ADDENDUM NO. 1
ISSUE DATE: September 15, 2023

RE: CHEMISTRY 2nd and 4th FLOOR LAB RENOVATION
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

UW-Madison Project No. **0047 2301** /UWSA Project No. **A-22-015**

BID SUBMISSION DUE by 1:30 PM, September 28, 2023
BID SUBMISSION DUE by 1:30 PM, October 12, 2023

FROM: Strang, Inc.
811 East Washington Avenue, Suite 200
Madison, WI 53703

TO: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Contract Documents dated September 15, 2023 as noted below. Acknowledge receipt of this Addendum by inserting the number and issue date of this addendum in the blank space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of 2 pages and the attached documents:

SPECIFICATIONS

- Table of Contents
- Invitation to Bid - GPC
- Invitation to Bid - MEP
- Instructions to Bidders - GPC
- Instructions to Bidders - MEP
- 08 71 100 – Finish Hardware
- 10 28 00 - Toilet, Bath and Laundry Accessories
- 27 08 00.41 AV Systems Commissioning
- 27 41 00 Audio-Video Systems
- 27 41 00.1 Audiovisual Systems Equipment Schedule

DRAWINGS

- A038 - DOOR SCHEDULE, TYPES, & DETAILS
- AV609 – SYSTEM DIAGRAMS

CHANGES TO BIDDING REQUIREMENTS:

1. Invitation to Bid (GPC and MEP)
    a. Revised Work by Owner.

2. Instructions to Bidders (GPC and MEP)
    a. Added contact information for bidder's question.

CHANGES TO CONDITIONS OF THE CONTRACT:

3. None

CHANGES TO SPECIFICATIONS (DIVISIONS 2 THRU 33):

4. Table of Contents
    a. Revised page numbers as indicated on revised Table of Contents, attached.

5. Section 08 71 00 Finish Hardware
    a. Changed Hardware Sets.

6. Section 10 28 00 Toilet, Bath and Laundry Accessories
    a. Changed accessories.

7. Section 21 30 00 FIRE PUMPS
    a. Replace Section 21 30 00 FIRE PUMPS with revised section attached to this addendum.

8. Sections 27 08 00.41 – AV Systems Commissioning
    a. Replace Section with revised Section.

9. Sections 27 41 00 – Audio-Video Systems
    a. Replace Section with revised Section.

10. Section 27 41 00.1 AV Equipment Schedule
    a. Replace Section with revised Section.

CHANGES TO DRAWINGS:

11. DRAWING SHEET A038 – Replace sheet with revised sheet attached to the addendum.
    a. Revised door hardware set on Door Schedule.

12. DRAWING SHEET AV609 – Replace sheet with revised sheet attached to this addendum.
    a. Revised system diagram in Detail 4 for Conference Room 4421.

ADDITIONAL INFORMATION:

Pre-bid Meeting Attendees:
Provided for information only.

END OF ADDENDUM

Strang, Inc.
811 East Washington Avenue, Suite 200
Madison, WI 53703

Capital Planning and Budget
UW Systems Administration
Madison Wisconsin 53706

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GPC INVITATION TO BID (Rev 11/2022)
THE BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

CHEMISTRY 2ND AND 4TH FLOOR LAB RENOVATION
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

UW-Madison Project No. **0084 2014** /UWSA Project No**. A-22-015**

BID OPENING for MEP BIDDERS: 2:00 P.M., September 28, 2023.
BID OPENING for GENERAL PRIME CONTRACTOR BIDDERS: 2:00 P.M., October 12, 2023.

OWNER: The Board of Regents of the University of Wisconsin on behalf of the University of Wisconsin-Madison, hereinafter termed the Owner.

NOTICE: All potential bidders must be certified by DOA prior to submitting bids on UW-Managed construction projects. All bids received from contractors who are not certified will be rejected. Contractor certification applications and instructions for completing the form may be obtained from the DOA Website DFD Contractor Certification page: https://doa.wi.gov/Pages/DoingBusiness/ContractorCertification.aspx .

This project is being let using a single prime bidding and contracting process. the Owner will publicly bid the applicable mechanical, electrical, plumbing, and fire protection (MEP) divisions of work **first.** Within five (5) days of the MEP bid opening, the Owner will identify a lowest, qualified, responsible, certified bidder in each applicable MEP division of work. These successful MEP bids must be included in all general prime contractor bids received. The owner will enter into a single contract with the lowest, qualified, responsible, certified general prime contractor and this general prime contractor shall enter into subcontracts with the successful MEP bidders. If a project does not include any mechanical, electrical, plumbing, or fire protection divisions of work, the Owner will bid one bid package for all work to general prime contractors.

The University of Wisconsin System Administration (UWSA) will ONLY be accepting construction bidding documents as follows:

- **PDF scanned file of all required bid documents, including bid and bid bond forms with an either original wet signatures or digital electronic signatures emailed to UWSA Bid Submissions at uwsabidsubmissions@uwsa.edu.** If submitting documents with electronic signatures, further information and requirements are in the following bullets.
- Include Project Name, Project Number, Project Location, Category of Work being bid on, Bid Date, and the Name and Address of Bidder within email submission.
- For documents that require a seal, please darken these scans for better visibility.
- For bids including a cashier's/certified check, please scan front and back of check and include with submission.
- Bidders may submit PDFs of bonds and powers of attorney containing e-signatures, e-corporate seals, and e-notaries affixed to each document in accordance with the Surety's obligations. **Telephone numbers are required for all electronic signatories** for oral verification as needed. Wisconsin law permits the use of remote online notarization if it is performed **using technology providers that have been approved by the Department of Financial Institutions (DFI)**. If a remote online notarization is used, it is the responsibility of the contractor and its Surety to ensure that the technology provider has been approved by DFI.
- Bidders may submit bid forms containing electronic signatures, but those signatures must be obtained using approved software in order to be accepted. **DocuSign software and Adobe Digital Signature software are approved for e-signatures** for submission of bids. Use of any other e-signature software will require additional verification and the bidder must obtain approval at least three (3) business days prior to submission of bids. Please contact lwoznick@uwsa.edu first regarding any proposed electronic signature software.

UWSA will NO LONGER accept bids via third party delivery (UPS, FEDEX, or DHL) or bids being dropped off in person.

- Bids must be submitted to the email address listed above (uwsabidsubmissions@uwsa.edu) by **1:30 p.m. CT** on the day that the bid submission is due. Email PDF submissions will receive a confirmation reply from UWSA. If for any reason a reply is not received after a PDF bid is emailed, please contact Lindsay Woznick at 608-265-6462.
- **Bidders are responsible for their bid being delivered by the time specified and delivery is entirely at the bidder's risk.**

The bid opening will be conducted via teleconference with the information listed below. All bids will be opened at 2:00 p.m. CT on the scheduled date. All lines will be muted upon entry of the teleconference. Upon dialing into the teleconference line, you will hear silence until the bid starts.

Join Zoom Meeting
https://wisconsin-edu.zoom.us/j/96119421731?pwd=eVF6VzM0Z2ZTalhqaCtpVGNLTnkzZz09&from=addon

Meeting ID: 961 1942 1731
Passcode: 820674
1 507 473 4847

In general, the work consists of the fit out of the fourth floor of the existing North Tower, Chemistry Building and the renovation of portions of the second floor of the Daniels tower. Work includes, but is not limited to selective demolition, framing, drywall and finishes, lab casework, and related mechanical, electrical, plumbing and fire protection work.

Bidding documents (drawings, specifications, and addenda) may be obtained only as electronic files (in PDF format)**:** as a downloadable file from the University of Wisconsin System Administration's Design and Construction Opportunities website (see website address below). Bidding documents may also be seen at various Builders' Exchanges that have downloaded the documents. Additional project bidding information, including plan holders lists are available on the University of Wisconsin System public website: https://www.wisconsin.edu/procurement/construction/. After opening the web page, select the **CHEMISTRY 2ND AND 4TH FLOOR LAB RENOVATION** project.

Base Bid will be received for: A single lump sum bid for All Work.

Bid Guarantee in the amount of 10% of the Bid must accompany each bid submitted. Contractor MUST submit hard copies of bid to UWSA within 10 working days of being notified of award.

Contract offer and construction phase records will be processed via email.

A pre-bid tour will be held on Thursday, September 7, 2023, promptly at 9:30 a.m. Meet in 2401, Chemistry North Tower Building, 1101 University Ave., Madison, WI. All parties interested in a tour must email Dan Hale at dhale@strang-inc.com before 9/05/2023. Pre-bid tour is expected to be about 2.5 hours.

All bidders are highly encouraged to attend this Pre-bid Conference / Building Tour and no separate tours will be conducted.

No verbal instructions or explanations will be given regarding the bid documents. Submit all questions to the A/E via email at sphillips@strang-inc.com.

Any other questions related to this project can be sent via email to the Procurement contact Lindsay Woznick at 608-265-6462 or lwoznick@uwsa.edu.

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MEP INVITATION TO BID (Rev 11/2022)
THE BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

CHEMISTRY 2ND AND 4TH FLOOR LAB RENOVATION
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

UW-Madison Project No. **0084 2014** /UWSA Project No**. A-22-015**

BID OPENING for MEP BIDDERS: 2:00 P.M., September 28, 2023.
BID OPENING for GENERAL PRIME CONTRACTOR BIDDERS: 2:00 P.M., October 12, 2023.

OWNER: The Board of Regents of the University of Wisconsin on behalf of the University of Wisconsin-Madison, hereinafter termed the Owner.

NOTICE: All potential bidders must be certified by DOA prior to submitting bids on UW-Managed construction projects. All bids received from contractors who are not certified will be rejected. Contractor certification applications and instructions for completing the form may be obtained from the DOA Website DFD Contractor Certification page: https://doa.wi.gov/Pages/DoingBusiness/ContractorCertification.aspx .

This project is being let using a single prime bidding and contracting process. the Owner will publicly bid the applicable mechanical, electrical, plumbing, and fire protection (MEP) divisions of work **first.** Within five (5) days of the MEP bid opening, the Owner will identify a lowest, qualified, responsible, certified bidder in each applicable MEP division of work. These successful MEP bids must be included in all general prime contractor bids received. The owner will enter into a single contract with the lowest, qualified, responsible, certified general prime contractor and this general prime contractor shall enter into subcontracts with the successful MEP bidders.

The University of Wisconsin System Administration (UWSA) will ONLY be accepting construction bidding documents as follows:

- **PDF scanned file of all required bid documents, including bid and bid bond forms with an either original wet signatures or digital electronic signatures emailed to UWSA Bid Submissions at uwsabidsubmissions@uwsa.edu.** If submitting documents with electronic signatures, further information and requirements are in the following bullets.
- Include Project Name, Project Number, Project Location, Category of Work being bid on, Bid Date, and the Name and Address of Bidder within email submission.
- For documents that require a seal, please darken these scans for better visibility.
- For bids including a cashier's/certified check, please scan front and back of check and include with submission.
- Bidders may submit PDFs of bonds and powers of attorney containing e-signatures, e-corporate seals, and e-notaries affixed to each document in accordance with the Surety's obligations. **Telephone numbers are required for all electronic signatories** for oral verification as needed. Wisconsin law permits the use of remote online notarization if it is performed **using technology providers that have been approved by the Department of Financial Institutions (DFI)**. If a remote online notarization is used, it is the responsibility of the contractor and its Surety to ensure that the technology provider has been approved by DFI.
- Bidders may submit bid forms containing electronic signatures, but those signatures must be obtained using approved software in order to be accepted. **DocuSign software and Adobe Digital Signature software are approved for e-signatures** for submission of bids. Use of any other e-signature software will require additional verification and the bidder must obtain approval at least three (3) business days prior to submission of bids. Please contact lwoznick@uwsa.edu first regarding any proposed electronic signature software.

UWSA will NO LONGER accept bids via third party delivery (UPS, FEDEX, or DHL) or bids being dropped off in person at 780 Regent Street.

- Bids must be submitted to the email address listed above (uwsabidsubmissions@uwsa.edu) by **1:30 p.m. CT** on the day that the bid submission is due. Email PDF submissions will receive a confirmation reply from UWSA. If for any reason a reply is not received after a PDF bid is emailed, please contact Lindsay Woznick at 608-265-6462.
- **Bidders are responsible for their bid being delivered by the time specified and delivery is entirely at the bidder's risk.**

The bid opening will be conducted via teleconference with the information listed below. All bids will be opened at 2:00 p.m. CT on the scheduled date. All lines will be muted upon entry of the teleconference. Upon dialing into the teleconference line, you will hear silence until the bid starts.

Join Zoom Meeting
https://wisconsin-edu.zoom.us/j/96119421731?pwd=eVF6VzM0Z2ZTalhqaCtpVGNLTnkzZz09&from=addon

Meeting ID: 961 1942 1731
Passcode: 820674
1 507 473 4847

In general, the work consists of the fit out of the fourth floor of the existing North Tower, Chemistry Building and the renovation of portions of the second floor of the Daniels tower. Work includes, but is not limited to selective demolition, framing, drywall and finishes, lab casework, and related mechanical, electrical, plumbing and fire protection work.

Bidding documents (drawings, specifications, and addenda) may be obtained only as electronic files (in PDF format)**:** as a downloadable file from the University of Wisconsin System Administration's Design and Construction Opportunities website (see website address below). Bidding documents may also be seen at various Builders' Exchanges that have downloaded the documents. Additional project bidding information, including plan holders lists are available on the University of Wisconsin System public website: https://www.wisconsin.edu/procurement/construction/. After opening the web page, select the **CHEMISTRY 2ND AND 4TH FLOOR LAB RENOVATION** project.

Base Bid will be received as a single lump sum bid for: 2) Fire Protection (Fire Suppression); 3) Plumbing; 4) Mechanical (Heating, Ventilating, Air Conditioning); and 5) Electrical.

Bid Guarantee in the amount of 10% of the Bid must accompany each bid submitted. Contractor MUST submit hard copies of bid to UWSA within 10 working days of being notified of award.

A pre-bid tour will be held on Thursday, September 7, 2023, promptly at 9:30 a.m. Meet in 2401, Chemistry North Tower Building, 1101 University Ave., Madison, WI. All parties interested in a tour must email Dan Hale at dhale@strang-inc.com before 9/05/2023. Pre-bid tour is expected to be about 2.5 hours.

All bidders are highly encouraged to attend this Pre-bid Conference / Building Tour and no separate tours will be conducted.

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GPC INSTRUCTIONS TO BIDDERS (Rev 11/2022)
UW-Madison Project No. **0084 2014** /UWSA Project No**. A-22-015**

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1. DEFINITIONS
In this document, the following terms are defined as:

(a) "Mechanical, electrical, or plumbing subcontractor" ("MEP Subcontractor") is a contractor that performs mechanical (Heating, Ventilating, and Air Conditioning), electrical, plumbing, or fire protection (fire suppression) work for the Project, and enters into a contract with the General Prime Contractor to perform their division of work.

(b) "Qualified bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)1.

(c) "Qualified responsible bidder" means a contractor who is a Qualified bidder and who is a Responsible bidder.

(d) "Responsible bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)2.

(e) "Single prime contracting" means bidding and contracting through a process in which only a general prime contractor has a contractual relationship with the owner and all mechanical, electrical, or plumbing subcontractors are identified by the department and are subcontractors to the General Prime Contractor.

(f) "General Prime Contractor" ("GPC") is a contractor that enters into a contract with the owner to perform all work as required by the Contract Documents and enters into contracts with subcontractors including MEP Subcontractors identified by the Owner.

(g) "Non-MEP Subcontractor" is a subcontractor to a General Prime Contractor in divisions of work other than mechanical, electrical, plumbing, and fire protection. This includes suppliers and installers to the General Prime Contractor.

(h) "Subcontractor" is all subcontractors on a project. This includes MEP Subcontractors, subcontractors to the MEP Subcontractors, and Non-MEP Subcontractors.

(i) “Contractor” is all contractors working on a project regardless of contractual relationship. This includes the General Prime Contractor, MEP Subcontractors, Non-MEP Subcontractors, and all Subcontractors, regardless of tier of subcontract.

(j) “DFD Project Manager” shall have the same meaning as the “Owner’s Representative” as defined in the A101 contract, article 8.2.

2. GENERAL

Time for bid opening shall be the prevailing central standard or daylight saving time in force at Madison, Wisconsin, on the date set forth in the Invitation to Bid.

All potential bidders must be certified by DOA prior to submitting bids on state construction projects over $50,000. All bids received from contractors who are not certified will be rejected. Contractor certification applications and instructions for completing the form may be obtained from the DOA Website DFD Contractor Certification page: https://doa.wi.gov/Pages/DoingBusiness/ContractorCertification.aspx or upon request from DFD--email dfdcertification@wisconsin.gov.

The Owner will issue an addendum if a successful MEP bid is withdrawn or rejected after the MEP Subcontractors have been identified but before the General Prime Contractor bid opening, This addendum will include a revised list of successful MEP bids that must be included in General Prime Contractor bids and will move the General Prime Contractor bid opening five (5) days later to allow bidders sufficient time to update their bids based on the revised MEP list.

Before submitting a bid, the Bidder shall examine all of the Bidding and Contract Documents listed in the Table of Contents of these specifications. The successful Bidder will be required to do all work which is shown on the drawings, mentioned in the specifications or reasonably implied as necessary to complete the contract for this project.

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

All bidders shall have established and diligently maintained a satisfactory safety program, and if eligible for Experience Modification Rating (EMR), must have a rating of 1.20 or less as established by the Wisconsin Compensation Rating Bureau (WCRB) or the National Council on Compensation Insurance (NCCI).

3. DRAWINGS AND SPECIFICATIONS

The Bidding Documents include the documents in these Specifications and the Drawings issued for Bidding, regardless if they are listed in the Table of Contents of these specifications or not.

Complete sets of Contract Documents for all trades will be issued to all Bidders, irrespective of the category of work to be bid on, in order that all Bidders may be familiar with the work of other trades as they affect their bid.

4. INTERPRETATION

No verbal explanation or instructions will be given in regard to the meaning of the drawings or specifications during the bid period. Bidders shall bring inadequacies, omissions or conflicts to the Architect/Engineer's attention at least ten (10) days before the date set for the MEP bid opening. Prompt clarification will be supplied to all bidders of record by addendum.

Failure to so request clarification or interpretation of the drawings and specifications will not relieve the successful Bidder of responsibility. Signing of the contract will be considered as implicitly denoting that the Contractor has thorough understanding of the scope of work and comprehension of the contract documents.

Neither the Architect/Engineer nor the Owner will be responsible for verbal instructions.

5. MANDATORY PRE-BID DOA CERTIFICATION

All potential bidders must become certified as qualified and responsible bidders **before** they can bid on state projects over $50,000. The criteria for determining certification of qualified and responsible bidders are itemized in Wis. Stat. s. 16.855(9m). If the Owner determines that more experience is necessary for a particular project, the Owner may include

additional requirements.

6. BID GUARANTEE

A bid bond prepared on the Bid Bond Form bound herein, payable to the Owner in the amount not less than 10% of the maximum bid shall accompany each bid as a guarantee. A bank certified check or a cashier's check may accompany each bid as a guarantee pursuant to Wis. Stat. s. 779.14(1m)(c)2.b. and 779.14(1s). Failure to enter into the contract with the Owner (including failure to obtain certificate of insurance and separate 100% performance and 100% payment bonds) may result in forfeiture of the Bid Bond. The company issuing the Bonds must be licensed to do business in Wisconsin.

Any bid which is not accompanied by a bid guarantee will not be accepted and will not be read at the bid opening.

All checks tendered as bid guarantee, except those of the three lowest bidders, will be returned to their makers within three (3) days after bid opening. All such retained checks will be returned immediately upon execution of the contract between the General Prime Contractor and the Owner.

7. WITHDRAWAL OF BIDS

Prior to the time fixed for bid opening, bids may be withdrawn by written request from the Bidder, without prejudice to the right of the Bidder to file a new bid. Withdrawn bids will be returned unopened.

After the bid has been opened, negligence on the part of the Bidder in preparing their bid confers **no** right for withdrawal of the bid without penalty.

If a bid contains an error, omission, or mistake, the bidder may limit liability to the amount of their bid guarantee by giving the Owner written Notice, within seventy-two (72) hours of the bid opening, of their intent not to execute the contract with the owner. If no such notice is given, the Owner reserves the right to obtain the amount of the difference in bid price between the low bidder and the next low bidder.

8. CONTRACT FORM

These specifications include a copy of the contract the successful Bidder is required to enter into with the owner. Bidders shall read and understand the conditions contained in this contract. The successful Bidder will be offered a contract via email to the contact provided by the bidder on the Bid Form.

