 and 1000 megohms regardless of length.

36 37 **STERILIZATION OF WATER DISTRIBUTION SYSTEM**

38 Prior to use, isolate and fill system with potable water. Allow to stand 24 hours. Flush each outlet proceeding from
39 the service entrance to the furthest outlet for minimum of 1 minute and until water appears clear. Fill system with a
40 solution of water and chlorine containing at least 50 parts per million of chlorine and allow to stand for 24 hours.
41 Alternately a solution containing at least 200 parts per million of chlorine may be used and allowed to stand for 3
42 hours. Flush system with potable water until chlorine concentration is no higher than source water level.

43
44 Wait 24 hours after final flushing. Take samples of water for lab testing. The number and location of samples shall
45 be representative of the system size and configuration and are subject to approval by Engineer. Test shall show the
46 absence of coliform bacteria. If test fails, repeat disinfection and testing procedures until no coliform bacteria are
47 detected. Submit test report indicating date and time of test along with test results.

48 49 **DIELECTRIC UNIONS AND FLANGES**

50 Install dielectric unions or flanges at each point where a copper-to-steel pipe connection is required in domestic
51 water systems.

52 53 **UNIONS AND FLANGES**

1 Install a union or flange at each connection to each piece of equipment and at other items which may require
2 removal for maintenance, repair, or replacement. Where a valve is located at a piece of equipment, locate the flange
3 or union connection on the equipment side of the valve. Concealed unions or flanges are not acceptable.

4

5 **PIPING SYSTEM LEAK TESTS**

6 Isolate or remove components from system which are not rated for test pressure. Test piping in sections or entire
7 system as required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.

8

9 If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints.

10

11 For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents or
12 loosening of flanges/unions. Measure and record test pressure at the high point in the system.

13

14 Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not
15 be acceptable.

16

17 Entire test must be witnessed by the Owners Project Representative. All pressure tests are to be documented on
18 forms to be provided to the contractor.

19

	Test	<u>Initial Test</u>	<u>Final Test</u>		
<u>System</u>	<u>Medium</u>	<u>Pressure</u>	<u>Duration</u>	<u>Pressure</u>	<u>Duration</u>
Above Ground Domestic Water	Water	N/A		100 psig	8 hr

22

23

24

END OF SECTION

1 **PIPING SYSTEM TEST REPORT**

2
3 **Date Submitted:** _____

4
5 **Project Name:** _____

6
7 **Location:** _____ **Project No:** _____

8
9 **Contractor:** _____

10
11 Plumbing Fire Sprinkler

12 Test Medium: Air Water Other _____

13
14 Test performed per specification section No. _____

15
16 Specified Test Duration _____ Hours Specified Test Pressure _____ PSIG

17
18 System Identification: _____

19 Describe Location: _____

20 _____

21	Test Date: _____	
22	Start Test Time: _____ Initial Pressure: _____ PSIG	
23	Stop Test Time: _____ Final Pressure: _____ PSIG	
24		
25		
26		

27 Tested By: _____ Witnessed By: _____

28 Title: _____ Title: _____

29 Signed: _____ Signed: _____

30 Date: _____ Date: _____

31 Comments: _____

32 _____

33 _____

34 _____

35 _____

36 _____

37 _____

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SECTION 22 13 00
SANITARY WASTE AND VENT PIPING

PART 1 – GENERAL

SCOPE

This section contains specifications for plumbing pipe and pipe fittings for this project.

RELATED WORK

22 05 29 – Hangers and Supports for Plumbing Piping and Equipment

REFERENCE

Applicable provisions of Division 1 govern work under this section.

REFERENCE STANDARDS

ANSI A21.4	
ANSI A21.11	
ANSI A21.51	
ANSI B16.3	Malleable Iron Threaded Fittings
ANSI B16.4	Cast Iron Threaded Fittings
ANSI B16.5	Pipe Flanges and Flanged Fittings
ANSI B16.22	Wrought Copper and Wrought Alloy Solder Joint Pressure Fittings
ANSI B16.29	Wrought Copper and Wrought Alloy Solder Joint Drainage Fittings – DWV
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
ASTM A74	Cast Iron Soil Pipe and Fittings
ASTM A105	Forgings, Carbon Steel, for Piping Components
ASTM A126	Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A234	Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
ASTM A888	Hubless Cast Iron Soil Piping and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications
ASTM B32	Solder Metal
ASTM B306	Copper Drainage Tube (DWV)
ASTM B813	Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube
ASTM C564	Standard Specification for Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings
ASTM C1540	Standard Specifications for Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings
ASTM D1785	Poly Vinyl Chloride (PVC) Plastic Pipe (SDR Series)
ASTM D2466	Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2564	Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings
ASTM D2665	Poly Vinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
ASTM D2729	Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D2855	Making Solvent Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings
ASTM D3034	Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D3139	Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
ASTM D3212	Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals
ASTM D3222	Unmodified Poly Vinylidene Fluoride (PVDF) Molding Extrusion and Coating Materials
ASTM D3311	Drain, Waste and Vent (DWV) Plastic Fitting Patterns
AWS A5.8	Brazing Filler Material
CISPI 301	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications

SHOP DRAWINGS

Schedule from the contractor indicating the ASTM or CISPI specification number of the pipe being proposed along with its type and grade if known at the time of submittal, and sufficient information to indicate the type and rating of fittings for each service.

Statement from manufacturer on his letterhead that pipe furnished meets the ASTM or CISPI specification contained in this section.

QUALITY ASSURANCE

Substitution of Materials: Refer to Division 1 – Basic Requirements.

Order all copper, cast iron, steel, PVC and polyethylene pipe with each length marked with the name or trademark of the manufacturer and type of pipe; with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the State.

DELIVERY, STORAGE AND HANDLING

Promptly inspect shipments to insure that the material is undamaged and complies with specifications.

Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, unions by storage inside or by durable, waterproof, above ground packaging.

Offsite storage agreements will not relieve the contractor from using proper storage techniques.

Storage and protection methods must allow inspection to verify products.

DESIGN CRITERIA

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, or CISPI specifications as listed in this specification.

Construct all piping for the highest pressures and temperatures in the respective system.

Non-metallic piping will be acceptable only for the services indicated. It will not be acceptable in ventilation plenum spaces, including plenum ceilings.

Where weld fittings or mechanical grooved fittings are used, use only long radius elbows having a centerline radius of 1.5 pipe diameters.

Where ASTM A53 type F pipe is specified, grade A type E or S, or grade B type E or S may be substituted at Contractor's option. Where the grade or type is not specified, Contractor may choose from those commercially available.

Where ASTM B88 type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper copper tubing may be substituted at Contractor's option.

PART 2 – PRODUCTS**SANITARY WASTE AND VENT**

INTERIOR ABOVE GROUND

Hubless cast iron soil pipe and fittings, ASTM A888; with no hub couplings, CISPI 310, ASTM A74. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Pipe Institute or receive prior approval of the Engineer.

Type M copper water tube, H (drawn) temper, ASTM B88; with cast copper drainage fittings (DMV), ANSI B16.23; wrought copper drainage fittings (DMV), ANSI B16.29; lead free (<.2%) solder, ASTM B32; flux, ASTM B813; copper phosphorus brazing alloy, AWS A5.8 BCuP. Mechanically formed brazed tee connections may be used in lieu of specified tee fittings for vent branch takeoffs up to one-half (1/2) the diameter of the main.

PVC plastic pipe, Schedule 40, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe fittings, ASTM D2665; socket fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564.

Galvanized steel pipe, Schedule 40, Type F, Grade A, ASTM A53; with cast iron threaded drainage fittings, ASTM B16.12.

INTERIOR BELOW

Cast iron soil piping and fittings, hub and spigot, service weight, ASTM A74, with neoprene rubber compression gaskets, ASTM C564, CISPI 301 and CISPI HSN 85. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Pipe Institute.

PVC Plastic pipe, Schedule 40, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; socket fittings patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564.

PART 3 – EXECUTION

GENERAL

Install pipe and fittings in accordance with reference standards, manufacturer's recommendations, and recognized industry practices.

PREPARATION

Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from the interior and exterior of each section of pipe and fitting prior to assembly.

ERECTION

Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit, and equipment of other trades and existing piping to allow sufficient clearances. In all cases, consult drawings for exact location of pipe spaces, ceilings heights, door and window openings, or other details before installing piping.

Where copper or steel piping is embedded in masonry or concrete, provide protective sleeve covering of elastomeric pipe insulation.

Maintain in clean condition internally during construction.

Provide clearance for installation of insulation, access to valves and piping specialties.

Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.

Do not route piping through transformer vaults or above transformers, elevator equipment rooms, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment.

Install all valves and piping specialties, including items furnished by others, as specified and/or detailed. Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures, and systems installed by others where same requires piping services indicated in this section.

COPPER PIPE JOINTS

Remove all slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces. Clean fitting and tube with metal brush, emery cloth or sandpaper. Remove residue from the cleaning operation, apply flux and assemble joint to socket stop. Apply flame to fitting until solder melts when placed at joint. Remove flame and feed solder into joint until full penetration of cup and ring of solder appears. Wipe excess solder and flux from joint.

THREADED PIPE JOINTS

Use a thread lubricant or Teflon tape when making joints; no hard setting pipe thread cement or caulking will be allowed.

SOLVENT WELDED PIPE JOINTS

Install in accordance with ASTM D2855 "Making Solvent Cemented Joints With PVC Pipe and Fittings". Saw cut piping square and smooth. Tube cutters may be used if they are fitted with wheels designed for use with PVC/CPVC pipe that do not leave a raised bead on pipe exterior. Support and restrain pipe during cutting to prevent nicks and scratches. Bevel ends 10-15 degrees and deburr interior. Remove any, dust, debris, moisture, grease and other superfluous materials from the pipe interior and exterior. Check dry fit of pipe and fittings. Reject materials which are out of round or do not fit within close tolerance. Use heavy body solvent cement for large diameter fittings.

Maintain pipe, fittings, primer and cement between 40 and 100 degrees during application and curing. Apply primer and solvent using separate daubers (3" and smaller piping only) or clean natural bristle brushes about 1/2 the size of the pipe diameter. Apply primer to the fitting socket and pipe surface with a scrubbing motion. Check for penetration and reapply as needed to dissolve the surface to a depth of 4-5 thousandths. Apply solvent cement to the fitting socket and pipe in an amount greater than needed to fill any gap. While both surfaces are wet, insert pipe into socket fitting with a quarter turn to the bottom of the socket. Solvent cement application and insertion must be completed in less than 1 minute. Minimum of 2 installers is required on piping 4" and larger. Hold joint for 30 seconds or until set. Reference manufacturer's recommendations for ignition set time before handling and for full curing time before pressure testing. Cold weather solvent/cement may be utilized only under unusual circumstances and when specifically approved by the Owner's Project Representative.

MECHANICAL HUBLESS PIPE CONNECTIONS

Place the gasket on the end of one pipe or pipe fitting and clamp the assembly on the other end of the pipe of fitting. Firmly seat the pipe or pipe fitting ends against the integrally molded shoulder inside the neoprene gasket. Slide the clamp assembly into position over the gasket. Tighten fasteners to manufacturer's recommended torque.

SANITARY WASTE AND VENT

Verify invert elevations and building elevations prior to installation. Install interior piping pitched to drain at minimum slope of 1/4" per foot where possible and in no case less than 1/8" per foot for piping 3" and larger.

Flush piping inlets (floor drains, mop basins, fixtures, etc.) with high flow of water at completion of project to demonstrate full flow capacity. Remove blockages and make necessary repairs where flow is found to be impaired.

PIPING SYSTEM LEAK TESTS

Isolate or remove components from system which are not rated for test pressure. Perform final testing for medical and lab gas with all system components in place. Test piping in sections or entire system as required by sequence of construction. Do not insulate or conceal piping until it has been successfully tested.

If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints. Backfill underground water mains prior to testing with the exception of thrust restrained valves which may be exposed to isolate potential leaks.

For hydrostatic tests, use clean water and remove all air from the piping being tests by means of air vents or loosening of flange/unions. Measure and record test-pressure at the high point in the system.

For air or nitrogen tests, gradually increase the pressure to not more than one half of the test pressure; then increase the pressure in steps of approximately one-tenth of the test pressure until the required test pressure is reached. Examine all joints and connections with a soap bubble solution or equivalent method. System will not be approved until it can be demonstrated that there is no measureable loss of test pressure during the test period.

Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.

Entire test shall be witnessed by the owners representative. All pressure tests are to be documented on forms to be provided to the contractor

System	Test Medium	Initial Test Pressure	Duration	Final Test Pressure
Sanitary Waste and Vent	Water	N/A	2 hr.	10' Water

END OF SECTION

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**SECTION 22 42 00
COMMERCIAL PLUMBING FIXTURES**

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PART 1 – GENERAL

6SCOPE

7This section includes specifications for plumbing fixtures, faucets and trim.

8

9RELATED WORK

10Section 22 11 00 – Facility Water Distribution

11Section 22 05 29 – Hangers and Supports for Plumbing Piping and Equipment

12

13REFERENCE

14Applicable provisions of Division 1 govern work under this section.

15

16QUALITY ASSURANCE

17Substitution of Materials: Refer to Division 1 – Basic Requirements.

18

19Plumbing products requiring approval by the State of Wisconsin Dept. of Commerce must be approved or
20have pending approval at the time of shop drawing submittal.

21

22SUBMITTALS

23Include data concerning sizes, utility sizes, rough in-dimensions, capacities, materials of construction,
24ratings, weights, trim, finishes, manufacturer's installation requirements, manufacturer's performance
25limitations and appropriate identification.

26

27DESIGN CRITERIA

28ANSI A112.6.1M-88 – Supports for Off-the Floor Plumbing Fixtures for Public Use.

29ANSI A112.19.2M-82 – Vitreous China Plumbing Fixtures.

30ANSI A112.19.5-79(R1990) – Trim for Water Closet Bowls, Tanks and Urinals

31ANSI A112.18.1-94-Finished Rough Brass Plumbing Fixture Fittings

32

33

PART 2 – PRODUCTS

34

35

36PLUMBING FIXTURES

37Manufacturers: Fixture descriptions establish fixture type, quality, materials, features and size. Products of
38the following manufacturers determined as equal by the Architect/Engineer will be accepted.

39 Water Closets – American Standard, Kohler, Zurn, Sloan

40 Flush Valves - Sloan, Zurn, Coyne & Delany

41 Water Closet Seats – Bemis, Beneke, Centoco, Olsonite Sperzel.

42

43 Sinks – Elkay, Just, Bradley, Sloan

44 Faucets – Chicago Faucet, Kohler, Speakman, Symmons, Sloan, Zurn.

45 Stops and Supplies – Chicago Faucet Co., T&S Brass, McGuire, Sioux Chief

46 (Heavy Duty Type Only)

47 Traps – Kohler, McGuire, Dearborn, Engineered Brass Co. (17 Gauge Min.), Sioux Chief

48 Carrier and Supports – Josam, Smith, Wade, Zurn

49

50

51

52Water Closet WC-1:

53 Wall hung, back outlet, white vitreous siphon jet water closet with elongated bowl, 1-1/2" top

54 spud, 2-5/2" passageway, 1.6 gallon flush, white open front seat, less cover, 24 volt operated flush

55 valve with remote push button control.

3RFB No. 318057

Commercial Plumbing Fixtures

4

22 42 00-1

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Fixture: Kohler “Kingston” K-4330

Flush Valve: Sloan “royal” Model 111-ES-S, with EL-154 transformer and EL-482-A electrical box/positioning support kit, and EL-172-A electric push button, 24 volt.

Seat: Bemis 1055SSC self-sustaining concealed check hinge.

Carrier: Commercial grade for a minimum of 650 pound support. Install WC-2 @ 17” to rim.

15 Sink S-1:

Counter mounted 18 Ga. Type 302 stainless steel single compartment sink with 3 faucet openings 4” on center, deck mounted faucet with 4” wrist blade handles and gooseneck spout.

Fixture: Elkay LR-2219

Faucet: Chicago Faucet Model 201-ACN8AE3-317XXCP

Drain: Elkay LK-18 open grid strainer

Trap: 1-1/2” x 1-1/2” 17 gauge P-Trap

Supplies & Stops: McGuire H2165LK with loose key handles.

PART 3 – EXECUTION

35 INSTALLATION

36 Verify the existing water closet rough-in dimensions before ordering new units.

37
38 Install all plumbing fixtures in accordance with manufacturer’s instructions. Set level and plumb. Secure
39 in place to counters, floors and walls providing solid bearing and secure mounting. Bolt fixture carriers to
40 floor and wall. Secure rough-in fixture piping to prevent movement exposed piping.

41
42 Install each fixture with trap easily removable for servicing and cleaning. Install fixture stops in readily
43 accessible location for servicing.

44
45 Install barrier free fixtures in compliance with IBC 1108 and 3408, COMM 69 and Federal ADA
46 Accessibility guidelines. Install barrier free lavatory traps parallel and adjacent to wall and supplies and
47 stops elevated to avoid contact by wheelchair users.

48
49 Each fixture shall have a stop valve installation to control the fixture. Stop valves shall be heavy duty type
50 with brass stems and screwed or sweat inlet connections. Compression type inlets are not acceptable.

51
52 Cover pipe penetrations with escutcheons. Exposed traps, stops, piping and escutcheons to be chrome
53 plated brass, same items in concealed locations may be of rough brass finish.

1
2

1 Seal openings between walls, floors and fixtures with mildew-resistant silicone sealant same color as
2 fixture.

3

4 Test fixtures to demonstrate proper operation. Replace malfunctioning units or components. Adjust valves
5 for intended water flow rate to fixtures without splashing, noise or overflow.

6

7 Protect fixtures during construction. At completion clean plumbing fixtures and trim using manufacturer's
8 recommended cleaning methods and materials.

9

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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 two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections.

RELATED WORK

Section 23 05 13 - Common Motor Requirements for HVAC.
Section 23 33 00 - Air Duct Accessories.

REFERENCE

Applicable provisions of Division 00 - Contracting Requirements and Division 01- General Requirements govern work under all Division 23 Sections.

REFERENCE STANDARDS

Abbreviations of standards organizations referenced in other sections are as follows:

AABC	Associated Air Balance Council
ADC	Air Diffusion Council
AAMCA	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.
UL	Underwriters Laboratories 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

Refer to Division 01, General Requirements, Equals and Substitutions.

Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and for obtaining the performance from the system into which these items are placed. This may include changes found necessary during the testing, adjusting, and balancing phase of the project.

PROTECTION OF FINISHED SURFACES

Refer to Division 01, General Requirements, Protection of Finished Surfaces.

Furnish one can of touch-up paint for each different color factory finish which is to be the final finished surface of the product. Deliver touch-up paint with other "loose and detachable parts" as covered in the General Requirements.

SLEEVES AND OPENINGS

Refer to Division 01, General Requirements, Sleeves and Openings.

1
2
3 **SEALING AND FIRE STOPPING**

4 Sealing and fire stopping of sleeves/openings between ductwork, piping, etc. and the sleeve, structural or
5 partition opening shall be the responsibility of the contractor whose work penetrates the opening. Provide
6 all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with section
7 07 84 00 Fire Stopping.
8

9 **SUBMITTALS**

10 Refer to Division 01, General Requirements, Submittals.

11
12 Submit for all equipment and systems as indicated in the respective specification sections, marking each
13 submittal with that specification section number. Mark general catalog sheets and drawings to indicate
14 specific items being submitted and proper identification of equipment by name and/or number, as indicated
15 in the contract documents.
16

17 Before submitting electrically powered equipment, verify that the electrical power and control requirements
18 for the equipment are in agreement with the electrical drawings. Include a statement on the shop drawing
19 transmittal to the architect/engineer that the equipment submitted and the motor starter schedules are in
20 agreement or indicate any discrepancies. See related comments in Section 23 05 13 in Part 1 under Electrical
21 Coordination.
22

23 Include wiring diagrams of electrically powered equipment.
24

25 Submit sufficient quantities of shop drawings to allow the following distribution:

- 26 • Operating and Maintenance Manuals 2 copies
- 27 • Testing, Adjusting and Balancing Contractor 1 copy
- 28 • Owner 1 copy
- 29 • A/E 1 copy
- 30
- 31 • Electronic copies may be submitted in lieu of paper copies. Entire submittal may not be
32 returned, only a Submittal Review Form with status of the submittal and any comments and
33 potentially selected sheets of the submittal with comments noted. Retain copies of the submittal
34 and submittal review on jobsite.
35

36 **CERTIFICATES AND INSPECTIONS**

37 Refer also to Division 01, General Requirements, Permits, Regulations, Utilities and Taxes.
38

39 Obtain and pay for all required State installation inspections except those provided by the Architect/Engineer
40 in accordance with code. Deliver originals of these certificates to the Division Project Representative.
41 Include copies of the certificates in the Operating and Maintenance Instructions.
42

43 **OPERATION AND MAINTENANCE DATA**

44 All operations and maintenance data shall comply with the submission and content requirements specified
45 under section GENERAL REQUIREMENTS.
46

47 In addition to the general content specified under GENERAL REQUIREMENTS supply the following
48 additional documentation:

- 49 1. Records of tests performed to certify compliance with system requirements
- 50 2. Certificates of inspection by regulatory agencies
- 51 3. Valve schedules
- 52 4. Lubrication instructions, including list/frequency of lubrication
- 53 5. Copies of all approved shop drawings.
- 54 6. Manufacturer's wiring diagrams for electrically powered equipment
- 55 7. Temperature control record drawings and control sequences
- 56 8. Parts lists for manufactured equipment
- 57 9. Warranties
- 58 10. Additional information as indicated in the technical specification sections
59

60 **TRAINING OF OWNER PERSONNEL**

61 Instruct owner personnel in the proper operation and maintenance of systems and equipment provided as part
62 of this project. Include not less than one hour of instruction, using the Operating and Maintenance manuals
63 during this instruction. All training to be during normal working hours.
64

1 **RECORD DRAWINGS**

2 Refer to Division 01, General Requirements, Record Drawings.

3
4 In addition to the data indicated in the General Requirements, maintain temperature control record drawings
5 on originals prepared by the installing contractor/subcontractor. Include copies of these record drawings with
6 the Operating and Maintenance manuals.
7

8
9 **PART 2 - PRODUCTS**

10
11 **ACCESS PANELS AND DOORS**

12
13 **LAY-IN CEILINGS:**

14 Removable lay-in ceiling tiles in 2 X 2 foot or 2 X 4 foot configuration provided under Section 09500 are
15 sufficient; no additional access provisions are required unless specifically indicated.
16

17 **GYPSON WALL BOARD WALLS AND CEILINGS:**

18 16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general applications,
19 stainless steel for use in toilets, showers, and similar wet areas, concealed hinges, screwdriver operated cam
20 latch for general applications, key lock for use in public areas, UL listed for use in fire rated partitions if
21 required by the application. Use the largest size access opening possible, consistent with the space and the
22 equipment needing service; minimum size is 12" by 12".
23

24 **SEALING**

25
26 **NON-RATED PENETRATIONS:**

27
28 **Pipe Penetrations:**

29 At pipe penetrations of non-rated interior walls, floors and exterior walls above grade, use urethane caulk in
30 annular space between pipe insulation and sleeve. For non-rated drywall, plaster or wood walls where sleeve
31 is not required use urethane caulk in annular space between pipe insulation and wall material.
32

33 **Duct Penetrations:**

34 Annular space between duct (with or without insulation) and the non-rated walls or floor opening shall not
35 be larger than 2". Where existing openings have an annular space larger than 2", the space shall be patched
36 to match existing construction to within 2" around the duct.
37

38 Where shown or specified, pack annular space with fiberglass batt insulation or mineral wool insulation.
39 Provide 4" sheet metal escutcheon around duct on both sides of partition or floor to cover annular space.
40

41
42 **PART 3 - EXECUTION**

43
44 **DEMOLITION**

45 Perform all demolition as indicated on the drawings to accomplish new work.

46 All pipe, wiring and associated conduit, insulation, ductwork, and similar items demolished, abandoned, or
47 deactivated are to be removed from the site by the Contractor. All piping and ductwork specialties are to be
48 removed from the site by the Contractor unless they are dismantled and removed or stored by the owner
49 Maintain the condition of material and/or equipment that is indicated to be reused equal to that existing before
50 work began.
51

52 **CUTTING AND PATCHING**

53 Refer to Division 01, General Requirements, Cutting and Patching.
54
55

56 **EQUIPMENT ACCESS**

57 Install all conduit, ductwork, and accessories to permit access to equipment for maintenance and service.
58

59 **COORDINATION**

60 Verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not
61 limited to, diffusers, register, grilles, and recessed or semi-recessed heating and/or cooling terminal units
62 installed in/on architectural surfaces.
63

1 Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated
2 and that interferes with other contractor's work shall be removed or relocated at the installing contractor's
3 expense.
4

5 Cooperate with the test and balance agency in ensuring Section 23 05 93 specification compliance. Verify
6 system completion to the test and balance agency (flushing, pressure testing, chemical treatment, filling of
7 liquid systems, proper pressurization and air venting of hydronic systems, clean filters, clean strainers, duct
8 and pipe systems cleaned, controls adjusted and calibrated, controls cycled through their sequences, etc.),
9 ready for testing, adjusting and balancing work. Install dampers, shutoff and balancing valves, flow
10 measuring devices, gauges, temperature controls, etc., required for functional and balanced systems.
11

12 **DUCT SLEEVES:**

13 Duct sleeves are not required in non-rated partitions or floors.
14

15 **END OF SECTION**
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4 **SECTION 23 05 93**
5 **TESTING, ADJUSTING, AND BALANCING FOR HVAC**

6
7 **PART 1 - GENERAL**

8
9 **SCOPE**

10 This section includes air and water testing, adjusting and balancing for equipment installed or reinstalled as
11 part of this project including VAV terminals, hot water radiation, cabinet unit heaters and exhaust fans.

12
13 **RELATED WORK**

14 Section 23 05 00 - Common Work Results for HVAC
15 Section 23 07 00 - HVAC Insulation
16 Section 23 09 14 - HVAC Control
17 Section 23 09 93 - Sequence of Operation for HVAC Controls
18 Section 23 37 13 – Diffusers, Registers and Grilles

19
20 **REFERENCE**

21 Applicable provisions of Division 01, General Requirements govern work under this section.

22
23 **REFERENCE STANDARDS**

24 AABC National Standards for Total System Balance, Sixth Edition, 2002.
25 ASHRAE ASHRAE Handbook, 2007 HVAC Applications, Chapter 37, Testing Adjusting and
26 Balancing.
27 NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems, Seventh
28 Edition, 2005.
29 TABB Tab Procedural Guide, First Edition, 2003.

30
31 **DESCRIPTION**

32 The Contractor will separately contract with an independent test and balance agency to perform all testing,
33 adjusting, and balancing of air and hydronic systems required for this project. Work related to the testing,
34 adjusting, and balancing that must be performed by the installing mechanical contractor is specified in other
35 section of these specifications.

36
37 Provide mechanical systems testing, adjusting and balancing as described in this section and indicated on
38 the drawings. Requirements include the balance of air and water distribution, adjustment of new and existing
39 systems and equipment to provide design requirements indicated on the drawings, electrical measurement
40 and verification of performance of all mechanical equipment, all in accordance with standards published by
41 AABC, NEBB, or TABB.

42
43 Test, adjust and balance all air and hydronic systems so that each room, piece of equipment or terminal device
44 meets the design requirements indicated on the drawings and in the specifications.

45
46 Verify that provisions are being made to accomplish the specified testing, adjusting and balancing work. If
47 problems are found, handle as specified in Part 3 under Deficiencies.

48
49 **QUALITY ASSURANCE**

50
51 **Qualifications**

52 An independent Firm specializing in the Testing and Balancing of HVAC systems for a minimum of 3 years.
53 A Firm not engaged in the commerce of furnishing or providing equipment or material generally related to
54 HVAC work other than that specifically related to installing Testing and Balancing components necessary
55 for work in this section such as, but not limited to sheaves, pulleys, and balancing dampers.

56
57 A certified member of AABC or certified by NEBB or TABB in the specific area of work performed.
58 Maintain certification for the entire duration of the project..

59
60 **SUBMITTALS**

61 See also Related Work in this section.

62
63 Submit testing, adjusting and balancing reports bearing the seal and signature of the NEBB, AABC or TABB
64 Certified Test and Balance Supervisor. The reports certify that the systems have been tested, adjusted and
65 balanced in accordance with the referenced standards; are an accurate representation of how the systems have

1 been installed and are operating; and are an accurate record of all final quantities measured to establish normal
2 operating values of the systems.

3
4 Format: Cover page identifying project name, project number and descriptive title of contents. Divide the
5 contents of the report into the below listed divisions:

- 6
- 7 * General Information
- 8 * Summary
- 9 * Air Systems

10
11 Contents: Provide the following minimum information, forms and data:

12
13 General Information: Inside cover sheet identifying Test and Balance Agency, Contractor, Architect,
14 Engineer, Project Name and Project Number. Include addresses, contact names and telephone numbers. Also
15 include a certification sheet containing the seal and signature of the Test and Balance Supervisor.

16
17 Summary: Provide summary sheet describing mechanical system deficiencies. Describe objectionable noise
18 or drafts found during testing, adjusting and balancing. Provide recommendations for correcting
19 unsatisfactory performances and indicate whether modifications required are within the scope of the contract,
20 are design related or installation related. List instrumentation used during testing, adjusting and balancing
21 procedures.

22
23 The remainder of the report to contain the appropriate standard NEBB, AABC, or TABB forms for each
24 respective item and system. Fill out forms completely. Where information cannot be obtained or is not
25 applicable indicate same.

26 27 28 **PART 2 - PRODUCTS**

29 30 **INSTRUMENTATION**

31 Provide all required instrumentation to obtain proper measurements. Application of instruments and
32 accuracy of instruments and measurements to be in accordance with the requirements of NEBB, AABC, or
33 TABB Standards and instrument manufacturer's specifications.

34
35 All instruments used for measurements shall be accurate, and calibration histories for each instrument to be
36 available for examination upon request. Calibration and maintenance of all instruments to be in accordance
37 with the requirements of NEBB, AABC, or TABB Standards

38 39 40 **PART 3 - EXECUTION**

41 42 **PRELIMINARY PROCEDURES**

43
44 Review preconstruction meeting report, applicable construction bulletins, applicable change orders and
45 approved shop drawings of equipment, outlets/inlets and temperature controls.

46
47 Check dampers and valves for correct positioning, equipment for proper rotation and belt tension,
48 temperature controls for completion of installation and hydronic systems for proper charge and purging of
49 air.

50
51 Identify deficiencies preventing completion of testing, adjusting and balancing procedures. Do not proceed
52 until systems are fully operational with all components necessary for complete testing, adjusting and
53 balancing. Installing Contractors are required to provide personnel to check and verify system completion,
54 readiness for balancing and assist Balancing Agency in providing specified system performance.

55 56 **PERFORMING TESTING, ADJUSTING AND BALANCING**

57 Perform testing, adjusting and balancing procedures on each system identified, in accordance with the
58 detailed procedures outlined in the referenced standards except as may be modified below.

59
60
61 In areas containing ceilings, remove ceiling tile to accomplish balancing work; replace tile when work is
62 complete and provide new tile for any tile that are damaged by this procedure

63
64 Cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary for
65 adequate performance of procedures. Patch using materials identical to those removed, maintaining vapor
66 barrier integrity and pressure rating of systems.

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Adjust register, grille and diffuser vanes and accessories to achieve proper air distribution patterns and uniform space temperatures free from objectionable noise and drafts within the capabilities of the installed system.

Final air system measurements to be within the following range of specified cfm:

Fans	0% to +10%
Supply grilles, registers, diffusers	0% to +10%
Return/exhaust grilles, registers	0% to -10%

Contact the temperature control contractor for assistance in operation and adjustment of controls during testing, adjusting and balancing procedures. Cycle controls and verify proper operation and setpoints. Include in report description of temperature control operation and any deficiencies found.

Leave systems in proper working order, replacing belt guards, closing access doors and electrical boxes, and restoring temperature controls to normal operating settings.

DEFICIENCIES

Division 23 00 00 contractor to correct any installation deficiencies found by the test and balance agency that were specified and/or shown on the Contract Documents to be performed as part of that division of work. Test and balance agency will notify the Owner's Project Representative of these items and instructions will be issued to the Division 23 00 00 contractor for correction of the deficient work. All corrective work to be done at no cost to Dane County. Retest mechanical systems, equipment, and devices once corrective work is complete as specified.

END OF SECTION

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SECTION 23 07 00
HVAC INSULATION

PART 1 - GENERAL

SCOPE

This section includes insulation specifications for heating, ventilating and air conditioning piping, ductwork and equipment.

RELATED WORK

Section 23 05 00 - Common Work Results for HVAC
Section 23 21 13 - Hydronic Piping
Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment
Section 23 31 00 - HVAC Ducts
Section 23 33 00 - Air Duct Accessories

REFERENCE

Applicable provisions of Division 01, General Requirements govern work under this section.

REFERENCE STANDARDS

ASTM C165 Test Method for Compressive Properties of Thermal Insulations
ASTM C177 Heat Flux and Thermal Transmission Properties
ASTM C302 Density of Preformed Pipe Insulation
ASTM C355 Test Methods for Test for Water Vapor Transmission of Thick Materials
ASTM C518 Heat Flux and Thermal Transmission Properties
ASTM C547 Mineral Fiber Preformed Pipe Insulation
ASTM C921 Properties of Jacketing Materials for Thermal Insulation
ASTM D5590 Test Method for Determining the Resistance of Coatings to Fungal Defacement
ASTM E84 Surface Burning Characteristics of Building Materials
ASTM E814 Standard Test Method for Fire Tests of Penetration Firestop Systems
MICA National Commercial & Industrial Insulation Standards
NFPA 225 Surface Burning Characteristics of Building Materials
UL 723 Surface Burning Characteristics of Building Materials

QUALITY ASSURANCE

Refer to Division 01, General Requirements, Equals and Substitutions

Insulation systems shall be applied by experienced contractors.

DESCRIPTION

Furnish and install all insulating materials and accessories as specified or as required for a complete installation. The following types of insulation are specified in this section:

- * Duct Insulation

Install all insulation in accordance with the latest edition of MICA (Midwest Insulation Contractors Association) Standard and manufacturer's installation instructions. Exceptions to these standards will only be accepted where specifically modified in these specifications.

SHOP DRAWINGS

Refer to Division 01, General Requirements, Submittals.

Submit a schedule of all insulating materials to be used on the project, including adhesives, fastening methods, fitting materials along with material safety data sheets and intended use of each material. Include manufacturer's technical data sheets indicating density, thermal characteristics, jacket type, and manufacturer's installation instructions.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

ENVIRONMENTAL REQUIREMENTS

Do not store insulation materials on grade or where they are at risk of becoming wet. Do not install insulation products that have been exposed to water.

1
2
3 **PART 2 - PRODUCTS**

4 **MATERIALS**

5 Manufacturers: CertainTeed, Manson, Childers, Dow, Extol, Fibrex, Halstead, Foster, Imcoa, Johns
6 Manville, Knauf, Owens-Corning, VentureTape or approved equal.

7 Use composite insulation systems (insulation, jackets, sealants, mastics, and adhesives) that have a flame
8 spread rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions:

9
10 Pipe insulation which is not located in an air plenum may have a flame spread rating not over 25 and a smoke
11 developed rating no higher than 450 when tested in accordance with UL 723 and ASTM E84.

12
13 **INSULATION TYPES**

14 Insulating materials shall be fire retardant, moisture and mildew resistant, and vermin proof. Insulation shall
15 be suitable to receive jackets, adhesives and coatings as indicated.

16
17 **FLEXIBLE FIBERGLASS INSULATION:**

18 Minimum nominal density of 0.75 lbs. per cu. ft., and thermal conductivity of not more than 0.30 at 75
19 degrees F, rated for service to 250 degrees F.

20
21
22 **ADHESIVES, MASTIC, SEALANTS, AND REINFORCING MATERIALS**

23 Products shall be compatible with surfaces and materials on which they are applied, and shall be suitable for
24 use at operating temperatures of systems to which they are applied.

25
26 **FIBERGLASS INSULATION ADHESIVE:**

27 Must comply with ASTM C916, Type II: Foster 85-60, Childers CP-127, Duro Dyne SSG.

28
29 **VAPOR RETARDING MASTIC:**

30 Below ambient equipment/piping insulation, mastic water vapor permeance shall be less than 0.03 perms at
31 45 mils dry film thickness per ASTM E 96: Foster 30-65 Vapor Fas, Childers CP-34,
32 Vimasco 749.

33
34 **JACKETS**

35 **FOIL SCRIM ALL SERVICE JACKETS (FSJ):**

36 Glass fiber reinforced foil kraft laminate, factory applied to insulation. Maximum permeance of .02 perms
37 and minimum beach puncture resistance of 25 units.

38
39 **ACCESSORIES**

40 All products shall be compatible with surfaces and materials on which they are applied, and be suitable for
41 use at operating temperatures of the systems to which they are applied.

42
43 Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for
44 applications specified.

45
46 Insulation bands to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be
47 0.015 inch for aluminum and 0.010 inch for stainless steel.

48
49 Tack fasteners to be stainless steel ring grooved shank tacks.

50
51 Staples to be clinch style.

52
53 Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.

54
55 Finishing cement to be ASTM C449.

56
57 Fibrous glass or canvas fabric reinforcing used with lagging adhesive shall have a minimum untreated weight
58 of 6 oz./sq. yd.

59
60 Joint sealants and metal jacketing sealants to be non-shrinking and permanently flexible.

61
62 Vapor retarding coatings to have maximum applied water vapor permeance of 0.03 perms or less at 45 ,ils
63 dry as tested by ASTM E96.

64
65 Fungicidal water base duct liner coating (Foster 40-20 or equal) to be compatible with vapor retarding
66 coating. This product must be EPA registered to be used inside HVAC ducts. Coating must comply with
67 ASTM D 5590 with 0 growth rating.

1
2
3 **PART 3 - EXECUTION**
4

5 **EXAMINATION**

6 Verify that all piping, equipment, and ductwork are tested and approved prior to installing insulation. Do not
7 insulate systems until testing and inspection procedures are completed.
8

9 **INSTALLATION**

10 All materials shall be installed in strict accordance with manufacturer's recommendations, building codes,
11 and industry standards.
12

13 Locate insulation and cover seams in the least visible location. All surface finishes shall be extended in such
14 a manner as to protect all raw edges, ends and surfaces of insulation.
15

16 Provide neatly beveled and coated terminations at all nameplates, uninsulated fittings, or at other locations
17 where insulation terminates.
18

19 Use full length material (as delivered from manufacturer) wherever possible. Scrap piecing of insulation or
20 pieces cut undersize and stretched to fit will not be accepted.
21

22 All pipe and duct insulation shall be continuous through walls, Vapor retarding jacket shall be maintained
23 continuous through all penetrations.
24

25 Provide a continuous unbroken moisture vapor retarding jacket on insulation applied to systems noted below.
26 Attachments to cold surfaces shall be insulated and vapor sealed to prevent condensation.
27

28 Provide a complete vapor retarding jacket for insulation on the following systems:

- 29 * Insulated Duct
- 30 * Equipment, ductwork or piping with a surface temperature below 65 degrees F

31
32 **PROTECTIVE JACKET INSTALLATION**

33 **PVC FITTING COVERS AND JACKETS (PFJ):**

34 Lap seams and joints a minimum of 2 inches and continuously seal PVC with welding solvent recommended
35 by jacket manufacturer. Lap slip joint ends 4" without fasteners where required to absorb expansion and
36 contraction. For sections where vapor retarding jacket is not required and jacket requires routine removal,
37 tack fasteners may be used. Secure PVC fitting covers with tack fasteners. For systems requiring a vapor
38 retarding jacket, apply a 1-1/2" band of mastic over ends, throat, seams and penetrations.
39

40 **ALL SERVICE JACKETS (ASJ) and FOIL SCRIM ALL SERVICE JACKETS (FSJ):**

41 Install according to manufacturer's recommendations using factory supplied lap seals and butt strip seals.
42

43 **DUCT INSULATION**

44 **GENERAL:**

45 Secure flexible duct insulation on sides and bottom of ductwork over 24" wide and all rigid duct insulation
46 with weld pins. Space fasteners 18" on center or less as required to prevent sagging.
47

48 Stop and point insulation around access doors and damper operators to allow operation without disturbing
49 insulation or jacket material.
50

51 Where rigid board or flexible insulation is specified, install high density inserts to prevent the weight of the
52 ductwork from crushing the insulation.
53

54 **DUCT INSULATION SCHEDULE:**

55 Provide duct insulation on new and existing remodeled ductwork in the following schedule:
56

SERVICE	INSULATION TYPE	JACKET	THICKNESS
Concealed supply ducts	Flexible Fiberglass	FSJ	1-1/2"

57
58 * Exposed supply branch ducts located in the space they are serving do not require insulation. Exposed
59 supply main ducts running through spaces they serve shall be insulated as exposed supply ducts scheduled
60 above.
61
62

63 **END OF SECTION**

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**SECTION 23 09 14
HVAC CONTROL**

PART 1 - GENERAL

SCOPE

This sections includes control system specifications for all HVAC

RELATED WORK

Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC - Coordination

REFERENCE

Applicable provisions of Division 01, General Requirements govern work under this section.

QUALITY ASSURANCE

Installing Contractor: Johnson Controls, Inc. Madison, WI

SYSTEM DESCRIPTION

The existing building HVAC control system is a Johnson Controls Metasys Expanded Architecture Building Automation System.

Existing VAV-E:

Control work in this project is the removal of existing VAV terminals thermostat/sensor at the present location within the renovation area and reinstallation in the location indicated on the new work plan for existing VAV-E presently serving the space.

Existing VAV-A:

This existing VAV terminal is ducted into the renovation space and capped. Provide and install a thermostat/sensor at location indicated on the new work plan and other required control devices compatible with the existing building control system to control existing VAV-A.

SUBMITTALS

Include the following information:

Manufacturer's data sheets indicating model number, pressure/temperature ratings, capacity, methods and materials of construction, installation instructions, and recommended maintenance. General catalog sheets showing a series of the same device is not acceptable unless the specific model is clearly marked.

Provide a complete set of control Record Drawings incorporating the changes required for this project.

DEMOLITION

Remove all controls to equipment be removed including control devices, wiring and conduit.

Maintain devices to be reinstalled or devices to remain in existing location to be reused.

PART 2 - PRODUCTS

CONTROL DEVICES

Provide all required control components to provide control of as described in this section.

PART 3 - EXECUTION

SEQUENCE OF OPERATION

The sequence of operation shall remain the same as existing.

INSTALLATION

Install system with trained mechanics and electricians employed by the control equipment manufacturer or an authorized representative of the manufacturer. Where installing contractor is an authorized representative of the control manufacturer, such authorization shall have been in effect for a period of no less than three years.

Install all control equipment, accessories and wiring, in a neat and workmanlike manner. All control devices must be installed in accessible locations.

1
2 Provide all electrical relays and wiring, line and low voltage, for control systems, devices and components.
3 Install all high voltage and low voltage wiring (includes low voltage cable) in metal conduit, Electrical Non-
4 metallic Tubing (ENT), or Electrical Metallic Tubing (EMT), as scheduled below and hereafter referred to
5 generically as conduit except above accessible ceilings as noted below. See Wire Conduit Installation
6 Schedule below for specific conduit or tubing to be used. All raceways, enclosures, fittings and associated
7 supports shall be provided and installed according to the requirements set forth in Division 16, NFPA 90
8 (NEC) and Chapter SPS 316 of the Wisconsin Administrative Code. All conduits shall be routed parallel
9 and/or perpendicular to walls and adjacent piping. Raceways shall be located to maintain headroom and
10 working clearance around equipment and devices that require inspection and service.

11
12 In general, support all raceways from the building structure. No component of a raceway system shall be
13 secured to corrugated metal roof deck. Do not impose on the installations of other trades. Securing conduit,
14 rods, straps, hangers, etc. to suspended ceiling components, electrical raceways, plumbing piping, fire
15 protection sprinkler piping, HVAC piping or ductwork, or their associated support systems, will not be
16 accepted.

17
18 Conduit shall be a minimum of 1/2 " for low voltage control provided the pipe fill does not exceed 40%.

19
20 Minimum low voltage wiring gauge to be 18 AWG for outputs and 20 AWG for inputs. All low voltage
21 wiring to be stranded.

22
23 Low voltage wiring can be run without conduit above accessible lay-in tile ceilings. All wiring in mechanical
24 rooms, above inaccessible hard ceilings, exterior locations, and in any exposed areas, and in all other
25 locations shall be in conduit. Wire for wall sensors shall be run in conduit. Wiring for radiation valves shall
26 be run in conduit where routed through walls.

27
28 Where wiring is installed free-air, installation shall comply with the following:

- 29 • Wiring shall run at right angles and be kept clear of other trades work.
- 30 • Wiring shall be supported utilizing "J" or "Bridal-type" steel mounting rings anchored to ceiling
31 concrete, piping supports, walls above ceiling or structural steel beams. Mounting rings shall be of
32 open design (not a closed loop) to allow additional wire to be strung without being threaded through
33 the ring. For mounting rings that do not completely surround the wire, attach the wire to the mounting
34 ring with a strap.
- 35 • Supports shall be spaced at a maximum 4-foot interval unless limited by building construction. If
36 wiring "sag" at mid-span exceeds 6-inches; another support shall be used.
- 37 • Wall penetrations shall be sleeved and fire stopped as specified.
- 38 • Wiring shall not be supported from existing cabling, existing tubing, plumbing or steam piping,
39 ductwork, any component of a suspended ceiling, or electrical or communications conduit.

40
41 **WIRE CONDUIT AND TUBING INSTALLATION SCHEDULE**

42 The following conduit schedule shall apply to wire in conduit where conduit is specified wiring.

43
44 Conduit other than that specified below for specific applications shall not be used.

45
46 Concealed or Exposed Dry Interior Locations: Rigid steel conduit. Intermediate metal conduit. Electrical
47 metallic tubing.

48
49 **ROOM THERMOSTATS AND TEMPERATURE SENSORS**

50 Reinstall existing thermostats / sensors currently controlling the existing VAV terminal presently serving the
51 renovation area and install new thermostats / sensors to control the VAV presently ducted into space and
52 capped.

53
54 Check and verify location of thermostats and other exposed control sensors with plans and room details
55 before installation. Locate room thermostats and sensors with occupant adjustment 48 inches above floor.
56 Align with light switches. For drywall installations, thermostat mounting shall use a back-box attached to a
57 wall stud, drywall anchors are not acceptable.

58
59 **OWNER TRAINING**

60 Formal training is not required. Review the work of installation for this project with the Owners
61 representative and maintenance staff.

62
63 **END OF SECTION**

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SECTION 23 31 00
HVAC DUCTS

PART 1 - GENERAL

SCOPE

This section includes specifications for all duct systems used on this project.

RELATED WORK

Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC

Section 23 33 00 - Air Duct Accessories

Section 23 37 13 - Diffusers, Registers and Grilles

REFERENCE

Applicable provisions of Division 01, General Requirements govern work under this Section.

REFERENCE STANDARDS

ANSI SS-EN 485-2	Aluminum and Aluminum Alloys-Sheet, Strip and Plate-Part 2: Mechanical Properties
ASTM B209	Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM A90	Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles
ASTM A623	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
ASTM A527	Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality
ASTM 924	Standard Specification for General Requirements for Sheet Steel, Metallic-coated by the Hot-dip Method
ASTM C 1071	Specification for Fibrous Glass Duct Lining Insulation
ASTM E 84	Test Method for Surface Burning Characteristics of Building Materials
ASTM C 1338	Test Method for Determining Fungal Resistance of Insulation Materials and Facings
ASTM G 21	Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
ASTM C 916	Standard Specification for Adhesives for Duct Thermal InsulationNFPA 90A Standard for the Installation of Air Conditioning and Ventilating Systems
UL 181	Standard for Safety for Factory Made Air Ducts and Air Connectors.
NAIMA	Fibrous Glass Duct Liner Standard

QUALITY ASSURANCE

Refer to Division 01, General Requirements, Equals and Substitutions.

SHOP DRAWINGS

Refer to Division 01, General Requirements, Submittals.

Include manufacturer's data and/or Contractor data for the following:

- * Fabrication and installation drawings.
- * Duct sealant and gasket material.
- * Duct liner including data on thermal conductivity, air friction correction factor, and limitation on temperature and velocity.

DESIGN CRITERIA

Construct all ductwork to be free from vibration, chatter, objectionable pulsations and leakage under specified operating conditions.

Use material, weight, thickness, gauge, construction and installation methods as outlined in the following SMACNA publications, unless noted otherwise:

- * HVAC Duct Construction Standards, Metal and Flexible, 3rd Edition, 2005
- * HVAC Air Duct Leakage Test Manual, 2nd Edition, 2012
- * HVAC Systems - Duct Design, 4th Edition, 2006

1
2 Use products which conform to NFPA 90A, possessing a flame spread rating of not over 25 and a smoke
3 developed rating no higher than 50.

4
5 **DELIVERY, STORAGE AND HANDLING**

6 Promptly inspect shipments to ensure that Ductwork is undamaged and complies with the specification.

7
8 Protect Ductwork against damage.

9
10 Protect Ductwork by storing inside or by durable, waterproof, above ground packaging. Do not store material
11 on grade. Protect Ductwork from dirt, dust, construction debris and foreign material. Where end
12 caps/packaging are provided, take precautions so caps/packaging remain in place and free from damage.

13
14 Offsite storage agreements do not relieve the contractor from using proper storage techniques.

15
16 Storage and protection methods must allow inspection to verify products.

17
18
19 **PART 2 - PRODUCTS**

20
21 **GENERAL**

22 All sheet metal used for construction of duct shall be 24 gauge or heavier except for round and spiral ductwork
23 and spiral duct take-offs 12" and below may be 26 gauge where allowed in SMACNA HVAC Duct
24 Construction Standards, Metal and Flexible, 3rd Edition, 2005.

25
26 Duct sizes indicated on plans are net inside dimensions; where duct liner is specified, dimensions are net,
27 inside of liner.

28
29 **DUCTWORK PRESSURE CLASS**

30
31 Minimum acceptable duct pressure class, for all ductwork except transfer ductwork, is 2 inch W.G. positive
32 or negative, depending on the application. Transfer ductwork minimum acceptable duct pressure class is 1
33 inch W.G. positive or negative, depending on the application. Duct system pressure classes not indicated on
34 the drawings to be as follows:

35
36

Supply duct downstream of VAV terminals	___1___ in. calc. S.P.	___2___ in. pressure class
Transfer air ducts	___1___ in. calc. S.P.	___1___ in. pressure class
Exhaust air ducts	___1___ in. calc. S.P.	___2___ in. pressure class
Return air ducts	___1___ in. calc. S.P.	___2___ in. pressure class

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41 **MATERIALS**

42 **GALVANIZED STEEL SHEET:**

43 Use ASTM A 653 galvanized steel sheet of lock forming quality. Galvanized coating to be 1.25 ounces per
44 square foot, both sides of sheet, G90 in accordance with ASTM A90. Provide "Paint Grip" finish or
45 galvanneal sheetmetal for ductwork that will be painted.

46
47 **ALUMINUM SHEET:**

48 Use ANSI/ASTM B209 aluminum sheet, alloy 3003H-14, capable of double seaming without fracture.

49
50 **LOW PRESSURE DUCTWORK (Maximum 2 inch pressure class)**

51 Fabricate and install ductwork in sizes indicated on the drawings and in accordance with SMACNA
52 recommendations, except as modified below.

53
54 Construct so that all interior surfaces are smooth. Use slip and drive or flanged and bolted construction when
55 fabricating rectangular ductwork. Use spiral lock seam construction when fabricating round spiral ductwork.
56 Sheet metal screws may be used on duct hangers, transverse joints and other SMACNA approved locations
57 if the screw does not extend more than 1/2 inch into the duct.

58
59 Use elbows and tees with a center line radius to width or diameter ratio of 1.5 wherever space permits. When
60 a shorter radius must be used due to limited space, install single wall sheet metal splitter vanes in accordance
61 with SMACNA publications, Type RE 3. Where space will not allow and the C value of the radius elbow,
62 as given in SMACNA publications, exceeds 0.31, use rectangular elbows with turning vanes as specified in

1 Section 23 33 00. Square throat-radius heel elbows will not be acceptable. Straight taps or bullhead tees are
2 not acceptable.

3
4 Where rectangular elbows are used, provide turning vanes in accordance with Section 23 33 00.

5
6 Provide expanded take-offs or 45 degree entry fittings for branch duct connections with branch ductwork
7 airflow velocities greater than 700 fpm. Square edge 90-degree take-off fittings or straight taps will not be
8 accepted.

9
10 Button punch snaplock construction will not be accepted on aluminum ductwork.

11
12 Round ducts may be substituted for rectangular ducts if sized in accordance with ASHRAE table of
13 equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by
14 written permission of the Architect/Engineer.

15
16 Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream
17 of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.

18 19 **DUCT SEALANT**

20 Manufacturer: 3M 800, 3M 900, H.B. Fuller/Foster, Hardcast, Hardcast Peal & Seal, Lockformer cold
21 sealant, Mon-Eco Industries, United Sheet Metal, or approved equal. Silicone sealants are not allowed in
22 any type of ductwork installation.

23
24 Install sealants in strict accordance with manufacturer's recommendations, paying special attention to
25 temperature limitations. Allow sealant to fully cure before pressure testing of ductwork, or before startup of
26 air handling systems.

27 28 **GASKETS**

29 **2 INCH PRESSURE CLASS AND LOWER:**

30 Soft neoprene or butyl gaskets in combination with duct sealant for flanged joints.

31 32 33 34 **PART 3 - EXECUTION**

35 36 **INSTALLATION**

37 Verify dimensions at the site, making field measurements and drawings necessary for fabrication and
38 erection. Check plans showing work of other trades and consult with Architect in the event of any
39 interference.

40
41 Make allowances for beams, pipes or other obstructions in building construction and for work of other
42 contractors. Transform, divide or offset ducts as required, in accordance with SMACNA HVAC Duct
43 Construction Standards, Figure 4-7, except do not reduce duct to less than six inches in any dimension and
44 do not exceed an 8:1 aspect ratio. Where it is necessary to take pipes or similar obstructions through ducts,
45 construct easement as indicated in SMACNA HVAC Duct Construction Standards, Figure 4-8, Fig. E. In
46 all cases, seal to prevent air leakage. Pipes or similar obstructions may not pass through high pressure or
47 fume exhaust ductwork.

48
49 Test openings for test and balance work will be provided under Section 23 05 93.

50
51 Provide frames constructed of angles or channels for coils, filters, dampers or other devices installed in duct
52 systems, and make all connections to such equipment including equipment furnished by others. Secure
53 frames with gaskets and screws or nut, bolts and washers.

54
55 Where two different metal ducts meet, the joint shall be installed in such a manner that metal ducts do not
56 contact each other by using proper seal or compound.

57
58 Install all motor operated dampers and connect to or install all equipment furnished by others. Blank off all
59 unused portions of louvers, as indicated on the drawings, with 1-1/2 inch board insulation with galvanized
60 sheet metal backing on both sides.

61
62 Do not install ductwork through dedicated electrical rooms or spaces unless the ductwork is serving this room
63 or space.

64
65 Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

- 1
2 Provide adequate access to ductwork for cleaning purposes.
3
4 Provide temporary capping of ductwork openings to prevent entry of dirt, dust and foreign material.
5
6 Protect diffusers, registers and grilles with plastic wrap or some other approved form of protection to
7 maintain dirt and dust free and to prevent entry of dirt, dust and foreign material into the Ductwork.
8
9 Install prefabricated grease ductwork assemblies in accordance with manufacturer requirements and NFPA
10 96.
11
12 During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent
13 construction dust from entering ductwork system.
14

15 **DUCTWORK SUPPORT**

16 Support ductwork in accordance with SMACNA HVAC Duct Construction Standards, Figure 5-5, except
17 supporting ductwork with secure wire method is not allowed.
18

19 Support with 3/32 inch, 7 x 7, stainless steel air-craft cable, with matching serrated spring loaded wedge
20 mechanism fasteners rated for actual load. Steel cable hanging systems will be allowed on round ductwork
21 under 12 inches diameter if installed utilizing two fasteners with two cable loops. Comply with the
22 manufacturer's installation instructions.
23

24 **CLEANING**

25 Remove all dirt and foreign matter from the entire duct system and clean diffusers, registers, grilles and the
26 inside of air-handling units before operating fans.
27

28 Clean duct systems with high power vacuum machines where systems have been used for temporary heat,
29 air-conditioning, or ventilation purposes during construction. Protect equipment that may be harmed by
30 excessive dirt with filters, or bypass during cleaning.
31

32 **LEAKAGE TEST**

33 Leakage test for ductwork downstream of air terminal devices may be omitted but will not relieve the
34 contractor from duct sealing requirements.
35

36 The Owner and Engineer shall inspect duct for construction and sealing. Based on observation of the
37 construction and sealing the system shall be accepted of the contractor shall be directed to make repairs until
38 the ductwork is acceptable.
39

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41 **END OF SECTION**
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SECTION 23 33 00
AIR DUCT ACCESSORIES

PART 1 - GENERAL

SCOPE

This sections includes accessories used in the installation of duct systems.

RELATED WORK

Section 23 05 29 - Hanger and Supports

Section 23 31 00 - HVAC Ducts

Section 23 37 13 - Diffusers, Registers and Grilles

REFERENCE

Applicable provisions of Division 1 govern work under this Section.

REFERENCE STANDARDS

NFPA 90A Standard for Installation of Air Conditioning and Ventilating Systems

SMACNA HVAC Duct Construction Standards - Metal and Flexible, 2nd Edition, 1995

UL 214

UL 555 (6th edition) Standard for Fire Dampers and Ceiling Dampers

UL 555S (4th edition) Leakage Rated Dampers for Use in Smoke Control Systems

QUALITY ASSURANCE

Refer to Division 01, General Requirements, Equals and Substitutions

SHOP DRAWINGS

Refer to Division 01, General Requirements, Submittals.

Submit for all accessories and include dimensions, capacities, ratings, installation instructions, and appropriate identification.

Include certified test data on dynamic insertion loss, self-noise power levels, and aerodynamic performance of sound attenuators.

Submit manufacturer's color charts where finish color is specified to be selected by the Architect/Engineer.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

PART 2 - PRODUCTS

MANUAL VOLUME DAMPERS

Manufacturers: Ruskin, Vent Products, Air Balance, or approved equal.

Dampers must be constructed in accordance with SMACNA Fig. 2-12, Fig. 2-13, and notes relating to these figures, except as modified below.

Reinforce all blades to prevent vibration, flutter, or other noise. Construct dampers in multiple sections with mullions where width is over 48 inches. Use rivets or tack welds to secure individual components; sheet metal screws will not be accepted. Provide operators with locking devices and damper position indicators for each damper; use an elevated platform on insulated ducts. Provide end bearings or bushings for all volume damper rods penetrating ductwork constructed to a 3" w.c. pressure class or above.

TURNING VANES

Manufacturers: Aero Dyne, Anemostat, Barber-Colman, Hart & Cooley, or approved equal.

Construct turning vanes and runners for square elbows in accordance with SMACNA Fig. 2-3 and Fig. 2-4 except use only airfoil type vanes. Construct turning vanes for short radius elbows and elbows where one dimension changes in the turn in accordance with SMACNA Fig. 2-5 and Fig. 2-6.

FLEXIBLE DUCT

1 Manufacturers: Anco Products, Clevaflex, Thermaflex, Flexmaster or approved equal.

2
3 Factory fabricated, UL 181 listed as a class 1 duct, and having a flame spread of 25 or less and a smoke
4 developed rating of 50 or under in accordance with NFPA 90A.

5
6 Suitable for pressures and temperatures involved but not less than a 180°F service temperature and ±2 inch
7 pressure class, depending on the application.

8
9 Duct to be composed of polyester film, aluminum laminate or woven and coated fiberglass fabric bonded
10 permanently to corrosion resistant coated steel wire helix. Two-ply, laminated, and corrugated aluminum
11 construction may also be used.

12
13 Where duct is specified to be insulated, provide a minimum 1 inch fiberglass insulation blanket with
14 maximum thermal conductance of 0.23 K (75 degrees F.) and vapor barrier jacket of polyethylene or
15 metalized reinforced film laminate. Maximum perm rating of vapor barrier jacket to be 0.1 perm.

16 **DUCT LINING**

17 Manufacturer: Manville, Owens-Corning, Knauf, or approved equal.

18
19 1 inch thick, flexible, mat faced insulation made from inorganic glass fibers bonded with a thermosetting
20 resin with thermal conductivity of .25 Btu inch / hour sq.ft. deg F.

21 Meet erosion testing per UL 181 or ASTM C 1071 for 5000 fpm maximum air velocity. ASTM C 411
22 maximum operating temperature rating of 250 deg F. ASTM E84 flame spread less than 25 and smoke
23 developed less than 50.

24
25 Meet requirements of ASTM C 1338 and ASTM G21 for fungi resistance.

26
27 Install liner using adhesive conforming to ASTM C 916.

28 **PART 3 - EXECUTION**

29 **MANUAL VOLUME DAMPERS**

30
31 Install manual volume dampers in each branch duct and for each grille, register, or diffuser as far away from
32 the outlet as possible while still maintaining accessibility to the damper. Install so there is no flutter or
33 vibration of the damper blade(s).

34 **TURNING VANES**

35
36 Install turning vanes in all rectangular, mitered elbows in accordance with SMACNA standards and/or
37 manufacturer's recommendations.

38
39 Install double wall, airfoil, 2 inch radius vanes in ducts with vane runner length 18" or greater and air velocity
40 less than 2000 fpm. Install double wall, airfoil, 4-1/2 inch radius vanes in ducts with vane runner length 18"
41 or greater and air velocity 2000 fpm or greater.

42
43 If duct size changes in a mitered elbow, use single wall type vanes with a trailing edge extension. If duct
44 size changes in a radius elbow or if short radius elbows must be used, install sheet metal turning vanes in
45 accordance with SMACNA Figure 2-5 and Figure 2-6.

46 **FLEXIBLE DUCT**

47
48 Flexible duct may only be used for final connections of air inlets and outlets at diffuser, register, and grille
49 locations which are concealed. Where flexible duct is used, it shall be the minimum length required to make
50 the final connections, but no greater than 5 feet in length, and have no more than one (1) 90 degree bend.

51
52 Secure inner jacket of flexible duct in place with stainless steel metal band clamp. Secure insulation vapor
53 barrier jacket in place with steel or nylon draw band. Sheet metal screws and/or duct tape will not be
54 accepted.

55
56 Individual sections of flexible ductwork shall be of one piece construction. Splicing of short sections will
57 not be accepted.

58
59 Flexible ductwork used as transfer duct shall be sized for a maximum velocity of 350 fpm.

60
61 Penetration of any partition, wall, or floor with flexible duct will not be accepted.

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DUCT LINING

Apply lining to the following ductwork:

- Transfer air ducts as detailed and noted on drawings

Install liner in compliance with the latest edition of NAIMA's Fibrous Glass Duct Liner Standard. Locate longitudinal joints at the corners of duct only. Cut and fit to assure lapped, compressed joints. Coat all transverse and longitudinal joints and edges with adhesive. Provide metal nosing on leading edge where lined duct is preceded by unlined duct. Adhere liner to duct with full coverage area of adhesive. Additionally secure liner to duct using mechanical fasteners spaced as recommended by the liner manufacturer without compressing liner more than 1/8" with the fasteners.

END OF SECTION

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**SECTION 23 37 13
DIFFUSERS, REGISTERS & GRILLES**

PART 1 - GENERAL

SCOPE

This section includes specifications for air terminal equipment.

PART 3 - EXECUTION
Installation

RELATED WORK

- Section 23 31 00 - HVAC Ducts
- Section 23 33 00 - Air Duct Accessories
- Section 23 05 93 - Testing, Adjusting and Balancing for HVAC

REFERENCE

Applicable provisions of Division 01, General Requirements govern work under this section.

REFERENCE STANDARDS

- NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
- UL 181 - Factory-Made Air Ducts and Connectors.
- ARI-ADC Standard 880

QUALITY ASSURANCE

Refer to Division 01, General Requirements, Equals and Substitutions.

SUBMITTALS

Refer to Division 01, General Requirements, Submittals.

Furnish submittal information including, but not limited to, the following:

- Manufacturer's name and model number
- Identification as referenced in the documents
- Capacities/ratings
- Materials of construction
- Sound ratings
- Dimensions
- Finish
- Color selection charts where applicable
- Manufacturer's installation instructions

DESIGN CRITERIA

All performance data shall be based on tests conducted in accordance with Air Diffusion Council (ADC) Test Code 1062 GRD 84.

1 **PART 2 – PRODUCTS**

2
3 **SQUARE CEILING DIFFUSERS**

4
5 Manufacturers: Carnes, Krueger, Titus, Metal-Aire, and E.H. Price

6
7 Aluminum or Steel unless otherwise indicated, louvered face furnished with frame type appropriate to
8 installation.

9
10 Directional blow pattern as shown on the drawings and/or as scheduled.

11
12 White, baked enamel finish or powder coat finish, unless otherwise indicated.

13
14 **EGGCRATE GRILLE**

15
16 Manufacturers: Carnes, Krueger, Titus, Metal-Aire, and E.H. Price

17
18 Aluminum construction with frame type appropriate to installation.

19
20 Grille face 1/2" x 1/2" or 1" x 1" grid pattern 1" deep with a minimum of 85% free area.

21
22 Grille sizes and finishes as shown on drawings and/or as scheduled.

23
24 White, baked enamel finish or powder coat finish, unless otherwise indicated..

25
26 Screw holes on surface counter sunk to accept recessed type screws.