9. CONTRACT INTERESTS BY STATE PUBLIC OFFICIALS

In accordance with section 19.45(6) of the Wisconsin Statutes, no state public official, member of a state public official's immediate family, nor any organization with which the state public official or a member of the official's immediate family owns or controls at least 10% of the outstanding equity, voting rights, or outstanding indebtedness may enter into any contract or lease involving a payment or payments of more than $3,000 within a twelve (12) month period, in whole or in part derived from state funds unless the state public official has first made written disclosure of the nature and extent of such relationship or interest to the board and to the department acting for the state in regard to such contract or lease. Any contract or lease entered into in violation of this subsection may be voided by the owner in an action commenced within three (3) years of the date on which the ethics board, or the department or officer acting for the state in regard to the allocation of state funds from which such payment is derived, knew or should have known that a violation of this subsection had occurred. This subsection does not affect the application of s.946.13.

10. DISCLOSURE OF OWNERSHIP

The Bidder shall disclose on the date of submitting a bid for this project, the name of any construction business of which the Bidder has had a 25% or greater interest as a shareholder, officer, partner, or owner at any time during the preceding three (3) years, if said construction business has been found by the Department of Workforce Development to have failed to pay the prevailing wage rate or at least 1.5 times the hourly basic rate of pay for hours worked in excess of the prevailing hours of labor to any employee at any time within the preceding three (3) years.

The "Disclosure of Ownership" form may be obtained at no charge from the Department of Workforce Development, Equal Rights Division, P.O. Box 8928, Madison, Wisconsin 53708.

11. MINORITY BUSINESS ENTERPRISE AND DISABLED VETERAN-OWNED BUSINESS INVOLVEMENT

"Minority Business Enterprise" (MBE) means: a business certified by the Wisconsin Supplier Diversity Program under Wis. Stat. s. 16.287(2).

"Disabled Veteran−Owned Business" (DVB) means: a business certified by the Wisconsin Supplier Diversity Program under Wis. Stat. s. 16.283(3).

In awarding construction contracts, the University of Wisconsin System Administration shall attempt to ensure that 5 percent of the total amount expended in each fiscal year is awarded to contractors which are minority businesses. The General Prime Contractor Bidder shall make every effort to award a minimum of 15% of the work to minority business enterprises (MBE) involvement for all projects within 60 mile radius of Milwaukee and 5% for projects located elsewhere.

In awarding construction contracts, the University of Wisconsin System Administration shall attempt to ensure that at least 1 percent of the total amount expended each fiscal year is awarded to contractors that are disabled veteran-owned businesses.

In order to assist the department in these endeavors we strongly encourage General Prime Contractors to use MBEs and DVBs.

General Prime Contractor Bidders shall submit a "Form A Affidavit of Compliance – Minority Business Enterprise and Disabled Veteran-Owned Business Provision" within seven days of the general prime contractor contract offer. This form should indicate the percentage of MBE/DVB participation commitment. All MEP Subcontractor Bidders shall also make every effort to encourage MBE and DVB involvement.

For assistance in identifying DOA certified MBE and DVB companies, please contact the Department of Administration Supplier Diversity Program at: DOABDMBD@wisconsin.gov, or by telephone at: (608)267-9550, or visit their website at: http://www.doa.wi.gov/Divisions/Enterprise-Operations/Supplier-Diversity-Program.

12. SUBSTANCE ABUSE PREVENTION

Mission/Purpose: The University of Wisconsin System Administration recognizes and supports drug-free workplace programs as an important element in the national strategy to reduce the devastating effects of drug and alcohol abuse in our society. the Owner requires contractors, subcontractors, suppliers and vendors to establish and enforce drug-free workplace policies and programs that conform to Sec 103.503 of the Wisconsin Statutes.

Statement: The possession, use of, distribution or purchase of illegal drugs, or use of alcohol at work by any employee on University of Wisconsin System Administration construction job sites, is strictly prohibited.

The terms of this Substance Abuse Program Statement shall cover all construction personnel who are working on University of Wisconsin System Administration job sites. This includes employees of all Contractors, Subcontractors, contractor suppliers, and their employees working at the job site.

General Prime Contractor's and Subcontractor's Written Program: Each General Prime Contractor and Subcontractor shall have in place a written Substance Abuse Program conforming to Sec 103.503(3) of the Wisconsin Statutes.

In addition, representatives of the Owner who believe that any General Prime Contractor's or Subcontractor's employee may be under the influence of alcohol or drugs shall, where deemed appropriate, contact the General Prime Contractor's or Subcontractor's appropriate management/supervision authority and request that appropriate action be taken. The General Prime Contractor's or Subcontractor's employer shall immediately remove an employee who is suspected of being under the influence of illegal drugs or alcohol shall be immediately removed from the job site.

Procedures for testing and handling of positive drug tests shall be in compliance and consistent with State and Federal laws.

Costs of Substance Abuse Programs and Testing: The cost associated with the development, implementation and enforcement of Substance Abuse Programs and any testing required shall be the responsibility of each individual General Prime Contractor and Subcontractor for their respective employees working on the job site. The Owner will not be responsible for any cost of substance abuse testing, rehabilitation or medical reviews related to substance abuse.

The General Prime Contractor and Subcontractors shall indemnify and hold the Owner harmless from any damages or other costs incurred that are related to the implementation or enforcement of any substance abuse policy or program.

13. METHOD OF AWARD - RESERVATION

General prime contractor bids that do not include the successful MEP bids identified by the Owner will be rejected.

The general prime contract will be awarded based on the following, as long as the cost does not exceed the amount of project funds available:

> The lowest dollar amount is submitted by a qualified, responsible, certified bidder on a SINGLE BASE BID for all work comprising the project.

Should a qualified, responsible, certified minority business enterprise or disabled veteran-owned business submit a bid that is no more than 5% higher than the apparent low bid, the Contract may be awarded to the minority business enterprise or disabled veteran-owned business.

Firms wishing to be considered for the 5% bidding preference must be certified as a minority business enterprise or disabled veteran-owned business by the Wisconsin Supplier Diversity Program should indicate in the space provided on the Bid Form that preference is requested.

The Owner reserves the right to reject any and all bids, or to waive any informality in any bid, or to accept any bid which will serve the best interests of the Owner.

Informational Bids will not be considered in establishing low bidder.

14. SECURITY FOR SEPARATE 100% PERFORMANCE AND SEPARATE 100% PAYMENT

Bidder is required to furnish separate 100 % performance and 100 % payment bonds to the benefit of the Board of Regents of the University of Wisconsin as the sole obligee. These bonds shall be delivered to the Owner with the signed contract. The Surety Company shall be licensed to do business in Wisconsin. The Bond must be dated the same date or subsequent to the date of the Contract.

A certified copy of power of attorney shall be provided by the Surety Company showing that the agent who signs the Bond has the power of attorney to sign for the Surety Company. This power of attorney must be signed by the Secretary or Assistant Secretary of the company and not by an attorney-in-fact. The power of attorney must bear the same or later date as the bond.

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

If the Bidder is a corporation, a current certified copy of the resolution or other official act of the directors of the corporation must be submitted showing that the person who signs the contract is authorized to sign contracts for the corporation. The corporate seal must be affixed to the resolution, contract, and separate performance and payment bonds. If the Bidder's corporation has no seal, the above documents must include a statement or notation to the effect that the corporation has no seal.

15. TAXES

The Bidder shall include in the bid all taxes required by law.

In accordance with section 71.80(16)(a), Wis. Stats., SURETY BOND; NONRESIDENT CONTRACTOR. "All nonresident persons, whether incorporated or not, engaging in construction contracting in this state as contractor or subcontractor and not otherwise regularly engaged in business in this state, shall file a surety bond with the department (Wisconsin Department of Revenue MS 5-77 Attn: Non-Resident Surety Bonds, 2135 Rimrock Rd., Madison, WI 53713, telephone (608)266-2776) payable to the department of revenue, to guarantee the 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. The amount of the bond shall be 3% of the contract or subcontract price on all contracts of $50,000 or more..."

As the Board of Regents is an exempt entity, building materials purchased for this project are exempt. The University of Wisconsin System CES number: 040706. The Certificate of Exempt Status (CES) will be provided to the awarded Contractor upon request.

16. SUBMISSION OF BIDS

All bids shall be submitted on the standard Bid Forms and only bids that are made on the Bid Forms will be considered. The entire Bid Form including the Addendum Receipt/Signature page, the Bid Bond Form, (if used), and other supporting documents (if any), shall be filled out and submitted in the manner specified hereinafter. SPECIFICATIONS SHALL NOT ACCOMPANY BID.

No bids for any subdivision or any subclassification of this work, except as indicated, will be accepted. Any conditional bid, amendment to the Bid Form or appendant thereto, the inclusion of any correspondence, written or printed matter, unsolicited material or data, or details of any nature other than the information specifically called for, will disqualify the Bid. Telecommunication alterations to the bid will not be accepted.

Space is provided on the Bid Form for General Prime Contractor's single bid. Appropriate insertions are as follows: numerals indicating the cost of the work, $0 if there is no cost for the work, or the words 'No Bid' if the bidder is not intending to bid the work. Blank space(s) will be considered the same as 'No Bid'.

Bidders shall submit a Single Base Bid for all the work.

Spaces are also provided on the Bid Form for General Prime Contractor's to list the successful MEP Subcontractors bids included in the General Prime Contractor's single base bid.

General prime contractor bids that do <u>not</u> include the successful MEP bids identified by the Owner will be rejected.

Any addendum issued during the time of bidding shall become a part of the Contract Documents. Bidders shall acknowledge receipt of such addendum in the appropriate space provided on the Bid Form. Bid will be rejected if receipt of an addendum applicable to the award of contract has not been acknowledged on the Bid Form.

The Owner is not responsible for bids not clearly labeled as required. Bids shall be signed, sealed, and delivered to the place indicated in the Invitation to Bid <u>before</u> the time designated in the Invitation to Bid. All bids shall be identified with the Project Name, Project Number, Project Location, Category of Work being bid on, Bid Date, and the Name and Address of Bidder.

Bidder shall be responsible for the bid being delivered to the place designated for the bid opening before the time specified. Bids received after the time indicated in the Invitation to Bid will be rejected and returned to Bidder unopened.

Bid will be considered invalid and will be rejected if it has not been signed by the Bidder.

Bids will be rejected if the bidder is not certified by DOA in the division(s) of work they bid on and/or if their bid amount exceeds their certification threshold in that division of work.

17. BASE BID

Base Bids shall be received as follows:
SINGLE BASE BID FOR ALL THE WORK.

Base Bid No. 1. All Work, as per specification Divisions 2 thru 33, applicable provisions of Division 1 and related drawings.

18. INFORMATIONAL BIDS

None.

19. UNIT PRICES

Unit prices requested on the Bid Form shall be given and, if included in the General Prime Contract, will be used for additions to or deductions from amount of work required under the Contract. Unit prices shall include all costs of materials, labor, insurance, taxes, overhead and profit.

The Owner reserves the right to reject any unit prices as given in the bid if they are considered excessive or unreasonable, or to accept any or all of the unit prices that may be considered fair and reasonable. If any unit price is rejected, the work governed by such unit price, if required, shall be treated as specified in General Conditions.

The Bidder shall refer to the Bid Form and the applicable technical section to determine the basis of unit measure and the detailed information related to each unit price item requested.

20. STATED ALLOWANCES

None.

21. SUBCONTRACTORS

GENERAL PRIME CONTRACTOR SUBCONTRACT WITH MEP SUBCONTRACTORS:

The successful General Prime Contractor shall offer a subcontract to the successful MEP Subcontractors identified by the Owner and included in the General Prime Contractor's bid. This subcontract between a General Prime Contractor and a MEP Subcontractor must include a scope of work clause identical to the scope of work clause included in the Bid Documents and the contract between the General Prime Contractor and the owner. A General Prime Contractor and an MEP Subcontractor may not enter any agreement in connection with bids submitted that would alter or affect the scope or price of the contracts entered into. This prohibition does not apply to the Owner change orders that result in changes to the plans or specifications, or to back charges allowed by the contract.

The General Prime Contractor must base the Project Schedule on the schedule that the MEP Subcontractors and General Prime Contractors bid on (in the specifications or bid instructions), unless otherwise agreed to by the MEP Subcontractor.

As the work progresses under any MEP subcontract for construction of a project, the General Prime Contractor shall, upon request of a subcontractor, pay to the subcontractor an amount equal to the proportionate value of the subcontractor's work properly completed, less retainage. The retainage shall be an amount equal to not more than 5 percent of the subcontractor's work completed until 50 percent of the subcontractor's work has been completed. At 50 percent completion, no additional amounts may be retained, and partial payments shall be made in full to the subcontractor unless the department certifies that the subcontractor's work is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the subcontractor's work is not satisfactory, additional amounts may be retained but the total retainage may not be more than 10 percent of the value of the work completed. Upon substantial completion of the subcontractor's work, any amount retained shall be paid to the subcontractor, less the value of any required corrective work or uncompleted work. All payments the General Prime Contractor makes under this paragraph shall be within 7 calendar days after the date on which the General Prime Contractor receives payment from the department.

The contract entered into between the General Prime Contractor and an MEP Subcontractor must contain all of the following clauses:

> **Scope of Work**. The MEP Subcontractor scope of work is identical to the General Prime Contractor scope of work included in these bidding and contract documents. By submitting and signing a bid, all bidders have examined all of the Bidding Documents listed in the Table of Contents of the project specifications. The successful bidders will be required to do all work which is shown on the drawings, mentioned in the specifications, or reasonably implied as necessary to complete the division of work bid for this project.
>
> **Prompt Payment.** (General prime contractor) shall pay (mechanical, electrical, or plumbing subcontractor) in accordance with section 16.855(19)(b), Wisconsin stats, for work that has been satisfactorily completed and properly invoiced by (mechanical, electrical, or plumbing subcontractor). A payment is timely if it is mailed, delivered, or transferred to (mechanical, electrical, or plumbing subcontractor) by the deadline under section 16.855(19)(b), Wisconsin stats.

If (mechanical, electrical, or plumbing subcontractor) is not paid by the deadline in this contract, (general prime contractor) shall pay interest on the balance due from the eighth day after the (general prime contractor) receives payment from the University of Wisconsin System Administration for the work for which payment is due and owing to (mechanical, electrical, or plumbing subcontractor), at the rate specified in section 71.82, Wisconsin stats., compounded monthly.
A (mechanical, electrical, or plumbing subcontractor) that receives payment as provided under this contract and that subcontracts with another entity shall pay those subcontractors, and be liable for interest on late payments to those subcontractors, in the same manner as the (general prime contractor) is required to pay the (mechanical, electrical, or plumbing subcontractor) under this contract.

Insurance and Bonds. (Mechanical, electrical, or plumbing subcontractor) shall not commence work under this contract until it has obtained all necessary insurance required of (mechanical, electrical, or plumbing subcontractor) in the contract between the (general prime contractor) and the University of Wisconsin System Administration. (mechanical, electrical, or plumbing subcontractor) shall provide a separate 100 percent performance bond and a separate 100 percent payment bond to the benefit of the (general prime contractor) as the sole named obligee. Original bonds shall be given to the (general prime contractor) and a copy shall be given to the University of Wisconsin System Administration no later than 10 days after execution of this contract.

Indemnification. To the fullest extent permitted by law, (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others whom (general prime contractor) is required to indemnify under its contract with the Owner, and the employees of any of them, from and against claims, damages, fines, penalties, losses, and expenses, including but not limited to attorney fees, arising in any way out of or resulting from the performance of the work under this contract, but only to the extent such claim, damage, fine, penalty, loss, or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of property, including but not limited to loss of use resulting therefrom and is caused by the negligence, or acts or omissions, of (mechanical, electrical, or plumbing subcontractor), its subcontractors, any of their employees, and anyone directly or indirectly employed by them or anyone for whose acts they may be liable, or (2) as related to such claims, damages, fines, penalties, losses, and expense of or against (general prime contractor), results from or arises out of the negligence of the (general prime contractor) or other fault in providing general supervision or oversight of the work of (mechanical, electrical, or plumbing subcontractor) or (3) as related to claims, damages, fines, penalties, losses, and expense against the University of Wisconsin System Administration, arises out of the department's status as owner of the project or project site.

In addition (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others (general prime contractor) is required to indemnify under its contract with the department, and the employees of any of them, from any liability, including liability resulting from a violation of any applicable safe place act, that (general prime contractor) or the owner incurs to any employee of (mechanical, electrical, or plumbing subcontractor) or any third party where the liability arises from a derivative claim from said employee, when the liability arises out of the failure of the (general prime contractor) or the owner to properly supervise, inspect, or approve the work or work area of (mechanical, electrical, or plumbing subcontractor), but only to the extent that the liability arises out of the acts or omissions of (mechanical, electrical, or plumbing subcontractor), its employees, or anyone for whom (mechanical, electrical, or plumbing subcontractor) may be liable, or from (mechanical, electrical, or plumbing subcontractor's) breach of its contractual responsibilities or arises out of (general prime contractor's) negligence or other fault in providing general supervision or oversight of (mechanical, electrical, or plumbing subcontractor's) work or arises out of the University of Wisconsin System Administration's status as owner of the project or project site. In claims against (general prime contractor) or the owner by an employee of (mechanical, electrical, or plumbing subcontractor) or its subcontractors or anyone for whose acts (mechanical, electrical, or plumbing subcontractor) may be liable, the indemnification obligation of this paragraph is not limited by a limitation on amount or type of damage, compensation, or other benefits payable by or for the (mechanical, electrical, or plumbing subcontractor) subcontractors under workers compensation act.

Except as identified above, the obligations of (mechanical, electrical, or plumbing subcontractor) under this indemnification do not extend to the liability of (general prime contractor) and its agents or employees arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or

specifications; (2) the giving of or failure to give directions or instructions by the (general prime contractor) or the University of Wisconsin System Administration or their agents or employees provided the giving or failure to give is the cause of the injury or damage; or (3) the acts or omissions of other subcontractors.

Retainage. Retainage shall occur and be in amounts and on a schedule equal to that in the contract between (general prime contractor) and the University of Wisconsin System Administration.

22. COMMENCEMENT AND COMPLETION

The successful General Prime Contractor Bidder shall commence work upon an executed contract with Owner. The General Prime Contractor shall not Mobilize until the date to be specified in a written "Notice to Proceed" issued by the Owner, and to fully complete all the work for Substantial Completion within **330** consecutive calendar days thereafter. Completion time will be converted to a specific date at the time the "Notice to Proceed" is issued. The construction duration and below milestone dates are based on the current bidding schedule, and subject to modification if bidding does not proceed as planned. Refer also to General Conditions for additional information in regards to time for completion.

The General Prime Contractor must base the Project Schedule on the schedule that the MEP Subcontractors and General Prime Contractors bid on (in the specifications or bid instructions), unless otherwise agreed to by the MEP Subcontractor. These milestones will be incorporated into the master project schedule after the Notice to Proceed is issued. The schedule must include, but is not limited to, the following milestone categories as they apply to the project:

Start Date (Month/Year)	End Date (Month/Year)	Schedule Milestones
11/2023	12/2023	Mobilization
11/2023	2/2024	Demolition
12/2023	1/2024	Selective Abatement by Owner
2/2024	5/2024	Framing
3/2024	8/2024	Mechanical, Electrical, Plumbing and Fire Protection Rough-in
4/2024	10\2024	Architectural Finishes and Labs
7/2024	10/2024	Mechanical, Electrical, Plumbing & Fire Protection Finishes
10/2024	11/2024	Commissioning and Punch
11/2024	11/2024	Substantial Completion

23. WORK BY THE OWNER

The following work will be accomplished by the Owner or will be let under separate contracts and will not be included under the General Prime Contract:

FURNITURE AND FIXTURES

Loose Furniture (Tables, Chairs, Desks, Residential appliance, etc.)

DOOR HARDWARE

Permanent cylinders and keying.

ACCESS CONTROL

Access Control head end equipment.

ASBESTOS ABATEMENT:

See General Requirements, HAZARDOUS SUBSTANCES for regulatory requirements, materials testing results, and General Prime Contractor's responsibility regarding ACM. General Prime Contractor is responsible for coordination with and scheduling of Owner's separate Contractor. See H Series Drawings, included for reference, for additional information.

AUDIO VISUAL EQUIPMENT:

Audio video work, as indicated on AV Drawings and specified in Section 27 41 00 and its schedules, and 27 08 00.41. Conduit, back-boxes and other raceways, as specified in Division 26 are not AV work as it relates to the prior statement. The Contractors shall coordinate their work with Owner's separate Contractor.

HAND DRYERS

Electric Hand Dryers, will be Owner furnished, Contractor installed to match Campus standards.

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MEP INSTRUCTIONS TO BIDDERS (Rev 11/2022)
UW-Madison Project No. **0084 2014** /UWSA Project No**. A-22-015**

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1. DEFINITIONS
In this document, the following terms are defined as:

(a) "Mechanical, electrical, or plumbing subcontractor" ("MEP Subcontractor") is a contractor that performs mechanical (Heating, Ventilating, and Air Conditioning, electrical, plumbing, or fire protection (fire suppression) work for the Project, and enters into a contract with the General Prime Contractor to perform their division of work.

(b) "Qualified bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)1.

(c) "Qualified responsible bidder" means a contractor who is a qualified bidder and who is a responsible bidder.

(d) "Responsible bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)2.

(e) "Single prime contracting" means bidding and contracting through a process in which only a general prime contractor has a contractual relationship with the owner and all mechanical, electrical, or audio visual subcontractors are identified by the department and are subcontractors to the General Prime Contractor.

(f) "General Prime Contractor" is a contractor that enters into a contract with the owner to perform all work as required by the Contract Documents and enters into contracts with subcontractors including MEP Subcontractors identified by the Owner.

(g) "Non-MEP Subcontractor" is a subcontractor to a General Prime Contractor in divisions of work other than mechanical, electrical, plumbing, and fire protection. This includes suppliers and installers to the General Prime Contractor.

(h) "Subcontractor "is all subcontractors on a project. This includes MEP Subcontractors, subcontractors to the MEP Subcontractors, and Non-MEP Subcontractors.

(i) “Contractor” is all contractors working on a project regardless of contractual relationship. This includes the General Prime Contractor, MEP Subcontractors, Non-MEP Subcontractors, and all Subcontractors, regardless of tier of subcontract.

(j) “DFD Project Manager” shall have the same meaning as the “Owner’s Representative” as defined in the A101 contract, article 8.2.

2. GENERAL

Time for bid opening shall be the prevailing central standard or daylight saving time in force at Madison, Wisconsin, on the date set forth in the Invitation to Bid.

All potential bidders must be certified by DOA prior to submitting bids on state construction projects over $50,000. All bids received from contractors who are not certified will be rejected. Contractor certification applications and instructions for completing the form may be obtained from the DOA Website DFD Contractor Certification page: https://doa.wi.gov/Pages/DoingBusiness/ContractorCertification.aspx or upon request from DFD--email dfdcertification@wisconsin.gov.

The Owner will issue an addendum if a successful MEP bid is withdrawn or rejected after the MEP Subcontractors have been identified but before the General Prime Contractor bid opening, This addendum will include a revised list of successful MEP bids that must be included in General Prime Contractor bids and will move the General Prime Contractor bid opening five days later to allow bidders sufficient time to update their bids based on the revised MEP list.

Before submitting a bid, the Bidder shall examine all of the Bidding Documents listed in the Table of Contents of these specifications. The successful Bidder will be required to do all work which is shown on the drawings, mentioned in the specifications or reasonably implied as necessary to complete the division of work being bid for this project.

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

All bidders shall have established and diligently maintained a satisfactory safety program, and if eligible for Experience Modification Rating (EMR), must have a rating of 1.20 or less as established by the Wisconsin Compensation Rating Bureau (WCRB) or the National Council on Compensation Insurance (NCCI).

3. DRAWINGS AND SPECIFICATIONS

The Bidding Documents include the documents in these Specifications and the Drawings issued for Bidding, regardless if they are listed in the Table of Contents of these specifications or not.

Complete sets of Bidding Documents for all trades will be issued to all Bidders, irrespective of the category of work to be bid on, in order that all Bidders may be familiar with the work of other trades as they affect their bid.

4. INTERPRETATION

No verbal explanation or instructions will be given in regard to the meaning of the drawings or specifications during the bid period. Bidders shall bring inadequacies, omissions or conflicts to the Architect/Engineer's attention at least ten (10) days before the date set for the MEP bid opening. Prompt clarification will be supplied to all bidders of record by addendum.

Failure to so request clarification or interpretation of the drawings and specifications will not relieve the successful Bidder of responsibility. Signing of the subcontract with the General Prime Contractor will be considered as implicitly denoting that the MEP Subcontractor has thorough understanding of the scope of work and comprehension of the Bidding Documents.

Neither the Architect/Engineer nor the Owner will be responsible for verbal instructions.

5. MANDATORY PRE-BID DOA CERTIFICATION

All potential bidders must become certified as qualified and responsible bidders **before** they can bid on state projects over $50,000. The criteria for determining certification of qualified and responsible bidders are itemized in Wis. Stat. s. 16.855(9m). If the Owner determines that more experience is necessary for a particular project, the Owner may include additional requirements.

6. BID GUARANTEE

A bid bond prepared on the Bid Bond Form bound herein, payable to the Owner in the amount not less than 10% of the maximum bid shall accompany each bid as a guarantee. A bank certified check or a cashier's check may accompany each bid as a guarantee pursuant to Wis. Stat. s. 779.14(1m)(c)2.b. and 779.14(1s). Failure to enter into the contract with the Owner (including failure to obtain certificate of insurance and separate 100% performance and 100% payment bonds) with the General Prime Contractor may result in forfeiture of the Bid Bond. The company issuing the Bonds must be licensed to do business in Wisconsin.

Any bid which is not accompanied by a bid guarantee will not be accepted and will not be read at the bid opening.

All checks tendered as bid guarantee, except those of the three lowest bidders, will be returned to their makers within three (3) days after bid opening. All such retained checks will be returned immediately upon execution of the contract between the General Prime Contractor and the MEP Subcontractor.

7. WITHDRAWAL OF BIDS

Prior to the time fixed for bid opening, bids may be withdrawn by written request from the Bidder, without prejudice to the right of the Bidder to file a new bid. Withdrawn bids will be returned unopened.

After the bid has been opened, negligence on the part of the Bidder in preparing their bid confers **no** right for withdrawal of the bid without penalty.

If a bid contains an error, omission, or mistake, the bidder may limit liability to the amount of their bid guarantee by giving the Owner written Notice, within seventy-two (72) hours of the MEP bid opening, of their intent not to execute the contract with the General Prime Contractor. If no such notice is given, the Owner reserves the right to obtain the amount of the difference in bid price between the low bidder and the next low bidder.

8. MEP BIDDER IDENTIFICATION

Within five (5) days of the MEP bid opening, the Owner will identify a lowest, qualified, responsible, certified MEP Subcontractor in each applicable MEP division of work (as long as the cost does not exceed the amount of project funds available).

The lowest dollar amounts submitted by qualified, responsible, certified bidders on the SEPARATE BASE BIDS for various specified mechanical, electrical, plumbing, and fire protection divisions of the work; or

The lowest dollar amount submitted by qualified, responsible, certified bidders on the COMBINED BASE BIDS for any combination of the Separate Base Bids for various specified mechanical, electrical, plumbing, and fire protection divisions of the work.

The Owner reserves the right to reject any and all bids, or to waive any informality in any bid, or to accept any bid which will serve the best interest of the Owner.

9. MEP SUBCONTRACT WITH GENERAL PRIME CONTRACTOR

The General Prime Contractor will offer the successful MEP Bidder (s) a subcontract. A contract entered into between a General Prime Contractor and a MEP Subcontractor must include a scope of work clause identical to the scope of work clause included in the MEP Subcontractor bid documents. A General Prime Contractor and an MEP Subcontractor may not enter any agreement in connection with bids submitted that would alter or affect the scope or price of the contracts entered into. This prohibition does not apply to the Owner change orders that result in changes to the plans or specifications, or to back charges allowed by the contract.

The General Prime Contractor must base the Project Schedule on the schedule that the MEP Subcontractors and General Prime Contractors bid on (in the specifications or bid instructions), unless otherwise agreed to by the MEP Subcontractor.

As the work progresses under any MEP subcontract for construction of a project, the General Prime Contractor shall, upon request of a subcontractor, pay to the subcontractor an amount equal to the proportionate value of the subcontractor's work properly completed, less retainage. The retainage shall be an amount equal to not more than 5 percent of the subcontractor's work completed until 50 percent of the subcontractor's work has been completed. At 50 percent completion, no additional amounts may be retained, and partial payments shall be made in full to the subcontractor unless the department certifies that the subcontractor's work is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the subcontractor's work is not satisfactory, additional amounts may be retained but the total retainage may not be more than 10 percent of the value of the work completed. Upon substantial completion of the subcontractor's work, any amount retained shall be paid to the subcontractor, less the value of any required corrective work or uncompleted work. All payments the General Prime Contractor makes under this paragraph shall be within 7 calendar days after the date on which the General Prime Contractor receives payment from the Owner.

The contract entered into between the General Prime Contractor and an MEP Subcontractor must contain all of the following clauses:

Scope of Work. The MEP Subcontractor scope of work is identical to the General Prime Contractor scope of work included in these bidding and contract documents. By submitting and signing a bid, all bidders have examined all of the Bidding Documents listed in the Table of Contents of the project specifications. The successful bidders will be required to do all work which is shown on the drawings, mentioned in the specifications, or reasonably implied as necessary to complete the division of work bid for this project.

Prompt Payment. (General prime contractor) shall pay (mechanical, electrical, or plumbing subcontractor) in accordance with section 16.855(19)(b), Wisconsin stats, for work that has been satisfactorily completed and properly invoiced by (mechanical, electrical, or plumbing subcontractor). A payment is timely if it is mailed, delivered, or transferred to (mechanical, electrical, or plumbing subcontractor) by the deadline under section 16.855(19)(b), Wisconsin stats.

If (mechanical, electrical, or plumbing subcontractor) is not paid by the deadline in this contract, (general prime contractor) shall pay interest on the balance due from the eighth day after the (general prime contractor) receives payment from the Owner for the work for which payment is due and owing to (mechanical, electrical, or plumbing subcontractor), at the rate specified in section 71.82, Wisconsin stats., compounded monthly.

A (mechanical, electrical, or plumbing subcontractor) that receives payment as provided under this contract and that subcontracts with another entity shall pay those subcontractors, and be liable for interest on late payments to those subcontractors, in the same manner as the (general prime contractor) is required to pay the (mechanical, electrical, or plumbing subcontractor) under this contract.

Insurance and Bonds. (Mechanical, electrical, or plumbing subcontractor) shall not commence work under this contract until it has obtained all necessary insurance required of (mechanical, electrical, or plumbing subcontractor) in the contract between the (general prime contractor) and the Owner. (mechanical, electrical, or plumbing subcontractor) shall provide a separate 100 percent performance bond and a separate 100 percent payment bond to the benefit of the (general prime contractor) as the sole named obligee. Original bonds shall be given to the (general prime contractor) and a copy shall be given to the Ownerno later than 10 days after execution of this contract.

Indemnification. To the fullest extent permitted by law, (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others whom (general prime contractor) is required to indemnify under its contract with the department, and the employees of any of them, from and against claims, damages, fines, penalties, losses, and expenses, including but not limited to attorney fees, arising in any way out of or resulting from the performance of the work under this contract, but only to the extent such claim, damage, fine, penalty, loss, or expense: (1) is

attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of property, including but not limited to loss of use resulting therefrom and is caused by the negligence, or acts or omissions, of (mechanical, electrical, or plumbing subcontractor), its subcontractors, any of their employees, and anyone directly or indirectly employed by them or anyone for whose acts they may be liable, or (2) as related to such claims, damages, fines, penalties, losses, and expense of or against (general prime contractor), results from or arises out of the negligence of the (general prime contractor) or other fault in providing general supervision or oversight of the work of (mechanical, electrical, or plumbing subcontractor) or (3) as related to claims, damages, fines, penalties, losses, and expense against the Owner, arises out of the department's status as owner of the project or project site.

In addition (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others (general prime contractor) is required to indemnify under its contract with the department, and the employees of any of them, from any liability, including liability resulting from a violation of any applicable safe place act, that (general prime contractor) or the owner incurs to any employee of (mechanical, electrical, or plumbing subcontractor) or any third party where the liability arises from a derivative claim from said employee, when the liability arises out of the failure of the (general prime contractor) or the owner to properly supervise, inspect, or approve the work or work area of (mechanical, electrical, or plumbing subcontractor), but only to the extent that the liability arises out of the acts or omissions of (mechanical, electrical, or plumbing subcontractor), its employees, or anyone for whom (mechanical, electrical, or plumbing subcontractor) may be liable, or from (mechanical, electrical, or plumbing subcontractor's) breach of its contractual responsibilities or arises out of (general prime contractor's) negligence or other fault in providing general supervision or oversight of (mechanical, electrical, or plumbing subcontractor's) work or arises out of the Owner's status as owner of the project or project site. In claims against (general prime contractor) or the owner by an employee of (mechanical, electrical, or plumbing subcontractor) or its subcontractors or anyone for whose acts (mechanical, electrical, or plumbing subcontractor) may be liable, the indemnification obligation of this paragraph is not limited by a limitation on amount or type of damage, compensation, or other benefits payable by or for the (mechanical, electrical, or plumbing subcontractor) subcontractors under workers compensation act.

Except as identified above, the obligations of (mechanical, electrical, or plumbing subcontractor) under this indemnification do not extend to the liability of (general prime contractor) and its agents or employees arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications; (2) the giving of or failure to give directions or instructions by the (general prime contractor) or the University of Wisconsin System Administration or their agents or employees provided the giving or failure to give is the cause of the injury or damage; or (3) the acts or omissions of other subcontractors.

Retainage. Retainage shall occur and be in amounts and on a schedule equal to that in the contract between (general prime contractor) and the Owner.

10. CONTRACT INTERESTS BY STATE PUBLIC OFFICIALS

In accordance with section 19.45(6) of the Wisconsin Statutes, no state public official, member of a state public official's immediate family, nor any organization with which the state public official or a member of the official's immediate family owns or controls at least 10% of the outstanding equity, voting rights, or outstanding indebtedness may enter into any contract or lease involving a payment or payments of more than $3,000 within a twelve (12) month period, in whole or in part derived from state funds unless the state public official has first made written disclosure of the nature and extent of such relationship or interest to the board and to the department acting for the state in regard to such contract or lease. Any contract or lease entered into in violation of this subsection may be voided by the owner in an action commenced within three (3) years of the date on which the ethics board, or the department or officer acting for the state in regard to the allocation of state funds from which such payment is derived, knew or should have known that a violation of this subsection had occurred. This subsection does not affect the application of s.946.13.

11. DISCLOSURE OF OWNERSHIP

The Bidder shall disclose on the date of submitting a bid for this project, the name of any construction business of which the Bidder has had a 25% or greater interest as a shareholder, officer, partner, or owner at any time during the preceding three (3) years, if said construction business has been found by the Department of Workforce Development to have failed to pay the prevailing wage rate or at least 1.5 times the hourly basic rate of pay for hours worked in excess of the prevailing hours of labor to any employee at any time within the preceding three (3) years.

The "Disclosure of Ownership" form may be obtained at no charge from the Department of Workforce Development, Equal Rights Division, P.O. Box 8928, Madison, Wisconsin 53708.

12. MINORITY BUSINESS ENTERPRISE AND DISABLED VETERAN-OWNED BUSINESS INVOLVEMENT

"Minority Business Enterprise" (MBE) means: a business certified by the Wisconsin Supplier Diversity Program under Wis. Stat. s. 16.287(2).

"Disabled Veteran−Owned Business" (DVB) means: a business certified by the Wisconsin Supplier Diversity Program under Wis. Stat. s. 16.283(3).

General Prime Contractors are strongly encouraged to use MBEs and DVBs.

General Prime Contractor Bidders shall submit a "Form A Affidavit of Compliance – Minority Business Enterprise and Disabled Veteran-Owned Business Provision" within seven days of the general prime contractor contract offer. This form should indicate the percentage of MBE/DVB participation commitment. All MEP Subcontractor Bidders shall also make every effort to encourage MBE and DVB involvement.

For assistance in identifying DOA certified MBE and DVB companies, please contact the Department of Administration Supplier Diversity Program at: DOABDMBD@wisconsin.gov, or by telephone at: (608)267-9550, or visit their website at: http://www.doa.wi.gov/Divisions/Enterprise-Operations/Supplier-Diversity-Program.

13. SUBSTANCE ABUSE PREVENTION

Mission/Purpose: The Board of Regents of the University of Wisconsin System recognizes and supports drug-free workplace programs as an important element in the national strategy to reduce the devastating effects of drug and alcohol abuse in our society. The the Owner requires contractors, subcontractors, suppliers and vendors to establish and enforce drug-free workplace policies and programs that conform to Sec 103.503 of the Wisconsin Statutes.

Statement: The possession, use of, distribution or purchase of illegal drugs, or use of alcohol at work by any employee on the Owner's construction job sites, is strictly prohibited.

The terms of this Substance Abuse Program Statement shall cover all construction personnel who are working on the Owner's job sites. This includes employees of all Contractors, Subcontractors, contractor suppliers, and their employees working at the job site.

General Prime Contractor's and Subcontractor's Written Program: Each General Prime Contractor and Subcontractor shall have in place a written Substance Abuse Program conforming to Sec 103.503(3) of the Wisconsin Statutes.

In addition, representatives of the Owner who believe that any General Prime Contractor's or Subcontractor's employee may be under the influence of alcohol or drugs shall, where deemed appropriate, contact the General Prime Contractor's or Subcontractor's appropriate management/supervision authority and request that appropriate action be taken. The General Prime Contractor's or Subcontractor's employer shall immediately remove an employee who is suspected of being under the influence of illegal drugs or alcohol shall be immediately removed from the job site.

Procedures for testing and handling of positive drug tests shall be in compliance and consistent with State and Federal laws.

Costs of Substance Abuse Programs and Testing: The cost associated with the development, implementation and enforcement of Substance Abuse Programs and any testing required shall be the responsibility of each individual General Prime Contractor and Subcontractor for their respective employees working on the job site. the Owner will not be responsible for any cost of substance abuse testing, rehabilitation or medical reviews related to substance abuse.

The General Prime Contractor and Subcontractors shall indemnify and hold the Owner harmless from any damages or other costs incurred that are related to the implementation or enforcement of any substance abuse policy or program.

14. SECURITY FOR SEPARATE 100% PERFORMANCE AND SEPARATE 100% PAYMENT

MEP Subcontractors will be required to deliver to the General Prime Contractor separate 100 % performance and 100 % payment bonds to the benefit of the General Prime Contractor as the sole obligee. Original bonds shall be given to the General Prime Contractor and a copy shall be given to the Owner no later than 10 days after the execution of the subcontract. Separate 100% performance and separate 100 % payment bond forms are included in Appendix 1 of these instructions.

15. TAXES

The Bidder shall include in the bid, all Sales, Consumer, Use and other similar taxes required by law.

In accordance with section 71.80(16)(a), Wis. Stats., SURETY BOND; NONRESIDENT CONTRACTOR. "All nonresident persons, whether incorporated or not, engaging in construction contracting in this state as contractor or subcontractor and not otherwise regularly engaged in business in this state, shall file a surety bond with the department (Wisconsin Department of Revenue MS 5-77 Attn: Non-Resident Surety Bonds, 2135 Rimrock Rd., Madison, WI 53713, telephone (608)266-2776.) payable to the department of revenue, to guarantee the 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. The amount of the bond shall be 3% of the contract or subcontract price on all contracts of $50,000 or more..."

As the Board of Regents is an exempt entity, building materials purchased for this project are exempt. The University of Wisconsin System CES number: 040706. The Certificate of Exempt Status (CES) will be provided to the awarded Contractor upon request.

16. SUBMISSION OF BIDS

All bids shall be submitted on the standard Bid Forms and only bids that are made on the Bid Forms will be considered. The entire Bid Form including the Addendum Receipt/Signature page, the Bid Bond Form (if used), and other supporting documents (if any) shall be filled out and submitted in the manner specified hereinafter. SPECIFICATIONS SHALL NOT ACCOMPANY BID.

No bids for any subdivision or any subclassification of this work, except as indicated, will be accepted. Any conditional bid, amendment to the Bid Form or appendant thereto, the inclusion of any correspondence, written or printed matter, unsolicited material or data, or details of any nature other than the information specifically called for, will disqualify the Bid. Telecommunication alterations to the bid will not be accepted.

Space(s) are provided on the Bid Form for each Division of Work. Appropriate insertions are as follows: numerals indicating the cost of the work, $0 if there is no cost for the work, or the words 'No Bid' if the bidder is not intending to bid the work. Blank space(s) will be considered the same as 'No Bid'.

Bidders may submit separate base bids for any divisions of work they are certified to bid on (Fire Suppression, Plumbing, Heating, Ventilating and Air Conditioning, and Electrical).

Bidders may submit combined base bids for any combination of base bid categories if they are certified in each division of work included in their combined base bid.

Any addendum issued during the time of bidding shall become a part of the Bidding Documents. Bidders shall acknowledge receipt of such addendum in the appropriate space provided on the Bid Form. Bid will be rejected if receipt of an addendum applicable to the award of contract has not been acknowledged on the Bid Form.

The Owner is not responsible for bids not clearly labeled as required. Bids shall be signed, sealed, and delivered to the place indicated in the Invitation to Bid before the time designated in the Invitation to Bid. All bids shall be identified with the Project Name, Project Number, Project Location, Category of Work being bid on, Bid Date, and the Name and Address of Bidder.