27
28
29 **PART 3 - EXECUTION**

30
31 **INSTALLATION**

32
33 Install grilles, registers and diffusers as shown on drawings and according to manufacturer's instructions.

34
35 Furnish diffusers with equalizing grids where it is not possible to maintain minimum 2 duct diameter straight
36 duct into diffuser. Equalizing grids shall consist of individually adjustable vanes designed for equalizing
37 airflow into diffuser neck and providing directional control of airflow.

38
39 Unless otherwise indicated, size ductwork drops to diffusers or grilles to match unit collar size.

40
41 Seal connections between ductwork drops and diffusers/grilles airtight.

42
43 Where diffusers, registers and grilles cannot be installed to avoid seeing inside duct, paint inside of duct with
44 flat black paint to reduce visibility.

45
46 **END OF SECTION**

1 SECTION 26 05 00

2
3 GENERAL ELECTRICAL REQUIREMENTS

4 PART 1 - GENERAL

5 1.01 SCOPE

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

8 1.02 GENERAL PROVISIONS

- 9 A. In general, the work includes: Electrical work and the kindred materials and operations as indicated
10 on the drawings and as specified in the following articles of:

11
12 Section 26 05 00 General Electrical Requirements
13 Section 26 09 23 Occupancy Sensor
14 Section 26 20 00 Basic Materials and Methods
15 Section 26 51 13 Lighting
16 Section 27 10 00 Telecommunications Distribution System
17 Section 28 13 00 Access Control System
18 Section 28 31 00 Fire Alarm System
19

- 20 B. Job Information: Obtain at building including:
21 1. Conditions affecting this Section of the Work.
22 2. Accessibility
23 3. Storage space.

24 1.03 GENERAL REQUIREMENTS

- 25 A. This Section of the Specifications applies to all electrical work. The General Conditions,
26 Supplementary Conditions, Summary of the Work, Instructions to Bidders and all Sections of the
27 Conditions of the Contract form a part of these specifications and the Contractor shall consult them in
28 detail. Electrical work indicated in other Sections of the Specifications to be done by the Electrical
29 Contractor shall be included in the Work of this Section.

30 1.04 DEFINITIONS

- 31 A. Certain terms used herein; on the drawings; and in the contract documents, shall be defined as
32 follows:
33 B. Provide: Furnish and install complete and ready for service.
34 C. Exposed: Exposed to view in any room, hallway, passageway, or outside.
35 D. Approval: The approval of the Architect in writing or by signed rubber stamp applied to drawings,
36 illustrations, etc.

37 1.05 INTENT OF DRAWINGS AND SPECIFICATIONS

- 38 A. These specifications and attendant drawings are intended to cover a complete installation of systems.
39 The omission of expressed reference to any item of labor or material necessary for the proper
40 execution of the work in accordance with present practice of the trade shall not relieve the Contractor
41 from providing such additional labor and materials.

42 1.06 DRAWINGS

- 43 A. The Electrical drawings do not attempt to show the complete details of building construction which
44 affect the electrical installation. The Contractor shall refer to the architectural, civil, structural and
45 mechanical drawings for additional details which affect the proper installation of this work. The
46 Contractor is cautioned that diagrams showing electrical connections and/or circuiting are

1 diagrammatic only and must not be used for obtaining lineal runs of wire to conduit. Wiring diagrams
2 do not necessarily show the exact physical arrangement of the equipment.

3 1.07 MATERIAL AND EQUIPMENT

- 4 A. All material and equipment shall be new and of the quality used for the purpose in good commercial
5 practice and shall be standard product of reputable manufacturers. Each major component of
6 equipment shall have the manufacturer's name, catalog number, and capacity or rating on a nameplate,
7 securely affixed on the equipment in a conspicuous place.

8 1.08 SUBSTITUTION AND APPROVAL OF MATERIAL

- 9 A. See Instructions to Bidders.
10 B. Such requests shall be accompanied by three copies of all necessary illustrations, cuts, drawings and
11 descriptions of material proposed for substitution and shall fully describe all points in which it differs
12 from the articles specified. Two copies will be retained by the Architect and one copy returned to the
13 Contractor with approval or revisions indicated thereon.

14 1.09 DAMAGE TO OTHER WORK

- 15 A. The Electrical Contractor will be held rigidly responsible for all damages to the work of his own or
16 any other trade resulting from the execution of his work. It shall be the Contractor's responsibility to
17 adequately protect his work at all times. All damages resulting from his operations shall be repaired
18 or the damaged portions replaced by the party originally performing the work, (to the entire
19 satisfaction of the Architect), and all cost thereof shall be borne by the Contractor responsible for the
20 damage.

21 1.10 COOPERATION WITH OTHER TRADES

- 22 A. This Contractor shall completely cooperate with all other trades in the matter of planning and
23 executing of the work. Every reasonable effort shall be made to prevent conflict and interferences as
24 to space requirements, dimensions, locations, openings, sleeving or other matters which tend to delay
25 or obstruct the work of any trade.

26 1.11 NEGLIGENCE

- 27 A. Should the Contractor fail to provide materials, templates, etc., or other necessary information causing
28 delay or expense to another party, he shall pay the actual amount of the damages to the party who
29 sustained the loss.

30 1.12 FIELD CHANGES

- 31 A. Should any change in drawings or specifications be required to comply with local regulations and/or
32 field conditions, the Contractor shall refer same to Architect for approval before any work which
33 deviates from the original requirements of the drawings and specifications is started. In the event of
34 disagreements as to the necessity of such changes, the decision of the Architect shall be final.

35 1.13 CUTTING AND PATCHING IN NEW CONSTRUCTION

- 36 A. As necessary and with approval to permit the installation of conduit or any part of the work under this
37 branch. Any cost caused by defective or ill-timed work shall be by the party responsible therefor.
38 Patching of holes, openings, etc. resulting from the work of this branch shall be furnished by this
39 contractor.
40 B. See Division 1 for additional requirements.

41 1.14 COMPLETION DATES

- 42 A. This Contractor shall be in a position to meet all completion dates established by the Architect and
43 shall furnish all labor of all classes required to meet such schedules and completion dates.

44 1.15 STANDARDS, CODES AND PERMITS

- 1 A. All work shall be installed in accordance with National, State and Local electrical codes, laws,
2 ordinances and regulations. Comply with all applicable OSHA regulations.
- 3 B. All materials shall have a U.L. label where a U.L. standards and/or test exists.
- 4 C. Prepare and submit to all authorities having jurisdiction, for their approval, all applications and
5 working drawings required by them.
- 6 D. Secure and pay for all permits and licenses required.

7 1.16 CLEAN-UP

- 8 A. This Contractor shall at all times keep the premises free from excessive accumulation of waste
9 material or rubbish resulting from his work, including tools, scaffolding and surplus materials, and he
10 shall leave his work broom clean or its equivalent.
- 11 B. In case of dispute, Architect may order the removal of such rubbish and charge the cost to the
12 responsible contractor as determined by the Architect. At the time of final clean-up all fixtures and
13 equipment shall be thoroughly cleaned and left in proper condition for their intended use.

14 1.17 TESTS

- 15 A. The Contractor shall provide all instrumentation, labor and conduct all tests required by the Architect.
16 All tests shall be made before any circuit or item of equipment is permanently energized. Circuits
17 shall be phased out and loads shall be distributed as evenly as possible on all phases. All phase
18 conductors shall be entirely free from grounds and short circuits. All instrumentation and personnel
19 required for testing shall be provided by the Contractor and all tests shall be conducted in the presence
20 of the Architect or his authorized representative.
- 21 B. System Tests:
 - 22 1. The following tests are required prior to energization of the electrical system:
 - 23 a. Secondary feeders shall have an insulation resistance test utilizing a megger applying a
24 test potential of 500 volts DC minimum.
 - 25 b. Establish secondary phase to ground voltages.
 - 26 c. Establish proper phase relationship and motor rotation.
 - 27 2. The following tests are required under normal load condition:
 - 28 a. Record secondary phase to phase and phase to ground voltages and phase currents at all
29 major equipment, apparatus, and on all secondary feeders. Voltage readings shall be
30 taken at line side terminals of distribution centers and panelboards.
 - 31 b. Confirm proper phase relationship and motor rotation.
 - 32 c. Confirm load balance at distribution centers and panels. Rebalance load if necessary
33 such that the minimum unbalance between phases shall not exceed 7-1/2%.
 - 34 d. Confirm operation of all electrically operated apparatus, such as circuit breakers,
35 transfer switches, etc., by exercising same under load.
 - 36 e. Record all settings and calibrations of circuit breakers, transfer switches, transformers,
37 meters, timing devices, etc.
- 38 C. Records:
 - 39 1. All test data obtained by the E.C. or manufacturer/supplier shall be recorded and filed with the
40 maintenance manual as part of permanent job records. Test data shall include identification of
41 instruments employed (field test only), condition of test (time, date, weather, etc.), parameters
42 of test, personnel conducting test, and any pertinent information or conditions noted during the
43 test.

44 1.18 SHOP DRAWINGS

- 45 A. Submit to Engineer for review, copies of manufacturer's shop drawings and/or equipment brochure
46 depicting:

- 1 1. Lighting Fixtures
- 2 2. Panelboards
- 3 3. Occupancy Sensors
- 4 4. Telecommunications Equipment and Cabling
- 5 5. Wiring Devices
- 6 6. Fire Alarm System
- 7 7. Access Control System
- 8 8. Other materials at the request of the Engineer

9 B. See Section 01300.

10 C. Shop drawings shall bear the Contractor's stamp indicating approval.

11 D. Any equipment fabrication prior to shop drawing review shall be at the Contractor's risk.

12 1.19 WORKMANSHIP

13 A. The installation of all work shall be made so that its several component parts will function as a
14 workable system complete with all accessories necessary for its operation, and shall be left with all
15 equipment properly adjusted and in working order. The work shall be executed in conformity with
16 the best accepted standard practice of the trade so as to contribute to efficiency and appearance. It
17 shall also be executed so that the installation will conform and adjust itself to the building structure,
18 its equipment and its usage.

19 1.20 DRAWINGS OF OTHER TRADES

20 A. The Contractor shall consult the drawings of the work for the various other trades; field layouts of the
21 parties performing the work of the other trades; their shop drawings, and he shall be governed
22 accordingly in laying out his work.

23 B. Specifically examine shop drawings to confirm voltage, current characteristics, and other wiring
24 requirements for utilization equipment. Bring any discrepancies to the attention of the A/E.

25 1.21 FIELD MEASUREMENTS

26 A. The Contractor shall take all field measurements necessary for his work and shall assume the full
27 responsibility for their accuracy.

28 1.22 STRUCTURAL INTERFERENCES

29 A. Should any structural interferences prevent the installation of the outlets, running of conduits, etc., at
30 points shown on drawings, the necessary minor deviation therefrom, as determined by the Architect,
31 may be permitted. Minor changes in the position of the outlets or equipment if decided upon before
32 any work has been done by the Contractor shall be made without additional charge.

33 1.23 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE

34 A. Before submitting a bid, the Contractor shall visit the site and familiarize himself with all features of
35 the building and site which may affect the execution of his work. No extra payment will be allowed
36 for the failure to obtain this information. If in the opinion of the Contractor there are omissions or
37 errors in the plans or specifications, the Contractor shall clarify these points with the Architect before
38 submitting his bid. In lieu of written clarification by addendum, resolve all conflicts in favor of the
39 greater quantity or better quality.

40 1.24 GUARANTEE

41 A. The Contractor shall unconditionally guarantee his work and all components thereof, excluding
42 lamps, for a period of one year from the date of his final payment. He shall remedy any defects in
43 workmanship and repair or replace any faulty equipment which shall appear within the guarantee
44 period to the entire satisfaction of the Architect at no additional charge.

1 1.25 TEMPORARY WIRING AND SERVICE

- 2 A. Provide temporary service from existing service. Temporary service shall support construction
3 activities.
- 4 B. All contractors shall provide and maintain their own extension cords and additional lamps as required
5 to perform his work properly. Contractors requiring temporary connections to 3 phase power service
6 and single phase feeders for other than lighting and small fractional horsepower motorized tools shall
7 make arrangement with the Electrical Contractor. Contractors requiring lighting outside of the
8 building shall make their own arrangements with the Electrical Contractor and pay all costs for
9 installation, maintenance and removal. Contractors requiring electrical equipment over one HP,
10 including welders, hoists, heaters and coolers shall make their own arrangements for such service
11 beyond the main switch and shall pay all costs thereof.
- 12 C. No permanent electrical equipment or wiring shall be used for temporary connections, unless
13 authorized by this Section, upon signed order and with approval by the Architect in behalf of the
14 Owner. Such approvals shall not shorten guarantee period.
- 15 D. Electrical energy to be paid for by owner.

16 1.26 ELECTRICAL SERVICE

- 17 A. The service is existing and provides 480Y/277 volts and 208Y/120 volts, three phase, four wire.

18 1.27 BRANCH CIRCUIT WIRING

- 19 A. See plans for general arrangement of circuits, conduit runs, and ratings of branch circuits and special
20 circuits.
- 21 B. Provide everything necessary to comply with the general scheme shown, including all types of
22 control.
- 23 C. Circuit numbers as shown on plans are for contractor to plan his wiring and for estimating purposes.
24 These numbers are not necessarily consecutive numbers of the panelboard breakers. Balanced load on
25 bus is to be the determining factor in arrangement of circuits. Balance loading to within 7 1/2%.
- 26 D. Minimum size of lighting system branch circuit conductors to be #12 AWG.
- 27 E. Conductors terminating at wired outlets shall extend at least eight (8) inches beyond outlet box
28 conduit fitting.
- 29 F. 120-volt circuit home runs greater than 50 feet in length shall have #10 AWG minimum size between
30 panel and first receptacle or fixture outlet.
- 31 G. The use of single-phase, multi-wire branch circuits with a common neutral is not permitted. All
32 branch circuits will be furnished and installed with an individual accompanying neutral, sized the
33 same as the phase conductors

34 1.28 MOTOR WIRING

- 35 A. Unless otherwise indicated on the drawings or elsewhere in these specifications, all motors shall be
36 furnished by others.
- 37 B. Motors shall be set in place by others and the associated motor starters and controllers shall be turned
38 over to this Contractor for erection and line voltage power wiring.
- 39 C. Any contractor supplying starters and controllers that are not part of this contract shall index same and
40 provide this Contractor with instructions as to proper location in sufficient time to permit the
41 installation of a concealed raceway system.
- 42 D. Where this Contractor is required to provide control wiring, the Contractor supplying the controllers
43 shall provide all necessary and required wiring diagrams for proper installation.
- 44 E. Low voltage (less than 115 volts) control wiring shall be by others, unless noted elsewhere in the
45 specifications except that this Contractor shall extend circuit to associated transformers, wire and
46 connect to same.

1 F. This Contractor shall examine the plans and specifications of other sections and shall include in his
2 bid all control wiring, as referenced to be performed by Section 16001.

3 G. Required disconnect switches furnished by other sections shall be installed by Section 16001.
4 Furthermore, this Contractor shall provide all disconnect switches required by code that are not
5 furnished by other sections.

6 1.29 SPECIAL OUTLETS

7 A. General: Furnish and install outlets, wiring and receptacles accordingly, at locations required by
8 equipment serviced or otherwise as directed. Extend wiring to outlets on equipment and make final
9 connection.

10 1.30 IDENTIFICATION

11 A. General:

- 12 1. Materials and equipment installed under this Section shall be clearly identified as listed below.
- 13 2. Locate identification conspicuously.
- 14 3. Terminology to be approved by Architect.
- 15 4. See plans for any additional items to be identified.
- 16 5. Loads such as motors shall be described by function rather than by the system of arbitrary
17 number as shown on electrical plans.
- 18 6. Use abbreviations sparingly.

19 B. Laminated Bakelite Plates: Engraved plastic nameplate shall be securely screwed or riveted to the
20 following equipment. Size 1" x 4" with 3/8" high letters; unless space available dictates differently.

- 21 1. Each panelboard, contactor, time switch, starter or disconnect switch. Locate on inside cover
22 of panels.
- 23 2. Each feeder at all accessible locations.
- 24 3. Each end of empty conduit runs to indicate the intended use of the conduit and the location of
25 opposite end. Use room numbers that are permanently assigned.

26 C. Typewritten Directory: Each panelboard both new and existing shall be provided with a typewritten
27 directory attached to the inside of panel door and covered with clear plastic indicating load served and
28 rooms served by each protective device in the respective panel. Spares and spaces shall be clearly
29 identified for existing panels, trace existing circuits to confirm use.

30 D. Switch Station:

- 31 1. All key switches shall be engraved indicating controlled item.
- 32 2. All remote switches shall be engraved indicating controlled item.

33 E. Conductor Identification:

- 34 1. Identify each conductor at each wiring device, connector or splice point with permanently
35 attached wrap-around adhesive markers as manufactured by Brady Co. or 3M.
- 36 2. This identification shall include branch circuit number, control circuit, or any other appropriate
37 number or lettering that will expedite future tracing and trouble shooting.

38 1.31 LOCATIONS OF OUTLETS AND WIRING DEVICES

39 A. Outlets:

- 40 1. Locations of outlets and electrical equipment on the drawings are approximate only. Unless
41 otherwise indicated on the drawings or established in the specifications, the exact locations of
42 electrical outlets shall be established in the field by directive from the Architect. Generally,
43 outlets shall be located as required for proper installation of equipment served and otherwise
44 locations shall be established by construction or code requirements and such as to be
45 coordinated with equipment of other trades.
- 46 2. This Section shall consult with the Architect and refer to all details, sections, elevations and
47 equipment plans and the plans of other trades for exact location.

- 1 3. The Architect reserves the right to make reasonable changes in the location of outlets,
2 apparatus or equipment up to the time of roughing in. Such changes as directed shall be made
3 by the Contractor without additional compensation.
- 4 4. Dimensions taken by scale shall not be used to establish rough-in locations.

5 B. Wiring Devices:

- 6 1. The approximate location of wiring devices are indicated on the drawings; the specific location
7 shall be determined in accordance with "Location of Outlets" of these specifications and as
8 follows.
- 9 2. This Section is referred to equipment plans, equipment shop drawings, elevation drawings and
10 other detail or dimensional drawings, and he shall consult with the Architect before installation
11 of proceeding with any work dependent upon this information.
- 12 3. Generally, wiring devices shall be located as follows:
 - 13 a. Wall receptacles shall generally be centered 15" above the finished floor and 6" above
14 surface of built-in counters and tables where same abuts wall and 4" above
15 backsplashes if counters are so equipped.
 - 16 b. Special purpose receptacles shall be located as required by equipment served.
 - 17 c. Switches shall be centered 48" above finished floor on latch side of door opening with
18 edge of plate not more than 12" from door frame, except as noted on the drawings.
 - 19 d. In hazardous areas, the location of wiring devices shall be established by Code
20 requirements which shall take precedence over conflicting information on the drawings
21 or included herein.

22 1.32 TELEPHONE SYSTEM

- 23 A. Refer to the electrical specification section 27 10 00 – Telecommunication Distribution System for
24 detailed information on the telephone system.
- 25 B. Dane County is currently using a VOIP (voice over internet protocol) telephone system so all
26 telephone cabling will be using same cabling used for data.
- 27 C. Telephone instruments, switching equipment, wiring, terminal blocks, and other accessories shall be
28 furnished and installed by the Owner (Dane County)
- 29 D. This Contractor shall supply all required conduit, sleeves, and service fittings for the telephone
30 system.
- 31 E. All conduits shall be complete with fish wire by this Contractor, and all telephone outlets shall be fed
32 by a minimum 1" conduit.
- 33 F. All telephone boxes shall be two gang boxes with one gang plaster cover.
- 34 G. Verify all phone locations with the Architect in the field.

35 1.33 SEALING AND FIREPROOFING

- 36 A. Sealing and fireproofing of openings between conduit, cable tray, wireway, trough, cablebus, busduct,
37 etc. and fire rated surfaces shall be the responsibility of the contractor whose work penetrates the
38 opening.
- 39 B. Sealing and fireproofing shall use materials and methods complying with ASTM E814 requirements
40 appropriate to the rating of the material penetrated.
- 41 C. Materials by Dow-Corning, 3M, Specified Technologies, Inc., and Chase-Foam are acceptable if in
42 accordance with (B) above.
- 43 D. Submit manufacturer's penetration details to authority having jurisdiction. Details shall confirm
44 method's compliance with ASTM E814.
- 45 E. Include copies of penetration details in Project Operation and Maintenance Manuals.

1 1.34 ALTERNATE BIDS

2 A. See Section 01030 for descriptions of alternates required.

3 END OF SECTION 26 05 00

SECTION 26 09 23

OCCUPANCY SENSOR LIGHTING CONTROL SYSTEM

PART 1 - GENERAL

1.01 SCOPE

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

1.02 GENERAL PROVISIONS

- A. In general, the work includes:
 - 1. Contractor's work to include all labor, materials, tools, appliances, control hardware, sensor, wire, junction boxes and equipment necessary for and incidental to the delivery, installation and furnishing of a completely operational occupancy sensor lighting control system, as described herein.
 - 2. Contractor/Supplier shall examine all general specification provisions and drawings for related electrical work required as work under Division 26
 - 3. Contractor must submit data sheets on sensors, control units and all junction boxes and mounting accessories, including all wiring diagrams.

1.03 EQUIPMENT QUALIFICATION

- A. Products supplied shall be from a manufacturer that has been continuously involved in the manufacturing of occupancy sensors for a minimum of five (5) years.
- B. All components shall be UL listed, offer a five (5) year warranty and meet all state and local applicable codes requirements.

1.04 SYSTEM DESCRIPTION

- A. The objective of this section is to ensure the proper installation of the occupancy sensor-based lighting control system so that lighting is turned off automatically after reasonable time delay when a room or area is vacated by the last person to occupy said room or area.
- B. The occupancy sensor-based lighting control shall accommodate all conditions of space utilization and all irregular work hours and habits.
- C. Contractor shall warrant all equipment furnished in accordance to this specification to be undamaged, free of defects in materials and workmanship, and in conformance with the specifications. The supplier's obligation shall include repair or replacement, and testing without charge to the owner, all or in parts of equipment which are found to be damaged, defective or non-conforming and returned to the supplier. The warranty shall commence upon the owner's acceptance of the project. Warranty on labor shall be for a minimum period of one (1) year.

1.05 SUBMITTALS

- A. Manufacturer shall substantiate conformance to this specification by supplying the necessary documents, performance data, and wiring diagrams. Any deviations to this specification must be clearly stated by letter and submitted.
- B. Submit a lighting plan clearly marked by manufacturer showing proper product, location, and orientation of each sensor.
- C. Submit any interconnection diagrams per major sub-system showing proper wiring.
- D. Submit standard catalog literature which includes performance specifications indicating compliance to the specification.

1 1.06 SYSTEM OPERATION

- 2 A. It shall be the contractor's responsibility to make all proper adjustments to assure owner's satisfaction
3 with the occupancy system.

4 PART 2 - PRODUCTS

5 2.01 ACCEPTABLE MANUFACTURERS

- 6 A. The Watt Stopper, Inc.
7 B. Or Equivalent Devices by the Following Manufacturers
8 1. Hubbell
9 2. Leviton
10 3. Sensor Switch

11 2.02 SYSTEM OPERATION

- 12 A. All products shall be Watt Stopper product numbers:
13 1. Ceiling Sensors: W-500A, W-1000A, W-2000A, W-2000H, W-PIR, DT-100L, CI-100, CI-
14 200.
15 2. Wall Sensors: WI-120A, WI-277A, WS-120, WS-277, WM-120, WM-277.
16 3. Power and Slave Packs: A-120E, A-277E, S-120/277.
17 4. Low Temperature: CB-100, CB-200.
18 B. Wall switch sensors shall be capable of detection of motion at desk top level up to 300 square feet,
19 and gross motion up to 1,000 square feet.
20 C. Wall switch sensors shall accommodate loads from 0 to 800 watts at 120 volts; 0 to 1,000 watts at 277
21 volts and shall have 180 degree coverage capability.
22 D. Bi-level wall switch sensors shall accommodate loads from 0 to 800 watts at 120 volts; 0 to 1,000
23 watts to 277 volts.
24 E. Passive Infrared sensors shall have a multiple segmented Lodif Fresnel lens, in a multiple-tier
25 configuration, with grooves-in to eliminate dust and residue build-up.
26 F. Passive Infrared and Dual Technology sensors shall have fully automatic operation, offer daylighting
27 foot-candle adjustment control and be able to accommodate dual level lighting.
28 G. All sensors shall be capable of operating normally with electronic ballast, PL lamp systems, and rated
29 motor loads.
30 H. Coverage of sensors shall remain constant after sensitivity control has been set. No automatic
31 reduction shall occur in coverage due to the cycling of air conditioner or heating fans.
32 I. All sensors shall have readily accessible, user adjustable controls for time delay and sensitivity.
33 Controls shall be recessed to limit tampering.
34 J. In the event of failure, a bypass manual override shall be provided on each sensor. When bypass is
35 utilized, lighting shall remain on constantly or control shall divert to a wall switch until sensor is
36 replaced. This control shall be recessed to prevent tampering.
37 K. Ultrasonic operating frequency shall be crystal controlled to within plus or minus 0.005% tolerance
38 to assure reliable performance and eliminate sensor cross talk. Sensors using multiple frequencies are
39 not acceptable.
40 L. All sensors shall provide a method of indication to verify that motion is being detected during testing
41 and that the unit is working.
42

- 1 M. Where specified, sensor shall have an internal additional isolated relay with Normally Open,
2 Normally Closed, and Common outputs for use with HVAC control, Data Logging, and other control
3 options. Sensors utilizing separate components to achieve this function are not acceptable.
- 4 N. All sensors shall have no leakage current to load in manual or in Auto/Off mode for safety purposes
5 and shall have voltage drop protection.
- 6 O. The Contractor shall certify in writing that installed sensors comply with the specified California
7 Energy Commission criteria for ultrasonic sound.
- 8 P. All sensors shall have UL rated, 94V-0 plastic enclosures.

9 2.03 CIRCUIT CONTROL HARDWARE - CU

- 10 A. Control Units - For ease of mounting, installation and future service, control unit(s) shall be able to
11 mount on external J boxes and be integrated self-contained unit consisting internally of load switching
12 control relay and a transformer to provide low-voltage power to a minimum of two (2) sensors.
- 13 B. Relay Contacts shall have ratings of:
 - 14 1. 13A - 120 VAC Tungsten
 - 15 2. 20A - 120 VAC Ballast
 - 16 3. 20A - 277 VAC Ballast

17 2.04 CONTROL WIRING

- 18 A. Control wiring between sensors and controls units shall be Class II, 18-24 AWG stranded U.L.
19 Classified, PVC insulated, or Teflon jacketed cable approved for use in plenums, where applicable.

20 PART 3 - EXECUTION

21 3.01 INSTALLATION

- 22 A. It shall be the contractor's responsibility with the supplier's assistance to locate and aim sensory in the
23 correct location required for complete and proper volumetric coverage within the range of coverage(s)
24 of controlled areas. Rooms shall have ninety (90) to one hundred (100) percent coverage to
25 completely cover the controlled area to accommodate all occupancy habits of single or multiple
26 occupants at any location within in the room(s). The locations and quantities of sensors shown on the
27 drawings are diagrammatic and indicate only rooms which are to be provided with sensors. The
28 contractor shall provide additional sensors if required to properly and completely cover the respective
29 room.
- 30 B. It is the contractor's responsibility to arrange a pre-installation meeting with the manufacturer's
31 factory authorized representative, at the owner's facility, to verify placement of sensors and
32 installation criteria.
- 33 C. Proper judgement must be exercised in executing the installation in the available space and to
34 overcome local difficulties due to space limitations or interference of structural components. The
35 contractor shall also provide, at the owner's facility, the training necessary to familiarize the owner's
36 personnel with the operation, use, adjustment, and problem-solving diagnosis of the occupancy
37 sensing devices and systems, or;

38 END OF SECTION 26 09 23

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SECTION 26 20 00

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SCOPE

- A. Conditions of the Contract and portions of Division One 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 01340.

E. Operation and Maintenance (O&M) Data:

- 1. Maintenance data for materials and products for inclusion in Operating and Maintenance specified in Section 01730.
- 2. Submit in accordance with Section 01340 and 01730.

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.

1 PART 2 - PRODUCTS

2 2.01 ELECTRICAL METALLIC TUBING (EMT)
3 INTERMEDIATE METALLIC CONDUIT (IMC)
4 GALVANIZED RIGID STEEL CONDUITS (GRS)

5 A. Manufacturers:

- 6 1. Allied Steel
- 7 2. Omega
- 8 3. Wheatland
- 9 4. Columbia

10 B. Manufacturer's standard lengths and size.

11 C. Protected inside and out by hot-dipped galvanized or electrogalvanized coating.

12 D. Minimum size: 1/2 inch.

13 E. Do not use aluminum conduit.

14 2.02 PLASTIC CONDUIT (PVC)

15 A. Manufacturers:

- 16 1. Carlon.
- 17 2. Genova.
- 18 3. Certainteed.

19 B. Standard lengths and sizes.

20 C. Schedule 40 or 80, heavy wall rigid plastic (PVC) conduit manufactured to NEMA TC2 standards,
21 UL listed, and as required by NEC.

22 D. Rated for 90 degrees C cable.

23 E. Minimum size: 2" inches.

24 2.03 FLEXIBLE CONDUIT

25 A. Manufacturers:

- 26 1. Triangle PWC, Inc.
- 27 2. Anaconda
- 28 3. Flexsteel
- 29 4. American Flexible Conduit

30 B. Galvanized flexible steel.

31 C. Standard conduit sizes.

32 D. Minimum Size: 1/2 inch.

33 2.04 LIQUIDTIGHT FLEXIBLE CONDUIT

34 A. Manufacturers:

- 35 1. O-Z/Gedney Company
- 36 2. American Flexible Conduit
- 37 3. Flex-Guard, Inc.
- 38 4. Liquatite
- 39 5. Anaconda

40 B. Galvanized flexible steel.

- 1 C. Standard conduit sizes.
- 2 D. Minimum Size: 1/2 inch.
- 3 E. Heavy wall PVC jacket.
- 4 2.05 FITTINGS
- 5 A. Manufacturers:
 - 6 1. Appleton Electric Company.
 - 7 2. Steel City, American Electric.
 - 8 3. Oz-Gedney Co.
- 9 B. Steel or malleable iron, zinc galvanized or cadmium plated.
- 10 C. Do not use indentor type fittings. Set screw fittings are acceptable.
- 11 D. Do not use aluminum or die cast fitting.
- 12 E. EMT IMC and GRS Connectors and Couplings:
 - 13 1. Threaded.
 - 14 2. Insulated throat.
 - 15 3. Rain and concrete type.
- 16 F. Flexible Conduit Connectors and Couplings:
 - 17 1. Threaded.
 - 18 2. Insulated throat.
 - 19 3. Grounding type.
- 20 G. Liquidtight Flexible Conduit Fittings:
 - 21 1. Liquidtight.
 - 22 2. Insulated throat.
 - 23 3. Threaded.
 - 24 4. Grounding type.
- 25 H. Expansion Joints:
 - 26 1. Conduit expansion fittings complete with copper bonding jumper, Crouse-Hinds Type XJ.
 - 27 2. Conduit expansion/deflection fittings with copper bonding jumper, Crouse-Hinds Type XD.
- 28 I. Seals:
 - 29 1. Wall entrance, Appleton Type FSK or FSC.
- 30 J. Drain Fittings:
 - 31 1. Automatic Drain Breather:
 - 32 a. Explosionproof.
 - 33 i. Safe for Class I, Groups C and D.
 - 34 b. Capable of passing minimum 25 cc water/minimum and minimum 0.05 cubic foot
 - 35 air/minimum at atmospheric pressure.
 - 36 2. Condensate Drain:
 - 37 a. Conduit outlet body, Type T.
 - 38 b. Threaded, galvanized plug with 3/16 inch drilled holed through plug.
- 39 2.06 WIRES, CABLES, AND CONNECTORS
- 40 A. Manufacturers:
 - 41 1. Wire and Cable:
 - 42 a. Continental

- 1 b. Southwire.
- 2 c. Rome Cable.
- 3 d. Houston Wire and Cable.
- 4 e. Beldon.
- 5 f. Dekoron.
- 6 g. Royal
- 7 h. South
- 8 i. General
- 9 2. Connectors:
- 10 a. Burndy.
- 11 b. Thomas and Betts.
- 12 c. Blackburn, American Electric.
- 13 3. Electrical Tape:
- 14 a. 3M Scotch Brand.
- 15 b. Plymouth.
- 16 c. or equal.
- 17 B. Copper wire only.
- 18 C. 600 v insulation (ASTM standard compounds) and color code conductors for low voltage (secondary
- 19 feeders and branch circuits) as required by NEC.
- 20 1. Type THWN-2 Stranded: Single conductor No. 12 AWG minimum for branch circuit and
- 21 feeder conductors size No. 8 AWG and smaller.
- 22 2. Type XHHW-2 Stranded: Single conductor for branch circuits, feeders and service conductors
- 23 larger than No. 8 AWG.
- 24 3. Provide grounding conductor with same insulation as circuit conductors when run with circuit
- 25 conductors.
- 26 4. Type THWN-2 Stranded: Single conductor No. 12 AWG minimum for 120 v control wiring
- 27 and No. 14 AWG minimum for graphic indication, nonshielded instrumentation and other
- 28 control wiring operating at less than 120 v unless otherwise noted on Drawings.
- 29 a. Provide high density polyethylene jacketed multi-wire cable assemblies in underground
- 30 conduit or duct.
- 31 D. Joints, Taps, and Splices:
- 32 1. Joints, Taps, and Splices in Conductors No. 10 AWG and Smaller: UL listed compression
- 33 spring-type solderless connectors with plastic cover.
- 34 2. Joints, Taps, and Splices in Conductors No. 8 AWG and Larger: Solderless two or four-bolt
- 35 compression type connectors of type that will not loosen under vibration or normal strains.
- 36 3. Terminations: Compression-type crimp lugs.

37 2.07 BOXES

- 38 A. Manufacturer:
- 39 1. Interior Outlet Boxes:
- 40 a. Appleton Electric Company.
- 41 b. Raco.
- 42 c. Steel City, American Electric.
- 43 2. Weatherproof Outlet Boxes:
- 44 a. Appleton Electric Company.
- 45 b. Crouse-Hinds Company.
- 46

- 1 c. O-Z/Gedney company.
- 2 d. Perfect-Line, American Electric.
- 3 3. Junction and Pull Boxes:
- 4 a. Hoffman Engineering Company.
- 5 b. Keystone Columbia, Inc.
- 6 c. Electromate.
- 7 B. Outlet Boxes - Flush Mounted:
- 8 1. Wall Outlets: Square corner, galvanized masonry type with internally mounted ears or 4-
- 9 inches square with raised cover having square corners and internally mounted ears.
- 10 2. Ceiling Lighting Fixture Outlet Boxes: 4-inch square galvanized box with raised cover set
- 11 flush with finished surface, complete with 3/8 inch fixture stud.
- 12 C. Outlet Boxes - Surface Mounted:
- 13 1. General Use: 4-inches square with raised device cover.
- 14 2. Weatherproof: Cast galvanized with threaded hub.
- 15 3. Safety outlet enclosure - Tay Mac Co. - Verify outlet configuration.
- 16 4. Hazardous Locations: Cast galvanized approved for classification of area.
- 17 D. Junction and Pull Boxes:
- 18 1. Fabricate from code gauge galvanized steel, with covers held in-place by corrosion resistant
- 19 machine screws.
- 20 2. Size as required by code for number of conduits and conductors entering and leaving box.
- 21 3. Provide with welded seams where applicable, and equipment with corrosion resistant nuts,
- 22 bolts, screws, and washers.
- 23 4. Finish with rust inhibiting primer.
- 24 2.08 FIRE RATED THROUGH FLOOR FITTINGS
- 25 A. None required.
- 26 2.09 WIRING DEVICES
- 27 A. Manufacturers:
- 28 1. Hubbell Wiring Device Division.
- 29 2. Pass and Seymour, Inc.
- 30 3. Leviton
- 31 4. Cooper Wiring Devices
- 32 B. Fabricated Devices:
- 33 1. Factory-fabricated, specification grade wiring devices in type, color, and electrical rating for
- 34 service indicated. White color or as selected by ENGINEER OR OWNER.
- 35 2. Wiring devices of one manufacturer.
- 36 3. See Drawing symbol schedule for identification of device type.
- 37 C. Switches:
- 38 1. General Use Lighting Switches: 20-amp toggle, equal to Hubbell No. 1221-I series.
- 39 2. Switches controlling equipment, operation of which is not evident from switch position, shall
- 40 include flush neon pilot light in conjunction with proper switch. Each switch shall be complete
- 41 with engraved plate to identify equipment being controlled (white letters on black, 1/8 inch
- 42 high minimum).
- 43

- 1 D. Receptacles:
- 2 1. General use duplex receptacles: NEMA No. 5-20R, grounding type, 20-amp Hubbell No.
- 3 5362 Specification Grade.
- 4 2. Special purpose receptacles as shown on Drawings and schedules.
- 5 3. GFI receptacles shall be Hubbell GFR5352IA
- 6 E. Wiring Device Plates and Covers:
- 7 1. Wall plates for wiring devices with ganging and cut-outs as indicated, provided with metal
- 8 screws for securing plates to devices, screw heads colored to match finish of plate.
- 9 2. Plates for Flush Mounted Devices: Equal to Sierra P line specifications grade Type No. 430
- 10 brushed stainless steel.
- 11 3. Telephone outlet configuration to match telephone outlet jack or cable.
- 12 4. Device plates for surface mounted Type FS or FD boxes to be Type FSK galvanized steel.
- 13 5. Device plates for surface mounted, 4-inch square bossed to be ½ inch raised galvanized steel
- 14 covers.
- 15 6. Weatherproof outlet enclosure for exterior devices or devices in damp locations to be marked
- 16 galvanized gray cast malleable with gasketed lift cover plate as shown on Drawings. Suitable
- 17 for wet locations while in use. Enclosure must be gasketed. Provide Intermatic WP1010MC,
- 18 WP1010HMC, or WP1030MC with appropriate mounting base(s) and inserts.
- 19 2.10 MOTOR STARTERS
- 20 A. None required.
- 21 2.11 MOTOR AND CIRCUIT DISCONNECTS
- 22 A. Manufacturers:
- 23 1. Eaton/Cutler-Hammer
- 24 2. Square D
- 25 3. General Electric
- 26 B. Enclosed Circuit Breaker Construction:
- 27 1. Dual cover interlock.
- 28 2. External trip indication.
- 29 3. Provisions for control circuit interlock.
- 30 4. Padlock provisions for padlock in Off position.
- 31 5. Handle attached to box, not cover.
- 32 6. Handle position indicates On, Off or Tripped.
- 33 7. Provisions for insulated or groundable neutral.
- 34 C. Safety Switches:
- 35 1. NEMA heavy duty Type HD.
- 36 2. Dual cover interlock.
- 37 3. Visible blades.
- 38 4. Provisions for control circuit interlock.
- 39 5. Pin type hinges.
- 40 6. Tin plated current carrying parts.
- 41 7. Quick make and break operator mechanism.
- 42 8. Handle attached to box, not cover.
- 43 9. Handle position indication, On in up position and Off in down position.
- 44 10. Padlock provisions for up to 3 padlocks in Off position.

- 1 11. UL listed lugs for type and size of wire specified.
- 2 12. Spring reinforced fuse clips for Class R fuses.
- 3 13. Provisions for insulated or groundable neutral.
- 4 14. UL listed short circuit rating 200,000 RMS amp with Class R fuses.
- 5 D. Enclosures:
- 6 1. Indoor: NEMA 1 code gauge steel with rust inhibiting primer and baked enamel finish.
- 7 2. Outdoor: NEMA 3R code gauge zinc coated steel with baked enamel finish.

8 2.12 FUSES

- 9 A. Manufacturers:
- 10 1. Bussmann
- 11 2. Gould Shawmut
- 12 3. Littlefuse
- 13 4. Brush
- 14 B. 250 v. Fuses:
- 15 1. Class RK-1, 1-end rejection or to fit mountings specified, 1/10 to 600 amps, 200,000-amp
- 16 interrupting rating.
- 17 a. Gould Shawmut Tri-Onic TR-R, dual element, time delay with short circuit protection
- 18 for motor, transformer, welder, feeder, and main service protection.
- 19 C. 600v Fuses:
- 20 1. Class RK-1, 1-end rejection or to fit mountings specified, 1/10 to 600 amps, 200,000-amp
- 21 interrupting rating.
- 22 a. Gould Shawmut Tri-Onic TR-R, dual element, time delay with short circuit protection
- 23 for motor, transformer, welder, feeder and main service protection.
- 24 2. Class L, bolt-in 601 to 6,000 amps, 200,000-amp interrupting rating.
- 25 a. Gould Shawmut A48Y, time delay for overload and short circuit protection for motor,
- 26 transformer, feeder, and main service protection.
- 27 3. Class CC, fast acting, single element, 1/10 to 30 amps, 200,000-amp interrupting rating.
- 28 a. Gould Shawmut ATDR, UL listed for motor control circuits, lighting ballasts, control
- 29 transformers, and street lighting fixtures.
- 30 D. Spare Fuses:
- 31 1. 10%, minimum of 3, of each type and rating of installed fuses.
- 32 E. Spare Fuse Cabinet:
- 33 1. Cabinet: Wall-mounted, 18-gauge minimum steel unit with full-length, recessed piano-hinged
- 34 door with key coded cam lock and pull.
- 35 2. Size: Provide for orderly storage of spare fuses of this project plus 15% spare capacity,
- 36 minimum.
- 37 3. Finish: Gray baked enamel.
- 38 4. Cabinet Door: Bear legend in stencilled 1-1/2 inch high letters, "Spare Fuses."

39 2.13 PANELBOARDS

- 40 A. Panelboards are existing.

41 2.14 MOLDED CASE CIRCUIT BREAKERS

- 42 A. Manufacturers:
- 43 1. Square D to match existing panels.

1 2.15 GROUND-FAULT CIRCUIT INTERRUPTER RECEPTACLES (GFCI)

- 2 A. Ratings:
 - 3 1. 120 vac.
 - 4 2. 20 amp.
- 5 B. Tripping Requirement:
 - 6 1. UL Class A.
- 7 C. Construction:
 - 8 1. Shallow depth.
 - 9 2. Line and load terminal screws.
 - 10 3. Noise suppression.
 - 11 4. Feed through.
 - 12 5. Standard duplex wall plates shall fit.
 - 13 6. NEMA 5-20R configuration.
- 14 D. Meet requirements of UL 943 ground-fault circuit interrupters.

15 2.16 GROUNDING AND BONDING

- 16 A. Products: Of types indicated and of sizes and ratings to comply with NEC. Where types, sizes,
17 ratings, and quantities indicated are in excess of NEC requirements, more stringent requirements and
18 greater size, rating, and quantity indications govern.
- 19 B. Conductor Materials: Copper.
- 20 C. Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including
21 stranding.
- 22 D. Equipment Grounding Conductor: Green insulated.
- 23 E. Grounding Electrode Conductor: Stranded cable.
- 24 F. Bare Copper Conductors:
 - 25 1. Solid Conductors: ASTM B3.
 - 26 2. Assembly of Stranded Conductors: ASTM B8.
 - 27 3. Tinned Conductors: ASTM B33.
- 28 G. Ground Bus: Bar annealed copper bars of rectangular cross section.
- 29 H. Braided Bonding Jumpers: Copper tape, braided No. 30 gage bar copper wire, terminated with copper
30 ferules.
- 31 I. Bonding Strap Conductor/Connectors: Soft copper, 0.05 inches thick and 2 inches wide, except as
32 indicated.
- 33 J. Connector Products
 - 34 1. General: Listed and labeled as grounding connectors for materials used.
 - 35 2. Pressure Connectors: High-conductivity-plated units.
 - 36 3. Bolted Clamps: Heavy-duty units listed for application.
 - 37 4. Exothermic Welded Connections: Provide in kit form and select for specific types, sizes, and
38 combinations of conductors and other items to be connected.

39 PART 3 - EXECUTION

40 3.01 GENERAL

- 41 A. Install products in accordance with NEC, manufacturer's instructions, applicable standards, and
42 recognized industry practices to ensure products serve intended function.

1 3.02 CONDUITS AND CONDUIT FITTINGS

- 2 A. Complete conduit installation prior to installing cables.
- 3 B. Unless specifically indicated otherwise on Drawings, use rigid galvanized steel conduit for general
4 wiring.
- 5 C. Provide watertight conduit system where installed in wet places, underground or where buried in
6 masonry or concrete.
- 7 D. EMT conduit may be used for conduit sizes up to 4 inches.
- 8 E. Conduit shall be run concealed except exposed surface conduit may be installed where noted on
9 Drawings or where concealment found to be impractical or impossible, and only with approval of
10 ENGINEER.
- 11 F. Continuous from outlet to outlet and from outlets to cabinets, junction or pull boxes.
- 12 G. Enter and secure to boxes ensuring electrical continuity from point of service to outlets.
- 13 H. Conduit runs extending through areas of different temperature or atmospheric conditions or partly
14 indoors and partly outdoors shall be sealed, drained, and installed in manner preventing drainage of
15 condensed or entrapped moisture into cabinets, motors or equipment enclosures.
- 16 I. Run conduits within concrete structures parallel to each other and spaced on center of at least three
17 times conduit trade diameter with minimum 2-inch concrete covering. Conduits over 1 inch may not
18 be installed in slab without approval of ENGINEER.
- 19 J. Run exposed conduits parallel to or at right angles with lines of building.
- 20 K. Route conduit runs above suspended acoustical ceilings not interfering with tile panel removals.
- 21 L. Secure conduit in-place with not less than 1 malleable corrosion-proof alloy strap or hanger per 8 feet
22 of conduit.
- 23 1. Do not use perforated strapping.
- 24 M. Connections to Motors and Equipment Subject to Vibration:
- 25 1. Flexible steel conduit not over 3 feet long or where exposed in mechanical and utility areas and
26 not subjected to moisture, dirt, and fumes.
- 27 2. Liquidtight flexible conduit not over 3 feet long where exposed in finished areas or where
28 subject to moisture, dirt, fumes, oil, corrosive atmosphere, exposed or concealed, with
29 connectors to ensure liquid tight, permanently grounded connection. Locate where least
30 subject to physical abuse.
- 31 N. Use double lock nuts and insulated bushings with threads fully engaged.
- 32 O. Connectors at fixture bodies and boxes shall be rigidly secured with galvanized lock nut and bushing.
- 33 P. Cap conduits after installation to prevent entry of debris.
- 34 Q. Install conduit expansion fittings complete with bonding jumper in following locations.
- 35 1. Conduit runs crossing structural expansion joint.
- 36 2. Conduit runs attached to two separate structures.
- 37 3. Conduit runs where movement perpendicular to axis of conduit may be encountered.
- 38 R. Install 4 feet-0 inch to 6 feet-0-inch flexible steel conduit drops from independent junction box
39 mounted above ceiling and accessible from below ceiling to recessed ceiling mounted equipment.
40 Allow for positioning of equipment to tile increments.
- 41 S. Negotiate beams and changes in ceiling heights with LB conduit fittings on outside corners and ells
42 on inside corners. Arrange bends and offsets in parallel conduits to present neat symmetrical
43 appearance.
- 44 T. In precast areas, run conduits in insulation space or in floor topping without crossing conduits, using
45 3/4 in. maximum conduit size.

- 1 U. Core drill through reinforced concrete with approval of ENGINEER.
- 2 V. Split, crushed or scarred conduit not acceptable.
- 3 W. Do not route over boiler, incinerator or other high temperature equipment.
- 4 X. Flexible metal conduit can only be used for final connections to motors, transformers, or to light
- 5 fixtures above suspended ceilings.

6 3.03 SURFACE METAL RACEWAY

- 7 A. Mount to surface with No. 8 flathead fasteners or approved support clips.
- 8 B. Do not pinch wires.
- 9 C. Remove metal burrs and sharp edges.
- 10 D. Provide bushing.
- 11 E. Install in accordance with manufacturer's recommendations.
- 12 F. Provide covers where two lengths come together.

13 3.04 WIRE AND CABLE

- 14 A. Run wire and cable in conduit unless otherwise indicated on Drawings.
- 15 B. On branch circuits, use standard colors.
- 16 C. Each tap, joint or splice in conductors No. 8 AWG and larger shall be taped with 2 half-lap layers of
- 17 vinyl plastic electrical tape and finish wrap of color coding tape, where required by code.
- 18 D. Run ground wire with power circuits; conduit shall not be grounding path.
- 19 E. Color Coding: Conductors for lighting and power wiring as indicated below.

20	<u>Phase</u>	<u>208/120v</u>	<u>480/277v</u>
21	A	Black	Brown
22	B	Red	Orange
23	C	Blue	Yellow
24	Neutral	White	Gray
25	Ground	Green	Green

26 3.05 BOXES

- 27 A. Install knockout closures to cap unused knockout holes where blanks have been removed.
- 28 B. Locate boxes to ensure accessibility of electrical wiring.
- 29 C. Secure boxes rigidly to subsurface upon which being mounted or solidly embed boxes in concrete or
- 30 masonry. Do not support from conduit.
- 31 D. Do not burn holes, use knockout punches or saw.
- 32 E. Provide outlet box accessories as required for each installation such as mounting brackets, fixture
- 33 study, cable clamps, and metal straps for supporting outlet boxes compatible with outlet boxes being
- 34 used and meeting requirements of individual wiring situations.
- 35 F. Location of outlets and equipment shown on Drawings is approximate. Verify exact location.
- 36 G. Minor modification in location of outlets and equipment is considered incidental up to distance of 10
- 37 feet with no additional compensation, provided notification of modification is given prior to roughing
- 38 in of outlet.
- 39 H. Flush outlets shall have edges or plaster flush with finished wall or ceiling surfaces so plates can be
- 40 drawn tightly to wall or ceiling surfaces.
- 41 I. Mounting heights:
- 42 1. Shall conform to ADA guidelines.

- 1 2. In general, unless otherwise shown on Drawings:
- 2 a. Switches: 48 inches above floor to top of box.
- 3 b. AC Receptacles and Telephone Outlets: 15 inches above floor to bottom of box or 6
- 4 inches above counters, counter backslashes in finished areas; 48 inches to top of box
- 5 above floor in unfinished areas.
- 6 c. Wall Bracket Lighting Fixtures: 8 inches above mirrors or 6 feet-6 inches above floor.
- 7 d. Pushbuttons: 48 inches above floor to top of box.
- 8 e. Motor Starters and Disconnect Switches: 60 inches above floor.
- 9 i. Thermostats: 48 inches above floor.
- 10 f. Bells and Horns: 8 feet-0 inches above floor.
- 11 g. Clocks: 8 ft.-0 inches above floor.
- 12 h. Fire Alarm visual signals 80" above floor.
- 13 i. Emergency Battery Units: 8 ft. - 0 inches above floor or 12" below ceiling.
- 14 J. Do not install boxes back to back or through wall. Offset outlet boxes on opposite sides of wall,
- 15 minimum 12 inches.
- 16 K. Where emergency switches occur adjacent to normal light switches, install in separate boxes in
- 17 accordance with NEC and device plate color coding separation.
- 18 L. Light Fixture Outlet Boxes:
- 19 1. Securely mount with approved type bar hangers spanning structural members to support
- 20 weight of fixture.
- 21 2. Do not support from conduit.
- 22 3. Equip with 3/8-inches fixture stud and tapped fixture ears.
- 23 3.06 FIRE RATED THROUGH FLOOR FITTINGS
- 24 A. None required.
- 25 3.07 WIRING DEVICES
- 26 A. Do not install devices until wiring is complete.
- 27 B. Do not use terminals on wiring devices (hot or neutral) for feed-through connections, looped or
- 28 otherwise. Make circuit connections by using wire connectors and pigtails.
- 29 C. Install gasket plates for devices or system components having light emitting features such as switch
- 30 with pilot light and dome lights. Where installed on rough textured surfaces, seal with black self-
- 31 adhesive polyfoam.
- 32 D. Ground receptacles with insulated green ground wire from device ground screw to bolted outlet box
- 33 connection or as shown on Drawings.
- 34 E. Wrap wiring devices with insulating tape.
- 35 F. Install emergency switches which occur adjacent to normal light switches in separate boxes to
- 36 maintain systems isolation in accordance with NEC.
- 37 3.08 OVERCURRENT PROTECTIVE DEVICES.
- 38 A. Install fuses just prior to energizing equipment.
- 39 B. Locate circuit breakers as shown on Drawings.
- 40 C. Install GFCI receptacles as required by NEC.
- 41 3.09 PANELBOARDS
- 42 A. Flush or surface mount as specified on Drawings and schedules.

- 1 B. Support panel cabinets independently to structure with no weight bearing on conduits.
- 2 C. Install recessed Panelboards to allow cover to be drawn tight against wall to provide neat appearance.
- 3 D. Install panelboards so top breaker is not higher than 6 feet-0 inches above floor.
- 4 E. Adjacent panel cabinets shall be same size and mounted in horizontal alignment.
- 5 F. Install typewritten directory in each panelboard, accurately indicating rooms or equipment being
- 6 served after final circuit changes have been made to balance circuit loads.
- 7 G. Install four spare 1 inch conduits from top of each flush mounted panelboard to area above ceiling for
- 8 future use. On flush mounted panelboards located on first and higher level floors, provide two spare 1
- 9 inch conduits from bottom of panelboard to ceiling area of floor below for future use.

10 3.10 GROUNDING AND BONDING

- 11 A. Application
 - 12 1. Equipment Grounding Conductor Application: Comply with NEC Article 250 for sizes and
 - 13 quantities of equipment grounding conductors, except where larger sizes or more conductors
 - 14 are indicated.
 - 15 a. Install separate insulated equipment grounding conductors with circuit conductors.
 - 16 Raceway may be used as equipment ground conductor where feasible in non-hazardous
 - 17 areas and permitted by NEC for lighting circuits. Install insulated equipment ground
 - 18 conductor in nonmetallic raceways unless designated for telephone or data cables.
- 19 B. Installation
 - 20 1. General: Ground electrical systems and equipment in accordance with NEC requirements
 - 21 except where Drawings or Specifications exceed NEC requirements.

22 3.11 FIELD QUALITY CONTROL

- 23 A. Control Circuits, Branch Circuits, Feeders, Motor Circuits, and transformers:
 - 24 1. Megger check to phase-to-phase and phase-to-ground insulation levels.
 - 25 a. Do not megger check solid state equipment.
 - 26 2. Continuity.
 - 27 3. Short circuit.
 - 28 4. Operational check.
- 29 B. Wiring Devices:
 - 30 1. Test receptacles with Hubbell 5200, Woodhead 1750 or equal tester for correct polarity, proper
 - 31 ground connection, and wiring faults.

32 3.12 ADJUSTMENT AND CLEANING

- 33 A. Circuit Breakers:
 - 34 1. Adjustable settings shall be set to provide selective coordination, proper operation, and
 - 35 compliance with NEC.
- 36 B. Restore damaged areas on PVC jacketed rigid conduit with spray type touch-up coating compound or
- 37 as directed by manufacturer.
- 38 C. Pull cleaning plug through conduits to clear of dirt, oil, and moisture.

39 END OF SECTION 26 20 00

SECTION 26 51 13

LIGHTING

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 SUMMARY

- A. Section Includes:
 - 1. Interior lighting fixtures.
 - 2. Exterior lighting fixtures.
 - 3. Lamps.
 - 4. Ballasts.
 - 5. Emergency lighting units.

1.03 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. C78 Series - Lamps.
 - 2. C82.2-84 - Fluorescent Lamp Ballasts.
 - 3. C82.4-85 - Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type).
 - 4. ANSI C2-90 - National Safety Code.
- B. Institute of Electrical and Electronics Engineers (IEEE):
 - 1. C62.41-91 - IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- C. National Fire Protection Association (NFPA):
 - 1. 70-93 - National Electric Code.
- D. Underwriters Laboratory (UL):
 - 1. 844-90 - UL Standard for Safety Electric Lighting Fixtures for Use in Hazardous (Classified) Locations.
 - 2. 924-90 - UL Standard for Safety Emergency Lighting and Power Equipment.
 - 3. 935-84 - UL Standard for Safety Florescent-Lamp Ballast.
 - 4. 1092 (P) - UL Standard for Safety Proposed First Edition of the Standard for Process Control Equipment.
 - 5. 1570-88 - UL Standard for Safety Florescent Lighting Fixtures.
 - 6. 1571-91 - UL Standard for Safety Incandescent Lighting Fixtures.
 - 7. 1572-91 - UL Standard for Safety High Intensity Discharge Lighting Fixtures.
 - 8. 1573-85 - UL Standard for Safety Stage and Studio Lighting Units.
 - 9. 1574-87 - UL Standard for Safety Track Lighting Systems.
 - 10. UL 773-87 - UL Standard for Safety Plug-In, Locking Type Photo controls for Use with Area Lighting.

- 1 E. RoHS - Restriction of Hazardous Substances. Council of the European Union (EC) Directive
2 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and
3 electronic equipment.
- 4 F. LM-79-08 (or latest) - IES Approved Method for the Electrical and Photometric
5 Measurements of Solid-State Lighting Products.
- 6 G. LM-80-08 (or latest) - IES Approved Method for Measuring Lumen Maintenance of LED
7 Light Sources.
- 8 H. TM-21-11 (or latest) - IES Technical Memorandum on Projecting Long Term Lumen
9 Maintenance of LED Light Sources.
- 10 I. NEMA SSL 1-2010 (or latest) - Electronic Drivers for LED Devices, Arrays, or Systems.

11 1.04 DEFINITIONS

- 12 A. Emergency Lighting Unit: Fixture with integral emergency battery power supply and means
13 for controlling and charging battery. Also known as emergency light set. Emergency units are
14 available with integral lamps only.
- 15 B. Fixture: Complete lighting unit, exit sign, or emergency lighting unit. Fixtures include lamps
16 and parts required to distribute light, position and protect lamps, and connect lamps to power
17 supply. Internal battery powered exit signs and emergency lighting units also include battery
18 and means for controlling and recharging battery. Emergency lighting units are available with
19 and without integral lamp heads and lamps.
- 20 C. Luminaire: Fixture.
- 21 D. Average Life: Time after which 50% will have failed and 50% will have survived under
22 normal conditions.

23 1.05 SUBMITTALS

- 24 A. Product Data:
 - 25 1. Describe fixtures, lamps, ballasts, poles, emergency lighting units, and accessories. Arrange
26 product data for fixtures in order of fixture designation. Include data on features and
27 accessories and following information:
 - 28 a. Outline drawings of fixtures indicating dimensions and principal features.
 - 29 b. Electrical ratings and photometric data with specified lamps and certified results of
30 independent laboratory tests.
 - 31 c. Data on batteries and chargers of emergency lighting units.
 - 32 B. Shop Drawings: Detail nonstandard fixtures and indicating dimensions, weights, methods of
33 field assembly, components, features, and accessories.
 - 34 C. Samples: Submit sample of fixture if different than specified.
 - 35 D. Miscellaneous:
 - 36 1. For substitutes only, product certifications signed by manufacturers of lighting fixtures
37 certifying that their fixtures comply with specified requirements.
 - 38 2. Warranty for rechargeable battery.
 - 39 3. Coordination drawings for fixtures that require coordination with other equipment installed in
40 same space.
 - 41 E. Submit in accordance with Division 1.

1 1.06 QUALITY ASSURANCE

- 2 A. Items provided under this section shall be listed and labeled by UL or other Nationally
3 Recognized Testing Laboratory (NRTL).
4 1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
5 2. Terms "listed" and "labeled" shall be as defined in National Electric Code, Article 100.
6 B. Regulatory Requirements:
7 1. National Electric Code: Components and installation shall comply with NFPA 70.
8 2. Comply with ANSI C2, "National Electrical Safety Code".
9 C. Coordinate fixtures mounting hardware and trim with ceiling tile.

10 1.07 WARRANTY

- 11 A. Requirements:
12 1. Special Project Warranty Period (Where called for herein.): 10 years, beginning on date of
13 Substantial Completion. Full warranty shall apply for first year of period, and prorata warranty
14 for last 9 years.
15 2. Protection of Metal from Corrosion: Warranty against perforation or erosion of finish due to
16 weathering.
17 3. Color Retention: Warranty against fading, staining, chalking due to effects of weather and
18 solar radiation.

19 PART 2 - PRODUCTS

20 2.01 FIXTURES, GENERAL

- 21 A. Comply with requirements specified in Articles below and lighting fixture schedule.

22 2.02 FIXTURE COMPONENTS, GENERAL

- 23 A. Metal Parts: Free from burrs, sharp corners, and edges.
24 B. Sheet Metal Components: Steel, except as indicated. Form and support components to
25 prevent warping and sagging.
26 C. Doors, Frames, and Other Internal Access: Smooth operating and free from light leakage
27 under operating conditions. Arrange to permit relamping without use of tools. Arrange doors,
28 frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and
29 when secured in operating position.
30 D. Reflecting Surfaces: Minimum reflectances as follows, except as otherwise indicated:
31 1. White surfaces: 85%.
32 2. Specular Surfaces: 83%.
33 3. Diffusing Specular Surfaces: 75%.
34 4. Laminated Silver Metallized Film: 90%.
35 E. Exterior Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag,
36 or deform in use. Provide filter/breather for enclosed fixtures.
37 F. Exterior Exposed Hardware Material: Stainless steel.
38

- G. Lenses, Diffusers, Covers, and Globes: 100% virgin acrylic plastic or water white, annealed crystal glass except as indicated.
 - 1. Plastic: Highly resistant to yellowing and other changes due to aging, exposure to heat and UV radiation.
 - 2. Lens Thickness: 0.125 inches, minimum.
- H. Photoelectric Relay: UL 773.
 - 1. Contact Relays: Single-throw, arranged to fail in the "on" position and factory set to turn light unit on at 1.5 to 3 foot-candles and off at 4.5 to 10 foot-candles with 15 seconds minimum time delay.
 - 2. Relay Mounting: In fixture housing.

2.03 SUSPENDED FIXTURE SUPPORT COMPONENTS

- A. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture.
- B. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy arranged to mount single fixture. Finish same as fixture.
- C. Rod Hangers: 3/16-inch diameter cadmium plated, threaded steel rod.
- D. Hook Hanger: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

2.04 LED Luminaires

- A. LED Luminaires shall meet all DesignLights Consortium® (DesignLights.org) Product Qualification Criteria. This does not require that the luminaire be listed on the DesignLights Consortium's® Qualified Products List, but they must meet the Product Qualification Criteria. The technical requirements that the luminaire shall meet for each Application Category are:
 - 1. Minimum Light Output.
 - 2. Zonal Lumen Requirements.
 - 3. Minimum Luminaire Efficacy.
 - 4. Minimum CRI.
 - 5. L70 Lumen Maintenance.
 - 6. Minimum Luminaire Warranty of 5 years (not pro-rated) to include LED driver and all LED components.

Additional requirements:

- B. Color Temperature of 3000K-5000K for interior fixtures as listed in the Light Fixture Schedule on the plans. The color temperature of exterior LED fixtures should not exceed 4100K (nominal).
- C. Color Consistency: LED manufacturer shall use a maximum 3-step MacAdam Ellipse binning process to achieve consistent fixture-to-fixture color for interior fixtures. Exterior fixtures shall use a maximum 5-step MacAdam Ellipse binning process.
- D. Glare Control: Exterior fixtures shall meet DesignLights Consortium's® criteria for Zonal Lumen Distribution requirements or Backlight-Uplight-Glare (BUG) standards for exterior fixtures.
- E. Luminaire shall be mercury-free, lead-free, and RoHS compliant.
- F. Luminaire shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
- G. Light output of the LED system shall be measured using the absolute photometry method following IES LM-79 and IES LM-80 requirements and guidelines.

- 1 H. Luminaire shall maintain 70% lumen output (L70) for a minimum of 50,000 hours.
- 2 I. Driver shall have a rated life of 50,000 hours, minimum.
- 3 J. Lumen output shall not depreciate more than 20% after 10,000 hours of use.
- 4 K. Driver and LEDs shall be furnished from a single manufacturer to ensure compatibility.
- 5 L. Luminaire Color Rendering Index (CRI) shall be a minimum of 80 for interior fixtures, and a
6 minimum of 70 for exterior fixtures.
- 7 M. LED fixture shall be thermally designed as to not exceed the maximum junction temperature
8 of the LED for the ambient temperature of the location the fixture is to be installed. Rated case
9 temperature shall be suitable for operation in the ambient temperatures typically found for the
10 intended installation. Exterior luminaires to operate in ambient temperatures of -20°F to 122°F
11 (-29°C to 50°C).
- 12 N. LED driver shall have a minimum power factor (pf) of 0.9 and a maximum crest factor (cf) of
13 1.5 at full input power and across specified voltage range.
- 14 O. Luminaire shall operate normally for input voltage fluctuations of plus or minus 10 percent.
- 15 P. Luminaire shall have a maximum Total Harmonic Distortion (THD) of 20% at full input
16 power and across specified voltage range.
- 17 Q. Wiring connections to LED drivers shall utilize polarized quick-disconnects for field
18 maintenance.
- 19 R. All connections to luminaires shall be reverse polarity protected and provide high voltage
20 protection in the event connections are reversed or shorted during the installation process.
- 21 S. Fuse Protections: All luminaires shall have built-in fuse protection. All power supply outputs
22 shall be either fuse protected or be Polymeric Positive Temperature Coefficient (PTC)-
23 protected as per Class 2 UL listing.
- 24 T. All luminaires shall be provided with knockouts for conduit connections.
- 25 U. The LED lighting fixture shall carry a limited 5-year warranty minimum for LED light
26 engine(s)/board array, and driver(s).
- 27 V. Provide all of the following data on submittals:
- 28 1. Delivered lumens
- 29 2. Input watts
- 30 3. Efficacy
- 31 4. Color rendering index.