Bidder shall be responsible for the sealed bid being delivered to the place designated for bid opening before the time specified. Bids received after the time indicated in the Invitation to Bid will be rejected and returned to Bidder unopened.

Bid will be considered invalid and will be rejected if it has not been signed by the Bidder.

Bids will be rejected if the bidder is not certified by DOA in the division(s) of work they bid on and/or if their bid amount exceeds their certification threshold in that division of work.

17. BASE BIDS

Fire Protection (Fire Suppression), Plumbing, Mechanical (Heating, Ventilating and Air Conditioning), and Electrical Base Bids shall be received utilizing one or all methods of bidding as follows:

SEPARATE BASE BIDS FOR THE VARIOUS DIVISIONS OF THE WORK.

Base Bid No. 2 Fire Suppression Work as per specification Division 21, applicable provisions of Division 1 and related drawings.

Base Bid No. 3 Plumbing Work as per specification Division 22, applicable provisions of Division 1 and related drawings.

Base Bid No. 4 Heating, Ventilating and Air Conditioning Work as per specification Division 23, applicable provisions of Division 1 and related drawings.

Base Bid No. 5 Electrical Work as per specification Division 26, 27, 28 applicable provisions of Division 1 and related drawings.

COMBINED BASE BIDS FOR ANY COMBINATION OF SEPARATE BASE BIDS FOR VARIOUS DIVISIONS OF THE WORK.

Base Bid No.____for_____, Base Bid No.____for_____ and Base Bid No.____for_____as per specifications, applicable provisions of Division 1 and related drawings.

18. INFORMATIONAL BIDS

None.

19. UNIT PRICES

Unit prices requested on the Bid Form shall be given and, if included in the General Prime Contract, will be used for additions to or deductions from amount of work required under the Contract. Unit prices shall include all costs of materials, labor, insurance, taxes, overhead and profit.

The Owner reserves the right to reject any unit prices as given in the bid if they are considered excessive or unreasonable, or to accept any or all of the unit prices that may be considered fair and reasonable. If any unit price is rejected, the work governed by such unit price, if required, shall be treated as specified in General Conditions.

The Bidder shall refer to the Bid Form and the applicable technical section to determine the basis of unit measure and the detailed information related to each unit price item requested.

20. STATED ALLOWANCES

None.

21. COMMENCEMENT AND COMPLETION

The successful mechanical, electrical, plumbing, or fire protection Bidder must agree to commence the work on or before a date to be specified in a written "Notice to Proceed" issued by the General Prime Contractor and to fully complete all the work within **330** consecutive calendar days thereafter. Completion time will be converted to a specific date at the time the "Notice to Proceed" is issued. The construction duration and below milestone dates are based on the current bidding schedule, and subject to modification if bidding does not proceed as planned. Refer also to General Conditions for additional information in regards to time for completion.

The General Prime Contractor must base the Project Schedule on the schedule that the MEP Subcontractors and General Prime Contractors bid on (in the specifications or bid instructions), unless otherwise agreed to by the MEP Subcontractor. These milestones will be incorporated into the master project schedule after the Notice to Proceed is issued. The schedule must include, but is not limited to, the following milestone categories as they apply to the project:

Start Date (Month/Year)	End Date (Month/Year)	Schedule Milestones
11/2023	12/2023	Mobilization
11/2023	2/2024	Demolition
12/2023	1/2024	Selective Abatement by Owner
2/2024	5/2024	Framing
3/2024	8/2024	Mechanical, Electrical, Plumbing and Fire Protection Rough-in
4/2024	10\2024	Architectural Finishes and Labs
7/2024	10/2024	Mechanical, Electrical, Plumbing & Fire Protection Finishes
10/2024	11/2024	Commissioning and Punch
11/2024	11/2024	Substantial Completion

22. WORK BY THE OWNER

The following work will be accomplished by the Owner or will be let under separate contracts and will not be included under the General Prime Contract:

FURNITURE AND FIXTURES
Loose Furniture (Tables, Chairs, Desks, Residential appliance, etc.)

DOOR HARDWARE
Permanent cylinders and keying.

ACCESS CONTROL
Access Control head end equipment.

ASBESTOS ABATEMENT:
See General Requirements, HAZARDOUS SUBSTANCES for regulatory requirements, materials testing results, and General Prime Contractor's responsibility regarding ACM. General Prime Contractor is responsible for coordination with and scheduling of Owner's separate Contractor. See H Series Drawings, included for reference, for additional information.

AUDIO VISUAL EQUIPMENT:
Audio video work, as indicated on AV Drawings and specified in Section 27 41 00 and its schedules, and 27 08 00.41. Conduit, back-boxes and other raceways, as specified in Division 26 are not AV work as it relates to the prior statement. The Contractors shall coordinate their work with Owner's separate Contractor.

HAND DRYERS
Electric Hand Dryers, will be Owner furnished, Contractor installed to match Campus standards.

***

SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

RELATED DOCUMENTS
Applicable provisions of Division 1 shall govern work under this Section.

SUMMARY
Section Includes:

- Public-use washroom accessories.
- Lab accessories
- Warm-air dryers.

ACTION SUBMITTALS
Product Data: For each type of product.

Samples: Full size, for each exposed product and for each finish specified.

CLOSEOUT SUBMITTALS
Maintenance data.

PART 2 - PRODUCTS

PERFORMANCE REQUIREMENTS
Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PUBLIC-USE WASHROOM ACCESSORIES
Toilet Tissue (Roll) Dispenser TPD:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- Torks Twin Jumbo Bath Tissue Roll Dispenser, 9 inch Single.

Description: Double-roll dispenser.
Mounting: Surface mounted.
Operation: Noncontrol delivery with standard spindle .
Capacity: Designed for 9-inch- diameter tissue rolls.
Material and Finish: Plastic.

Waste Receptacle PT/R:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- A&J Washroom Accessories, Inc.
- American Specialties, Inc.; ASI Group.
- Bobrick Washroom Equipment, Inc.
- Bradley Corporation.

Mounting: Semirecessed, equivalent to Bobrick B-3961 with auto-advance 8-inch by 8-inch diameter paper roll.
Minimum Capacity: 18 gal.
Material and Finish: Stainless steel, No. 4 finish (satin) .

Lockset: Tumbler type for waste receptacle.

Liquid-Soap Dispenser SD:

Owner Furnished, Contractor installed.

Grab Bar GB:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A&J Washroom Accessories, Inc.
American Specialties, Inc.; ASI Group.
Bobrick Washroom Equipment, Inc.
Bradley Corporation.

Mounting: Flanges with concealed fasteners.
Material: Stainless steel, 0.05 inch thick.

Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.

Outside Diameter: 1-1/2 inches.
Configuration and Length: As indicated on Drawings .

Tampon/Sanitary Napkin Vendor:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A&J Washroom Accessories, Inc.
American Specialties, Inc.; ASI Group.
Bobrick Washroom Equipment, Inc.
Bradley Corporation.

Basis of Design: Bradley 4017 series
Type: Sanitary napkin and tampon.
Mounting: Fully recessed, designed for 4-inch (100-mm) wall depth.
Capacity: 30 napkins and 28 tampons.
Operation: No coin (free).
Exposed Material and Finish: Stainless steel, No. 4 finish (satin).
Lockset: Tumbler type with lock and key.

Sanitary-Napkin Disposal Unit SNR:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A&J Washroom Accessories, Inc.
American Specialties, Inc.; ASI Group.
Bobrick Washroom Equipment, Inc.
Bradley Corporation.

Mounting: Surface mounted.
Door or Cover: Self-closing, disposal-opening cover.
Receptacle: Removable.
Material and Finish: Stainless steel, No. 4 finish (satin) .

LAB ACCESSORIES

Paper Towel Dispensers:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A&J Washroom Accessories, Inc.
American Specialties, Inc.; ASI Group.
Bobrick Washroom Equipment, Inc.
Bradley Corporation.

Description: 22 gauge stainless steel unit capable of holding 525 multi-fold or 400 C-fold towels.
Mounting: Surface.

WARM-AIR DRYERS

Owner Furnished, Contractor Installed: Dyson Airblade V.

FABRICATION

Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

INSTALLATION

Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

END OF SECTION 10 28 00

SECTION 08 71 00
FINISH HARDWARE

PART 1 - GENERAL

RELATED DOCUMENTS
Applicable provisions of Division 01 shall govern work under this Section.

SUMMARY
Section Includes:

Door Hardware, including electric hardware.

Related Documents
Applicable provisions of Division 1 shall govern work under this Section.

REFERENCES:
Use date of standard in effect as of Bid date.

American National Standards Institute – ANSI 156.18 – Materials and Finishes.

ANSI A117.1 – Specifications for making buildings and facilities usable by physically handicapped people.

ADA – Americans with Disabilities Act of 1990

BHMA – Builders Hardware Manufacturers Association

DHI – Door and Hardware Institute

NFPA – National Fire Protection Association

NFPA 80 – Fire Doors and Windows
NFPA 101 – Life Safety Code
NFPA 105 – Smoke and Draft Control Door Assemblies
NFPA 252 – Fire Tests of Door Assemblies

UL – Underwriters Laboratories

UL10C – Fire Test of Door Assemblies as amended to incorporate positive pressure testing.

WHI – Warnock Hersey Incorporated

SDI – Steel Door Institute

AWI – Architectural Woodwork Institute

SUBMITTALS & SUBSTITUTIONS
SUBMITTALS: Submit six copies of schedule per Division 1. Organize **vertically formatted** schedule into Hardware Sets following guidelines established in Door & Hardware Institute Handbook (DHI) Sequence and Format for the Hardware Schedule with index of doors and headings, indicating complete designations of every item required for each door or opening. Include the following information:

Type, style, function, size, quantity and finish of hardware items.
Use BHMA Finish codes per ANSI A156.18.

Name, part number and manufacturer of each item.
Fastenings and other pertinent information.
Location of hardware set coordinated with floor plans and door schedule.
Explanation of abbreviations, symbols, and codes contained in schedule.
Mounting locations for hardware.
Door and frame sizes, materials and degrees of swing.
List of manufacturers used and their nearest representative with address and phone number.
Catalog cuts.
Manufacturer's technical data and installation instructions for electronic hardware.
Date of jobsite visit.

Furnish as-built/as-installed schedule with closeout documents, including manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

QUALITY ASSURANCE:
Qualifications:

Hardware supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years. Who is or who employs an experienced Architectural Hardware Consultant (AHC) who is available, at reasonable times during the course of the Work, for consultation about project's hardware requirements to Owner, Architect and Contractor.

Electrified hardware supplier: An experienced door hardware supplier who has completed projects with electrified door hardware similar in material, design and extent to that indicated for this project, who has a record of successful in-service performance and is acceptable to manufacturer of materials. Shall prepare data for electrified door hardware based on testing and engineering analysis of manufacturer's assemblies similar to those in this project.

Responsible for detailing, scheduling and ordering of finish hardware.

Hardware: New, free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.

Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

Fire-Rated Openings: In compliance with NFPA 80. Provide proper latching hardware, non-flaming door closers and approved-bearing hinges. Furnish openings complete.

Pre-Installation Meetings: Prior to start of hardware installation, contractor shall schedule and conduct pre-installation meeting with hardware supplier, lock, exit device, and door closer manufacturers' representative(s), installer and related trades, to coordinate materials and techniques, and sequence complex hardware items and systems installation. Proper and correct installation and adjustment of hardware is to be reviewed, and criteria for punch list review will be established. Contractor shall notify hardware supplier two weeks prior to installation of the institutional door hardware to coordinate the pre-installation meeting. Manufacturer's representatives shall meet with the installing contractor to reduce institutional door hardware conflicts, review the approved installation techniques, and to advise on the proper hardware adjustment procedures.

Written documentation of date and attendees/participants is to be provided to architect and owner for record.

Coordination: Work with Section 28 13 00 contractor and submit product data and wiring diagrams for electrified hardware components for use in City permit submittal.

DELIVERY, STORAGE AND HANDLING:
Delivery: coordinate delivery to appropriate locations (shop or field).

Permanent keys and cores: secured delivery direct to Owner's representative.

Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers. Shipments direct from manufacturer to Site are not acceptable.

Storage: Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc…

PROJECT CONDITIONS:
Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical as the same operation and quality as type specified, subject to Architect's approval.

Prior to submittal, carefully inspect existing conditions to verify finish hardware required to complete Work, including size, strike plate size, quantities, and sill conditions material. **This means a job site visit!** If conflict between the scheduled material and existing conditions, submit request for directions from Architect.

SEQUENCING AND COORDINATION:
Reinforce walls for wall stops.

Coordinate finish floor materials and floor-mounted hardware.

Conduit and raceways as needed for electrical and electronic hardware items. Fire/life-safety system interfacing. Point-to-point wiring diagrams plus riser diagrams to related trades.

Furnish manufacturer templates to door and frame fabricators.

Use hardware consultant to check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

WARRANTY:
Part of respective manufacturers' regular terms of sale. Provide manufacturers' warranties:

Bored Locksets:	Seven years.
Mortise Locksets:	Three years.
Closers:	Ten years mechanical, two years electrical.
Exit Devices:	Three years.
Hinges:	One year butt hinges, lifetime geared hinges.
Other Hardware:	One year.

COMMISSIONING:
Test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.

Test electrical hardware systems for satisfactory operation.

Test hardware interfaced with fire/life-safety system for proper operation and release.

MAINTENANCE:
Extra Materials: See Schedule under "Attic Stock". Include as part of the base bid.

Furnish operating and maintenance data of manufacturers for door hardware items. Include instructions for operation, adjustments and maintenance and parts list.

Instruct personnel of Owner in proper adjustments and maintenance of door hardware and hardware finishes during final adjustment phase of hardware installation.

Furnish a complete set of specialized tools as needed for continued adjustment, maintenance, removal and replacement of door hardware by Owner.

PART 2 - PRODUCTS

MANUFACTURERS:
Listed acceptable alternate manufacturers: submit for review products with equivalent function and features of scheduled products.

ITEM:	MANUFACTURER:	ACCEPTABLE SUB:
Hinges	(IVE) Ives	McKinney
Continuous Hinges	(SEL) Select	McKinney
Pivots	(IVE) Ives	Rixson
Power Transfers	(ABH) ABH Mfg.	Securitron, Dorma
Key System	(SCH) Schlage	No Substitution
Locks	(SCH) Schlage	Sargent
Aluminum Door Locks	(ADA) Adams Rite	No Substitution
Exit Devices	(VON) Von Duprin	Sargent
Closers	(LCN) LCN	Sargent
Flush Bolts	(IVE) Ives	Rockwood
Coordinators	(IVE) Ives	Rockwood
Push & Pull Plates	(IVE) Ives	Rockwood
Kickplates	(IVE) Ives	Rockwood
Stops & Holders	(IVE) Ives	Rockwood
Magnetic Door Hold-Opens	(LCN) LCN	Rixson
Overhead Stops	(GLY) Glynn-Johnson	Rixson
Thresholds	(ZER) Zero International	(NGP) Nat'l Guard; Pemko
Seals & Bottoms	(ZER) Zero International	(NGP) Nat'l Guard; Pemko

Provide hardware items required to complete the work in accordance with these specifications and manufacturers' instructions.

Include items inadvertently omitted from this specification. Note these items in submittal for review. There will not be any extra's allowed for items that should have been picked up during bidding.
Where scheduled item is now obsolete, bid and furnish manufacturers updated item at no additional cost to the project.

HANGING MEANS:
Conventional Hinges: Hinge open widths minimum, but, of sufficient throw to permit maximum door swing. Steel or stainless steel pins and concealed bearings.

Three hinges per leaf to 7 foot, 6 inch height. Add one for each additional 30 inches in height, or any fraction thereof.
Extra heavy weight hinges on doors over 3 foot, 5 inches in width.
Outswinging exterior doors: non-ferrous with non-removable (NRP) pins.
Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
Provide shims and shimming instructions for proper door adjustment.
Scheduled Hinges are Ives 5BB1, 5BB1HW
Finish of hinges is to be 652 and 630.

Continuous Hinges: A pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising. The door leaf and jamb leaf shall be geared together for the entire length of the hinge and

joined by a channel. Hinge knuckle shall be monolithic in appearance. Continuous hinge with visible knuckle separations are not acceptable. Vertical door loads shall be carried on minimum ¾" acetal bearings through a full 180 degrees. The door leaf and jamb leaf shall have templated screw hole locations for future replacement needs. All heavy duty hinges (HD) shall have a minimum of 32 bearings for a 7' length.

Factory machine hinge leaves for electric power transfer device where specified in Hardware Sets.
Scheduled Hinge: Select SL11HD at Aluminum Doors / Select SL24HD at Hollow Metal and Wood Doors.

LOCKSETS, LATCHSETS, DEADBOLTS:
Mortise Locksets and Latchsets:

Chassis: cold-rolled steel, handing field changeable without disassembly.
Latchbolts: ¾ inch throw stainless steel anti-friction type.
Lever Trim: through-bolted, accessible design, cast lever or solid extruded type levers as scheduled. Filled hollow tube design unacceptable.
Spindles: security design independent break-away. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.
Thumbturns: accessible design not requiring pinching or twisting motions to operate.
Deadbolts: stainless steel 1-inch throw.
Strikes: 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing.
Scheduled Lock Series and Design: Schlage L series 03N design (03A at L9496 & L9486 functions only).
Certifications:

ANSI A156.13, 1994, Grade 1 Operational, Grade 1 Security
ANSI/ASTM F476-84 Grade 31 UL Listed

Aluminum Door Deadlock:

Adams-Rite MS1850S Series with armor faceplate to suit door edge. Backset shall be 1-1/2" unless door stile width requires narrower backset.

EXIT DEVICES/PANIC HDW
General features:

Independent lab-tested 2,000,000 cycles.
Push-through touch pad design. No exposed touch bar fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.
¾" throw deadlocking latchbolts.
No exposed screws to show through glass doors.
Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.
Releasable with 32 lb. maximum pressure under 250 lb. load to the door.
Heavy cast metal flush mounted end caps finished to match exit device.

Specific features:

Non-Fire rated devices to have cylinder dogging.
Lever Trim: Breakaway type (996L), forged brass or bronze escutcheon min .130" thickness, match lockset lever design.
Exterior doors to have Ives "Vandal-Resistant" pulls.
Rod and latch guards with surface vertical rod devices.
Fire-Labeled Devices: UL label indicating "Fire EXIT HDW". Vertical rod devices less bottom rod (LBR) unless otherwise scheduled.

Delayed Egress Devices: Function achieved within single exit device component, including latch, delayed locking device, request-to-exit switch, nuisance alarm, remote alarm, key switch, indicator lamp, relay, internal horn, door position input, external inhibit input plus fire alarm input. NFPA 101 "Special Locking Arrangement" compliant.
Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.
Removable Mullions: Removable with single turn of building key. Securely reinstalled without need for key. Furnish storage brackets (MT54) for securely stowing the mullion when removed.
Furnish one 98/99MK parts maintenance kit per project.
Scheduled Exit Device: Von Duprin 99 series
Finish of Exit Devices is to be US26D

Power Supplies: Power supplies are to provide filtered, regulated power to operate electrical products including electrified exit devices. Output power is to be field-selectable for either 24VDC at 2.0 ampere or 12VDC at 4.0 ampere. Standard input is to be 120VAC at 1.0 ampere or 240VAC at 0.5 ampere. Steel enclosure shall incorporate key lock and have minimum quantity of five knockout holes for conduit connection. Terminal block to accept up to 14 gauge wire.

Scheduled Power Supplies: Von Duprin PS914-2RS

Electrical Power Transfer Devices: Fully concealed when door is closed, power transfer device is to have two 18 gauge or ten 24 gauge wires as indicated by model scheduled.

Scheduled Power Transfer Devices: Von Duprin EPT-10

EXIT DEVICES
Manufacturers:

Scheduled Manufacturer: Von Duprin 99 series,

Requirements:

Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit and/or Fire EXIT HDW. Cylinders: Refer to "KEYING" article, herein.
Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to the standard architectural finishes to match the balance of the door hardware.
Exit devices shall incorporate a fluid damper or other device that eliminates noise associated with exit device operation. Touchpad shall extend a minimum of one half of the door width, but not the full length of the exit device rail. End-cap will have two-point attachment to door. Touch-pad shall match exit device finish, and shall be stainless steel for US26, US26D, US28, US32, and US32D finishes; for all other finishes, the touch-pad finish shall be of compatible finish to exit device. Only compression springs will be used in devices, latches, and outside trims or controls.
Exit devices to incorporate a dead latching feature for security and/or for future addition of alarm kits and/or other electrical requirements.
Concealed vertical exit devices shall be a cable-actuated concealed vertical latch system available in two-point and less bottom latch (LBL) configurations. Vertical rods are not acceptable.