32
33 *Emergency LED Fixture Compatibility with Inverters:*

- 34 W. Emergency Inverters shall be sine-wave type or have written confirmation from the luminaire
35 manufacturer that the fixture will function with a square-wave inverter.

36
37 *Dimming:*

- 38 X. LED driver shall be compatible with dimming controls where dimming is indicated on the
39 plans. Dimmable drivers shall use Dimming Constant Current (DCC) or Pulse Width
40 Modulation (PWM) operation.
- 41 Y. LED fixtures shall dim to (20%, 15%, 10%, 5%, or 0.1%) as specified in the Light Fixture
42 Schedule on the plans without visible flicker or “popcorn effect”. “Popcorn effect” is defined
43 as the fixture being on a pre-set dimmed level (less than 100%) and going to 100% prior to
44 returning to the pre-set level when power is returned to the fixture.

1 2.05 EXIT SIGNS

- 2 A. Conform to UL 924.
3 1. Sign Colors: Conform to local code.

4 2.06 EMERGENCY LIGHTING UNITS

- 5 A. Conform to UL 924. Provide self-contained units with following features and additional
6 characteristics as indicated.
7 1. Battery: Sealed, maintenance-free, lead-acid type with 10-year nominal life minimum, and
8 special project warranty.
9 2. Charger: Minimum 2-rate, fully-automatic, solid-state type, with sealed transfer relay.
10 3. Operation: Relay automatically turns lamp on when supply circuit voltage drops to 80% of
11 nominal or below. Lamp automatically disconnects from battery when voltage approaches
12 deep-discharge level. Relay disconnects lamps and battery automatically recharges and floats
13 on trickle charge when normal voltage is restored.
14 4. Time-Delay Relay: Provide time-delay relay in emergency lighting unit control circuit
15 arranged to hold unit "on" for fixed interval after restoration of power from an outage. Provide
16 adequate time delay to permit HID lamps to restrike and develop output.
17 5. Wire Guard: Where indicated, provide heavy chrome plated wire guard arranged to protect
18 lamp heads or fixtures.

19 2.07 LAMPS

- 20 A. Conform to ANSI C78 series applicable to each type of lamp.

21 2.08 FINISH

- 22 A. Steel Parts: Manufacturer's standard finish applied over corrosion-resistant primer, free of
23 streaks, runs, holidays, stains, blisters, and defects. Remove fixtures showing evidence of
24 corrosion during project warranty period and replace with new fixtures.
25 B. Other Parts: Manufacturer's standard finish.
26 C. Verify and provide light fixture finishes as selected by ARCHITECT for all light fixture types.
27 Include colored finish selection tables with product submittals. Upon request submit actual
28 material finish swatches for A/E review.

29 PART 3 - EXECUTION

30 3.01 INSTALLATION

- 31 A. Setting and Securing: Set units plumb, square, and level with ceiling and walls, and secure
32 according to manufacturer's printed instructions and approved submittals.
33 B. Support For Recessed and Semi recessed Fixtures: Units may be supported from suspended
34 ceiling support system. Install ceiling system support rods or wires at minimum of four rods
35 or wires per fixture located not more than 6 inches from fixture corners.
36 1. Fixtures Smaller Than Ceiling Grid: Install minimum of four rods or wires for each fixture
37 and locate at corner of ceiling grid where fixture is located. Do not support fixtures by ceiling
38 acoustical panels.
39 2. Fixtures of Sizes Less Than Ceiling Grid: Center in acoustical panel. Support fixtures
40 independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.
41 3. Install support clips for recessed fixtures, securely fastened to ceiling grid members, at or near
42 each fixture corners.
43 C. Support for Suspended Fixtures: Brace pendants and rods that are 4 feet long or longer to
44 limit swinging. Support stem mounted single-unit suspended fluorescent fixtures with twin-
45 stem hangers. For continuous rows, use tubing or stem for wiring at one point and tubing or

1 rod for suspension for each unit length of chassis, including one at each end.

2 D. Lamping: Lamp units according to manufacturer's instructions.

3 3.02 CONCRETE FOUNDATIONS

4 A. Construct concrete foundations with 3,000-pound, 28-day concrete conforming to
5 requirements of Division 3. Comply with details and manufacturer's recommendations for
6 reinforcing, anchor bolts, nuts, and washers.

7 3.03 GROUNDING

8 A. Ground fixtures and metal poles according to Section 26 05 11.

9 1. Poles: Install 10-foot driven ground rod at each pole.

10 2. Nonmetallic Poles: Ground metallic components of lighting unit and foundations.
11 Connect fixtures to grounding system with No. 6 AWG conductor.

12 3.04 FIELD QUALITY CONTROL

13 A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

14 B. Give 7-day notice of dates and times for field tests.

15 C. Verify normal operation of each fixture after fixtures have been installed and circuits have
16 been energized with normal power source.

17 D. Interrupt electrical energy to demonstrate proper operation of emergency lighting installation.

18 a. Duration of supply.

19 b. Low battery voltage shut-down.

20 c. Normal transfer to battery source and retransfer to normal.

21 d. Low supply voltage transfer.

22 E. Replace or repair malfunctioning fixtures and components, then retest. Repeat procedure until
23 units operate properly.

24 3.05 ADJUSTING AND CLEANING

25 A. Clean fixtures upon completion of installation. Use methods and materials recommended by
26 manufacturer.

27 B. Adjust aimable fixtures to provide required light intensities.

28 END OF SECTION 26 51 13

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SECTION 27 10 00

TELECOMMUNICATIONS DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.01 SCOPE

- A. The basic scope of this project is as follows:
 - 1. Provide new cables and patch panels for new outlets in the project area..
 - 2. 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

- 1 i. ANSI/TIA/EIA-758(A) -- Customer-Owned Outside Plant Telecommunications
2 Cabling Standard
- 3 B. Install cabling in accordance with the most recent edition of BICSI® publications:
- 4 1. BICSI -- Telecommunications Distribution Methods Manual
- 5 2. BICSI -- Cabling Installation Manual
- 6 3. BICSI -- LAN Design Manual
- 7 4. BICSI -- Customer-Owned Outside Plant Design Manual
- 8 C. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part
9 of the specifications as if herein repeated or hereto attached. If the contractor should note items in the
10 drawings or the specifications, construction of which would be code violations, promptly call them to
11 the attention of the owner's representative in writing. Where the requirements of other sections of the
12 specifications are more stringent than applicable codes, rules, regulations, and ordinances, the
13 specifications shall apply.

14 1.03 PERMITS, FEES, AND CERTIFICATES OF APPROVAL

- 15 A. As prerequisite to final acceptance, supply to the owner certificates of inspection from an inspection
16 agency acceptable to the owner and approved by local municipality and utility company serving the
17 project.

18 1.04 SYSTEM DESCRIPTION

- 19 A. Telecommunications cabling system generally consists of one telecommunications outlet in each
20 workstation, wall telephones in common and mechanical areas and telecommunications rooms (TRs)
21 located on each floor.
- 22 B. The typical work area consists of a single-gang plate with three standards compliant work area outlets.
- 23 1. Each work area outlet consists of one (1) four-pair data Category 6 cable or above, installed
24 from work area outlet to the TR. Terminate data cables on rack mounted modular patch panels
25 located in the appropriate TR.

26 1.05 SUBMITTALS

- 27 A. Submit to the engineer/designer shop drawings, product data (including cut sheets and catalog
28 information), and samples required by the contract documents. Submit shop drawings, product data,
29 and samples with such promptness and in such sequence as to cause no delay in the work or in the
30 activities of separate contractors. The engineer/designer will indicate approval of shop drawings,
31 product data, and samples submitted to the engineer by stamping such submittals "APPROVED" with
32 a stamp. Submitted shop drawings shall be initialed or signed by the contractor, showing the date and
33 the contractor's legitimate firm name.
- 34 1. By submitting shop drawings, product data, and samples, the contractor represents that he or
35 she has carefully reviewed and verified materials, quantities, field measurements, and field
36 construction criteria related thereto. It also represents that the contractor has checked,
37 coordinated, and verified that information contained within shop drawings, product data, and
38 samples conform to the requirements of the work and of the contract documents. The
39 engineer/designer remains responsible for the design concept expressed in the contract
40 documents as defined herein.
- 41 2. The engineer's/designer's approval of shop drawings, product data, and samples submitted by
42 the contractor shall not relieve the contractor of responsibility for deviations from requirements
43 of the contract documents, unless the contractor has specifically informed the
44 engineer/designer in writing of such deviation at time of submittal, and the engineer/designer
45 has given written approval of the specific deviation. The contractor shall continue to be
46 responsible for deviations from requirements of the contract documents not specifically noted
47 by the contractor in writing, and specifically approved by the engineer in writing.
- 48

- 1 3. The engineer's/designer's approval of shop drawings, product data, and samples shall not
2 relieve the contractor of responsibility for errors or omissions in such shop drawings, product
3 data, and samples.
- 4 4. The engineer's/designer's review and approval, or other appropriate action upon shop
5 drawings, product data, and samples, is for the limited purpose of checking for conformance
6 with information given and design concept expressed in the contract documents. The
7 engineer's/designer's review of such submittals is not conducted for the purpose of
8 determining accuracy and completeness of other details such as dimensions and quantities, or
9 for substantiating instructions for installation or performance of equipment or systems, all of
10 which remain the responsibility of the contractor as required by the contract documents. The
11 review shall not constitute approval of safety precautions or of construction means, methods,
12 techniques, sequences, or procedures. The engineer's/designer's approval of a specific item
13 shall not indicate approval of an assembly of which the item is a component.
- 14 B. Perform no portion of the work requiring submittal and review of shop drawings, product data, or
15 samples, until the engineer/designer has approved the respective submittal. Such work shall be in
16 accordance with approved submittals.
- 17 C. Submit shop drawings, product data, and samples as a complete set within thirty (30) days of award of
18 contract.
- 19 1. For initial submission and for resubmission required for approval, submit four (4) copies of
20 each item. The engineer/designer will only return two copies. Make reproductions as required
21 for your use and distribution to subcontractors.
- 22 2. Illegible submittals will not be checked by the engineer.
- 23 D. General: Submit the following:
- 24 1. Bill of materials, noting long lead time items
- 25 2. Optical loss budget calculations for each optical fiber run
- 26 3. Project schedule including all major work components that materially affect any other work on
27 the project
- 28 E. Shop drawings: Submit the following:
- 29 1. Backbone (riser) diagrams.
- 30 2. System block diagram, indicating interconnection between system components and
31 subsystems.
- 32 3. Interface requirements, including connector types and pin-outs, to external systems and
33 systems or components not supplied by the contractor.
- 34 4. Fabrication drawings for custom-built equipment.
- 35 F. Product Data -- Provide catalog cut sheets and information for the following:
- 36 1. Wire and cable
- 37 2. Outlets, jacks, faceplates, and connectors
- 38 3. All metallic and nonmetallic raceways, including surface raceways, outlet boxes, and fittings
- 39 4. Terminal blocks and patch panels
- 40 G. Project record drawings:
- 41 1. Submit project record drawings at conclusion of the project and include:
- 42 a. Approved shop drawings
- 43 b. Plan drawings indicating locations and identification of work area outlets, nodes,
44 telecommunications rooms (TRs), and backbone (riser) cable runs
- 45 c. Telecommunications rooms (TRs) and equipment room (ER and/or MC) termination
46 detail sheets.
- 47 d. Cross-connect schedules including entrance point, main cross-connects, intermediate
48 cross-connects, and horizontal cross-connects.

- 1 e. Labeling and administration documentation.
- 2 f. Warranty documents for equipment.
- 3 g. Copper certification test result printouts and diskettes.
- 4 (a.) Optical fiber power meter/light source test results.

5 1.06 QUALITY ASSURANCE

- 6 A. The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this
7 type and size.
- 8 B. Upon request by the engineer/designer, furnish a list of references with specific information regarding
9 type of project and involvement in providing of equipment and systems.
- 10 C. Equipment and materials of the type for which there are independent standard testing requirements,
11 listings, and labels, shall be listed and labeled by the independent testing laboratory.
- 12 D. Where equipment and materials have industry certification, labels, or standards (i.e., NEMA -
13 National Electrical Manufacturers Association), this equipment shall be labeled as certified or
14 complying with standards.
- 15 E. Material and equipment shall be new, and conform to grade, quality, and standards specified.
16 Equipment and materials of the same type shall be a product of the same manufacturer throughout.
- 17 F. Subcontractors shall assume all rights and obligations toward the contractor that the contractor
18 assumes toward the owner and engineer/designer.

19 1.07 WARRANTY

- 20 A. Unless otherwise specified, unconditionally guarantee in writing the materials, equipment, and
21 workmanship for a period of not less than fifteen (15) years from date of acceptance by the owner.
22 The owner shall deem acceptance as beneficial use.
- 23 B. Transfer manufacturer's warranties to the owner in addition to the General System Guarantee. Submit
24 these warranties on each item in list form with shop drawings. Detail specific parts within equipment
25 that are subject to separate conditional warranty. Warranty proprietary equipment and systems
26 involved in this contract during the guarantee period. Final payment shall not relieve you of these
27 obligations.

28 1.08 DELIVERY, STORAGE, AND HANDLING

- 29 A. Protect equipment during transit, storage, and handling to prevent damage, theft, soiling, and
30 misalignment. Coordinate with the owner for secure storage of equipment and materials. Do not
31 store equipment where conditions fall outside manufacturer's recommendations for environmental
32 conditions. Do not install damaged equipment; remove from site and replace damaged equipment
33 with new equipment.

34 1.09 SEQUENCE AND SCHEDULING

- 35 A. Submit schedule for installation of equipment and cabling. Indicate delivery, installation, and testing
36 for conformance to specific job completion dates. As a minimum, dates are to be provided for bid
37 award, installation start date, completion of station cabling, completion of riser cabling, completion of
38 testing and labeling, cutover, completion of the final punch list, start of demolition, owner acceptance,
39 and demolition completion.

40 1.10 USE OF THE SITE

- 41 A. Perform all work with the building occupied
 - 42 B. Access to building wherein the work is performed shall be as directed by the owner.
- 43

1 PART 2 - PRODUCTS

2 2.01 MANUFACTURERS

3 A. Hubbell, Ortronics, Panduit

4 1. Or any other approved equivalent manufacturer that meets the performance requirements of
5 this specification. Category 6 performance is standard.

6 2. Contractor shall be a certified installer.

7 B. Berk-Tek

8 C. Belden

9 D. Mohawk

10 E. Commscope

11 F. Superior Essex

12 G. Optical Cable Corporation

13 2.02 FABRICATION

14 A. Fabricate custom-made equipment with careful consideration given to aesthetic, technical, and
15 functional aspects of equipment and its installation.

16 2.03 SUITABILITY

17 A. Provide products that are suitable for intended use, including, but not limited to environmental,
18 regulatory, and electrical.

19 2.04 STATION CABLE

20 A. VOICE TELECOMMUNICATIONS STATION CABLE

21 1. Solid copper, 24 AWG, 100 W balanced twisted-pair (UTP) Category 6 cables with four
22 individually twisted-pairs, which meet or exceed the mechanical and transmission performance
23 specifications in ANSI/TIA/EIA-568-B.2 up to 250 MHz.

24 a. Listed Type CMP (as required in the NEC 2011).

25 B. DATA STATION CABLE (Copper)

26 1. Solid copper, 24 AWG, 100 W balanced twisted-pair (UTP) Category 6 cables with four
27 individually twisted-pairs, which meet or exceed the mechanical and transmission performance
28 specifications in ANSI/TIA/EIA-568-B.2 up to 250 MHz.

29 a. Listed Type CMP (as required in the NEC 2011).

30 2.05 WORK AREA OUTLETS

31 A. VOICE/DATA WORK AREA OUTLETS (Copper only)

32 1. Single-gang stainless steel mounting plate with four (4) openings containing the following
33 devices:

34 a. Voice Outlet - 8-pin modular, Category 6, unkeyed, white, pinned to T568A standards.

35 b. One Data Outlet - 8-pin modular, Category 6, unkeyed, blue, pinned to T568A
36 standards.

37 c. Two dust covers.

38 2. The device color of outlets and jacket color for cabling that will be used on the project shall be
39 coordinated with the Dane County Information Technology (IT) Department prior to the
40 beginning of any work. It is intended that the Dane County standard being maintained.

41 B. WALL VOICE OUTLETS

- 1 1. Single-gang stainless steel faceplate with six-conductor jack and wall telephone mounting lugs
2 C. DATA ONLY WORK AREA OUTLET
3 1. Single-gang faceplate with 8-pin modular, category 6, unkeyed, blue data jack, pinned to
4 T568A standards
5 D. VOICE ONLY WORK AREA OUTLET
6 1. Single-gang faceplate with 8-pin modular, category 6, unkeyed, white telephone jack, pinned
7 to T568A standards

8 2.06 PATCH PANELS

- 9 A. 19 in. rack mountable, 24-port 8-pin modular to insulation displacement connector (IDC) meeting
10 Category 6 performance standards and pinned to T568 A standards. Typical examples of IDC
11 connections are the 110, BIX, and Krone.

12 2.07 EQUIPMENT RACKS

- 13 A. Racks are existing.

14 PART 3 - EXECUTION

15 3.01 PRE-INSTALLATION SITE SURVEY

- 16 A. Prior to start of systems installation, meet at the project site with the owner's representative and
17 representatives of trades performing related work to coordinate efforts. Review areas of potential
18 interference and resolve conflicts before proceeding with the work. Facilitation with the General
19 Contractor will be necessary to plan the crucial scheduled completions of the equipment room and
20 telecommunications closets.
21 B. Examine areas and conditions under which the system is to be installed. Do not proceed with the
22 work until satisfactory conditions have been achieved.
23 C. The contractor shall be responsible for meeting with the Owner's (Dane County) Information
24 Technology staff prior to the start of any installation to coordinate the work to be installed as part of
25 this project. It is the design intent to maintain any cabling or installation standards that are currently
26 in use by Dane County.
27 1. Failure to perform this meeting may cause work to be removed and reinstalled if not deemed
28 acceptable by Dane County.

29 3.02 HANDLING AND PROTECTION OF EQUIPMENT AND MATERIALS

- 30 A. Be responsible for safekeeping of your own and your subcontractors' property, such as equipment and
31 materials, on the job site. The owner assumes no responsibility for protection of above named
32 property against fire, theft, and environmental conditions.

33 3.03 PROTECTION OF OWNER'S FACILITIES

- 34 A. Effectively protect the owner's facilities, equipment, and materials from dust, dirt, and damage during
35 construction.
36 B. Remove protection at completion of the work.

37 3.04 INSTALLATION

- 38 A. Receive, check, unload, handle, store, and adequately protect equipment and materials to be installed
39 as part of the contract. Store in areas as directed by the owner's representative. Include delivery,
40 unloading, setting in place, fastening to walls, floors, ceilings, or other structures where required,
41 interconnecting wiring of system components, equipment alignment and adjustment, and other related
42 work whether or not expressly defined herein.
43 B. Install materials and equipment in accordance with applicable standards, codes, requirements, and

1 recommendations of national, state, and local authorities having jurisdiction, and National Electrical
2 Code® (NEC) and with manufacturer's printed instructions.

3 C. Adhere to manufacturer's published specifications for pulling tension, minimum bend radii, and
4 sidewall pressure when installing cables.

5 1. Where manufacturer does not provide bending radii information, minimum-bending radius
6 shall be 15 times cable diameter. Arrange and mount equipment and materials in a manner
7 acceptable to the engineer and the owner.

8 D. Penetrations through floor and fire-rated walls shall utilize intermediate metallic conduit (IMC) or
9 galvanized rigid conduit (GRC) sleeves and shall be fire stopped after installation and testing,
10 utilizing a firestopping assembly approved for that application.

11 E. Install station cabling to the nearest telecommunications room (TR), unless otherwise noted.

12 F. Installation shall conform to the following basic guidelines:

13 1. Use of approved wire, cable, and wiring devices

14 2. Neat and uncluttered wire termination

15 G. Attach cables to permanent structure with suitable attachments at intervals of 48 to 60 inches.
16 Support cables installed above removable ceilings.

17 H. Install adequate support structures for 10 foot of service slack at each TR.

18 I. Support riser cables every three (3) floors and at top of run with cable grips.

19 1. Limit number of four-pair data riser cables per grip to fifty (50)

20 J. Install cables in one continuous piece. Splices shall not be allowed except as indicated on the
21 drawings or noted below:

22 K. Provide overvoltage protection on both ends of cabling exposed to lightning or accidental contact with
23 power conductors.

24 3.05 GROUNDING

25 A. Grounding shall conform to ANSI/TIA/EIA 607(A) - Commercial Building Grounding and Bonding
26 Requirements for Telecommunications, National Electrical Code®, ANSI/NECA/BICSI-568 and
27 manufacturer's grounding requirements as minimum.

28 B. Bond and ground equipment racks, housings, messenger cables, and raceways.

29 C. Connect cabinets, racks, and frames to single-point ground which is connected to building ground
30 system via #6 AWG green insulated copper grounding conductor.

31 3.06 LABELING

32 A. Labeling shall conform to ANSI/TIA/EIA-606(A) standards. In addition, provide the following:

33 1. Label each outlet with permanent self-adhesive label with minimum 3/16 in. high characters.

34 2. Label each cable with permanent self-adhesive label with minimum, 1/8 in. high characters, in
35 the following locations:

36 a. Inside receptacle box at the work area.

37 b. Behind the communication closet patch panel or punch block.

38 c. Use labels on face of data patch panels. Provide facility assignment records in a
39 protective cover at each telecommunications closet location that is specific to the
40 facilities terminated therein.

41 d. Use color-coded labels for each termination field that conforms to ANSI/TIA/EIA-
42 606(A) standard color codes for termination blocks.

43 e. Mount termination blocks on color-coded backboards.

44 f. Labels shall be machine-printed. Hand-lettered labels shall not be acceptable.

- 1 g. Label cables, outlets, patch panels, and punch blocks with room number in which
- 2 outlet is located, followed by a single letter suffix to indicate particular outlet within
- 3 room, i.e., S2107A, S2107B. Indicate riser cables by an R then pair or cable number.
- 4 h. Mark up floor plans showing outlet locations, type, and cable marking of cables. Turn
- 5 these drawings over to the owner two (2) weeks prior to move in to allow the owner's
- 6 personnel to connect and test owner-provided equipment in a timely fashion.
- 7 i. Three (3) sets of as-built drawing shall be delivered to the owner within four (4) weeks
- 8 of acceptance of project by the owner. A set of as-built drawings shall be provided to
- 9 the owner in magnetic media form (3.5" floppy disks) and utilizing CAD software that
- 10 is acceptable to the owner. The magnetic media shall be delivered to the owner within
- 11 six (6) weeks of acceptance of project by owner.

12 3.07 TESTING

- 13 A. Testing shall conform to ANSI/TIA/EIA-568-B.1 standard. Testing shall be accomplished using level
- 14 IIe or higher field testers.
- 15 B. Test each pair and shield of each cable for opens, shorts, grounds, and pair reversal. Correct
- 16 grounded, and reversed pairs. Examine open and shorted pairs to determine if problem is caused by
- 17 improper termination. If termination is proper, tag bad pairs at both ends and note on termination
- 18 sheets.
- 19 1. Perform testing of copper cables with tester meeting ANSI/TIA/EIA-568-B.1 requirements.

20
21 **Category 6 Test Parameters:**
22

Frequency Mhz	Category 6 Cable Permanent Link Test					
	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
	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

- 23
- 24 C. Propagation Delay
- 25 1. The maximum propagation delay determined in accordance with the ANSI/TIA/EIA –568B.2
- 26 for a Permanent Link configuration shall be less than 498-ns measured at 10MHz. (Note: In
- 27 determining the permanent link propagation delay, the propagation delay contribution of
- 28 connecting hardware is assumed to not exceed 2.5 ns from 1 MHz to 250MHz).
- 29 D. Delay Skew
- 30 1. For all frequencies from 1 MHz to 250 MHz, Category 6 cable propagation delay skew shall
- 31 not exceed 44ns/100m at 20 degrees C, 40 degrees C, and 60 degrees C. In addition, the
- 32 propagation delay skew between all pairs shall not vary more than +/- 10ns from the measured
- 33 value at 20 degrees C when measured at 40 degrees C and 60 degrees C. Compliance shall be
- 34 determined using a minimum 100m of cable.

- 1 E. In order to establish testing baselines, cable samples of known length and of the cable type and lot
2 installed shall be tested. The cable may be terminated with an 8-position Category 6 Modular plug (8-
3 pin) to facilitate testing. Net Propagation Velocity (NPV) and nominal attenuation values shall be
4 calculated based on this test and be utilized during the testing of the installed cable plant. This
5 requirement can be waived if NPV data is available from the cable manufacturer for the exact cable
6 type under test.
- 7 F. In the event results of the tests are not satisfactory, the Contractor shall make adjustments,
8 replacement and changes as are necessary, and shall then repeat the test or tests which disclosed faulty
9 or defective material, equipment or installation method, and shall make additional tests as the
10 Engineer deems necessary at no additional expense to the project or user agency.
- 11 G. Where any portion of system does not meet the specifications, correct deviation and repeat applicable
12 testing at no additional cost to the owner.

13 3.08 FIELD QUALITY CONTROL

- 14 A. Employ job superintendent or project manager during the course of the installation to provide
15 coordination of work of this specification and of other trades and provide technical information when
16 requested by other trades. This person shall maintain current RCDD® (Registered Communications
17 Distribution Designer) registration and shall be responsible for quality control during installation,
18 equipment set-up, and testing.
- 19 B. At least 30 percent of installation personnel shall be BICSI Registered Telecommunications Installers.
20 Of that number, at least 15 percent shall be registered at the Technician Level, at least 40 percent shall
21 be registered at the Installer Level 2, and the balance shall be registered at the Installer Level 1.
- 22 C. Installation personnel shall meet manufacturer's training and education requirements for
23 implementation of extended warranty program.

24
25
26
27

END OF SECTION 27 10 00

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SECTION 28 13 00

ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.01 SCOPE

- A. Conditions of the Contract and portions of Division One 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 Continental Access system installed in the Dane County Courthouse 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. Materials are available from Gappa Security 317 East Main Street, Waupun, WI 53963.
- B. Contact Zach Gappa at 920-324-2260.
- C. Materials shall be purchased from a source with the capabilities 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.

- 1 E. Closeout Submittals: Submit the following:
- 2 1. Operation and Maintenance Data: Operation and maintenance data for installed products in
3 accordance with Division 1 Closeout Submittals. Include troubleshooting guide, wiring terminal
4 identification and equipment parts list.
- 5 2. Warranty: Warranty documents specified herein.
- 6 F. Project Closeout
- 7 1. The contractor shall furnish manufacturer's manuals of the completed system including individual
8 specifications sheets, schematics, inter-panel and intra-panel wiring diagrams.
- 9 a. All information necessary for the proper maintenance and operation of the system must
10 be included.
- 11 b. Provide four copies.
- 12 2. Demonstrate proper function to Owner and Fire Department.
- 13 3. Operating manuals and users' guides shall be provided at the time of the training.

14 1.06 WARRANTY

- 15 A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document
16 executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation
17 of, other rights Owner may have under Contract Documents.
- 18 1. Warranty Period: 3 years commencing on the Date of Substantial Completion.
- 19 2. All materials and installation shall be guaranteed to be free of defects in material and
20 workmanship for one year after final acceptance of installation and tests.

21 1.07 INSTALLATION STANDARDS

- 22 A. The system shall be installed in accordance with the 2017 NEC.
- 23 B. The completed system shall follow state and local electrical codes.
- 24 C. All wiring shall test free from grounds and shorts.

25 PART 2 - PRODUCTS

26 2.01 POWER SUPPLY

- 27 A. Provide an Altronix SMP7PMCTXS.
- 28 1. 115 VAC input.
- 29 2. 12VDC/24VDC selectable output.
- 30 3. 6 ampere continuous supply current output.
- 31 4. Filtered and electronically regulated outputs.
- 32 5. Short circuit and thermal overload protection.
- 33 6. Built-in charger for battery backup.
- 34 7. AC input and DC output LED indicators.
- 35 8. AC fail supervision (form C contact rated 1A at 28VDC)
- 36 9. In NEMA 1 enclosure.
- 37

- 1 2.02 ACCESS CONTROLLER
- 2 A. Provide an Access Controller capable of controlling 4 doors, compatible with the existing system.
- 3 B. Provide interface components to link to existing Access Controllers.
- 4 C. System must be compatible with existing Dane County proximity cards.
- 5 2.03 CARD READERS
- 6 A. Provide HID RP10SE at door 5052A.
- 7 B. Provide HID RPK40SE at door 5052L.
- 8 2.04 ELECTRIC STRIKES
- 9 A. To be furnished by the Hardware Section: wired by this Section. Coordinate voltage and other
10 requirements.
- 11 2.05 PROXIMITY CARDS
- 12 A. Furnished by owner.
- 13 PART 3 - EXECUTION
- 14 3.01 INSTALLATION
- 15 A. Cabling Requirements
- 16 1. Wiring may be run concealed, free air. See following article.
- 17 2. Verify cable types with the Manufacturer.
- 18 3. Provide 120V AC outlet.
- 19 4. All cables shall be plenum rated.
- 20 B. Locate equipment in existing electrical closet.
- 21 3.02 FREE AIR WIRING
- 22 A. All wiring shall be run "free-air", in conduit or in surface raceway. "Free-air" wiring is allowed where it
23 can be completely concealed. If wiring cannot be concealed, it shall be installed in wire mold in finished
24 areas and in conduit in unfinished areas.
- 25 B. Where installed "free-air", comply with the following:
- 26 1. Cable shall run at right angles and be kept clear of other trades work.
- 27 2. Cables shall be supported according to code utilizing bridle rings anchored to ceiling concrete,
28 piping supports or structural steel beams. Rings shall be designed to maintain cables bend to
29 larger than the minimum bend radius (typically 4 x cable diameter).
- 30 3. Supports shall be spaced at a maximum 4-foot interval unless limited by building construction. If
31 cable "sag" at mid-span exceeds 12-inches, another support shall be used.
- 32 4. Cable shall never be laid directly on the ceiling grid.
- 33 5. Cables shall not be attached to or supported by, existing cabling, plumbing or steam piping,
34 ductwork, ceiling supports or electrical or communications conduit.
- 35 6. A coil of 2 feet in each cable shall be placed in the ceiling at each "free-air" wired device. These
36 "service loops" shall be secured at the last cable support before the cable reaches the device and
37 shall be coiled from 100% to 200% of the cable recommended minimum bend radius.

- 1 7. Devices wired with conduit shall be provided with an 8-inch wire tail at each device box
- 2 8. To reduce or eliminate EMI, the following minimum separation distances from ≤480V Power lines
- 3 shall be adhered to:
- 4 a. Twelve (12) inches from power lines of <5-kVa.
- 5 b. Eighteen (18) inches from high voltage lighting (including fluorescent).
- 6 c. Thirty-nine (39) inches from power lines of 5-kVa or greater.
- 7 d. Thirty-nine (39) inches from transformers and motors.
- 8 9. All cable shall be free of tension at both ends. In cases where the cable must bear some stress,
- 9 Kellem grips shall be used to spread the strain over a longer length of cable.
- 10 10. Manufacturers minimum bend radius specifications shall be observed in all instances. Care should
- 11 be taken in the use of cable ties to secure and anchor the station cabling. Ties should not be over
- 12 tightened as to compress the cable jacket. No sharp burrs should remain where excess length of
- 13 the cable tie has been cut.
- 14 11. All vertical cable extensions to devices located below the finished ceiling shall be in conduit.
- 15 C. Contractor shall furnish all required installation tools to facilitate cable pulling without damage to the
- 16 cable jacket. Such equipment is to include, but not limited to, sheaves, winches, cable reels, cable reel
- 17 jacks, duct entrance tunnels, pulling tension gauge and similar devices. All equipment shall be of
- 18 substantial construction to allow steady progress once pulling has begun. Makeshift devices, which may
- 19 move or wear in a manner to pose a hazard to the cable, shall not be used.
- 20 D. All cable shall be pulled by hand unless installation conditions require mechanical assistance. Where
- 21 mechanical assistance is used, care shall be taken to insure that the maximum tensile load for the cable as
- 22 defined by the manufacturer is not exceeded. This may be in the form of continuous monitoring of
- 23 pulling tension, use of a “break-away” or other approved method.

24 3.03 LOCAL CODE AUTHORITY SUBMITTALS

- 25 A. This Contractor is responsible for making required submittals to the Madison Fire Department.
- 26 B. Pay any fees required for review.

27 3.04 MANUFACTURER’S INSTRUCTIONS

- 28 A. Compliance: Comply with manufacturer’s product data, including product technical bulletins, product
- 29 catalog installation instructions, and product carton instructions for installation.

30 3.05 EXAMINATION

- 31 A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under
- 32 other sections, are acceptable for product installation in accordance with manufacturer’s instructions.

33 3.06 SYSTEM STARTUP

- 34 A. Power shall only be applied to the system after re-checking for proper grounding of the system and
- 35 measuring all loops for lack of shorts, grounds, and open circuits.
- 36 B. System supplier shall be responsible for coordinating all hardware programming of the system with the
- 37 Dane County. Coordinate all door functions with each tenant representative and Dane County.
- 38 Cardholder data base programming shall be by Dane County.

39 3.07 COMMISSIONING

- 40 A. After all work is completed and prior to requesting acceptance test, Contractor shall conduct a final
- 41 inspection and pre-test all equipment and system features. Each building shall be acceptance tested

1 individually when completed. Contractor shall correct any deficiencies discovered as the result of the
2 inspection and pre-test of all contractor installed equipment and materials.

3 B. Contractor shall submit a request for the acceptance test in writing to the Project Representative no less
4 than fourteen days prior to the requested test date. The request for acceptance test shall be accompanied
5 by a certification from Contractor that all work is complete and has been pre-tested, and that all
6 corrections have been made.

7 C. During acceptance test, Contractor shall demonstrate all equipment and system features to the State's
8 Project Representative and Tenant. Contractor shall remove covers, open wiring connections, operate
9 equipment, and perform other reasonable work as requested by the Project Representative.

10 D. Any portions of the work found to be deficient or not in compliance with the Project Drawing and
11 Specifications will be rejected. The Project Representative will prepare a list of any such deficiencies
12 observed during the acceptance test. Contractor shall promptly correct all deficiencies. Upon correction
13 of deficiencies, Contractor shall submit a request in writing to the Project Representative for another
14 acceptance test.

15 E. If, at the conclusion of the acceptance test, all work is found to be acceptable and in compliance with the
16 Project Drawings and Specifications, the Project Representative will issue a Certificate of Substantial
17 Completion to Contractor.

18

19

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 (Dane County Courthouse) 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. The contractor shall be aware the building does meet the definition of high-rise construction and all fire alarm devices shall contain the ability for digital voice communications. Therefore, speaker/strobe devices will be used instead of horn/strobe devices. Provide any necessary power extender (NAC) panels for the visual notification devices as required.
- C. 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 Kelly Vils at Kelly.vils@jci.com.
- D. The Contractor shall be aware that most of 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.

- 1 E. Manufacturer's Services:
- 2 1. Manufacturer's representative factory trained service engineer for equipment specified herein shall
3 be present at job site to supervise final adjustment of system after installation complete, equipment
4 startup, and training of OWNER'S personnel for system operation.
- 5 2. Manufacturer shall direct services to system and equipment operation, maintenance,
6 troubleshooting, and equipment and system related areas.

7 1.03 SUBMITTALS

8 A. Shop Drawings to include:

- 9 1. Data sheets and equipment description.
10 2. Bill of materials listing components.
11 3. Component wiring diagrams.
12 4. System wiring and interconnection diagrams showing all devices – not a typical diagram.

13 B. Operation and Maintenance (O & M) Data: Submit in accordance with Division 1. Provide electronic
14 record drawings in Autocad Version 2016 or newer on CD.

15 C. Field quality control test results.

16 1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

17 A. Receive equipment at job site, verify applicable components and quantity delivered per invoice.

18 B. Handle equipment to prevent internal components damage, breakage, denting, and scoring enclosure and
19 finish.

20 C. Do not install damaged equipment.

21 D. Store equipment in clean, dry space and protect from dirt, fumes, water, construction debris, and physical
22 damage.

23 E. After installation, protect from damage by Work of other trades.

24 PART 2 - PRODUCTS

25 2.01 GENERAL

26 A. Use of manufacturer's name and model or catalog number is for purpose of establishing standard of
27 quality, general configuration, and operating characteristics desired only.

28 2.02 ACCEPTABLE MANUFACTURERS

29 A. SimplexGrinnell

30 B. Due to the existence of the existing SimplexGrinnell fire alarm control panel, no other manufacturers will
31 be accepted.

32 2.03 SYSTEM OPERATION

33 A. The system operation for the existing SimplexGrinnell fire alarm control panel shall remain as is with no
34 modifications.

1 PART 3 -

2 3.01 FIRE ALARM CONTROL PANEL

3 A. The fire alarm control panel is an existing SimplexGrinnell addressable FACP. This equipment will
4 remain in place and the fire alarm system shall be extended to the areas of remodeling with compatibility
5 with this fire alarm control panel.

6 3.02 SMOKE DETECTION

7 A. Smoke detectors shall be Photoelectric type, SimplexGrinnell True Alarm Analog Sensing 4098 series.

- 8 1. Analog addressable.
- 9 2. Light scattering principle.
- 10 3. UL magnet test feature.
- 11 4. Remote test by control panel command.
- 12 5. Dual alarm and power LED.
- 13 6. Adjustable sensitivity via panel command.
- 14 7. Mounts on 4" octagon or 4" square box with square to round ring.

15 B. Duct smoke detector shall be SimplexGrinnell addressable True Alarm Photoelectric Sensor 4098-9755.

- 16 1. Analog addressable.
- 17 2. For air velocity between 300 and 4000 feet per minute.
- 18 3. Sampling tube as required for duct width dimensions.

19 C. Isolation module:

- 20 1. Automatically isolate wire-to-wire short circuit from SLC loop.
- 21 2. Provide one for each 20 addressable/intelligent devices.
- 22 3. Amber LED shall flash to indicate activation.
- 23 4. Mount on 4 inch square or 4 inch square box with 2 gang ring.

24 3.03 HEAT DETECTION

25 A. Heat detector shall be SimplexGrinnell E-Series Electronic Heat Detector 4098 series

- 26 1. Analog addressable fixed plus rate of rise.
- 27 2. Dual termistors.
- 28 3. Self restoring.
- 29 4. Mount on 4" octagon or 4" square box with square to round ring.

30 3.04 MODULES:

31 A. Monitor module

- 32 1. Monitor contact closing devices (Class B).
- 33 2. Addressable.
- 34 3. Mounts on 4" square or 4" square with 2 gang ring.

35

- 1 B. Control module
- 2 1. Addressable.
- 3 2. DPDT relay contact rated at 3.0A, 30VDC, 0.5A 110VAC.
- 4 3. Mount on 4" square or 4" square with 2 gang ring.
- 5 4. Must be located with 3' of device being controlled.
- 6 C. Isolation module
- 7 1. Automatically isolate wire-to-wire short circuit from SLC loop.
- 8 2. Provide one for each 20 addressable/intelligent devices (Maximum of 25 devices per module).
- 9 3. Amber LED shall flash to indicate activation.
- 10 4. Mount on 4" square or 4" square with 2 gang ring.

11 3.05 PULL STATIONS

- 12 A. Pull station shall be a SimplexGrinnell 4099-9003
- 13 1. Double action, Push operation, English
- 14 2. Addressable.
- 15 3. Lexan construction.
- 16 4. Key reset.
- 17 5. Within ADA 5lb. pull force.
- 18 6. Includes Braille text on station handle.
- 19 7. Bi-color LED visible through handle of station.
- 20 8. Mount on 4" square with 1 gang ring.

21 3.06 NOTIFICATION DEVICES - SIGNALS

- 22 A. Speaker/Strobe unit shall be Wheelock Series ET70 addressable speaker/visual notification devices.
- 23 1. Speaker
- 24 a. High quality voice or tone reproduction with tamps for 1/4, 1/2 , 1 or 2 watts at 25 or
- 25 70.7 VRMS.
- 26 2. Strobe
- 27 a. 15/75cd, 75cd, or 110cd strobe as required (synchronized) (See plans for candela
- 28 requirements).
- 29 3. Mounts on 4" square or 4" square with 1- or 2-gang ring.
- 30 4. All devices shall be wall-mounted wherever possible. However, where required due to existing
- 31 conditions, ceiling mounted speaker/strobe devices shall be allowed to be used.

- 32 B. Strobe unit shall be Wheelock Series RSS visual notification devices mounted to RSSP plates.
- 33 1. 15/75cd, 75cd, or 110cd strobe as required (synchronized) (See plans for candela requirements).
- 34 2. Mounts on 4" square box or 4" square with 1- or 2-gang ring.

- 35 C. All notification devices shall be white.

37 3.07 NOTIFICATION APPLIANCE CIRCUIT PANEL

- 38 A. Notification Appliance Circuit Panel (NAC) shall be SimplexGrinnell 4009 Series

39

- 1 1. Provides four, power-limited NACs with general alarm operation, available as Class B or Class A,
2 each rated 2 A (expandable to eight NACs)
3 a. Includes 8 A power supply/charger
4 b. Follows coded or non-coded alarm input
- 5 3.08 MAGNETIC DOOR HOLDERS
- 6 A. Door holder shall be LCN 404SE (Furnished and installed by General Contractor):
- 7 1. Closer holder combination
8 2. 24V DC solenoid
- 9 3.09 FLOW, PRESSURE AND TAMPER SWITCHES
- 10 A. Wire and install in accordance with requirements of other specification sections and wire as specified in
11 this section. Provide necessary monitor modules and circuits. Wire and install outdoor sprinkler alarm
12 bell. Flow, pressure, tamper switches and sprinkler alarm bell furnished by others.
- 13 3.10 SLAVE FAN RELAY
- 14 A. Slave fan relay shall be SimplexGrinnell model 4090-9002 Relay IAM
- 15 PART 4 - EXECUTION
- 16 4.01 INSPECTION
- 17 A. Examine areas and conditions under which fire alarm system to be installed and notify ENGINEER in
18 writing of conditions detrimental to proper and timely completion of Work.
- 19 4.02 INSTALLATION
- 20 A. Installation of the Fire Alarm/Life Safety System shall be in strict compliance with manufacturer's
21 recommendations. Consult the manufacturer's Control Panel and Peripheral Equipment installation
22 manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system
23 installation.
- 24 B. Power Requirements:
- 25 1. The Fire Alarm Control Panel (FACP) and/or Notification Appliance Circuit (NAC) panels shall
26 be connected to a separate 20 ampere, 120 volt dedicated branch circuit labeled as FIRE ALARM.
27 2. The Control Panel Cabinet shall be grounded securely using a copper grounding conductor.
28 3. Conduit shall enter the Fire Alarm Control panel backbox only at those areas of the back box
29 which have factory conduit knockouts.
30 4. All field wiring shall be completely supervised. In the event of a primary power failure,
31 disconnected standby battery, removal of any internal modules, or any open circuits in the field
32 wiring; an audible and visual trouble signal will be activated until system and its associated field
33 wiring are restored to normal condition.
- 34 C. Cables must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed
35 in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
- 36 D. SLC loops shall be loaded to no more than 75% of their capacity.
- 37

- 1 E. Install wiring in accordance with Section 26 05 00 and shall be in accordance with the NEC, NFPA 72
2 1999, local and state codes, as shown on the drawings, and as recommended by the major equipment
3 manufacturer. See Article 3.06 FREE AIR CABLING for further requirements.
- 4 1. SLC loop shall be 2 #16 shielded FPLR or FPLP cable as required.
5 2. Signal circuit wiring shall be 2 conductor #14 or 2 conductor #12 FPLR or FPLP cable as
6 required. 2#14 or 2#12 THHN is acceptable if signal circuits are enclosed in listed raceway.
7 Synchronization modules shall be utilized to provide audio and visual synchronization over 2
8 conductors. Consult loading chart for proper wire gauge and wire length to insure against
9 excessive DC voltage drop. A minimum of 20.5V DC must be available at the last signal of a
10 NAC under full alarm condition.
11 3. Provide 2 #14 from control panel or door holder power supply to door holders.
- 12 F. Provide all fire alarm system wiring drops to devices within raceways and junction boxes. Where
13 existing conditions prohibit fishing existing walls, to avoid excessive cutting and restoration metallic
14 wiremold finished to match existing wall surface shall be permitted where allowed by
15 OWNER/ENGINEER, routing subject to OWNER/ENGINEER approval. Install conduit in accordance
16 with Section 16001 and as shown on Drawings.
- 17 G. All fire detection and alarm system devices, control panels and remote annunciators shall be flush
18 mounted when located in finished areas and may be surface mounted when located in unfinished areas.
- 19 H. Smoke detectors shall not be installed prior to the system programming and test period. If construction is
20 ongoing during this period, measures shall be taken to protect smoke detectors from contamination and
21 physical damage. Ref: NFPA 72, 1999 2-3.6.1.3.
- 22 I. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may
23 be exposed in unfinished areas if approved by Owner/Engineer before installation. All system junction
24 boxes shall be as manufactured by system supplier or painted red and stenciled with fire alarm system
25 designation.
- 26 J. All fire detection and alarm system devices shall be flush mounted when located in finished areas and
27 may be surface mounted when located in unfinished areas if approved by Owner/Engineer before
28 installation.
- 29 K. All conductor identification shall be labeled in accordance with 26 05 00 at all accessible locations
30 including at control panel, junction boxes and at devices for future tracing and maintenance.
- 31 L. Provide concealed 3/4" conduit and wire to telephone terminal board from main fire alarm control panel.
- 32 M. Coordinate connections with supplier of central station network system.
- 33 N. Provide concealed 3/4" conduit and wire to security panel for monitoring of trouble, supervisory and
34 system alarm.
- 35 O. Provide elevator recall and elevator shunt trip using addressable control modules. Utilizing detector
36 auxiliary contacts is not acceptable and violates NFPA 72, 1999 3-9.2.1. Provide Elevator shunt trip
37 power supervision for integrity per NFPA 72, 1999 3-9.4.4.
- 38 4.03 ADJUSTMENT AND CLEANING
- 39 A. Clean system equipment and enclosure of dirt and debris.
40

- 1 4.04 FIELD QUALITY CONTROL
- 2 A. Provide the service of a NICET certified, Level II minimum, factory-trained technician authorized by the
3 manufacturer of the fire alarm equipment to technically supervise and participate during all of the
4 adjustments and test for the system.
- 5 B. System shall test free from grounds, opens, and short circuits.
- 6 C. Upon completion of installation of fire alarm equipment, CONTRACTOR shall provide ENGINEER
7 with signed written statement substantially in form as follows.
- 8 D. "The undersigned having been engaged as the CONTRACTOR on the "DANE COUNTY
9 COURTHOUSE BUILDING" confirms the fire alarm equipment was installed in accordance with
10 wiring diagrams, instructions, and directions provided to us by the manufacturer."

11 4.05 WARRANTY

- 12 A. All work performed, and all material and equipment furnished under this contract shall be from defects
13 and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of
14 maintenance, labor and materials required to correct any defect during this one-year period shall be
15 included in the submittal bid.

16 4.06 FREE AIR WIRING

- 17 A. All wiring shall be run "free-air", in conduit or in surface raceway. "Free-air" wiring is allowed where it
18 can be completely concealed. If wiring cannot be concealed, it shall be installed in wiremold in finished
19 areas and in conduit in unfinished areas.
- 20 B. Where installed "free-air", comply with the following:
- 21 1. Cable shall run at right angles and be kept clear of other trades work.
- 22 2. Cables shall be supported according to code utilizing bridle rings anchored to ceiling concrete,
23 piping supports or structural steel beams. Rings shall be designed to maintain cables bend to
24 larger than the minimum bend radius (typically 4 x cable diameter).
- 25 3. Supports shall be spaced at a maximum 4-foot interval unless limited by building construction. If
26 cable "sag" at mid-span exceeds 12-inches, another support shall be used.
- 27 4. Cable shall never be laid directly on the ceiling grid.
- 28 5. Cables shall not be attached to or supported by, existing cabling, plumbing or steam piping,
29 ductwork, ceiling supports or electrical or communications conduit.
- 30 6. A coil of 2 feet in each cable shall be placed in the ceiling at each "free-air" wired fire alarm
31 device. These "service loops" shall be secured at the last cable support before the cable reaches the
32 device and shall be coiled from 100% to 200% of the cable recommended minimum bend radius.
- 33 7. Devices wired with conduit shall be provided with an 8-inch wire tail at each device box and 36-
34 inch wire tails at the FACP and FAAP.
- 35 8. To reduce or eliminate EMI, the following minimum separation distances from $\leq 480V$ Power lines
36 shall be adhered to:
- 37 a. Twelve (12) inches from power lines of $<5\text{-kVa}$.
- 38 b. Eighteen (18) inches from high voltage lighting (including fluorescent).
- 39 c. Thirty-nine (39) inches from power lines of 5-kVa or greater.
- 40 d. Thirty-nine (39) inches from transformers and motors.
- 41 9. All cable shall be free of tension at both ends. In cases where the cable must bear some stress,
42 Kellem grips shall be used to spread the strain over a longer length of cable.
- 43

- 1 10. Manufacturers minimum bend radius specifications shall be observed in all instances. Care should
2 be taken in the use of cable ties to secure and anchor the station cabling. Ties should not be over
3 tightened as to compress the cable jacket. No sharp burrs should remain where excess length of
4 the cable tie has been cut.
- 5 11. All vertical cable extensions to fire alarm devices located below the finished ceiling shall be in
6 conduit.
- 7 C. Contractor shall furnish all required installation tools to facilitate cable pulling without damage to the
8 cable jacket. Such equipment is to include, but not limited to, sheaves, winches, cable reels, cable reel
9 jacks, duct entrance tunnels, pulling tension gauge and similar devices. All equipment shall be of
10 substantial construction to allow steady progress once pulling has begun. Makeshift devices, which may
11 move or wear in a manner to pose a hazard to the cable, shall not be used.
- 12 D. All cable shall be pulled by hand unless installation conditions require mechanical assistance. Where
13 mechanical assistance is used, care shall be taken to insure that the maximum tensile load for the cable as
14 defined by the manufacturer is not exceeded. This may be in the form of continuous monitoring of
15 pulling tension, use of a “break-away” or other approved method.
- 16 4.07 DEPARTMENT OF COMMERCE SUBMITTALS
- 17 A. This Contractor is responsible for making required Department of Commerce or City of Madison Fire
18 Department submittals.
- 19 B. Pay any Department of Commerce or City of Madison Fire Department fees for reviewing submittal.
20 These fees should be included in the contractors bid.
- 21 C. Make submittal after engineering review has been obtained for shop drawings.
- 22 D. Incorporate any Department of Commerce or City of Madison Fire Department comments into shop
23 drawings and as-builts.

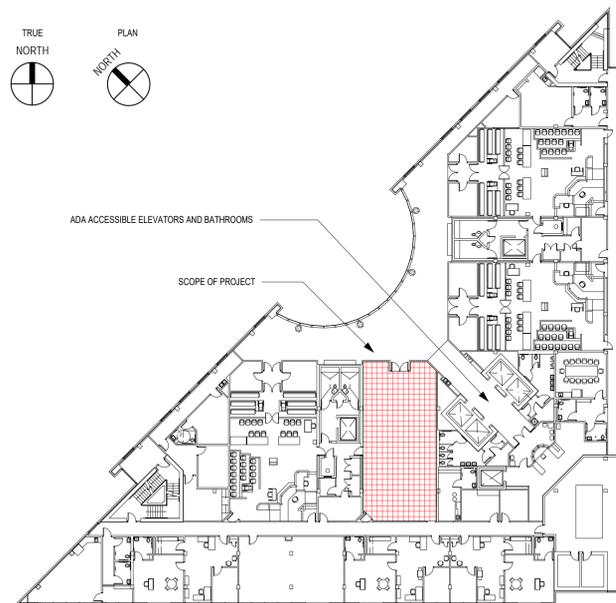
24 END OF SECTION 28 31 00

DANE COUNTY COURTHOUSE ATIP RENOVATION

215 SOUTH HAMILTON STREET, MADISON, WI 53703

DORSCHNER ASSOCIATES
18008-00
RFP NUMBER
318057

BUILDING FLOOR PLAN



INDEX OF DRAWINGS

Sheet Number	Sheet Name
GENERAL G100	COVER SHEET
ARCHITECTURAL A205 A305 A700 A800 A850 A900	FIFTH FLOOR PLAN / DEMOLITION PLAN FIFTH FLOOR REFLECTED CEILING PLAN WALL PARTITION TYPES AND DOOR SCHEDULES INTERIOR ELEVATIONS INTERIOR DETAILS FINISH PLANS
FIRE PROTECTION FP101	FIRE PROTECTION FLOOR PLAN
PLUMBING P101	PARTIAL PLUMBING FLOOR PLAN, DIAGRAMS, SYMBOLS AND ABBREVIATIONS
MECHANICAL M101	PARTIAL FIFTH FLOOR HVAC DEMOLITION & NEW WORK PLANS
ELECTRICAL E000 E100 E200 E201 E300	SYMBOLS, ABBREVIATIONS AND SCHEDULES FIFTH FLOOR ELECTRICAL DEMOLITION PLAN FIFTH FLOOR LIGHTING PLAN FIFTH FLOOR POWER AND SYSTEMS PLAN ELECTRICAL DETAILS

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT	ID	INSIDE DIAMETER
A/C	AIR CONDITIONING	IN	INCH
ACT	ACOUSTICAL CEILING TILE	INFO	INFORMATION
ADD	ADDENDUM (ADDITIONAL)	INT	INTERIOR
ADJ	ADJACENT	INV	INVERT
AFF	ABOVE FINISHED FLOOR	JAN	JANITOR
AL	ALUMINUM	JT	JOINT
ALT	ALTERNATING	KIT	KITCHEN
ANOD	ANODIZED	KO	KNEE OPENING
AP	ACCESS PANEL	LAV	LAVATORY
AP	ACOUSTIC PANEL	LV	LEVEL
APOX	APPROXIMATE	LP	LOW POINT
AVG	AVERAGE	M	MIRROR
BB	BULLETIN BOARD	MAX	MAXIMUM
BD	BOARD	MECH	MECHANICAL
BLDG	BUILDING	MIN	MINIMUM
BLKG	BLOCKING	MISC	MISCELLANEOUS
BM	BEAM	MB	MARKER BOARD
B.O.	BOTTOM OF	MTL	METAL
BRG	BEARING	N	NORTH
BYND	BEYOND	NA	NOT APPLICABLE
CAB	CABINET	NC	NOT IN CONTRACT
CC	CORNER GUARD	ND	NON-OPERATIONAL DOOR
CHW	CLOTHES HOOK MOUNTED ON WALL	NTS	NOT TO SCALE
CJ	CONTROL JOINT	OA	OVERALL
CL	CENTER LINE	OC	ON CENTER(S)
CLG	CELLING	OD	OUTSIDE DIAMETER
CLR	CLEARANCE	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
CMU	CONCRETE MASONRY UNIT	OFDI	OWNER FURNISHED DIAMETER
CO	CLEAN-OUT	OP	OWNER FURNISHED OWNER INSTALLED
COL	COLUMN	OPK	OPENING
CONC	CONCRETE	OPP	OPPOSITE
CONST	CONSTRUCTION	OPP HD	OPPOSITE HAND
CONT	CONTINUOUS, CONTINUE	PC	PRECAST CONCRETE
CORR	CORRIDOR	PERF	PERFORATE(D)
CRS	COURSE	PL	PLATE
CPT	CARPET	PLAM	PLASTIC LAMINATE
CT	CERAMIC TILE	PLWD	PLYWOOD
CTR	CENTER	PNL	PANEL
CUN	CABINET UNIT HEATER	PSF	POUNDS PER SQUARE FOOT
CW	CURTAIN WALL	PSI	POUNDS PER SQUARE INCH
DBL	DOUBLE	PT	PRE-TREATED
DIA	DIAMETER	RCP	REFLECTED CEILING PLAN
DIAG	DIAGONAL	RD	ROOF DRAIN
DM	DIMENSION	REF	REFRIGERATOR
DN	DOWN	REQD	REQUIRED
DR	DOOR	REV	REVERSE
DTL	DETAIL	RM	ROOM
DW	DISH WASHER	RO	ROUGH OPENING
DWG	DRAWING	S	SOUTH
DWR	DRAWER	SECT	SECTION
E	EAST	SF	SQUARE FOOT (FEET)
EA	EACH	SH	SHEET
EJ	EXPANSION JOINT	SIM	SIMILAR
ED	ELECTRIC HAND DRYER	SLS	SOLID SURFACE
EL	ELEVATION	SPEC	SPECIFICATION
ELEC	ELECTRICAL	SQ	SQUARE
ELEV	ELEVATOR	SS	STAINLESS STEEL
EMER	EMERGENCY	STD	STANDARD
EQ	EQUAL	STL	STEEL
EXST	EXISTING	SUSP	SUSPENDED
EXT	EXTERIOR	SYS	SYSTEM
EWC	ELECTRIC WATER COOLER	TB	TACK BOARD
EWL	ELECTRIC WALL HEATER	T&B	TOP AND BOTTOM
EF	EPOXY FINISH	TD	TOWEL DISPENSER
FA	FIRE ALARM	TEMP	TEMPORARY/TEMPERED
FD	FLOOR DRAIN	THK	THICKNESS
FIXT	FIXTURE	TYP	TYPICAL
FLOOR	FLOOR	UC	UNDERCUT
FLR	FLOOR	UNO	UNLESS NOTED OTHERWISE
FO	FACE OF	VCT	VINYL COMPOSITION TILE
FOB	FACE OF BRICK	VERT	VERTICAL
FOC	FACE OF CENTER	VIF	VERIFY IN FIELD
FOF	FACE OF FINISH	VIN	VINYL
FOM	FACE OF MASONRY	W	WEST
FS	FOLDING SHOWER SEAT	WB	WOOD BASE
FX-#	FIRE EXTINGUISHER AND CABINET - TYPE	WC	WATER CLOSETS
GA	GAUGE	WD	WOOD
GB	GRAB BAR	WI	WITH
GL	GLASS, GLAZING	W/O	WITHOUT
GWB	GYPSSUM WALL BOARD		
HB	HOSE BIBB		
HCP	HANDICAPPED		
HM	HOLLOW METAL		
HORIZ	HORIZONTAL		
HT	HEIGHT		
HVAC	HEATING/VENTILATING/AIR CONDITIONING		

ARCHITECTURAL SYMBOLS AND LEGEND

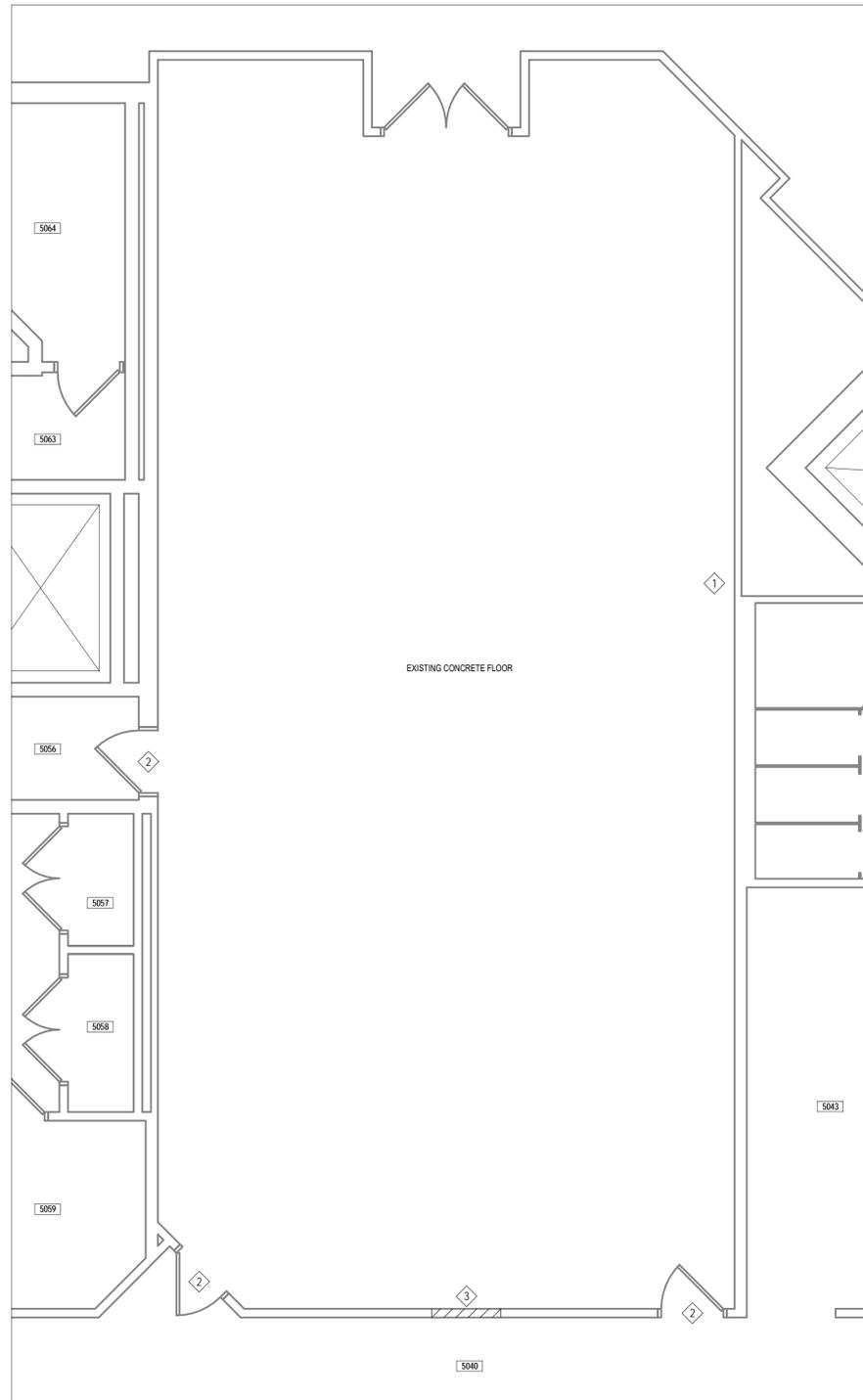
	DETAIL REFERENCE
	SHEET REFERENCE - TOP OF BUBBLE DETAIL NUMBER - BOTTOM OF BUBBLE
	WALL SECTION REFERENCE
	BUILDING SECTION REFERENCE
	CALL OUT REFERENCE
	INTERIOR ELEVATION REFERENCE
	EXTERIOR ELEVATION REFERENCE
	PARTITION TYPE REF. SEE SHEET A700
	NEW WALLS
	WINDOW TYPES SEE XXXX
	1 HOUR FIRE RATED WALL
	2 HOUR FIRE RATED WALL
	NEW DOOR SWING W/ NUMBER SEE XXXX
	EXISTING DOOR SWING
	REQUEST FOR INFORMATION (RFI) SYMBOL AND ADDENDUM (ADD) SYMBOL
	CONSTRUCTION BULLETIN (CB) SYMBOL
	REVISION CLOUD
	ROOM NAME & NUMBER. SEE ROOM FINISH SCHEDULE SHEET A900
	DEMOLITION NOTE
	DEMOLITION

TOILET ACCESSORY SCHEDULE:

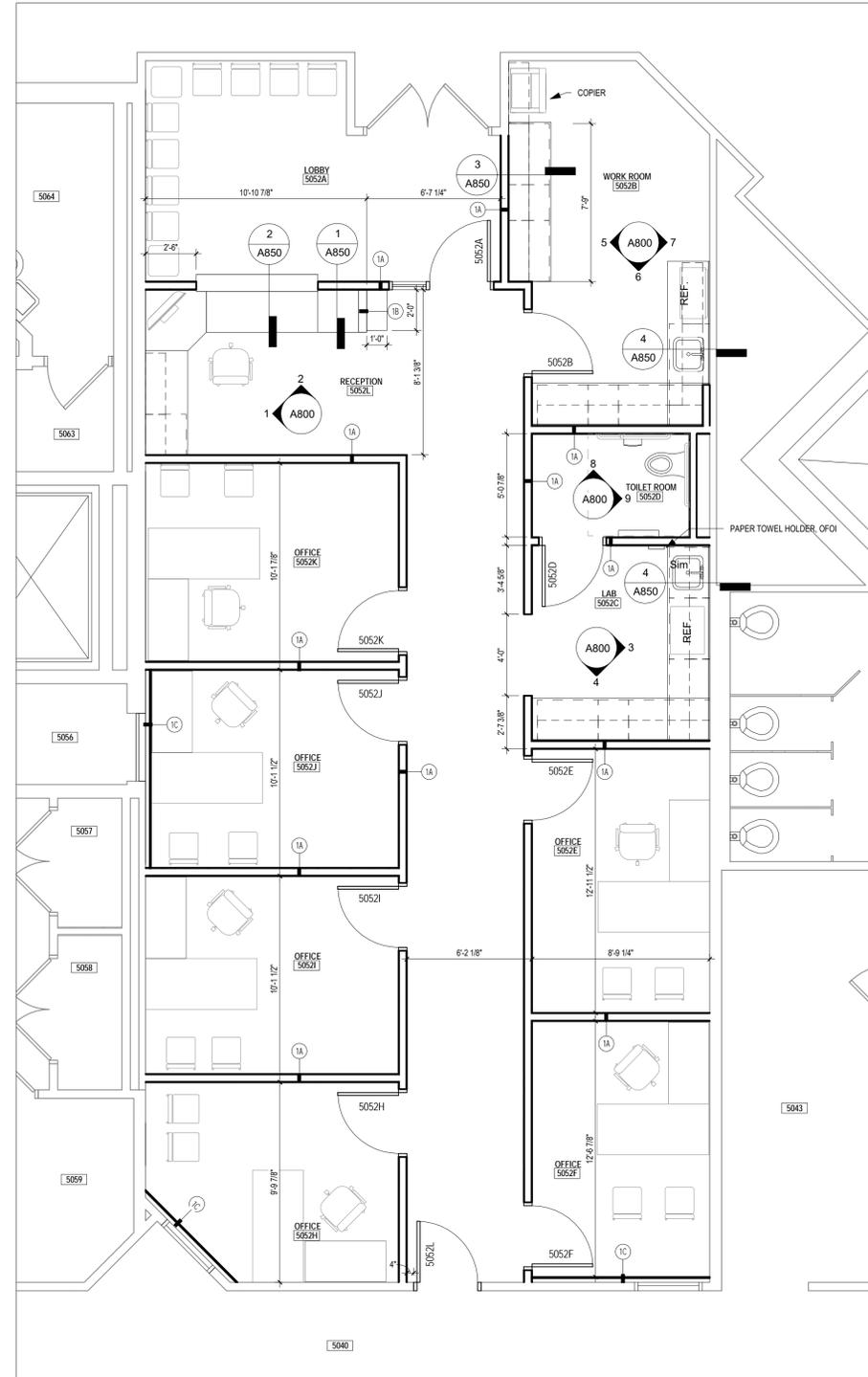
ABBREVIATION	STD. MOUNTING HEIGHT
AP	SEE PLAN AND ELEVATION
CHW	(1) 5'-0" A.F.F., (1) 4'-0" A.F.F. SEE ELEVATIONS FOR OTHER LOCATIONS
EWC	(1) 2'-11" A.F.F. TO SPOUT OUTLET, (1) 3'-5" A.F.F. TO SPOUT OUTLET
G88	CENTER @ 2'-10" A.F.F., 3'-2" A.F.F. IN SHOWER
G818	HORIZ. CENTER @ 2'-10" A.F.F.; VERT. 3'-4" @ B.O. BAR HORIZ. CENTER @ 3'-2" A.F.F.; VERT. 3'-7" @ B.O. BAR IN SHOWER
G836	CENTER @ 2'-10" A.F.F., 3'-2" A.F.F. IN SHOWER
G848	CENTER @ 2'-10" A.F.F., 3'-2" A.F.F. IN SHOWER
G890	CENTER @ 2'-10" A.F.F., 3'-2" A.F.F. IN SHOWER
LAV	TYPICAL: TOP @ 2'-10" A.F.F.
M	BOTTOM @ 3'-4" MAX A.F.F.
SD	TOP @ 48" A.F.F.
SDL	LAVATORY MOUNTED
SNL	TOP @ 15" MIN., 48" MAX A.F.F.
TD	48" A.F.F. MAX. TO OPERATING COMPONENTS (SEE PLAN)
TPH	OUTLET 15" MIN., 48" MAX A.F.F., 7'-9" IN FRONT OF WC TO CL, MAINTAIN 2' CLEAR AT GRAB BAR (SEE PLAN)
WC	SEE PLUMBING



PROJECT LOCATION MAP



2 FIFTH FLOOR DEMOLITION PLAN
1/4" = 1'-0"



1 FIFTH FLOOR PLAN
1/4" = 1'-0"



FLOOR PLAN GENERAL NOTES

1. SEE SHEET A700 FOR PARTITION TYPES.
2. SEE SHEET A700 FOR DOOR AND FRAME ELEVATIONS AND DOOR SCHEDULE.
3. DIMENSIONS ARE TO FACE OF PAINTED SURFACE UNLESS NOTED.
4. SEE SHEET A900 FOR ROOM FINISH INFORMATION.
5. SEE MEP DRAWINGS FOR FURTHER INFORMATION.
6. FURNITURE SHOWN IS OWNER FURNISHED OWNER INSTALLED.
7. FIELD VERIFY CONDITIONS AND NOTIFY ARCHITECT OF ANY DISCREPANCY.
8. REMOVE PLYWOOD AND PATCH EXISTING OPENINGS IN GWB WALLS. REPAIR ALL EXISTING GWB WHERE DAMAGED BY DEMOLITION. MAINTAIN ALL EXISTING FIRE RATINGS.
9. ALL EXISTING GWB WALLS REQUIRE JOINT TREATMENT, FINISHING INCLUDING TEXTURE. SEE SPECIFICATION 09 29 00.