Cable shall include color-coded stainless steel with polytetrafluoroethylene (Teflon®) liner and stainless steel core wire. Latches and center slides are color coded to aid in installation. Conduit and core wire ends snap into latch and center slides without the use of tools. Latchbolts and blocking cams shall be manufactured from sintered metal low carbon copper- infiltrated steel, with a molybdenum disulfide coating for low friction and consistent performance.
Top latchbolt shall have a minimum 0.382 inch and greater than 90 degree engagement with strike to prevent door and frame separation under high static load. Bottom latchbolt, when used, shall have a minimum of 0.44 inch engagement with strike.

Product cycle life shall exceed 1,000,000 cycles.
Latch release does not require separate trigger mechanism.
Top and bottom latch must operate independently of each other. Top latch will fully engage top strike even when bottom latch is compromised.
Cable and latching system shall have the ability to:

Be assembled as a complete assembly and function prior to being installed in the door.
Install into the door as a one-piece single assembly
Be installed independently of device installation and function on door even prior to device and trim installation.
Connect to the exit device at a single attachment point.
Adjust bottom latch height from a single point, after the system is installed and connected to exit device, while the door is hanging
Alter latch position up and down within two-inches without additional adjustment.
Ability to remove the system while door is hanging.
Configure latchbolt mounting: double or single tab mount for steel doors, and wood doors, face mount for aluminum doors, eliminating requirement of tabs.
Provide adjustable exit device to latch center line adjustment. Ensures double tab mounting option for top latch, regardless of exit device centerline.

Provide exit devices with manufacturer's approved strikes.
Provide exit devices cut to door width and height. Locate exit devices at a height recommended by the exit device manufacturer, allowable by governing building codes, and approved by the Architect.
Mechanism case shall sit flush on the face of all flush doors, or spacers shall be furnished to fill gaps behind devices. Where glass trim or molding projects off the face of the door, provide glass bead kits.
Non-fire-rated exit devices shall have cylinder dogging (LD).
Non-fire-rated exit devices WITH Card Access shall have no dogging capabilities (LD).
Removable mullions shall be a 2 inches x 3 inches steel tube. Where scheduled, mullion shall be of a type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to a 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.

Lever style will match the lever style of the locksets (06).
Lever trim on doors serving rooms considered by the authority having jurisdiction to be hazardous shall have a tactile warning.

Exit devices for fire rated openings shall be UL labeled fire EXIT HDW.
Field drill weep holes per manufacturer's recommendation for exit devices used in full exterior application, highly corrosive areas, and where noted in the hardware sets.
Provide electrical options as scheduled.

CLOSERS

General: One manufacturer for closer units throughout the Work, including surface closers, high security closers, overhead concealed closers, floor closers, low-energy door operators and electromagnetic hold-open closers.

Surface Closers:

Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.
ISO 2000 certified. Units stamped with date-of-manufacture code.
Independent lab-tested 8,000,000 cycles.
Thru-bolts at wood doors unless doors are provided with closer blocking. Non-sized, non-handed, and adjustable.
Place closer inside building, stairs and rooms.

Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.
Opening pressure: Exterior doors 8.5 lb., interior doors 5 lb., labeled fire doors 15 lb.
Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.
Extra-duty arms (EDA) at all doors scheduled with parallel arm units.
Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.
Exterior doors do not require seasonal adjustments in temperatures from 120 degrees F to –30 degrees F, furnish data on request.
Non-flaming fluid will not fuel door or floor covering fires.
Scheduled Closer: LCN 4040XP
Finish of Door Closers is to be 689

Low-Energy Door Operators:

Where "Low Energy Power Operated Door" as defined by ANSI Standard A156.19 is indicated for doors required to be accessible to the disabled, provide electromechanical powered operators complying with the ADA requirements.
Shall have Power Boost for additional latching force to ensure secure latching.
Modular design, adjustments easily accessible from the front, UL listed for use on labeled doors.
Shall have safety slow/stop function. Once door starts to open, any person or object entering the swing area will cause the door to go into a safety slow speed.
Shall have built in 24V power supply for actuators, card readers, electric strikes and magnetic door locks, inputs for both swing and stop side sensors and available to accept either 120VAC or 220VAC input power. All wiring connections between operator modules made by easy-to-handle electrical connectors. Shall comply with both UL and NEC requirements for Class 1 and Class 2 wiring by providing separate conduits for each.
Shall have seven independent electronic adjustments to tailor the operator for specific site conditions. Opening speed, holding force at 90 degrees, sequential trigger and time delay, hold-open time at 90 degrees, opening force, clutch "breakaway" force setting, electric strike trigger and dime delay.
Shall have Push-N-Go feature allowing the door to open mechanically after the door is opened 5 degrees manually.
Furnish actuators and other controls Wikk Industries or BEA , Inc.as specified in Hardware Sets.
Scheduled Operators: Stanley Magic Force or Stanley Magic Access.

FLUSH BOLTS AND DUSTPROOF STRIKES, COORDINATORS

Automatic Flush Bolts shall be UL listed for use in pairs or as single top bolt with auxiliary latch for labeled pairs of wood or hollow metal doors. Top bolts are to have no internal spring, thus reducing reduced activation force.

Scheduled automatic flush bolts: Ives FB31P
Finish of automatic flush bolts is to be 630

Constant Latching Flush Bolts shall be UL listed for use in pairs or as single top bolt with auxiliary latch for labeled pairs of wood or hollow metal doors. Low actuation forces. Inactive door will re-latch automatically.

Scheduled constant latching flush bolts: Ives FB51P / FB52P
Finish of constant latching flush bolts is to be 626

Manual Flush Bolts shall be provided in pairs, be non-handed, fit standard ANSI metal door prep and be UL listed for use on doors with fire ratings up to 3 hours. Bolts shall have minimum 5/8" bolt throw with 7/8" vertical adjustment. Top bolt rod shall be provided in length to position activating lever not more than 80 inches above the finished floor.

Scheduled manual flush bolts: Ives FB458
Finish of manual flush bolts is to be 626.

Dustproof Strikes are to be spring loaded plunger type, with locking ring for use with threshold, or mounting flange for installation where no threshold is present.

Scheduled dustproof strikes: Ives DP1/DP2
Finish of dustproof strike is to be 630

Coordinators shall prevent the active door from closing before inactive door. Stop mounted channel 1-5/8" x 5/8" steel tubing x length to suit door opening. Coordinator shall be UL listed. Furnish filler bars to fill gap between end of coordinator and inactive door frame. Furnish mounting brackets for all stop mounted hardware such as exit device strikes, door closer PA shoes, etc. Coordinators shall be prepared (cutout) at the factory for surface applied or concealed vertical rod panic devices if required.

Scheduled coordinator: Ives COR

OVERHEAD STOPS AND HOLDERS

Surface mounted and concealed overhead stops and holders shall be heavy duty 300 series stainless steel, brass/bronze and steel materials, as required for specified finish, with finished metal end caps. Holders shall incorporate selective, adjustable hold-open mechanism. Templating of both surface and concealed overhead stops and holders allows for 85 to 115 degree stop/hold open position.

Scheduled surface mounted overhead stops and holders are Glynn-Johnson 90 Series; scheduled concealed overhead stops and holders are Glynn-Johnson 100 series.
Finish is to be 630

CYLINDERS

Manufacturer and Product:

Scheduled Manufacturer and Product: Schlage Primus XP LKB, No Substitute
Requirements: Provide cylinders/cores complying with the following requirements.

Cylinders/cores compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer's series as indicated.

Full-sized cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
Nickel silver bottom pins.

Forward cylinders/cores to Owner, separately from keys, by means as directed by Owner.

Project Cylinder/Core Distribution: Provide cylinders/cores complying with the following requirements in Project locations as indicated.

Exterior Doors: Primus cylinders with interchangeable cores requiring use of restricted, patented keys incorporating dual-locking mechanism with 5 interlocking pins to check for patented key features.
Doors Designated as High Security: Primus cylinders with permanent cores requiring use of restricted, patented keys incorporating dual-locking mechanism with 5 interlocking pins to check for patented key features; compliant with UL437 for drill and pick resistance; and integrated into exterior keying system without change to bitting combinations.
Interior Doors: Conventional cylinders with permanent cores requiring use of restricted, patented keys incorporating dual-locking mechanism with 1 nickel silver blocking pin to check for patented key features; and integrated into exterior system without change to bitting combinations.
Owner or Owner's Representative will replace temporary construction cores with permanent cores.

OTHER HARDWARE

Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

Scheduled kick plates are: Ives 8400
Finish of kick plates is to be 630

Door Stops: Provide stops to protect walls, casework or other hardware.

Unless otherwise noted in Hardware Sets, provide wall type with appropriate fasteners. Where wall type cannot be used, provide overhead type.
Scheduled door stops are: Ives WS401CVX/CCV
Finish of door stops is to be 626

Seals: Specially formulated to withstand greater temperature extremes while providing maximum protection against air infiltration. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability. Proposed substitutions: submit for approval.

Meets UL10B and ASTM E283 classification.
Sound control openings: Use components tested as a system using nationally accepted standards by independent laboratories. Ensure that the door leafs have the necessary sealed-in-place STC ratings.
Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C / UBC Standard 7-2. Where required, intumescent seals vary in requirement by door type and door manufacturer – careful coordination required.
Finish of seals is to be Charcoal/Black

Automatic door bottoms: low operating force units. Doors with automatic door bottoms plus head and jamb seals cannot require more than two pounds operating force to open when closer is disconnected.

Scheduled door bottoms: Zero International
Finish of door bottoms is to be Clear/Aluminum.

Sweeps: Specially formulated to withstand greater temperature extremes while providing maximum protection against air infiltration. Neoprene or nylon brush type as scheduled.

Scheduled sweeps: National Guard Products 199N, 600
Finish of sweeps is to be Clear/Aluminum.

Thresholds: As scheduled and per details. Substitute products: certify that the products equal or exceed specified material's thickness.

Exteriors: Set in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 "Thermal and Moisture Protection". Non-ferrous ¼ inch fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL).
Fire-rated openings, 90min or less duration: use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253. Use threshold unit as scheduled. If none scheduled, request direction from Architect.
Sound control openings: Set in bed of mastic sealant.
Finish of thresholds is to be mill finish aluminum.

Panic Pulls: When specified for use with exit devices pulls shall be 1 1/4" round bar offset type with 48" offset pulls.

Scheduled pulls: Ives 9264F 72"
Finish of pulls is to be 630.

Pulls: Provide 1" diameter round bar stock with 8" center-to-center pulls. Provide 2-1/2" clearance.

Scheduled pulls: Ives 8103EZ-10"
Finish of pulls is to be 630.

Push Plates: Push plates shall be minimum .050" thickness brass, bronze or stainless steel as appropriate for specified finish. Plates are to be in size scheduled in Hardware Sets. Beveled four sides, and provided with fasteners appropriate for attaching to doors. Where "CFC" or "CFTP" is indicated in Hardware Sets, factory drill holes in face of push plates to accommodate deadbolt cylinder or turnpiece.

Scheduled push plates: Ives 8200 4" X 16"
Finish of push plates is to be 630.

Pull Plates: Where pull plates are listed in the Hardware Sets, provide half round pull, 8" center-to-center, with 2-1/2" projection, factory attached to push plate in size indicated.

Scheduled pull plates: Ives 8303-0
Finish of pull plates is to be 630.

Push/Pull Bars: Where push/pull bars are listed in the Hardware Sets, provide 1" diameter round bar stock with 10" center-to-center offset pulls.

Scheduled push/pull bars: Ives 9190-0
Finish of push/pull bars is to be 630.

Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.

Silencers: Interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered pre-punched silencer holes.

Key Cabinet: As part of this contract, the finish hardware supplier shall provide one TelKee surface mounted key cabinet, Aristocrat "AWC" model. Cabinet shall be fully set-up and indexed with all keys attached to hook clips, indexed and recorded. Capacity of key cabinet shall be same as number of locks and cylinders on project, plus an additional 50% for future expansion. Components of key cabinet shall include, in quantities to accommodate "job plus 50%" requirements listed above, the following:

Numbered Label Sheets
Key Gathering Envelopes
Key Tags
Permanent Key Tags for File Keys
Duplicate Key Tags
System Index Sheets:

Alphabetical Index
Hook Number Index
Key Numerical Index
Master Index
Cross Index

Signature Cards
Permanent Loan Register

Completely set up and indexed key cabinet shall be delivered with a signed receipt to Owner.

FINISH:
Generally BHMA 626 Satin Chromium.

Areas using BHMA 626 to have push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise noted.

Door closers: factory powder coated to match other hardware, unless otherwise noted.

Aluminum items: match predominant adjacent material. Seals to coordinate with frame color.

KEYING REQUIREMENTS:

Key System: Schlage Primus patented keyway, non-interchangeable core typically with interchangeable core type operating cylinders for PANIC HDW and removable mullions. **OR** interchangeable core throughout. All ***Permanent Cores and Keying*** shall be by University of Wisconsin Madison Lock Shop.

Construction keying: Furnish temporary keyed-alike cylinders/cores. Owner to replace Construction Cores with Permanent Cores at substantial completion.
Temporary cylinders/cores remain Supplier's property.
Furnish 2 construction Master keys.
Furnish 2 construction Control keys.

Key Cylinders: Utility patented, 6-pin solid brass construction.

Cylinders/cores: ***Lock Cylinders and Permanent Cores*** are keyed by University of Wisconsin Lock Shop where permanent records are maintained. Locks and cylinders same manufacturer.

Key System: Schlage Everest patented keyway, non-interchangeable core typically with interchangeable core type operating cylinders for PANIC HDW. All ***Permanent Cores and Keying*** shall be by University of Wisconsin Madison Lock Shop.

Construction keying: Furnish temporary keyed-alike cylinders/cores. Owner to replace Construction Cores with Permanent Cores at substantial completion.
Temporary cylinders/cores remain Supplier's property.
Furnish 2 construction Master keys.
Furnish 2 construction Control keys.

Key Cylinders: Utility patented, 6-pin solid brass construction.

Cylinders/cores: ***Lock Cylinders and Permanent Cores*** are keyed by University of Wisconsin Lock Shop where permanent records are maintained. Locks and cylinders same manufacturer.

Key System: Schlage Classic keyway, non-interchangeable core typically with interchangeable core type operating cylinders for PANIC HDW and removable mullions. All ***Permanent Cores and Keying*** shall be by University of Wisconsin Madison Lock Shop.

Construction keying: Furnish temporary keyed-alike cylinders/cores. Owner to replace Construction Cores with Permanent Cores at substantial completion.
Temporary cylinders/cores remain Supplier's property.
Furnish 2 construction Master keys.
Furnish 2 construction Control keys.

Key Cylinders: Utility patented, 6-pin solid brass construction.

Cylinders/cores: ***Lock Cylinders and Permanent Cores*** are keyed by University of Wisconsin Lock Shop where permanent records are maintained. Locks and cylinders same manufacturer.

PART 3 - EXECUTION

ACCEPTABLE INSTALLERS:
Installer must demonstrate suitable competence and experience with installing finish hardware on like projects.

PREPARATION:
Ensure that walls and frames are square and plumb before hardware installation.

Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.

Notify Architect of any code conflicts before ordering material.

Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

Existing frames and doors scheduled to receive new hardware: carefully remove existing hardware, tag and bag, and turn over to Owner. Match new locksets strike plates to existing frame preps.

Patch and fill wood frames and doors with solid wood stock or dowel material before cutting for new hardware. Do not reuse existing screw holes - - fill and re-pilot.
Metal doors/frames: Weld or fasten with screws filler pieces in existing hardware cut-outs and mortises not scheduled for re-use by new hardware. Leave surfaces smooth by using non-metallic filler material.
Patch all holes, sand smooth and paint existing doors and frames scheduled to receive new hardware.

INSTALLATION
Install hardware per manufacturer's instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.

Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.

Drill pilot holes for fasteners in wood doors and/or frames.

Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for re-use.

ADJUSTING
Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.

Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner's satisfaction at no additional cost to Owner.

Inspection: Prior to owner's occupancy, the general contractor shall schedule and conduct a post-installation meeting with the hardware supplier and the manufacturer representative who supplied the commercial locks, the exit devices, the door controls/closers, etc.. The purpose is to eliminate any or all institutional door hardware "punch list" items. This will enable the general contractor and the owner to gain approval for their building occupancy permit much quicker.

Follow-up inspection: Installer to provide letter of agreement to Owner that approximately 6 months after substantial completion, installer will visit Project with representatives of the manufacturers of the locking devices and door closers to accomplish following:

Re-adjust hardware.
Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.
Identify items that have deteriorated or failed.
Submit written report identifying problems and likely future problems.

DEMONSTRATION:
Demonstrate electrical hardware systems, including adjustment and maintenance procedures.

PROTECTION/CLEANING:
Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

SCHEDULE OF FINISH HARDWARE
See door schedule in drawings for hardware set assignments.

Manufacturers and their abbreviations used in this schedule:

ADA	Adams Rite
GLY	Glynn-Johnson Hardware
IVE	H. B. Ives
LCN	LCN Closers
SCE	Schlage Electronic Security
SCH	Schlage Lock Company
STA	Stanley Technologies
TEL	TelKey
VON	Von Duprin
ZER	Zero International

The following is a general listing of finish hardware requirements and is not intended as a final detailed schedule. It is the responsibility of the finish hardware supplier to thoroughly review these plans and specifications, and to include in his bid any items of finish hardware, whether or not specifically called for in the following hardware groups, required by established standards or practices, or as necessary to meet state and local building codes. These items include, but are not specifically limited to, special templates, wiring diagrams, shim kits for exit devices, filler bars and door closer arm mounting brackets for bar type coordinators, drop plates or other door closer accessory items, special fasteners required for attachment of hardware to doors, frames, or other substrates, and filler plates for use as required by the permanent removal of hardware items from existing doors and/or frames. Where there is unclear or conflicting information in the Hardware Sets, the hardware supplier shall make every effort to gain clarity from the architect prior to bid date. If clarification is not made prior to bid date, the hardware supplier is to make note of any ambiguities or conflicts in the documents in his bid, and these issues will be resolved post-bid. There will be no "Extras" or Change Orders to cover errors and/or omissions which should have been evident prior to bidding.

Hardware Group No. 99

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	SL24HD	628	SEL
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CLASSROOM LOCK	L9070L 03N	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH MC	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	GASKET	137NA	CL	NGP
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 100

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	PT105/PT180	US32D	ABH
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-L-M996-03-FS-CON 24 VDC	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	AUTO OPERATOR	MAGIC FORCE	AL	STA
2	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	5050B	BRN	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

CARD ACCESS SYSTEM, READER, POWER SUPPLY, WIRING AND CONNECTIONS BY SECURITY PROVIDER.

Hardware Group No. 101

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	SPRING HINGE	3SP1 4.5 X 4.5	652	IVE
1	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
4	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
2	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	OFFICE W/SIM RETRACT	L9056L 03N L583-363 L283-721	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	COORDINATOR	COR7G	626	IVE
1	EA	SURFACE CLOSER	4040XP EDA MC	689	LCN
2	EA	WALL STOP	WS401CVX	626	IVE
1	SET	GASKET	137NA	CL	NGP
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 102

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	MANUAL FLUSH BOLT	FB458 24"	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080L 03N	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
2	EA	WALL STOP	WS401CVX	626	IVE
1	SET	GASKET	137NA	CL	NGP
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 103

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1 4 X 4 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CYLINDER DEAD LOCK	L464L	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
2	EA	FLUSH PULL	950	626	IVE
2	EA	OH STOP & HOLDER	90F	630	GLY
1	SET	GASKET	137NA	CL	NGP
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 104

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080L 03N	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	SURFACE CLOSER	4040XP REG MC	689	LCN
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 105

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080L 03N	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	OH STOP & HOLDER	90F	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 106

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE W/SIM RETRACT	L9056L 03N L583-363 L283-721	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY

Hardware Group No. 107

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE W/SIM RETRACT	L9056L 03N L583-363 L283-721	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	WALL STOP	WS401CVX	626	IVE

Hardware Group No. 108

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070L 03N	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY

Hardware Group No. 109

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	CLASSROOM LOCK	L9070L 03N	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 110

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	OFFICE W/SIM RETRACT	L9056L 03N L583-363 L283-721	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 111

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03N	626	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 112

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	INSTITUTION LOCK	L9082L 03N	626	SCH
2	EA	MORTISE CYLINDER	30-007	626	SCH
2	EA	CONSTRUCTION CORE	23-030-ICX		SCH
2	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	OH STOP	90SE	630	GLY
1	EA	FIRE/LIFE CLOSER	4040SE MC WMS	MTLPC	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	SET	SEALS	5050B	BRN	NGP

Hardware Group No. 113

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03N	626	SCH
1	EA	WALL STOP	WS401CVX	626	IVE

Hardware Group No. 114

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03N	626	SCH
1	EA	WALL STOP	WS401CVX	626	IVE
1	SET	SEALS	5050B	BRN	NGP
1	EA	DOOR BOTTOM	420NA	CL	NGP

Hardware Group No. 115

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03N	626	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	SET	SEALS	5050B	BRN	NGP
1	EA	DOOR BOTTOM	420NA	CL	NGP

Hardware Group No. 116

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CLASSROOM DEAD LOCK	L463L	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	PUSH PLATE	8200 4" X 16" CFC	630	IVE
1	EA	PULL PLATE	8303 10" 3.5" X 15" CFT	630	IVE
1	EA	SURFACE CLOSER	4040XP REG MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE

Hardware Group No. 117

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080L 03N	626	SCH
1	EA	MORTISE CYLINDER	30-007	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401CVX	626	IVE

Hardware Group No. 118

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7245F SET	630	IVE
1	EA	INTERMEDIATE PIVOT	7245F INT	630	IVE
1	EA	CYLINDER DEAD LOCK	L464L	626	SCH
1	EA	MORTISE CYLINDER	30-007 - PROVIDE CORRECT FSIC HOUSING FOR DOOR THICKNESS	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH

Hardware Group No. 119

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7245F SET	630	IVE
1	EA	INTERMEDIATE PIVOT	7245F INT	630	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	MANUAL FLUSH BOLT	FB458 36"	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE

Hardware Group No. 120

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONTINUOUS HINGE	224XY	628	IVE
1	EA	CYLINDER DEAD LOCK	L464L	626	SCH
1	EA	MORTISE CYLINDER	30-007 - PROVIDE CORRECT FSIC HOUSING FOR DOOR THICKNESS	626	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX		SCH
1	EA	PERMANENT CORE	20-740-XP-LKB	626	SCH

END OF SECTION

SECTION 27 08 00.41
AV SYSTEMS COMMISSIONING
BASED ON DFDM MASTER SPECIFICATION DATED 06/01/21

PART 1 - GENERAL

SCOPE
The work associated with this section WILL NOT be bid as part of the Division 27 scope of work.

Work in this section includes Audio Visual components and other equipment and accessories necessary to constitute a completely coordinated system. This system, interfaced with Division 26 conduit and raceway will meet, in every respect, all operational and quality standards specified herein.

RELATED WORK
Section 01 91 01 – Commissioning Process
Section 26 05 04 – Cleaning, Inspection, and Testing of Electrical Equipment
Section 27 41 00 – Audiovisual Systems

REFERENCE
Applicable provisions of Division 1 govern work under this section.

AV-Specific
AVIXA 10:2013 Audiovisual Systems Performance Verification Guide

SUBMITTALS
Reference the General Conditions of the Contract for submittal requirements.

Reference Section 01 91 01 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

Unless noted otherwise, the equipment identified in PART 2 of the referenced section remains the property of the contractor at the completion of the commissioning process.

Additional submittals (e.g., Test Plan, Test Results, Schematics, etc.) required during and in follow-up to construction are detailed in Part 3.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

TESTING AND ACCEPTANCE
General
Perform Technical (performance) and Operational (system function) testing of the installed system.

Coordinate test schedule and test plan with the DFD, Agency and AE.

Provide a minimum of two (2) weeks advance notice to allow for participation by those wishing to do so. Failure to provide this notice shall be grounds for the DFD to reject any and all documentation of test results or demonstration and to require a repeat of those test(s) and/or demonstration.

Provide Test Plan as part of the notice or sooner.

Prior to scheduling formal test and demonstration of the installed system:

- Coordinate cleanup and readiness of Telecom and/or AV Equipment Rooms per specification Section 26 05 04 and of all areas where testing/demonstration is to take place. Coordinate with other contractors and agency to limit activity and noise in those areas during testing/demonstration.
- Perform preliminary Technical and Operational testing. Where results indicate a failure, correct conditions prior to formal test and demonstration.
- Complete the applicable Construction Verification Checklists and submit to the AE for review.

Supply all equipment and personnel necessary to conduct functional and performance testing.

All equipment used in testing shall be maintained and calibrated per manufacturer's guidelines.

Perform tests related to connected equipment by others only with the permission and presence of the agency and/or responsible contractor.

Test Plan

Provide plan customized per project scope. Include Technical and Operational test requirements for each room type including:

- Audio System Performance (AP)
- Video System Performance (VP)
- Control System Performance (CON)
- Electrical Power Sequencing
- Network (wired and wireless)

All functional tests shall be reported as pass/fail. Identify pass/fail limit for each test.

Identify test equipment (make/model) to be used.

Identify set-up of each test including a sketch of the planned set-up (hand-drawn sketches are acceptable).

Provide examples of test forms/reports to be used.

Technical Testing

Tests shall include, but not be limited to, the following:

- Systems to be inspected and tested:
  - Sound systems, including:
    - System inputs and outputs
    - Wired and wireless microphone systems
    - Audio program sources
    - Preamplifiers, mixers, analog signal processors, and digital signal processors
    - Audio signal distribution network
    - Distribution amplifiers and power amplifiers
    - Loudspeakers
    - Assistive listening systems
    - Recording equipment
  - Video presentation systems, including:
    - Video program sources
    - Video switchers and routers
    - Video signal processing equipment
    - Video distribution equipment
    - Video displays and projection systems
  - Digital signage systems
    - Content management software
    - Audiovisual signal acquisition interfaces
    - Digital signage servers
    - Digital signage distribution
    - Video displays and projection systems
  - Audiovisual control systems
    - Control system network
    - Control system processors
    - Control system interface panels
    - Control system interfaces

<u>Audio System</u>

- Systems shall provide clear, natural sound uniformly distributed throughout the listening areas. The entire electro-acoustic system shall be carefully balanced and equalized to provide a high order of intelligibility and gain without feedback or reverberant coloration. Adequate power capability shall be provided to insure the necessary dynamic range and prevent distortion at peak levels.
- Electronic Frequency Response: Within ±0.5dB from 20Hz to 20kHz
- Acoustic Frequency Response: 50 Hz to 15 kHz, 3dB/octave roll-off above 2000 Hz, ±2dB, measured at continuous one-third octave bands at seated ear height.
- Sound System Coverage: as measured in accordance with AVIXA Audio Coverage Uniformity in Listener Areas - A102.01:2017.
- Intelligibility: Greater than 0.50 STI at any seat in the audience area.
- Noise: System noise shall not exceed an equivalent input noise of -120dBu based on a 20 kHz noise bandwidth. Predominant noise component in the system output under any operating condition will be that of the input stages. Adjustment of any system controls shall produce no audible clicks, pops, thumps, or other spurious noises.
- Acoustic Signal-to-Noise Ratio (including crosstalk and hum at all input/output levels): 60dB
- Dynamic Range: The system shall deliver a minimum sound pressure level of 75dB with a 10 dB peaking factor to any location at seated ear height at less than 5% total acoustic harmonic distortion. When system is driven to maximum output, clipping shall first occur in the power amplifiers.
- Total Harmonic Distortion: 0.05% maximum from 20Hz to 20kHz
- Polarity: A positive pressure at any system microphone shall produce a positive pressure from the loudspeakers.

<u>Video System</u>

- Systems shall provide, clear, bright, and natural images viewable throughout the respective designed viewing area. Each video display system shall be balanced for color and brightness and free from extraneous interference or artifacts.
    - Frequency Response:
        - Composite: Flat from 30Hz to 6MHz, +/-2% (ref.=1MHz)
        - YC: Flat from 30Hz to 10MHz, +/-2% (ref.=1MHz)
        - Component: Flat from 30Hz to 100MHz, +/-2% (ref.=1MHz)
        - RGBHV: Flat from 30Hz to 300MHz, +/-2% (ref.=1MHz)
    - Signal-to-Noise Ratio (including crosstalk and hum at all input/output levels): 60dB, p-p signal to RMS noise
    - Differential Gain: <2%
    - Differential Phase: <2 degrees at 3.58MHz
    - Tilt: <2%
    - System Gain: Unity, +/-1%
    - System Levels: <2% between sources
    - Timing: <20nS, Y/C, Y/Cr/Cb, RGB
    - Luminance: In conformance with NTSC RS-170A standards
    - Chroma level: In conformance with NTSC RS-170A standards
    - Observable noise or hum: None

Control System

- Verify all systems connections are operational and devices pass signal as specified.
- Audio and video network devices: Verify all IP-connected signal processing equipment is properly configured with IP addresses, gatekeeper addresses, network configurations, and subnets as applicable.
- Control system network devices: Verify all IP-connected signal processing equipment is properly configured with IP addresses, gatekeeper addresses, network configurations, and subnets as applicable.
- External devices:
    - Applies to drapes, shades, screens, lights, security, life safety, and HVAC systems or devices.
    - Confirm all external devices and systems operate as specified prior to connection to AV control system.
    - Confirm control system interfaces exist and are functional.
    - Confirm control system functions not obvious from control flow diagrams.
- Control system communications: Confirm all control system programming installed and properly communicating with intended equipment or systems.
- Control system user interface:
    - Confirm user interface conforms to user or specified requirements.
    - Confirm all pages and buttons operate as intended.
- Control system power cycling and recovery: Confirm control system will restart and resume full operation following cycling of AC power to the control system.
- Document results of all system testing.

Electrical Power

Network (wired and wireless)

Operational Testing

Demonstrate system operation per specification Section 27 41 00 – AUDIOVISUAL SYSTEMS, Article TYPICAL ROOM/SYSTEM DESCRIPTIONS. The major equipment and functional requirements identified for each room type are the basis for these tests and for expected operation of each room type.

DOCUMENTATION

Test and Measurement Report

Provide per testing plan, documentation of test results for each system and room.

Provide documentation of test equipment make and model used and calibration date of each.

Construction Verification Checklists

Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as "N/A". Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress meetings.

CV-27 41 00 –Audio/Video Systems

Location: _____

A) SYSTEM TEST & DOCUMENTATION

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
❑ CHECKLIST GROUP COMPLETE				INITIALS:		_____			DATE:		_____		

Question Details

1) Test Plan submitted.
2) Technical Testing Complete.
3) Operational Testing Complete.
4) Test and Measurement Report submitted.
5) As-built Drawings submitted.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

CV-27 41 00.01 – Identification for Audio/Video Systems

Equipment Identification/Tag: _______
Location: _________________________

A) LABELING

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
❑ CHECKLIST GROUP COMPLETE				INITIALS:	_____________				DATE:	_____________			

Question Details

1) AV Equipment outlet faceplates labeled as specified.
2) Cabling at AV Equipment outlet labeled as specified and verification at source destination.
3) AV DTP Modular Patch Panels for Project Design Included as specified.
4) Termination of AV DTP equipment jacks per manufacturer connection specifications.
5) Termination of AV Equipment IP Network Connections.
6) Fiber Optic Patch Panels for AV signals in a point-to-point fiber optic cabling distribution system for transmit and receive equipment use.
7) AV DTP Copper Cabling at Modular Patch Panels at Main AV Equipment Room(s) labeled in accordance with specification requirements.
8) AV Fiber Optic Cabling at Patch Panels at Main AV Equipment Room(s) labeled in accordance with specification requirements.
9) AV riser fiber optic cabling (if applicable) labeled as specified.
10) AV Backboxes, AV Equipment Racks and Cabinets, and AV Enclosures labeled as specified.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

CV-27 41 00.02 – Audio/Video Structured Cabling

Equipment Identification/Tag: _______
Location: _________________________

A) HORIZONTAL CABLING IN CONDUIT - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
❑ CHECKLIST GROUP COMPLETE				INITIALS:	______________			DATE:			______________		

Question Details

1) Exposed cabling has been visually inspected for physical damage and any damaged cabling has been replaced. AV Cabling jacket and insulation are in good condition.
2) Cable color(s) matches specification requirements for given cable type.
3) AV Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
4) Conduits swabbed to remove foreign material prior to pulling cables.
5) AV Cables pulled though conduit at the same time, with pulling lubricant used as required to ease pulling tensions.
6) AV Cabling is splice free.
7) Bend radii conforms to manufacturer recommendations for each cable type.
8) Appropriate slack provided in length required by specifications for given AV cabling type and termination point.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

B) AV UNENCLOSED HORIZONTAL CABLING - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below) 1)	2)	3)	4)	5)	6)	7)	8)		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO		
❑ CHECKLIST GROUP COMPLETE				INITIALS:	_______________				DATE:	_______________			

Question Details

1) Exposed cabling has been visually inspected for physical damage and any damaged cabling has been replaced. AV Cabling jacket and insulation are in good condition.
2) AV Cable color(s) matches specification requirements for given cable type.
3) AV Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
4) AV Cabling supported via “J-hook” or “bridle-type” supports at spacing defined within specifications. (Bridle-type supports configured with bend-radius control.) Supports are independent of piping, ductwork, equipment, cable tray or other conduit.
5) Minimum separations provided for AV cabling per specifications to minimize EMI.
6) AV cabling is splice free.
7) Bend radii conform to manufacturer recommendations for each AV cable type.
8) Appropriate slack provided in length required by specifications for given AV cabling type and termination point.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

C) AV EQUIPMENT OUTLET - INSTALLATION CHECKS

				Questions (See details below)									
Date	**Description of Work Performed**	**% Complete**	**Initials**	**1)**	**2)**	**3)**	**4)**	**5)**	**6)**	**7)**	**8)**	**9)**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
				YES **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	**YES** **NO**	
❑ **CHECKLIST GROUP COMPLETE**				**INITIALS:**	______________				**DATE:**	______________			

Question Details

1) AV Equipment Outlet faceplate material and color are as specified.
2) AV Outlets installed at locations and heights specified in contract documents for given outlet type. AV Outlets mounted at same height for given outlet type throughout facility.
3) AV Outlets are level.
4) AV Outlets are flush to finished surface.
5) AV Connector types and colors are as specified.
6) AV Connector positions and faceplate layout are as specified. Faceplate layout for a given configuration is same throughout installation.
7) Unused AV connector positions fitted with a bank insert color-matched to the faceplate color.
8) AV Connectors fitted with Dust Covers as specified and as applicable.
9) AV Outlets secured using tamper-resistant fasteners (if applicable).

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

D) HORIZONTAL CABLING AT AUDIO/VIDEO EQUIPMENT ROOM - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
				YES NO	YES NO	YES NO	YES NO	YES NO					
❑ CHECKLIST GROUP COMPLETE				INITIALS:					DATE:				

Question Details

1) Modular Patch Panels and Termination Blocks provided as specified.
2) AV Cable is supported at rear of Patch Panels and at entry to Termination Blocks.
3) Copper Twisted Pair terminated as specified. AV Cable jacket is removed only to the extent required for termination and within manufacturers recommended limits. AV Cable pairs untwisted only to the extent required for termination and within manufacturers recommended limits.
4) AV Cabling secured using hook-and-loop ties within the room.
5) Horizontal Jumper Management in place on AV Equipment Racks as specified.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

E) AV BACKBONE CABLING - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
❑ CHECKLIST GROUP COMPLETE				INITIALS:	______________				DATE:	______________			

Question Details

1) Fiber Optic Patch Panels and Termination Blocks provided as specified.
2) Unused Fiber Optic Patch Panel positions fitted with blanks or cover plates as applicable.
3) Cable color(s) matches specification requirements for given cable type.
4) Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
5) Cabling supported within equipment rooms and in vertical chases as specified. Supports are independent of piping, ductwork, equipment, cable tray or other conduit. Wire-mesh-type support grips or other approved means used where cable must bear stress.
6) Appropriate slack provided in length required by specifications for given cabling type and termination point.
7) Cabling is splice free.
8) Fiber Optic Duplex Coupling orientation (e.g., A-B, B-A) is as specified. Fibers positioned in sequence; positions are same at both ends of cable.
9) Metallic Cable armor and/or Shielding bonded to telecommunications ground.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

F) CABLING AND PATHWAYS (AUDIO/VIDEO) - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below) 1)	2)	3)	4)	5)	6)	7)			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO			
❑ CHECKLIST GROUP COMPLETE				INITIALS:	______________				DATE:	______________			

Question Details

1) AV Cable bend radii conform to manufacturer recommendations for given wire type and gauge.
2) Penetrations through floor and rated walls are sealed as specified using an Assembly rated for the wall or floor penetrated.
3) Penetrations through non-rated walls are sealed as specified for given space type.
4) Audio/Video Cabling pulled in separate conduits from normal power, emergency power, security, and control systems.
5) Conduit junction boxes are painted and tagged in accordance with specification requirements.
6) Pull cord provided in each conduit. Includes occupied and vacant conduit.
7) AV Cross-connects are complete and documented as specified.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

G) AV TESTING CHECKS

		%		Questions (See details below)									
Date	**Description of Work Performed**	**Complete**	**Initials**	**1)**	**2)**	**3)**	**4)**	**5)**	**6)**	**7)**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
				YES NO	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**	**YES NO**			
❑ CHECKLIST GROUP COMPLETE				**INITIALS:**		______________			**DATE:**		______________		

Question Details

1) Maximum Horizontal Copper Cable (Audio/Video CAT) length is less than 295' for all cables installed.
2) Copper Horizontal Twisted-pair Cabling Tested as specified.
3) Copper Backbone Twisted-pair Cabling Tested as specified.
4) Copper Horizontal Coax Cabling Tested as specified.
5) Copper Backbone Coax Cabling Tested as specified.
6) Fiber Optic Backbone Cabling Tested as specified.
7) Test Results are documented as specified and submitted for review.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

CV-27 41 00.03 – Audio/Video Equipment Room Fittings

Equipment Identification/Tag: _______
Location: _________________________

A) EQUIPMENT ROOM FITTINGS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO				
❑ CHECKLIST GROUP COMPLETE				INITIALS:	______________				DATE:	______________			

Question Details

1) Equipment Rack(s) and/or Cabinet(s) installed as specified, including clearances, anchoring to floor and side bracing.
2) Equipment Rack(s) configured with vertical management per specification.
3) Cable Runway installed per specification.
4) Drop-outs in place where cable exits cable runway to equipment rack to control cable bending to within bend-radius specifications.
5) Equipment Rack(s), cable runway and other hardware as specified bonded to Telecommunications Ground (TGB or TGMB) in accordance specification requirements. Rack or cabinet finish (paint) removed at point-of-contact with grounding hardware.
6) Power Strip / Surge Suppressor installed per specification.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

CV-27 41 00.04 – Audio/Video Patch Cords and Network Wire

Equipment Identification/Tag: _____
Location: _____

A) AUDIO/VIDEO PATCH CORDS AND NETWORK WIRE

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)						
				YES NO	YES NO	YES NO	YES NO						
				YES NO	YES NO	YES NO	YES NO						
				YES NO	YES NO	YES NO	YES NO						
				YES NO	YES NO	YES NO	YES NO						
				YES NO	YES NO	YES NO	YES NO						
				YES NO	YES NO	YES NO	YES NO						
				YES NO	YES NO	YES NO	YES NO						
				YES NO	YES NO	YES NO	YES NO						
❑ CHECKLIST GROUP COMPLETE				INITIALS:		_____			DATE:		_____		

Question Details

1) Fiber Optic Patch Cords delivered to Agency.
2) Copper Twisted Pair Patch Cords and Work Area Cord Cords delivered to Agency.
3) Coax Patch Cords and Work Area Cords delivered to Agency.
4) Cross-connect wire and Spool holders delivered to Agency.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

SECTION 27 41 00
AUDIO-VIDEO SYSTEMS
BASED ON DFD MASTER SPECIFICATION DATED 03/21/22

PART 1 - GENERAL

SCOPE

The work associated with this section WILL NOT be bid as part of the Division 27 scope of work.

Work in this section includes Audiovisual components and other equipment and accessories necessary to constitute a completely coordinated system. This system, interfaced with Division 26 conduit and raceway will meet, in every respect, all operational and quality standards specified herein.

RELATED WORK

Applicable provisions of Division 01 govern work under this Section.

Section 01 91 01 – Commissioning Process
Section 26 05 00 – Common Work Results for Electrical
Section 26 05 04 – Cleaning, Inspection and Testing of Electrical Equipment
Section 26 05 26 – Grounding and Bonding for Electrical Systems
Section 26 05 29 – Hangers and Supports for Electrical Systems
Section 26 05 33 – Raceway and Boxes for Electrical Systems
Section 27 05 33.41 – Raceway and Boxes for Audio-Video Systems
Section 26 05 53 – Identification for Electrical Systems
Section 27 05 53 – Identification for Communications Systems
Section 27 08 00 – Commissioning of Communications
Section 27 08 00.41 – AV System Commissioning
Section 27 10 00 – Structured Cabling
Section 27 11 00 – Communications Equipment Room Fittings
Section 27 41 00.1 – Audiovisual Systems Equipment Schedule
Section 27 41 00.2 – Audiovisual Systems Cable Schedule

Coordinate with Division 26 on raceway/junction box locations for audiovisual equipment and routing of audio, video, control, and power cables/raceway from equipment, terminal and pull boxes to system equipment racks.