DEMOLITION GENERAL NOTES

1. SEE MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS FOR EXISTING WALL / CEILING MOUNTED ELECTRICAL CONDUIT DEMOLITION.
2. SEE MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS FOR ALL WALL / CEILING MOUNTED DEVICES NOT SPECIFICALLY LISTED IN THESE DRAWINGS.
3. EXISTING CONCRETE FLOOR.
4. EXISTING EXPOSED STRUCTURE IS APPROXIMATELY 16' - 0" AFF.

DEMOLITION PLAN KEY NOTES

- 1 DEMOLISH PORTION OF WALL FOR MEP. REFER TO MEP DRAWINGS.
- 2 REMOVE PORTION OF DOOR HARDWARE. REFER TO 08 71 00.
- 3 REMOVE PORTION OF EXISTING WALL FOR DOOR INSTALLATION.

PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION
215 SOUTH HAMILTON
STREET, MADISON, WI
53703

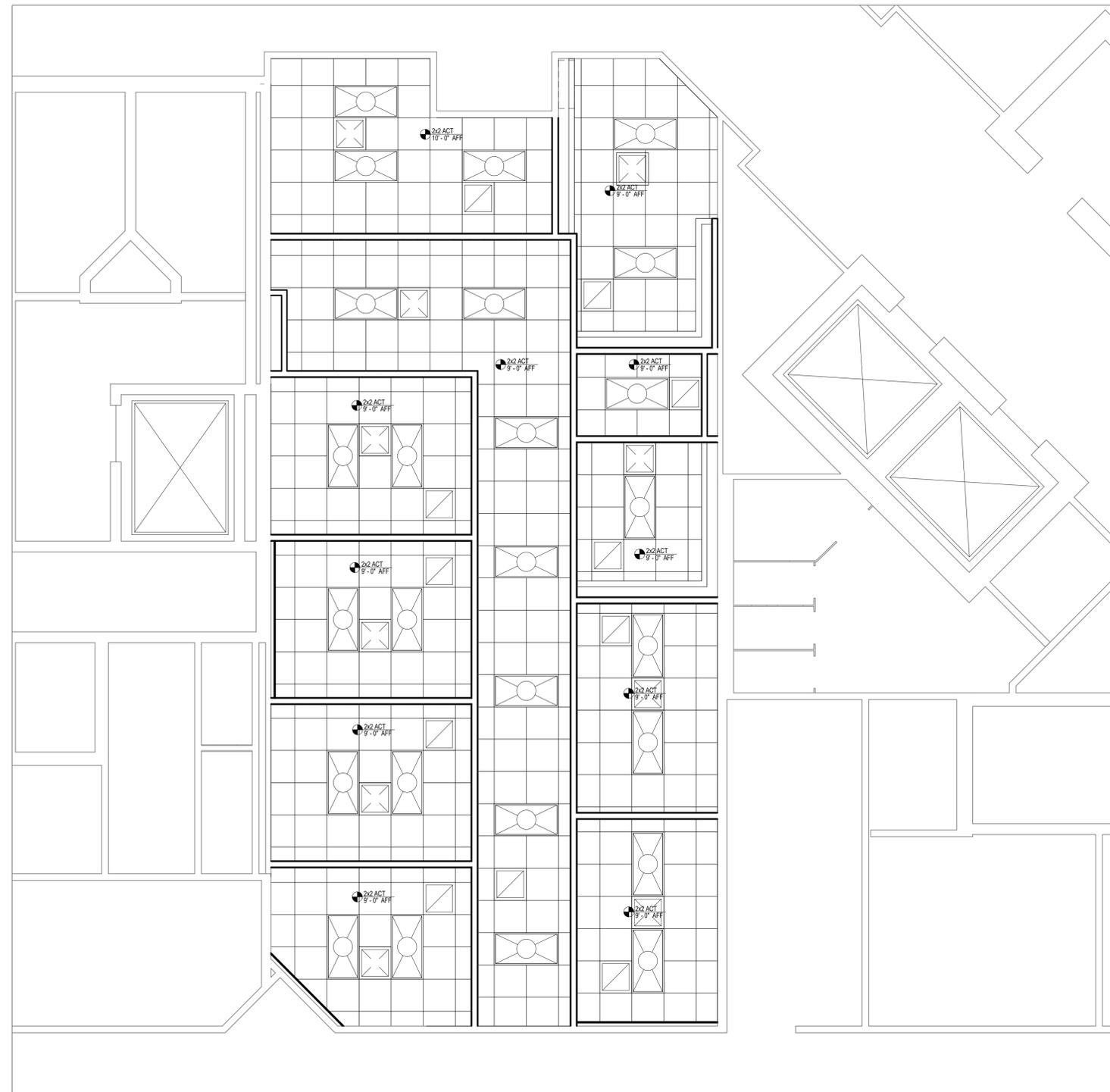
PROJECT NO.
18008-00

DRAWING
FIFTH FLOOR PLAN /
DEMOLITION PLAN

DATE
01.16.19

REFLECTED CEILING PLAN SYMBOLS:

	GYPSUM WALL BOARD
	HARDWOOD VENEER
	DEMO ACOUSTICAL
	2x2 ACOUSTICAL
	2x4 LIGHT FIXTURE
	1x4 LIGHT FIXTURE
	EXIT LIGHT, ARROW INDICATES DIRECTION PLACE CENTER OF 2x2 TILE
	RECESSED DOWNLIGHT, SEE ELECTRICAL
	WALL WASHER, SEE ELECTRICAL
	DIRECTIONAL DOWNLIGHT, SEE ELECTRICAL
	LINEAR INDIRECT PENDANT FIXTURE, SEE ELECTRIC
	LINEAR INDIRECT SCONCE FIXTURE, SEE ELECTRIC
	INDIRECT SCONCE FIXTURE, SEE ELECTRICAL
	1x4 FLUORESCENT, SEE ELECTRICAL
	PENDANT FIXTURE, SEE ELECTRICAL
	HVAC SUPPLY DIFFUSER
	HVAC EXHAUST/TRANSFER DIFFUSER
	LINEAR HVAC DIFFUSER
	SMOKE DETECTOR
	OCCUPANCY SENSOR
	SPRINKLER HEAD
	LED
	WALL WASHER
	ACCESS PANEL
	ELECTICAL OUTLET, CEILING



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

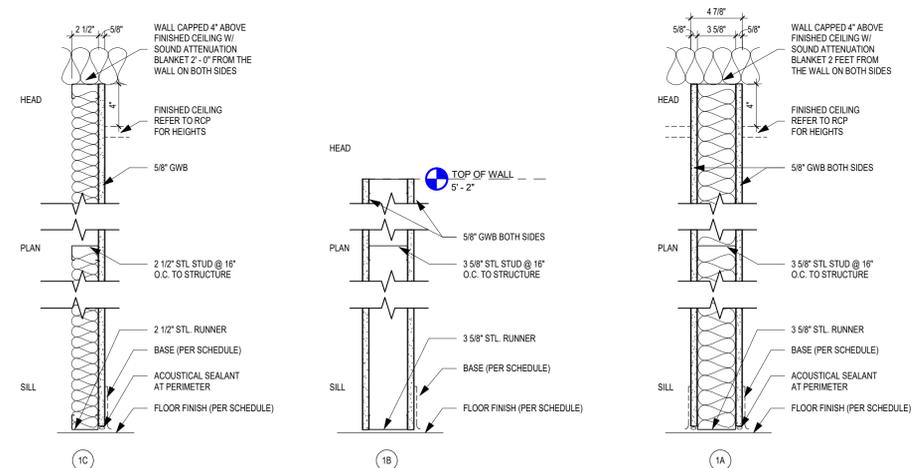
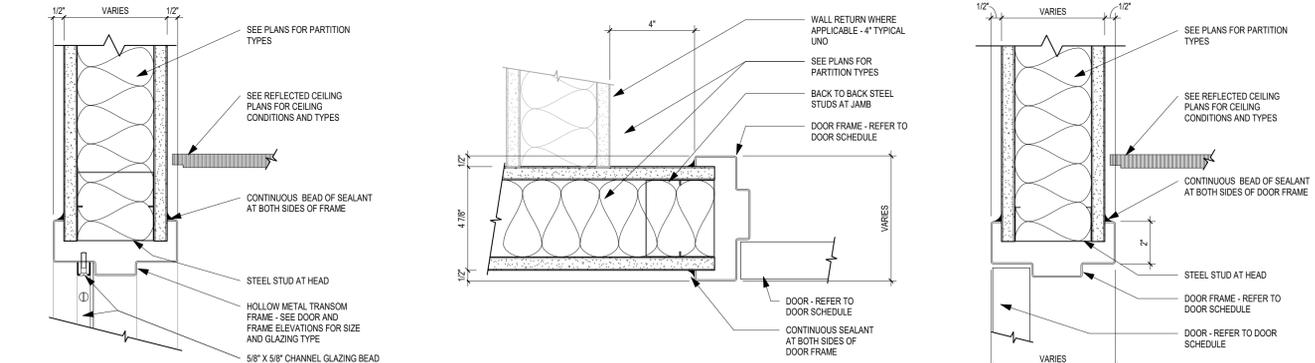
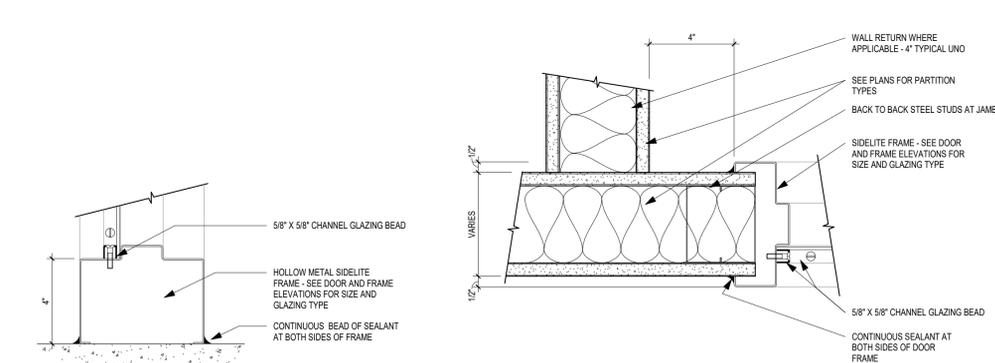
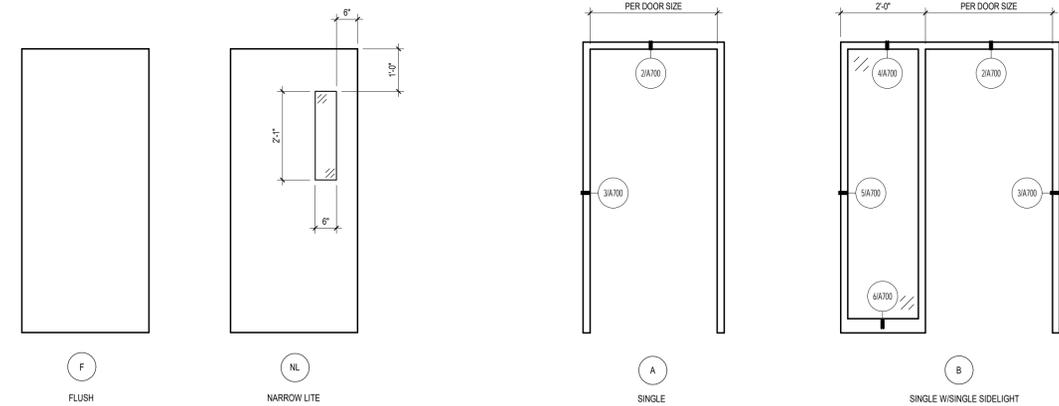
PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION
215 SOUTH HAMILTON
STREET, MADISON, WI
53703

PROJECT NO.
18008-00

DRAWING
FIFTH FLOOR REFLECTED
CEILING PLAN

DATE
01.16.19

DA- DOOR SCHEDULE													
DOOR NUMBER	QTY	DOOR				FRAME		DETAILS			HARDWARE SET	COMMENTS	
		WIDTH	HEIGHT	ELEV	MATERIAL	UNDERCUT	ELEV	MATERIAL	HEAD	JAMB			SILL
FIFTH FLOOR													
5052A	1	30	70	F	WD		B	HM	2/A700,4/A700	3/A700,5/A700	6/A700	1A	REMOTE RELEASE
5052B	1	30	70	NL	WD		A	HM	2/A700	3/A700		1B	CARD READER
5052D	1	30	70	NL	WD		A	HM	2/A700	3/A700		2A	
5052E	1	30	70	NL	WD		A	HM	2/A700	3/A700		3A	
5052F	1	30	70	NL	WD		A	HM	2/A700	3/A700		3A	
5052H	1	30	70	NL	WD		A	HM	2/A700	3/A700		3A	
5052I	1	30	70	NL	WD		A	HM	2/A700	3/A700		3A	
5052J	1	30	70	NL	WD		A	HM	2/A700	3/A700		3A	
5052K	1	30	70	NL	WD		A	HM	2/A700	3/A700		3A	
5052L	1	30	70	NL	WD		A	HM	2/A700	3/A700		3A	CARD READER W/ KEYPAD
30/70 NOTATION REFERS TO 3'-0" X 7'-0" DOOR SIZE													



ISSUE

PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION
215 SOUTH HAMILTON
STREET, MADISON, WI
53703

PROJECT NO.
18008-00

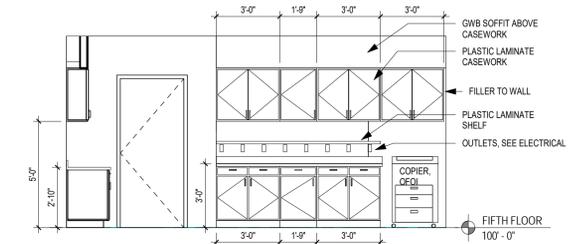
DRAWING
WALL PARTITION TYPES
AND DOOR SCHEDULES

DATE
01.16.19

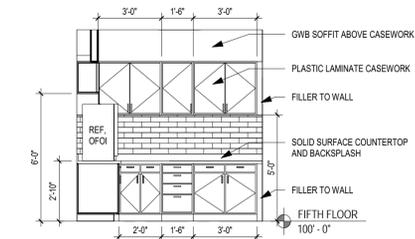
A700

INTERIOR ELEVATION NOTES

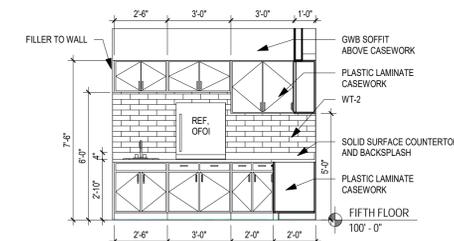
1. FINISH PLANS REPRESENT FLOOR FINISH, TRANSITIONS, WALL PROTECTION & ACCENT PAINT.
2. REFER TO FLOOR PLANS FOR INTERIOR ELEVATION REFERENCE TAGS.
3. REFER TO INTERIOR ELEVATIONS FOR MULTIPLE WALL FINISH LOCATIONS.
4. REFER TO REFLECTED CEILING PLANS FOR CEILING MATERIALS AND LOCATIONS.



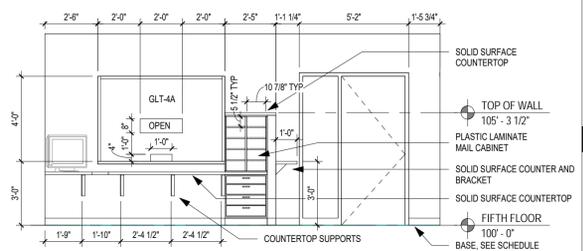
5 WORK ROOM WEST ELEVATION
1/4" = 1'-0"



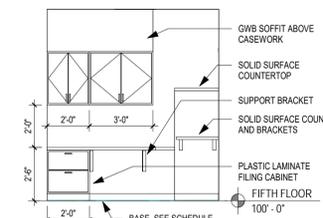
4 LAB SOUTH ELEVATION
1/4" = 1'-0"



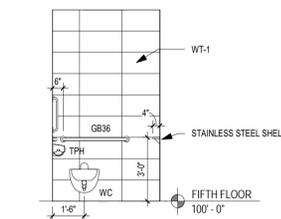
3 LAB EAST ELEVATION
1/4" = 1'-0"



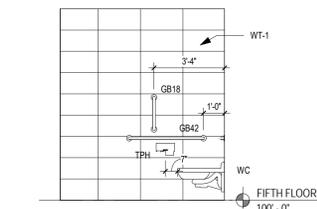
2 RECEPTION NORTH ELEVATION
1/4" = 1'-0"



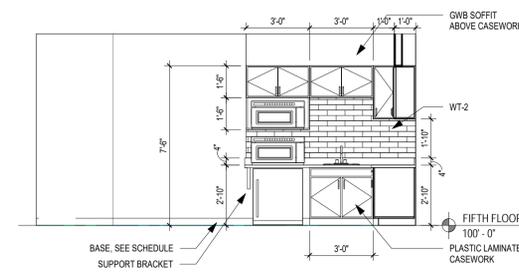
1 RECEPTION WEST ELEVATION
1/4" = 1'-0"



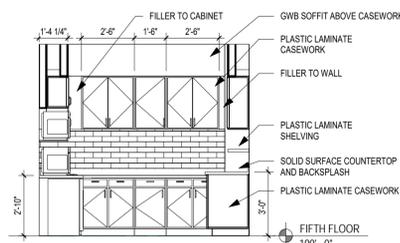
9 TOILET ROOM EAST ELEVATION
1/4" = 1'-0"



8 TOILET ROOM NORTH ELEVATION
1/4" = 1'-0"



7 WORK ROOM EAST ELEVATION
1/4" = 1'-0"



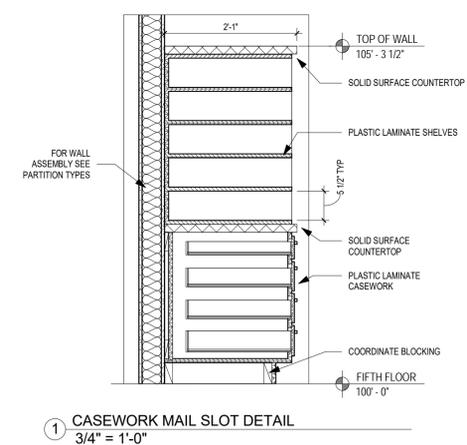
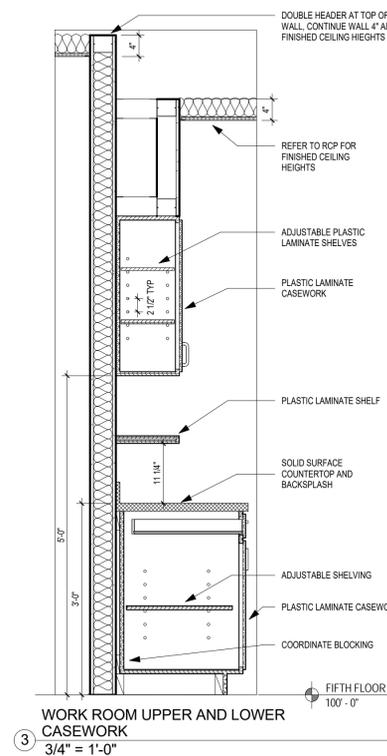
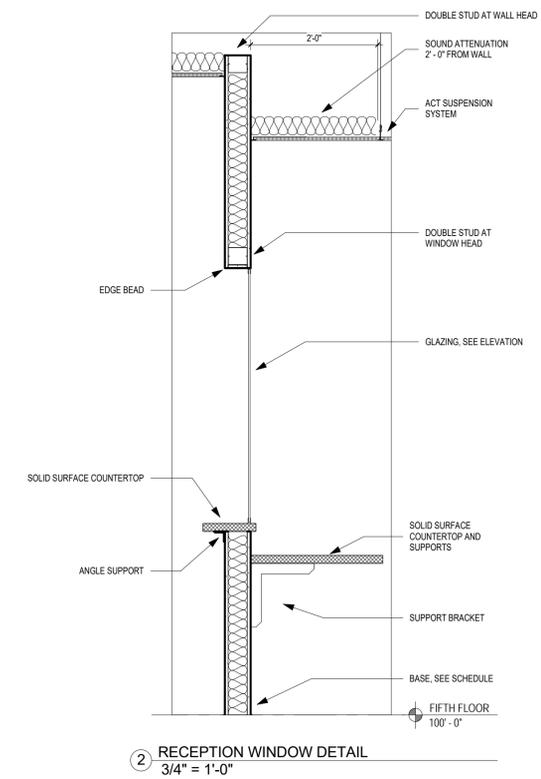
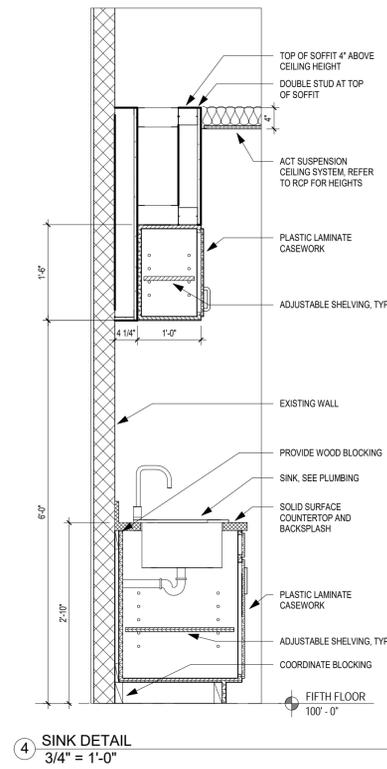
6 WORK ROOM SOUTH ELEVATION
1/4" = 1'-0"

PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION
215 SOUTH HAMILTON
STREET, MADISON, WI
53703

PROJECT NO.
18008-00

DRAWING
INTERIOR ELEVATIONS

DATE
01.16.19



PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION
215 SOUTH HAMILTON
STREET, MADISON, WI
53703

PROJECT NO.
18008-00

DRAWING
INTERIOR DETAILS

DATE
01.16.19

Architecture
Planning

Dorschner Associates, Inc.
848 E. Washington Ave., Ste 112
Madison, Wisconsin 53703

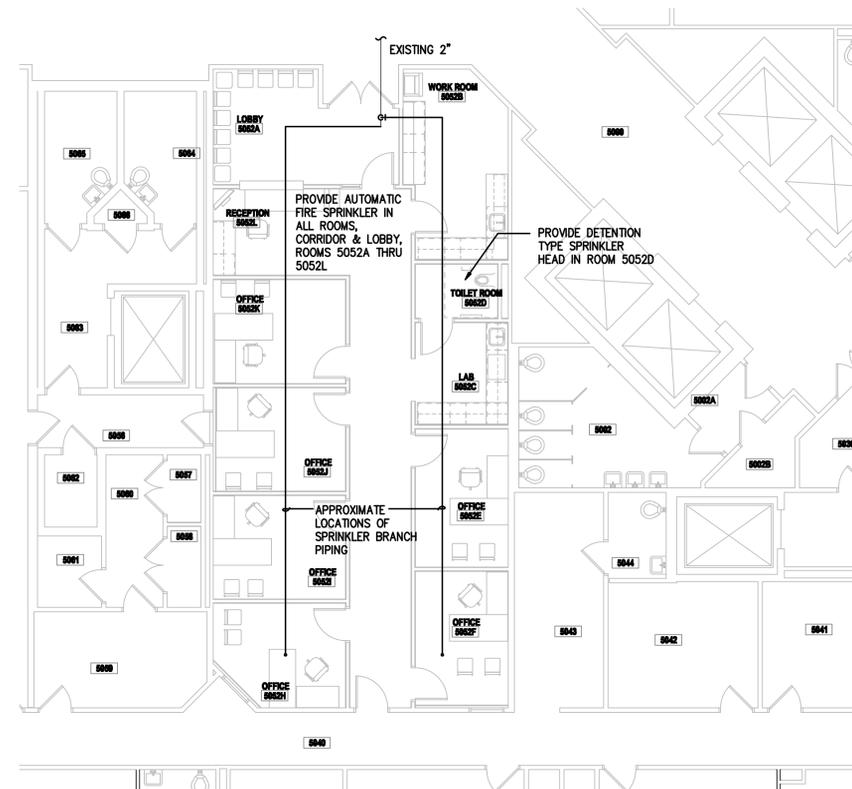
SPD
SELECT PLUMBING DESIGN, LLC

4564 EVERGREEN ROAD
MIDDLETON, WI 53562

(608) 836-9674

Project No. 18-005

ISSUED



A PARTIAL FLOOR PLAN – FIRE PROTECTION
 FP101 SCALE: 1/8" = 1'-0"



PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION

215 SOUTH HAMILTON
STREET, MADISON, WI
53703

18008-00

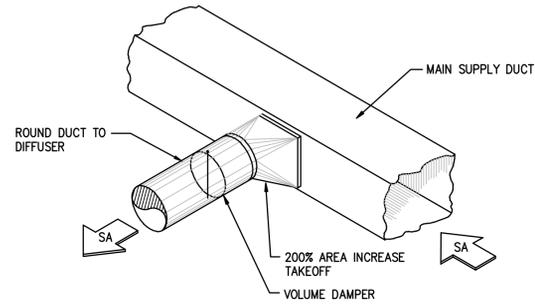
DRAWING
FIRE PROTECTION
FLOOR PLAN

DATE

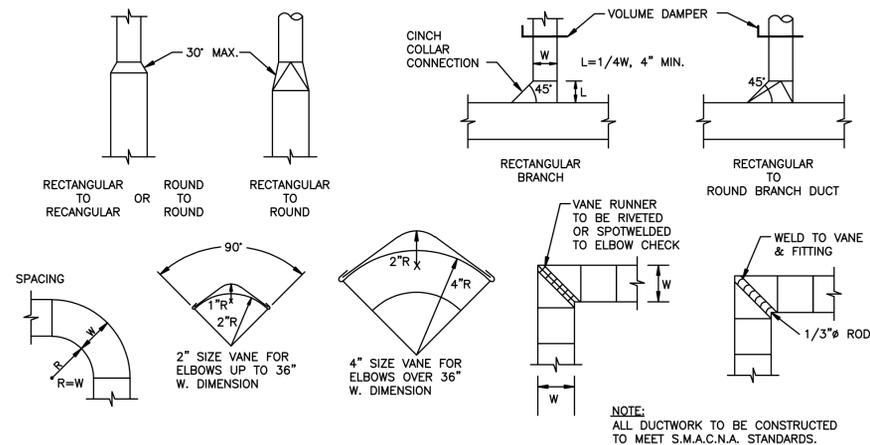
01/16/19

FP101

GRILLE, REGISTER, DIFFUSER SCHEDULE										
MARK	MANUFACTURER	MODEL NO.	DESCRIPTION	MATERIAL	MOUNTING	AIR PATTERN	SIZE	CFM	DAMPER	REMARKS
CD-1	CARNES	SKTA	SQUARE LOUVERED FACE WITH EXTENDED PANEL	STEEL	24 X 24 T BAR	4 WAY	6X6	100 - 140	NO	1, 2, 3, 4
CD-2	CARNES	SKTA	SQUARE LOUVERED FACE WITH EXTENDED PANEL	STEEL	24 X 24 T BAR	4 WAY	9X9	175	NO	1, 2, 3, 4
CD-3	CARNES	SKTA	SQUARE LOUVERED FACE WITH EXTENDED PANEL	STEEL	24 X 24 T BAR	3 WAY	6X6	140	NO	1, 2, 3, 4
RG-1	CARNES	RATA	1/2"X1/2"X1" WITH EXTENDED PANEL	ALUMINUM	24 X 24 T BAR	EGG CRATE	8X8	100 - 140	NO	2, 3
RG-2	CARNES	RATA	1/2"X1/2"X1" WITH EXTENDED PANEL	ALUMINUM	24 X 24 T BAR	EGG CRATE	10X10	175	NO	2, 3
EG-1	CARNES	RATA	1/2"X1/2"X1" WITH EXTENDED PANEL	ALUMINUM	24 X 24 T BAR	EGG CRATE	6X6	75	NO	2, 3, 5
REMARKS										
1 RAPID INDUCTION OPTION "V"										
2 SQUARE TO ROUND CONNECTION										
3 ROUND NECK, SIZE AS INDICATED BY SIZE OF SUPPLY, RETURN OR EXHAUST RETURN DUCT										
4 BALANCING DAMPER IN SUPPLY DUCT										
5 BALANCING DAMPER IN EXHAUST DUCT										

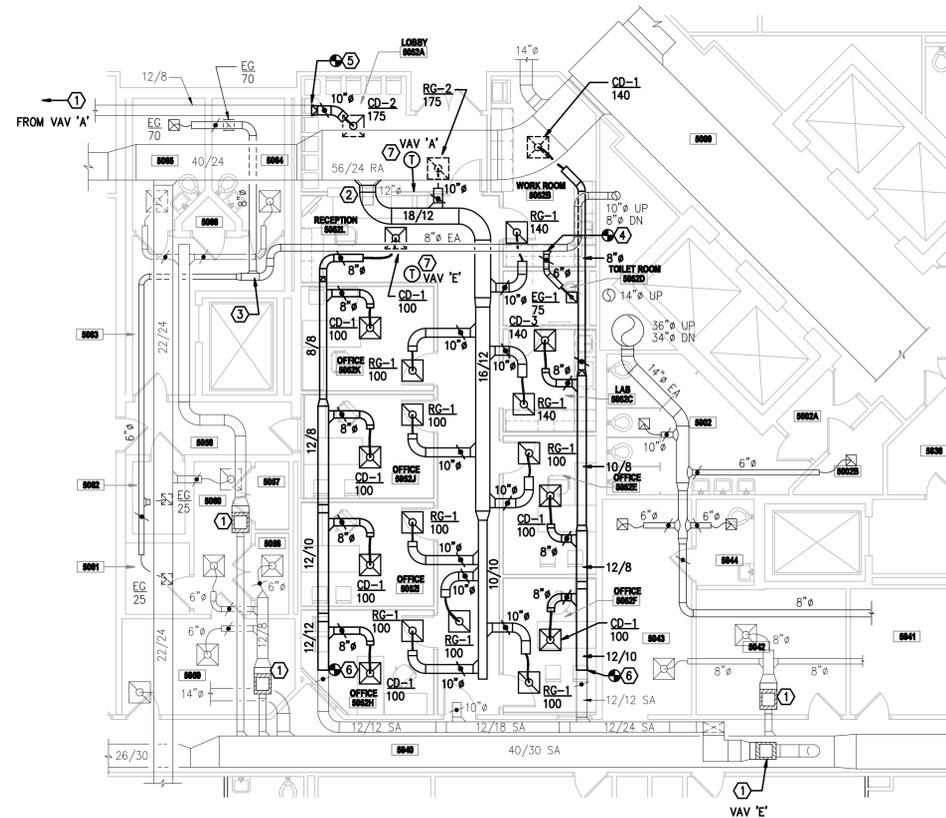


C BRANCH DUCT TAKEOFF DETAIL
M1.0 NOT TO SCALE



B GENERAL DUCT DETAILS
M101 NOT TO SCALE

- DUCTWORK NEW WORK KEY NOTES
- EXISTING VARIABLE AIR VOLUME BOX TO REMAIN.
 - REMOVE THE EXISTING 12"Ø RETURN AIR BRANCH DUCT AND CONNECT NEW 18/12 RETURN DUCT AT THAT SAME LOCATION.
 - BALANCE ALL EXISTING EXHAUST GRILLE (4 TOTAL) ON THIS BRANCH DUCT.
(2) @ 70 CFM AND (2) @ 25 CFM.
 - CONNECT NEW 6"Ø EXHAUST DUCT TO THE EXISTING 8"Ø DUCT AT THIS LOCATION.
 - CONNECT NEW 10"Ø SUPPLY DUCT TO THE EXISTING 12/8 DUCT (FROM VAV-'A')
 - REMOVE ENDCAP AND CONNECT NEW 12/12 SUPPLY DUCT TO THE EXISTING 12/12 DUCT AT THIS LOCATION.
 - REMOVE THERMOSTAT / SENSOR FROM EXISTING LOCATION AND REINSTALL AT LOCATION INDICATED.