DEFINITIONS

The following shall serve as general identifiers and govern the specified herein.

AV/IT – Abbreviation for “Audiovideo/Information Technology”.
AVIXA – “AVIXA” The Audiovisual Integrated Experience Association. The trade association representing the professional audiovisual and information communication industries worldwide. Previously known as InfoComm.
AV Systems – “Audiovisual Systems” include all equipment necessary to fulfil the intent of sharing, communicating, recording, audio/video sources to classrooms, conference rooms, large gathering rooms in person or virtually.
AV Systems Room – An enclosed area or room specifically designated for locating equipment racks for the AV system equipment that include routing, monitoring, termination, and/or cross connecting of audiovisual system cable (i.e., riser cable) to other audiovisual system cable and/or equipment and racks.
AV System Installer – The Electrical Contractor’s business unit or sub-contractor responsible for work covered by this section and related drawings.
AV Control System Programmer – The programmer that develops the control code and touch panel user interface to operate the AV system.
BYOD – “Bring Your Own Device”. This refers to users bringing their own device as a source for AV systems.

CEC – Abbreviation for "Consumer Electronics Control", an HDMI feature designed for the user to command and control CEC enabled devices – e.g., Displays, DVD, others – that are connected through HDMI connectors.
CIS - Abbreviation for "Common Intelligibility Scale" used to provide a scale for a room intelligibility response.
CTS – "Certified Technology Specialist" the AV basic level of tested certification offered by AVIXA.
CTS-D – "Certified Technology Specialist - Designer" the AV designer level of tested certification offered by AVIXA.
CTS-I – "Certified Technology Specialist - Installer" the AV installation level of tested certification offered by AVIXA.
DSP – "Digital Signal Processor", a microprocessor-based system to take input signals from sources such as microphones, audiovisual sources, and phone lines and process them with built-in audio tools. Route them to outputs for use in multiple destinations in the AV system architecture.
HDMI – Abbreviation for "High-Definition Multimedia Interface", a proprietary audio-video interface for transmitting uncompressed video data and compressed signals from an HDMI compliant source to an HDMI compliant display including projectors. HDMI implements the EIA/CEA-861 standards.
HVAC – "Heating Ventilation and Air Conditioning". Division 23 Contractor responsibility.
NIC – The terms "NIC" and "Not in Contract" are equivalent to "Provided by Others." The Contractor is responsible for providing cabling, plates, installation materials, and other infrastructure as indicated on drawings and herein to provide ready installation of NIC equipment.
OFCI – The term "OFCI" is defined as "Owner Furnished Contractor Installed" shall refer to equipment that will be furnished by the Owner or Agency for installation by the Contractor.
OFOI – The term "OFOI" is defined as "Owner furnished Owner installed" to indicate the AV, computer equipment that will be provided by owner or agency.
STI – Abbreviation for "Speech Transmission Index" to measure speech intelligibility in a room or theater.
Telecom/Data Installer – The Electrical Contractor's business unit or sub-contractor responsible for Division 27 work that does NOT include the AV systems as described in specification 27 41 00.

REFERENCES

All work and materials shall conform in every detail to the rules and requirements of the National Fire Protection Association, the Wisconsin Electrical Code and present manufacturing standards.

All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a particular item, then other national independent testing standards shall apply, and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.

Other applicable standards (plus applicable update bulletins and errata) are as follows:

General
- ANSI/IEEE C2 - National Electrical Safety Code
- SPS Chapter 316 – Wisconsin Dept. of Safety and Professional Services Electrical Code

AV-Specific
- AVIXA AV/IT Infrastructure Guidelines for Higher Education – No Document Number Published
- AVIXA Display Image Size for 2D content in Audio/Visual Systems - V202.01:2016
- AVIXA Audiovisual Systems Performance Verification – ANSI/INFOCOMM 10:2013
- AVIXA Audio Coverage Uniformity in Listener Areas - A102.01:2017
- AVIXA Cable Labeling for Audiovisual Systems – F502.01:2015
- AVIXA Rack Building for Audiovisual Systems - F502.01:2018

Structured Cabling and Infrastructure
- Refer to specification Section 27 10 00.

SCOPE OF WORK

General

Provide all materials, labor, drawings, in the design for a complete and fully operational AV system as described herein and on related drawings. See Article AV SYSTEM DESIGN and TYPICAL ROOM/SYSTEM DESCRIPTIONS.

Provide all connectors, hardware, transformers, power supplies, rack panels, interfaces, fasteners, wire harnessing materials, bushings, and any other incidentals required for complete and proper functioning of this system whether specifically listed or not.

Coordination

Coordinate with the AE, Agency, Architect, Electrical Divisions 26, 27, and 28 and other trades to comply with all requirements as defined by the Plans and Specifications.

Coordinate with Division 26 as applicable to include AV-specific power and grounding and bonding.

Coordinate with Division 27 Telecom/Data installer as applicable to include AV-specific Telecom/Data devices.

Coordinate with the Architect and Agency on final color selection and/or the painting of any exposed loudspeakers and any/all exposed system components to match the room's aesthetics and finishes.

Coordinate Conference Room table-mounted AV input assemblies as applicable. Include automatic cable recoiling. Identify proposed location with-in tabletop(s) to coordinate aesthetics for final table ordering (by agency) and hole cutting by table supplier.

Installation

Installation work shall not begin on the project without approved Shop Drawings.

Follow manufacturer's recommendations as specified for cabling and equipment system installation.

Provide cable management hardware as required including areas internal to rack cabinets, areas between pieces of equipment not housed in rack cabinets, and areas that extend cabling from rack cabinets and equipment to the greater facility cabling infrastructure.

Furnish and manage all lifts, ladders, scaffolding or other resources as needed for safe installation. Coordinate with other trades as needed.

Ensure that all equipment, except for portable equipment, are firmly fastened or attached in place. A safety factor of at least five shall be utilized for all brackets, fasteners, and attachments.

Provide safety retention cables for overhead equipment such as loudspeakers, projectors, etc.

Ensure that all equipment mounting styles and locations comply with the 2010 ADA Standards for Accessible Design.

Furnish AV-specific boxes as noted on the AV drawings for installation by Division 26.

Work by Others

- Conduit, power receptacles, junction boxes, cable raceways, electrical back-boxes, and floor boxes by Division 26. (See above re: AV-specific boxes.)
- Grounding Infrastructure – not including rack, cabinet, equipment, etc. by Division 26.
- Lighting fixtures, lighting dimming systems, and lighting controllers by Division 26.
- Blocking as required to support wall-mounted AV components by General Prime Contractor.
- Millwork – except where otherwise specified – by General Prime Contractor.
- Window shades, drapes, or controllers by General Prime Contractor.
- Video conferencing equipment by the Owner's Agency.

AV SYSTEM DESIGN

General

See Article TYPICAL ROOM/SYSTEM DESCRIPTIONS for project-specific requirements.

The design shall provide for a minimum 4K resolution as the design required for displays, and projectors.

Performance requirements for some systems may exceed this. See PART 2.

Digital audio systems as the design requires for mixing analog audio signals and digital audio signals. Coordinate any RF based audio systems with Agency for operating frequencies already in use on campus.

Provide a control system design that will operate as the design requires include feedback from the Agency on operational concerns.

Coordination with Agency's Video Conferencing Department
Coordinate installation, testing, adjustment, and training with the Agency's Video Conferencing department. The Agency will provide and install the following equipment:

- Video conferencing codec, camera, microphones, and control panel.

The AV Systems Installer will provide and install the following equipment:

- Displays and mounts
- Audio amplifiers and ceiling-mounted loudspeakers
- Signal extenders for audio, video, and control between the conference table and the AV equipment at the front of the room.

Coordination with Agency's IP Network
Coordinate network requirements with agency where agency LAN is to be used or linked to for AV connectivity. Consider for each AV device on the Agency's network (not limited to) the following:

- IP address (DHCP or Static)
- Subnet information
- VLAN setup, authorization including AV over IP specific equipment and Dante audio equipment.

Provide an AV equipment list which includes equipment MAC addresses at the time of requesting IP network information.

AV System Programming
Provide an operational AV System Control program designed and programmed with the submittals as specified including screen layouts of touch panels for Owner approval.

Provide Develop, install, and debug all custom control programming code as required and/or as specified. Provide to the Owner uncompiled programming control code as specified and audio DSP operating code.

Provide low voltage control system interfaces (serial, IP, relay dry contact) to facilitate operation of lighting and/or shades where specified.

Testing
Test and adjust AV systems and components for optimal performance.

Provide test data measurements that are included with test equipment used in testing system performance.

Provide initial date of test and measurement verification reports to the AE Consultant as specified.

Verify that all individual AV system components operate within the complete AV system as intended by the approved AV system design documents and specifications.

PROJECT MANAGEMENT

Oversee and coordinate all activities for the successful completion of the Project.

Provide to the Owner, as a part of the prefabrication submittal, the name of the Project Manager that will manage all duties and responsibilities as specified herein, during the term of the project, including the name of a backup Project Manager.

Make decisions on behalf of the AV System Installer on a day-to-day basis and shall retain the authority of accepting notices of deduction, inspection reports, payment schedules and any other project related correspondence on behalf of the owner.

Manage schedule and attend project management meetings, during which time all system related issues are discussed, scheduled, confirmed, and/or resolved.

Upon notification by the Owner of any project related installation issue or issue that may contradict the specifications as stated herein, the Project Manager shall respond to such issue verbally and/or in writing within an eight (8) hour period.

Responses to such issues as stated above shall include a clear understanding of the issue, along with a tentative plan of action, reflecting milestones and/or deadlines to resolve the issue.

Where appropriate, based on the overall importance of the project issue, the Project Manager shall follow-up their initial response with a written response to the issue within 24 hours of identification of the issue.

Submit prior to installation a schedule reflecting key milestone of the Project, including but not limited to the following:

- Kick-off meeting
- Master Plan submittal
- Prefabrication submittal
- Ordering, delivery, and installation of head-end System equipment
- Field equipment delivery
- Installation schedule including start and end dates and major milestones
- Final System test
- Acceptance of System
- Delivery of Documentation
- Training

Provide updates to the schedule on a weekly basis to reflect the status of each key milestone as the Project progresses.

Provide updates to the above-mentioned items at the request of the Owner, and shall address each item, as it relates to the active status of the Project.

TYPICAL ROOM/SYSTEM DESCRIPTIONS:

Conference Room (Large)

- A room with seating capacity of 12-16 people.
- The system will enable content sharing and display from laptops connected at the conference table to two 98” flat panel displays on the front wall of the room.
- Provide connections through cable cubbies at the conference table.
- Provide a 4x1 HDMI switcher/HDBT transmitter mounted to the underside of the table.
- Provide a wireless gateway to support wireless content sharing by meeting participants.
- The system will support Teams-based video conferencing using an Owner-provided conferencing system. The system will support dual displays.
- Provide a wall-mounted USB camera located between the displays at the front of the room.

- Microphones will be mounted at the conference table for use during audio or video conferencing meetings.
- Provide ceiling-mounted loudspeakers to distribute audio in the room.
- Provide an RF-based assistive listening system, receivers, and ear buds for the room.
- Provide a touch-sensitive control panel at the conference table for control of the system. The control panel will be used to turn power on or off to the system, select sources for presentation or content-sharing, place or receive audio or video conference calls, adjust system volume, and mute or unmute microphones.
- Active audiovisual system components will be mounted in a credenza equipped with mounting rails and hardware to support installation, wiring, and maintenance.

Conference Room (Small)

- A room with seating capacity of 6-10 people.
- The system will enable content sharing and display from laptops connected at the conference table to an 86" flat panel display on the front wall of the room.
- Provide hardwired connectivity at the conference table for a single laptop using an HDBT extender at the conference table.
- Provide a wireless gateway to support wireless sharing by meeting participants.
- Provide ceiling-mounted loudspeakers to distribute audio in the room.
- Provide an RF-based assistive listening system, receivers, and ear buds for the room.
- Provide a touch-sensitive control panel at the conference table for control of the system. The control panel will be used to turn power on or off to the system, select sources for presentation or content-sharing, and adjust system volume.
- Active audiovisual system components will be mounted in rough-in located behind the display.

Digital Signage Locations

- Provide a flat panel display and mounting hardware in the waiting room of the Daniels Building 2nd Floor suite.
- The digital signage player will be furnished by the Owner and installed by the AV systems integrator.
- The digital signage player will be connected to the Owner's existing digital signage content development software and content distribution system.

Faculty Workrooms

- A small conference area for collaboration for two to four participants.
- Provide a wall-mounted 49" flat panel display for content sharing and video conferencing.
- Provide a display-mounted media bar below the display to support a "Bring Your Meeting" model that allows the user to access the camera, microphones, and loudspeakers in the media bar for use with the meeting software provided on their laptop. Extend USB connectivity from the media bar and display to an interface panel located below the display.
- The display and system will wake on connect of an HDMI source to the system and turn off after dis-connect of this source.
- Install owner-furnished equipment in one Faculty Workroom.

Interview Rooms

- A small conference area for collaboration for two to four participants.
- Provide a wall-mounted 49" flat panel display for content sharing and video conferencing.
- Provide a display-mounted media bar below the display to support a "Bring Your Meeting" model that allows the user to access the camera, microphones, and loudspeakers in the media bar for use with the meeting software provided on their laptop. Extend USB connectivity from the media bar and display to an interface panel located below the display.
- The display and system will wake on connect of an HDMI source to the system and turn off after dis-connect of this source.

QUALITY ASSURANCE

Manufactured Items

The manufacturer(s) of cabling and connectivity components shall be a company specializing in and having a minimum of five years documented experience in producing products like those specified in this and related sections.

AV System Installer Qualifications

General

AV System Installer shall:

- Have been in the professional AV business for a minimum of five (5) years.
- Have expertise in designing and building an AV system of the size and scope described herein and in related drawings.
- Have successfully completed one or more projects of scope 50% or more of the magnitude specified by these documents.
- Have the necessary certifications to install products and provide for Guarantees as specified herein.
- Be a dealer for the past five years for the active equipment provided.
- Be capable of providing all quality control (QC) and safety inspections as needed throughout installation.
- Have access to and experience with Test Equipment necessary to perform commissioning tasks as detailed in specification Section 27 08 00.41.

Certifications

AV System Installer shall have:

- AVIXA Certified Technology Specialist certification with a designer endorsement (CTS-D) in good standing for design review.
- AVIXA Certified Technology Specialist certification with an installation endorsement (CTS-I) in good standing.
- Installation Personnel shall have a AVIXA CTS certification; no more than four (4) CTS certified installers for everyone CTS-I certified installer on-site.
- Certifications shall be current and in place at time of Bidding and remain so throughout project.

AV Control System Programmer Certifications and Qualifications:

Individuals performing the AV/DSP control programming and setup shall have manufacturer's control system programming training and certification for the specified AV control system designed in the contract documents.

Shall be the dealer of record for the control system specified.

Provide an uncompiled final approved copy of the AV/DSP source code to Agency via agreed method.

Sub-Contractors shall conform to the same certification standards listed above. All AV/DSP control source code shall become the property of the Agency upon completion of the project.

SUBMITTALS

General:

The AV System Installer shall be responsible for verifying the accuracy of the system designs documented in the Scope of Work and related acceptance of responsibility provided in the shop drawings.

Submit general catalog sheets and system design drawings with model numbers highlighted to indicate specific items proposed and proper identification of equipment by name and/or number, as indicated in the design documents.

AE consultant shall provide comments for the Contractor's correction and resubmission. Do not submit hard copies of web pages. Failing to follow these instructions does not relieve the Contractor from the requirement of meeting the project schedule.

Group Submittals to include complete submittals of related systems, products, and accessories in a single submittal.

Mark dimensions and values in units to match those specified.

The drawing submittals shall be non-scanned printed in electronic (Acrobat PDF) format.

Reproductions of AE Consultant's drawings shall not be acceptable.

Drawings shall be rendered in AutoCAD. CAD drawings will be required as part of final documentation.

Provide Submittal documents as required to support the construction schedule to be identified at the Pre-Construction Meeting.

Submittal documents that are re-submitted for review shall include revision dates that indicate when changes from previous reviews were performed. All revisions made to re-submittal documents must be clouded and all clouds must be identified by the corresponding line-item number on the review roster. A list of changes to re-submittal documents must also be included.

Shop drawings

Wiring diagrams shall show AV systems wiring and schematic designations and equipment locations on drawings submitted in 30" x 42" format.

Provide a full list in Excel spreadsheet form of cable runs including termination locations, numbers/identification, equipment schedule, and electrical grounding to AV equipment rack locations and AV headend locations.

Floor plan drawings shall be required for raceway, floor boxes, poke throughs, and cabling. Drawings shall indicate pull-box locations required in addition to boxes already indicated on the plans.

Include in wiring diagram drawings electrically powered equipment that shall remain on (not under system control) and the electrically powered equipment that shall be on/off under system control.

Provide conduit riser drawings for AV conduits required for installation of back boxes and ceiling enclosures including the proper grounding inclusion on the schematic drawings.

Provide detailed drawings of instructor workstations indicating the locations of AV equipment to be mounted in the workstations (if applicable).

Provide detailed elevation drawings of equipment racks providing locations of AV equipment being mounted in these racks and future space openings.

Drawings shall include cable layouts, locations for terminal blocks, transformers, relays, and power supplies.

Provide Display- and Projection System-specific drawings and calculations. Include screen sizes, projector locations, projector throw ranges and field verified measurements to confirm lens selection and viewing angles (plan drawings).

Provide remote control touch screen layouts and flowcharts. Provide full size drawing sheet (PDF Format) showing touch panel screen shots organized as a flow chart.

Develop and submit As-Built Drawings detailing the installed systems as specified for approval including the room numbers on drawings that reflect Agency room numbers and not Architect room numbers.

During Construction
Provide updates to the AV system design that may affect the design drawings as approved. The updates shall include change orders and equipment model updates that are due to model changes by the specified manufacturer.

Mockups
Provide on request, mockups of:

- Floor boxes
- Poke-through assemblies
- AV backboxes
- Wall mounted touch panels
- AV-specific boxes and wall plates
- Conference room table-mounted AV input assembly

Provide samples of the AV System furniture finishes to provide selection before ordering to be reviewed and approved by Owner and Architect.

WORK BY STATE AND/OR AGENCY
Video conferencing equipment including codecs, cameras, microphones, and control interfaces.

WARRANTY
Provide guarantees per Conditions of the Contract.

Warranty Period:

- Equipment and Materials – two (2) years
- Labor – one (1) year

Manufacturer warranties shall be activated in the Agency's name.

Items not covered include Agency-caused failure, defect or damage including controls re-adjustment, system re-tuning or injury to the system beyond normal wear.

During the warranty period – within 48 hours of original notification – provide emergency service to restore operation of the system, replacing defective materials, repairing faulty workmanship, making temporary repairs, and providing loaner equipment as necessary, all at no charge.

Provide to the Agency before any service call whether such call is or is not covered under warranty. The Agency may be invoiced for non-warranty calls.

Make available after hours or weekend service at a premium rate not to exceed 1.5 times normal hourly rate.

Provide technical support via telephone at no charge during the warranty period.

Maintain engineering and service departments capable of rendering phone support and advice regarding system operations regarding installation and operational adjustment of the systems. This support may result in scheduling a service call to the site to further determine any equipment issues that could not be handled via the phone support.

The equipment listed in "Work by State and/or Agency" that was OFCI shall have warranty provided by AV System Installer for the installation work.

Prior to the end of the warranty period provide (2) scheduled follow up service and maintenance visits by technically qualified personnel to make AV system updates and adjustments at no additional charge.

Make all tests, adjustments, or replacements in the presence of Agency technician, or other person designated by the Agency Representative. Upon completion of each call provide a report to clearly indicate any replacements or adjustments and any evidence of tampering.

All service calls pertaining to control system (e.g., alteration of buttons, non-responsive commands, etc.) shall fall under the purview of the Control System Programmer.

PART 2 - PRODUCTS

EQUIPMENT STANDARDS

Components that comprise the various systems shall be UL listed where a UL listing exists for that component.

Displays and projectors shall have at minimum 4K video resolution.

Video extenders shall have at minimum 4K video resolution. Extenders shall operate with CAT6 or fiber optic cable.

Video sources shall have at minimum 4K video resolution. When the video sources do not meet the minimum video resolution requirement the design shall include video scaling to match the display or projector resolution.

Control system shall provide operational control of devices either through RS-232 or IP based interfaces. The control system shall also provide contact control for devices that use this type of control interface. The control system shall also provide IR based connection for devices that use an IR handheld remote for control.

Verify the completeness of the drawings, specifications, and schedules and the suitability of devices including AV equipment firmware to meet the design intent of the specifications.