A FIFTH FLOOR PLAN - HVAC NEW WORK
M101 SCALE: 1/8" = 1'-0"

PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION
215 SOUTH HAMILTON
STREET, MADISON, WI
53703
18008-00
DRAWING
PARTIAL FIFTH FLOOR
HVAC DEMOLITION &
NEW WORK PLANS

DATE

01/16/19

M101

LIGHT FIXTURE SCHEDULE										
TAG	LAMP DATA		DESCRIPTION	LIGHTING FIXTURE			MOUNT	CEILING TYPE	VOLT	SEE NOTE
	NO	TYPE		MAKE	CATALOG NO					
A	-	37W / 4220 LUMENS / 3500K LED	2 x 4 FLAT PANEL LED	MAXLITE	MLFP-24EP-40-35		RECESSED	GRID	120	
X	-	LED	EXIT LIGHT	LITHONIA	LGM-S-W-R-120277		TOP OR BACK	GRID	120	

SPECIAL OUTLET SCHEDULE														
TAG	DRIVING	LOC.	FEED FROM			BREAKER		BRANCH WIRING			POWER			SEE NOTE
			PANEL	CIRCUIT	SIZE	POLE	NO	SIZE	COND.	VOLT	PH	LOAD		
COPY	COPIER	5052B	P5C	11	20	1	2+G	12	1/2"	120	1	VERIFY		
MICRO-1	MICROWAVE	5052B	P5C	12	20	1	2+G	12	1/2"	120	1	VERIFY	1	
MICRO-2	MICROWAVE	5052B	P5C	14	20	1	2+G	12	1/2"	120	1	VERIFY	2	
REF	REFRIGERATOR	5052C	P5C	13	20	1	2+G	12	1/2"	120	1	VERIFY	1	

- NOTES:
- PROVIDE NEMA TYPE 5-15R GFI RECEPTACLE MOUNTED HORIZONTALLY ABOVE COUNTER.
 - PROVIDE NEMA TYPE 5-15R GFI RECEPTACLE MOUNTED HORIZONTALLY ABOVE COUNTER ON SHELF. VERIFY MOUNTING HEIGHT PRIOR TO ROUGH-IN

PANEL P5CA															
100 AMPS MAIN LUGS			208Y/120 VOLT, THREE PHASE, FOUR WIRE						LOCATION: 5052F						
MOUNTING TYPE: RECESS			SHORT CIRCUIT INTERRUPTING RATING: 10 K.A.I.C												
CIRCUIT BKR.	AMPS	POLES	DESCRIPTION	LOAD TYPE	CIRCUIT WATTS	PHASE LOADS			CIRCUIT WATTS	LOAD TYPE	DESCRIPTION	CIRCUIT BKR.			
						A	B	C				AMPS	POLES		
20	1	1	LIGHTING	R	962	1	2162			2	1200	R	RECEPTACLES - 6	20	1
20	1	1	RECEPTACLES - 6	R	1200	3		2400		4	1200	R	RECEPTACLES - 6	20	1
20	1	1	RECEPTACLES - 6	R	1200	5		2400		6	1200	R	RECEPTACLES - 6	20	1
20	1	1	RECEPTACLES - 6	R	1200	7	2000			8	800	R	RECEPTACLES - 4 GFI	20	1
20	1	1	RECEPTACLES - 6	R	1200	9	2000			10	800	R	RECEPTACLES - 4 GFI	20	1
20	1	1	S.O. - COPY.	R	1000	11		2500		12	1500	R	S.O. - MICRO-1	20	1
20	1	1	S.O. REF	R	800	13	2300			14	1500	R	S.O. - MICRO-2	20	1
20	1	1	RECEPTACLES - 6	R	1200	15		1200		16					
20	1	1	SPARE			17		0		18					
20	1	1	SPARE			19	0			20					
20	1	1	SPARE			21	0			22					
20	1	1	SPARE			23	0			24					
20	1	1	SPARE			25	0			26					
20	1	1	SPARE			27	0			28					
						29	0			30					
					6462	5600	4900				PANEL TOTAL LOAD =		17.0	KW	
													47.1	AMP	

NOTES:

- PROVIDE SQUARE D TYPE NO DOOR-IN-DOOR.
- XXX
- XXX

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
- EWG 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
- 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

FIRE ALARM SYMBOLS

- [FACP] NEW FIRE ALARM CONTROL PANEL
- [FAM] EXISTING FIRE ALARM CONTROL PANEL
- [FAAP] NEW FIRE ALARM ANNUNCIATOR PANEL
- [FAA] EXISTING FIRE ALARM ANNUNCIATOR PANEL
- [FAS] NEW FIRE ALARM PULL STATION 48" AFF
- [FAS] EXISTING FIRE ALARM PULL STATION
- [FAS] NEW (HORN/STROBE) (SPEAKER/STROBE) 80" AFF TO BOTTOM OF BOX OR 6" DOWN FROM CEILING TO TOP OF BOX WHICHEVER IS LOWER
- [FAS] EXISTING (HORN/STROBE) (SPEAKER/STROBE)
- [FAS] NEW PULL STATION WITH NEW (HORN/STROBE) (SPEAKER/STROBE) 80" AFF ABOVE
- [FAS] EXISTING FIRE ALARM PULL STATION WITH EXISTING (HORN/STROBE) (SPEAKER/STROBE) ABOVE
- [FAS] NEW (INTELLIGENT) (CONVENTIONAL) PHOTOELECTRIC SMOKE DETECTOR
- [FAS] EXISTING (INTELLIGENT) (CONVENTIONAL) SMOKE DETECTOR
- [FAS] NEW FIRE ALARM STROBE - ADA RATED 80" TO BOTTOM OF BOX OR 6" DOWN FROM CEILING TO TOP OF BOX WHICHEVER IS LOWER

ELECTRICAL SYMBOLS

- [Symbol] RECESSED, SURFACE OR PENDANT FIXTURE
- [Symbol] INDUSTRIAL STRIP FIXTURE
- [Symbol] RECESSED FIXTURE
- [Symbol] WALL MOUNTED FIXTURE
- [Symbol] MOUNTED EXIT SIGN - CEILING MOUNTED
- [Symbol] MOUNTED EXIT SIGN - WALL MOUNTED
- [OS] OCCUPANCY SENSOR (AUTO OFF / AUTO FULL ON) - CEILING MOUNTED
- [OS] OCCUPANCY SENSOR (AUTO OFF / AUTO 50% ON) - CEILING MOUNTED
- [VS] VACANCY SENSOR (AUTO OFF / MANUAL ON BY MANUAL SWITCH) - CEILING MOUNTED
- [DS] DAYLIGHT SENSOR
- [DS] DAYLIGHT SENSOR WITH OCCUPANCY SENSOR (AUTO OFF / AUTO FULL ON)
- [Symbol] 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)
- [Symbol] DUAL LEVEL 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)
- [Symbol] DIMMER SWITCH - 0-10 VOLT LUTRON NOVA-T. 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)
- [Symbol] 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
- [Symbol] DUPLEX RECEPTACLE - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX OR HEIGHT AS INDICATED - (GFI) GROUND FAULT CIRCUIT INTERRUPTER - (WP) WEATHER PROOF
- [Symbol] DOUBLE DUPLEX RECEPTACLE - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX OR HEIGHT AS INDICATED
- [Symbol] DUPLEX RECEPTACLE - MOUNT HORIZONTAL ABOVE COUNTER - (GFI) GROUND FAULT CIRCUIT INTERRUPTER
- [Symbol] DOUBLE DUPLEX RECEPTACLE - MOUNT ABOVE COUNTER
- [Symbol] SPECIAL OUTLET
- [Symbol] MOTOR
- [Symbol] DISCONNECT SWITCH
- [Symbol] JUNCTION BOX
- [Symbol] PUSHBUTTON - MOUNT 48" TO TOP OF BOX
- [Symbol] ELECTRICAL PANEL
- [Symbol] VOICE/DATA OUTLET - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX (C) ABOVE COUNTER OR HEIGHT AS INDICATED. PROVIDE (2) CAT6 CABLES AND JACKS.
- [Symbol] DATA OUTLET - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX (C) ABOVE COUNTER OR HEIGHT AS INDICATED
- [Symbol] FLOOR DUPLEX RECEPTACLE AND VOICE/DATA OUTLET
- [WAP] WIRELESS ACCESS POINT
- [TV] TELEVISION OUTLET - MOUNT 15" ABOVE FLOOR TO BOTTOM OF BOX OR HEIGHT AS INDICATED
- [ES] ELECTRIC DOOR STRIKE
- [CR] CARD READER
- [DPS] DOOR POSITION SWITCH
- [Symbol] DETAIL NUMBER
- [Symbol] NOTE OR DETAIL SYMBOL
- [Symbol] SHEET LOCATION

ELECTRICAL SHEET INDEX	
SHEET NUMBER	SHEET NAME
E000	SYMBOLS, ABBREVIATIONS AND SCHEDULES
E100	FIFTH FLOOR DEMOLITION PLAN
E200	FIFTH FLOOR LIGHTING PLAN
E201	FIFTH FLOOR POWER AND SYSTEMS PLAN
E300	ELECTRICAL DETAILS

2018-0207.00

GRAEF
One Honey Creek Corporate Center
125 South 94th Street, Suite 401
Milwaukee, WI 53214-1470
414 / 259 1500
414 / 259 0037 fax

PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION

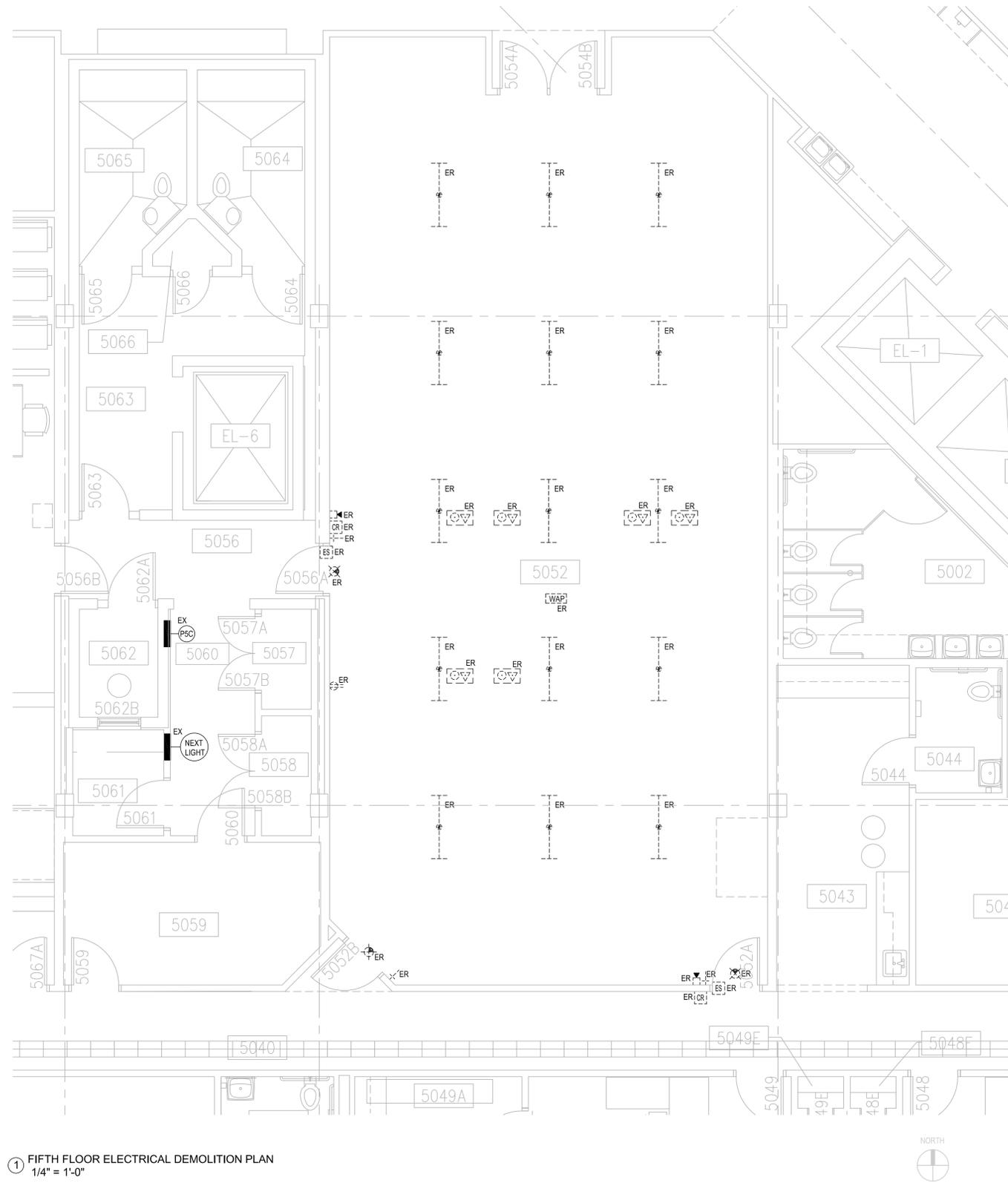
215 SOUTH HAMILTON
STREET, MADISON, WI
53703

PROJECT NO.
18008-00

DRAWING
SYMBOLS,
ABBREVIATIONS AND
SCHEDULES

DATE
01.16.19

E000



① FIFTH FLOOR ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"



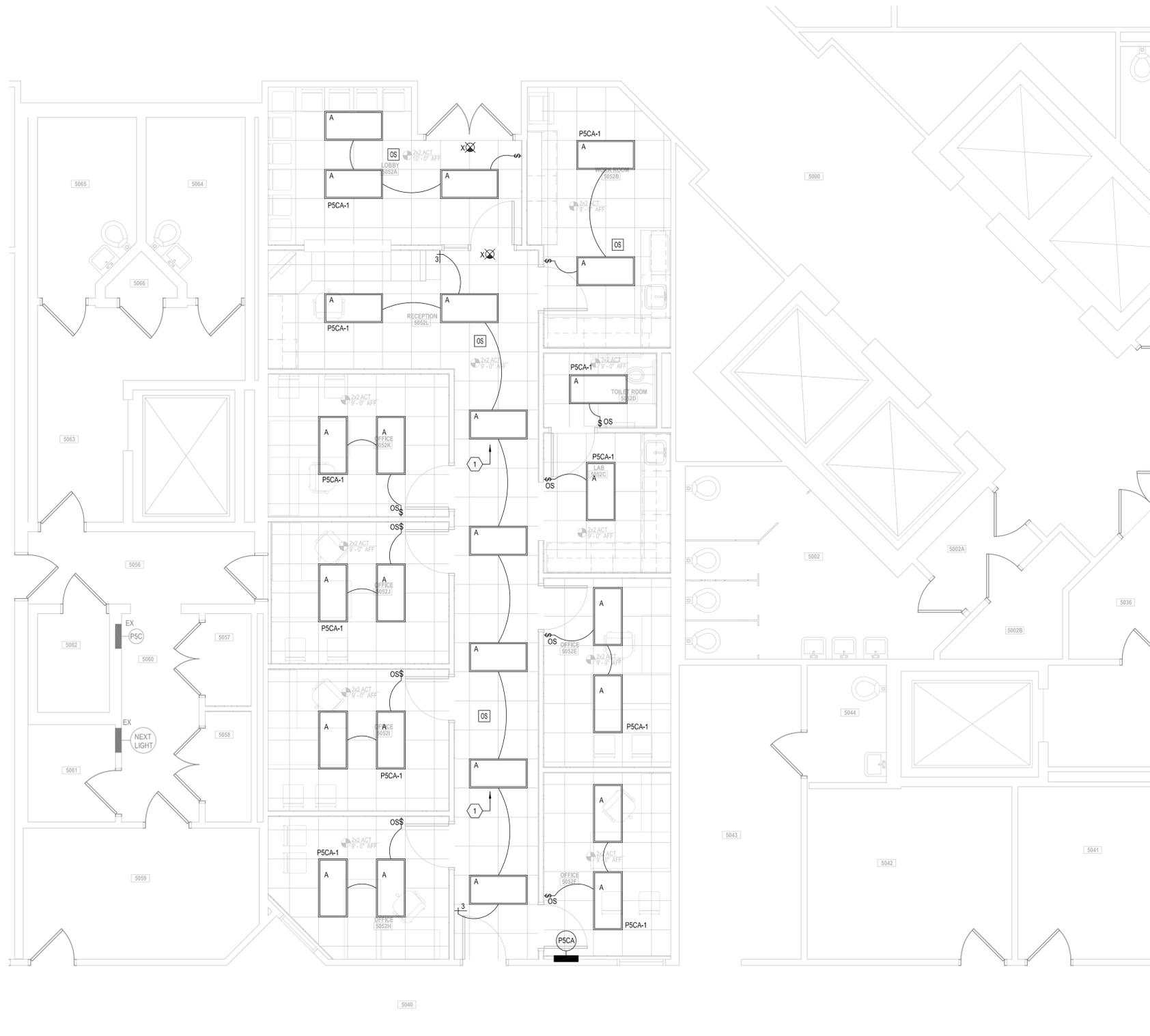
PROJECT
DANE COUNTY
COURTHOUSE ATIP
RENOVATION
215 SOUTH HAMILTON
STREET, MADISON, WI
53703

PROJECT NO.
18008-00

DRAWING
FIFTH FLOOR
ELECTRICAL
DEMOLITION PLAN

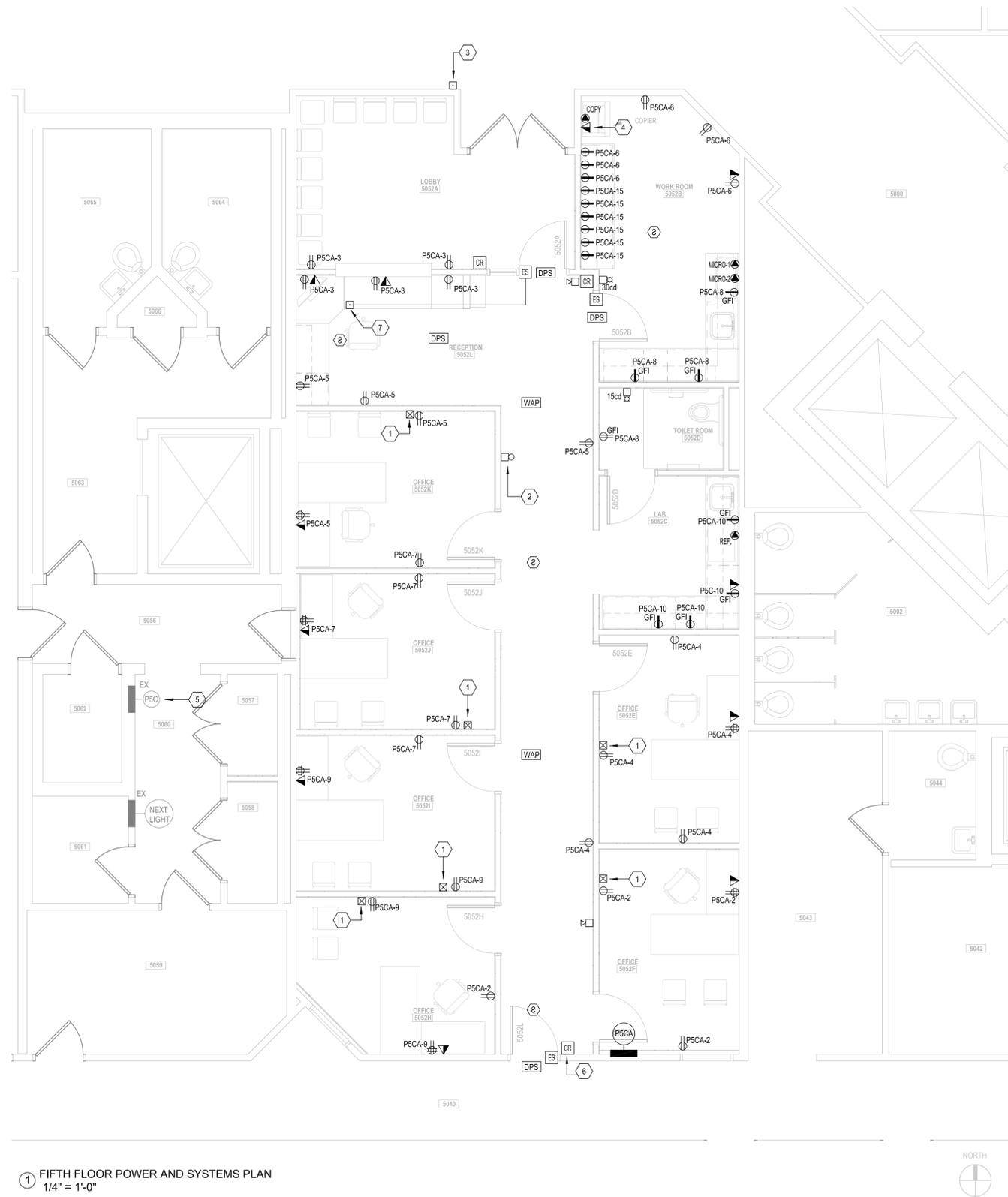
DATE
01.16.19

KEYED NOTES THIS SHEET
1 WIRE TO LIFE SAFETY CIRCUIT SERVING AREA THROUGH UL 924 RELAY.

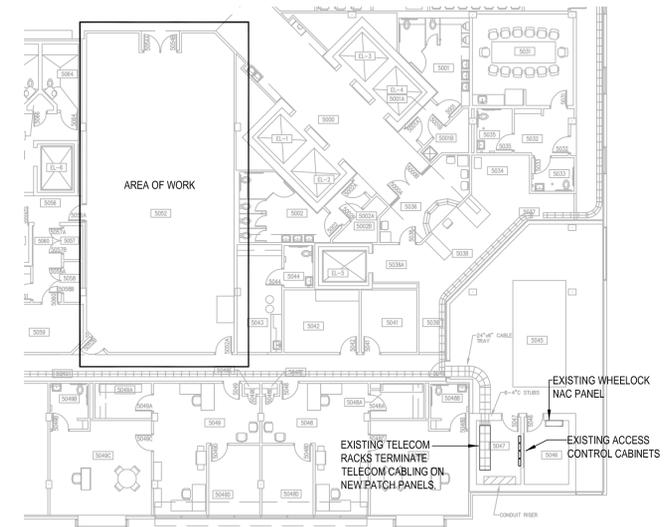


1 FIFTH FLOOR LIGHTING PLAN
1/4" = 1'-0"





① FIFTH FLOOR POWER AND SYSTEMS PLAN
1/4" = 1'-0"



② PARTIAL PLAN - EXISTING ELECTRICAL (RM. 5046) AND DATA (RM. 5047) ROOM
1/16" = 1'-0"

KEYED NOTES

- ① PROVIDE 2 GANG BOX WITH 1 GANG PLASTER RING AND BLANK COVER. STUB 1" C. TO ACCESSIBLE CEILING FOR FUTURE TELECOM OUTLET.
- ② PROVIDE NUTONE LA11BG DOOR CHIME. PROVIDE NUTONE C815 TRANSFORMER IN BOX BEHIND CHIME.
- ③ PROVIDE NUTONE PB69LSN DOOR BELL PUSH-BUTTON.
- ④ OUTLET TO INCLUDE ONE ANALOG JACK AND ONE DATA JACK.
- ⑤ ADD (1) 100A, 3P BREAKER IN EXISTING SQUARE D NQOD PANEL TO SERVER NEW 100A PANEL "P5CA". EXTEND #2 PLUS 1#8 IN 1-1/4" TO NEW PANEL "P5CA". CUT AND PATCH WALL.
- ⑥ SUCCESSFUL KEYPAD INPUT AND CREDENTIAL READ ARE NECESSARY TO RELEASE STRIKE.
- ⑦ PROVIDE PUSHBUTTON BELOW COUNTER WHERE APPROVED BY OWNER TO RELEASE ELECTRIC STRIKE.

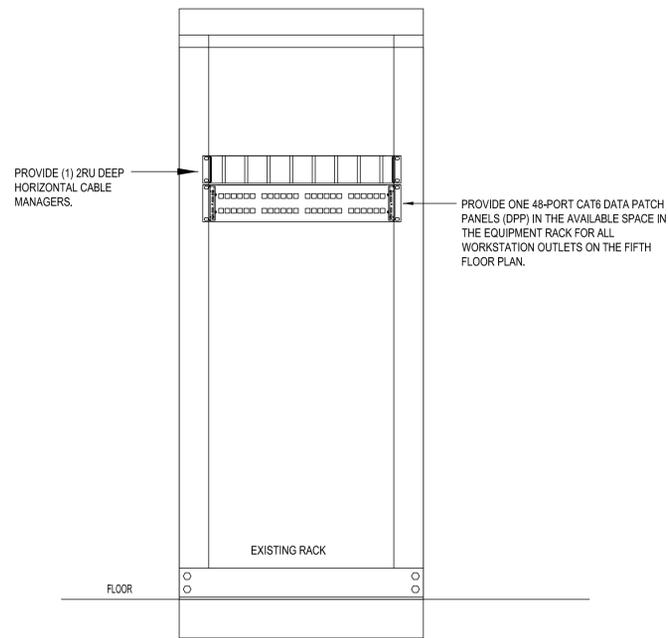


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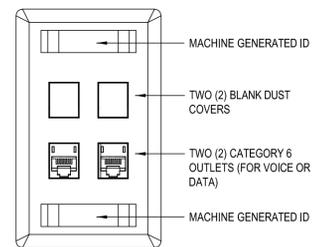
PROJECT NO.
18008-00

DRAWING
FIFTH FLOOR POWER
AND SYSTEMS PLAN

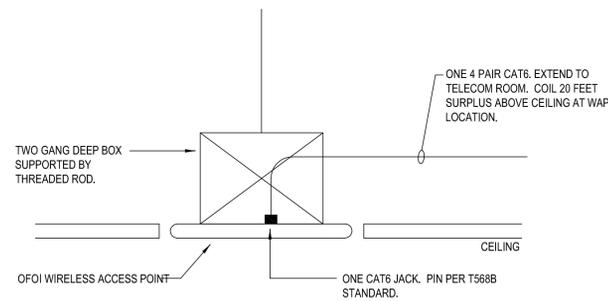
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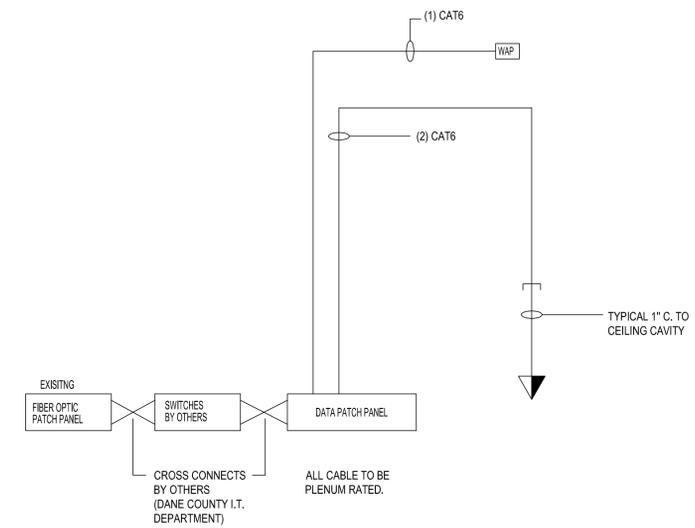
C
E300
ELEVATION - EXISTING TELECOM RACK
NOT TO SCALE



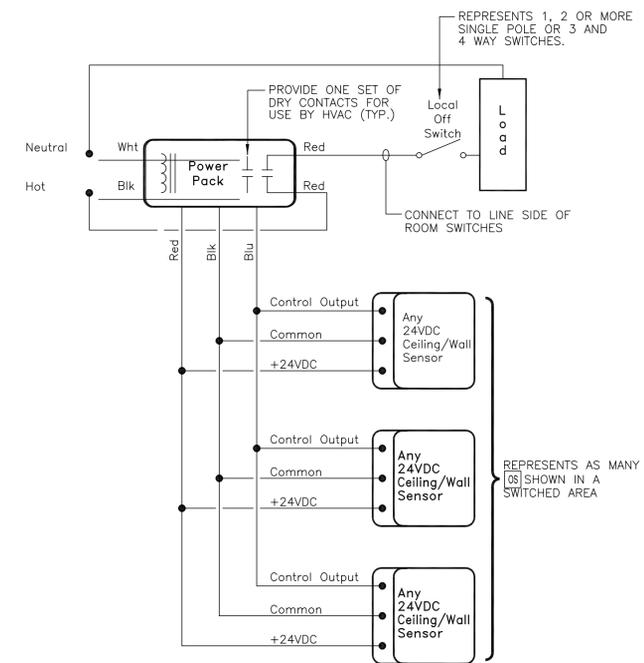
D
E300
TYPICAL WORKSTATION DATA OUTLET DETAIL
NOT TO SCALE



E
E300
WIRELESS ACCESS POINT [WAP] - REQUIRES CAT6 CABLE
NOT TO SCALE



A
E300
DATA RISER DIAGRAM - CATEGORY 6 PERFORMANCE
NOT TO SCALE



B
E300
WIRING DIAGRAM - OCCUPANCY SENSORS
NOT TO SCALE

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DRAWING
ELECTRICAL DETAILS

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