Shall provide any additional equipment, accessories, or incidentals required, whether specifically mentioned herein, without claim for additional payment, it being understood that a complete operational system is required.

Equivalent manufacturers and products shall be in strict accordance with this specification.

SUBSTITUTIONS

Refer to contract terms & conditions.

Requesting a substitution prior to submitting bid must be sent to the AE consultant four weeks in advance of the bidding due date.

Request for approval of a substitution shall include the reason for requesting the substitution along with any relevant product data. Engineering data must be submitted along with request showing that the substitution will work and perform to the intent of the system design.

Request to substitute loudspeaker arrays designed for arenas, theaters, auditoriums shall include a complete room model of the space in EASE 4.2 or higher, demonstrating equivalent coverage to the AE Consultant's satisfaction, the suitability of the proposed loudspeaker arrays in addition to documentation described above.

EQUIPMENT CHANGES

Provide the latest model AV equipment included in the design drawings.

If the specified AV equipment has been discontinued, the replacement AV equipment for that model shall meet the specified design requirements. Notification to AE and owner shall include the discontinued model number and the replacement model number.

RACEWAY AND BOXES
Coordinate with Division 26.

See specification Sections 26 05 33 - Raceway and Boxes for Electrical Systems and 27 05 33.41 - Raceway and Boxes for Audio-Video Systems and drawings.

CABLING
General
See specification Section 27 10 00 for general cable installation requirements.

Refer to Section 27 41 00.2 – Master Audiovisual Cable Schedule for all cables used in these systems.

AV EQUIPMENT
General
Equipment identified as "Owner Furnished Owner Installed (OFOI)" included is for reference only.

Refer to Section 27 41 00.1 – Audiovisual Systems Equipment Schedule for all audiovisual equipment.

AV Power Distribution
Coordinate with Division 26 contractor for all AV systems power distribution requirements.

PART 3 - EXECUTION

GENERAL
Verify all dimensions and conditions at the project site. Submit any conflicts for resolution and coordinate their efforts with the Construction Manager and AE Consultant for coordination of the conflicts, completion of work, and to avoid conflicts over scheduling, access, and locations of their work.

The Project Manager shall be responsible for ensuring all floor boxes and back boxes noted as Standard, if applicable, are supplied to the Division 26 contractor for the project.

The Division 26 Contractor shall ensure all power connections are installed as noted on the drawings.

AV System Installer is responsible for providing a coordinated schedule of completion of each system or space to the Division 26 Contractor to ensure timely completion of AV installation.

Provide all mounting brackets, raceways, sleeves, rack rails, termination plugs, jacks, faceplate mounting hardware, back boxes, and other unique components as necessary to securely mount equipment and panels.

Coordinate with other divisions of work the interface of room systems including lighting control systems, motorized shades, motorized projection lifts, motorized projection screens, HVAC system, e.g., where noted on drawings.

Provide painting and finishing as may be required to match components, cabinetry, and room décor. Coordinate the color and finish of any visible element of the system with Project Manager approval.

Determine the location for mounting projector/lift, camera, and display device to ensure these mountings to be free from vibration or shaking. If these mounting locations are not free of vibration or shaking, provide isolation mounting devices to ensure the projected video images are stable.

Provide power control for selected equipment racks and AV devices including but not limited to what is shown on the bid documents. All devices should be capable of being shut down except for the control system, audio digital signal processor, and AV network switches. If a power sequencer is included in design, then the AV System Installer shall provide the power on and off sequence of equipment included on the schematic AV drawings.

Provide to Agency the AV equipment MAC addresses and serial numbers for coordination with Agencies IT network administrator.

Provide all firmware updates as needed for AV devices prior to final system testing.

SITE CONDITIONS

Coordination:

Coordinate all work with other on-site trades.

Schedule and manage equipment delivery and make appropriate arrangements to coordinate with job site personnel for the proper receiving, handling, and secure storage of equipment delivered.

Site Clean-up:

Keep the project site free of all debris generated by the AV System Installer's work to the satisfaction of the Owner or Construction Manager. Remove waste and debris related to the specified work from the site daily and leave the relevant areas and equipment clean and in an operational state. Repair any damage caused to the premises by the AV System Installer's installation activities at no cost to the Owner.

At the completion of work, remove all remaining waste materials, tools/job box belonging to the AV System Installer including construction equipment, machinery, and surplus materials.

Confine operations at the site to the areas permitted in the Contract Documents and do not unreasonably encumber the site with materials or equipment.

WIRING AND TERMINATIONS

Do not exceed manufacturer's recommendations for cable pulling tension. Where cable-pulling lubricant is used, the lubricant must not damage the conduit and cable sleeve materials and must not harden over time to prevent future pulls.

Install a nylon pull string in every conduit. If additional cables are pulled in after the initial cable pull, pull a nylon pull string with the added cable. Coordinate installation of pull strings with the Electrical Contractor.

Color-code all systems wiring with labeling and coding as submitted and approved by shop drawing. Cabling shall be continuous and shall not be spliced between equipment. Maintain color coding and tagging throughout the system at all accessible locations to the cabling.

Communication cables passing through any plenum space and not encased in steel conduits must be plenum rated for their entire length.

The fire stop system shall comply with the latest editions of NEC and with NFPA 101-Life Safety Code and shall be made available for inspection by the local Authority Having Jurisdiction. The fire stop systems and products shall be UL tested and material shall be UL classified as materials for use in through-penetration fire stops.

Verify the fire rating of all walls and floors affected by their work.

LABELING

Equipment Racks & Rack-mounted Equipment

See specification Section 27 05 53 – Identification for Communications Systems for label material, text, and general installation requirements.

Provide labeling for rack-mounted equipment with engraved and filled plastic laminate. Other methods of labeling rack-mounted equipment may be accepted upon prior approval by the AE Consultant and/or Owner.

Provide labels of contrasting color for rack-mounted equipment and racks on both the front and the rear.

Clearly label all racks, rack-mounted equipment, switches, controls, and panels unless noted otherwise.

Panels and plates shall be a minimum of 1/8" thick anodized aluminum etched, and epoxy filled unless noted otherwise.

Permanently mark each wire with a number at each end. Labels must be printed. Do not use adhesive wire labels from wire books.

Coordinate with Division 26 to ensure that power receptacles within each rack and at remote equipment locations are labeled and match to the appropriate panel and circuit breaker.

EQUIPMENT RACKS AND CABINETS

Assemble equipment racks using best industry practices and tested off-site before on-site delivery and installation. No rack assembly shall be allowed on site depending on size and time frame of project without being completely wired except for terminations of field wiring to the rack.

All equipment racks shall be grounded to the isolated ground bus and shall be isolated from all other building and conduit grounds.

Ensure that all equipment is installed with adequate cooling and ventilation.

Coordinate with Division 26 contractor and construction manager the delivery of assembled racks to the construction site. Protect racks from dust, construction debris, and other job site hazards during the entire duration of the installation.

Thoroughly clean all racks and equipment contained therein upon completion of the project and just prior to turn over.

Security covers designed to limit tampering of preset levels shall conceal all rack-mounted equipment not requiring frequent adjustment. Install blank and or vented panels as needed to fill unused spaces in racks.

RIGGING

Install and mount equipment specified herein.

Provide drawings detailing mounting methods as well as attachment points and load ratings to building structure. If required by the AE Consultant, a structural engineer shall sign and stamp the drawings.

Coordinate with all applicable trades. The rigging installer shall have experience in load calculations and the needed installation practices for safe rigging as the project equipment may require.

Provide safety wire of sufficient strength to anything suspended over audience areas excepting those that have three or more suspension points.

Minimum safety factor for all mounting and rigging: 5:1.

AV devices shall not share or utilize supporting structures intended for other systems.

CONTROL SYSTEM – TOUCH SCREENS

General

Provide a description of the control system requirements to serve as a basis for the control system programming. Touch screen layouts and function shall not be limited to the operations outlined in this description.

Coordinate and schedule a meeting with AE Consultant and Owner to discuss touch screen operation prior to developing page layouts. Submit the touch screen page layouts and page relationship diagram, with a written button-by-button description of the function of each button for review by the AE Consultant and Owner or Owner's Representative.

Pressing button "System On" shall power up devices in sequence. Pressing button "System Off" shall be followed by a confirmation page to confirm system to turn off in sequence.

Provide light control presets as required in design. Include level control of lights (if integrated into control system), program volume, individual audio source volumes, etc. Microphone volumes shall be independently controlled on a subpage.

The control panels shall be intuitive and allow control of any source device available with a minimum of button presses. Provide visible feedback of the current operation of sources controlled on the touch panel. The panel should indicate audio levels for program and voice and indicate current lighting levels or preset.

Provide an information/help button on introduction page (splash page) of touch screen for project information/ help contact phone number. When pressed, display popup page that contains the following information.

PROJECT
Agency Name & Address
Room Name/Number
Original Installation Date
Current Version of Control Program

HELP DESK: Phone Number

SYSTEM DESIGNER: Name
Address
Telephone

AV SYSTEM INSTALLER: Company Name
Address
Telephone
[Technical Support Telephone if other that # above]

[GPC][STC]: Name
Address
Telephone

PROJECT ARCHITECT: Company Name
Address
Telephone

Coordinate and receive approval from Owner on graphics and final layout of project information page, welcome page (splash page).

Coordinate with the Owner and AE Consultant any control pages and/or functions that require passwords.

CONTROLLED DEVICES

Provide in the control coding and GUI touch screens positive real-time feedback of individual component control-state conditions. The feedback shall have minimum delay in response.

Provide an interface to environmental controls that are triggered with a specific device (e.g., dry contact relay). The trigger for the environmental control should provide feedback from the device rather than a simple button push.

Include a control system interface to mechanical or electronic devices such as screens, window shades, or room lighting. Where interfacing with systems installed by other trades, coordinate exact interface location with the appropriate contractor.

Provide remote power relays, wherever possible, which shall be used to switch AV power to those devices whose power on/off function is otherwise not controllable. Using a device's "stand-by" mode is an acceptable form of power down.

Include, when using infrared control, an external current sensor as part of the infrared control system; the sensor shall provide positive feedback to the control system to indicate whether the device is in a power on or power off state.

If requested by the Owner, all or selected control system processors shall be programmed with an Auto Shutdown feature. Power off schedule shall be consulted with Owner prior to programming.

Owner furnished computers shall be connected to constant power source and shall not be included in the power down process.

Wherever devices that require keypad-style dialing, such as audio or video conferencing, mimic a telephone keypad display to allow dialing from the touch screen. Provide a display window above the keypad to display the number being dialed. The AV System Installer shall provide a backspace key to modify dialed numbers.

VIDEO CODECS AND CAMERAS

In the control programming dialing control provide a touch screen layout similar in look to the manufacturer handheld remote. Minimum features shall include local camera control, far end camera control, phone-add, and privacy function. The AV privacy function shall mute the near end audio or video (selectable audio, video, or both) and the control system shall provide a large icon to indicate that selected privacy is enabled.

Determine camera presets in consultation with the Owner.

VOICE-OVER-IP (VOIP)

Coordinate with Agency on users need to operate the VOIP system via the touch panels.

Integrated rooms with video Codec and audio conference calling will need the AV control system to operate the VOIP/SIP interface. In those rooms where this is required the following will serve as guidance for operation via the touch panels:

- The control system shall be able to initiate calls via VOIP, SIP, or analog telephone. Provide a touch screen layout similar in look to a standard touch tone phone. The audio privacy function shall mute near end audio and the control system shall provide a large icon to indicate that privacy is enabled.

- Touch screens specified with SIP/RAVA functionality with built-in speaker and microphone shall initiate calls via VOIP, SIP, or standard telephone. Determine a separate touch screen layout in consultation with Owner as the page may be used as a phone, intercom, or help desk.

DIGITAL SIGNAL PROCESSOR (DSP)
Provide input and output signal routing with DSP audio system processing adjustments.

Provide programming provisions included and discussed with Owner about system reboots or system resets as it may affect the control interface of the audio DSP system.

Include Acoustic Echo Cancellation (AEC).

NETWORK
General
Agency may require managed switches even though unmanaged switches allow portions of the AV systems to function.

Agency may also have campus standards of a selected manufacturer that will be the responsibility of the AV system installer to confirm that the AV system design will operate with the campus selected equipment.

Review with Agency's network administrator AV streaming protocols that are included in the systems design. Switch selection shall meet manufacturer's specifications for specified or substituted equipment (e.g., AVB, CobraNet, Dante, etc.).

Switches for Digital Video Systems and Control Systems
Provide managed switches with gigabit (1Gbps) Base-T Ethernet ports and non-blocking layer-2 functionality. Ports shall provide a maximum of 34.2 Watts PoE.

Where specified, switches requiring PoE shall support Type 1 PoE, Class 0-3 power sourcing on Ethernet ports and Type 2 PoE+, Class 4 power sourcing on Ethernet ports. Reference to the schematics for the number of ports that require PoE and verify switch will be capable of power sourcing the number of ports simultaneously.

Provide a brush grommet panel above or below switch if Ethernet ports connected on the front face of network switch when mounted in an equipment rack.

Dante Network Switch
Dante network switches, where specified, shall have Ethernet Ports with gigabit (1Gbps) and 1.488Mpps packet forwarding rate at minimum. Dante switches shall be non-blocking layer-2 managed switches supporting DiffServe (DSCP) Quality of Service (QoS) with strict priority and four (4) queues per port.

Confirm that all ports are capable of simultaneous gigabit transfer and capable of switching off Energy Efficient Ethernet (EEE) and other power-saving features.

Configure DiffServe (DSCP) QoS to give top priority to the Dante clock synchronization and audio data the next highest priority.

VLAN's shall be used to separate virtual networks for audio and non-Dante data over same network. Multicast transmissions may be required for audio sent to multiple Dante devices. To minimize unnecessary duplication of audio streams in multicast, Internet Group Management Protocol (IGMP) shall be enabled in the Dante Controller software.

Where specified for switches located over long distances, a switch shall be capable of supporting optical modules.

Refer to Audinate support documents for full setup details.

Q-Lan Network Switch
Q-Lan is a specific network protocol for QSC Q-Sys products. The AV Systems Installer shall have a certified Q-Sys designer/programmer where such products are specified.

Refer to QSC's support documents for full setup details.

GROUNDING
Do not connect metallic raceway of any type to equipment racks. This includes but is not limited to AC power and AV conduits. Ground equipment racks using stranded copper wire conductors connected only to isolated technical ground buss and bonded to equipment rack ground buss.

Isolate AV equipment racks that have metal wheels or metal based leveling feet from floor by use plywood sheeting. Paint all six surfaces of the plywood with fire retardant paint. Isolate equipment rack AC receptacles from equipment rack by use of isolated ground receptacles.

Exception: Plywood sheeting is not required if equipment rack has isolating plastic or rubber wheels or isolating plastic cap leveling feet.

Connect receptacle-isolated grounds only to isolated technical ground buss.

Refer to 26 05 26 articles "CONDUCTORS" and "COMMUNICATIONS SYSTEM GROUNDING".

AV SYSTEMS CLEAN POWER
Do not use installation methods, practices that may compromise the AV system's isolated ground, clean power scheme. Complete description and specifications for AV systems isolated ground clean power system listed in article section 26 05 26.

TECHNICAL REQUIREMENTS
Speaker and Amplifiers
Install manufacturer-provided security covers over all amplifier gain knobs.

Label each amplifier with which speaker zones each amp channel is driving.

Set gain levels for appropriate gain structure and maximum range of system volume.

Sequence power so amplifier is last device to turn on and first device to turn off.

Assistive Listening System
Provide receivers with Ear Speakers, and Rechargeable Batteries for required percentage of seating per ADA 2010.

Provide Neck loops for required percentage of receivers per ADA 2010.

Provide charging case.

Speakers (Ceiling, Pendant, Wall-Mounted and Suspended Type)
Include custom painting in bid.

Coordinate color with Architect and Owner prior to installation of speaker grills.

Coordinate color with Architect and Owner prior to purchase and installation of suspended speakers, wall mounted speakers, and pendant speakers.

Provide all required rigging hardware.

Provide all required mounting hardware including safety cabling.

Provide free air cable support.

Schedule and coordinate speaker placement with other trades.

Digital Video System
Provide Video Media Test reports for each system.

Adjust Video Media transmitters and receivers for proper EDID tables and resolutions confirmed with project and OFCI devices.

Video Media receivers shall be set to maintain aspect ratio as determined by display orientation.

Transmitters shall be set to auto switch between Digital and Analog inputs.

Provide Owner with complete list of all IP address.

Adhere to streaming specifications for each AV product manufacturer as they have different requirements for each product.

Coordinate V-LAN'S and IP schemes with owner.

Equipment Racks in Casework
Coordinate installation in architectural millwork or case work section.

Provide proper ventilation for maintaining equipment temperature below 80 degrees F.

Fire Alarm Coordination
All AV System audio shall be muted when fire alarm is activated.

Coordinate with Division 28.

Provide low voltage cable to fire alarm actuator.

Provide fire alarm actuator connection to relay input on AV system control master.

Flat-Panel Video Displays
Confirm display size and orientation with Owner prior to Owner ordering display.

Confirm final mounting height and mounting locations with Owner prior to installing displays.

Flat-Panel Display installation shall meet ADA guidelines.

Supply appropriate wall mount brackets and specified backboxes.

Coordinate with GPC the installation of wall blocking for wall mounting brackets.

Coordinate with Division 26 on providing and installing power outlets for AV back boxes.

Install, terminate, and test the Flat-Panel Video Displays.

Provide and install AV over IP Network Connections and Digital Video connections.

Touch screen control
Provide individual control of each flat panel display as it may apply to that display's use in the design.
Volume.

On/Off.
Input selects.
Cable TV.
Channel up/down.
Keypad channels enter.
Channel presets.

Floor Boxes and Poke-Thru Assemblies and Outdoor Boxes
Coordinate with Division 26 and Telecom/Data Installer to ensure all required power and connectivity are provided.

See PART 1 direction re: mock-ups.

Input/Output Panels
Mount at standard outlet height unless otherwise indicated in plans.

Coordinate finish with Architect prior to purchase or installation.

Confirm nomenclature of engraved labels with AE Consultant and Owner prior to ordering by submitting panel layouts with submittal package. See PART 1 Article SUBMITTALS.

Confirm number sequence of inputs and outputs with AE Consultant and Owner prior to ordering.

Interconnect Cables
Provide analog and digital interconnect cables/wiring for AV system inputs/outputs.

Loudspeakers and Emitters
Verify cabling routes, distances, paths between speakers, and mounting hardware manufacturer.

Provide all required mounting hardware including safety cabling.

Coordinate speaker placement with other trades (HVAC, lighting, fire protection, etc.).

Coordinate color with Owner / Architect.

Provide additional speaker cable support as required. Where mounting in ceiling tile, provide support in the form of a tile bridge or other means. Do not support speaker solely by ceiling tile.

Touch screens and Button Panel Controllers
Must meet ADA guidelines.

Coordinate color with Owner/Architect approval.

Locate to avoid any conflicts with podium display.

Touch Screen Control
Provide welcome page.
Provide owner representative approved graphics for welcome page.
All touch screen pages, and popup pages must be approved by Owner representative and AE Consultant.
Provide Help button on touch screen that displays help pages and Owner contact information for help calls.
Develop help pages that provide a button-by-button graphic representation of panel functionality.
Provide PDF printout of all help file pages.
Touch screen at equipment rack shall control system power.
Touch screen at equipment rack shall function as master panel and shall control all system functions.

Touch screen layout and graphics shall be user friendly, intuitive, and consist of high-quality graphics and buttons that reflect a high-end technology system.

Upon completion, turn over to the Owner all accessories included with the manufacturer's equipment but not used for the physical installation of the device. This includes but is not limited to remote controls, batteries, tools, installation hardware, cases, covers, software, etc.

COMMISSIONING

See section 27 08 00.41 – AV System Commissioning. Includes Testing and Acceptance requirements and Commissioning Checklists.

DOCUMENTATION

General

Upon AE acceptance of the installed system, provide documentation as detailed below.

Submit all documentation in electronic form.

Provide:

- As-built drawings
- Maintenance and Operations Manuals
- Test and Measurement Report (per 27 08 00.41)
- Construction Verification Checklists (per 27 08 00.41)

As-built Drawings

Provide updated Shop Drawings documenting as-built conditions for each system and room, including:

- Floor and ceiling plans showing device locations
- Schematics with wire-numbers
- Rack elevations
- Power and grounding. Include sequencing schedule where applicable.

Maintenance and Operations Manuals

Refer to DIVISION 1 - GENERAL REQUIREMENTS, Article 33 "Operating and Maintenance Manuals and Instructions".

Provide copies of approved submittals per specification Section 27 41 00. Documents should include products used on the project.

Provide User Manuals for all equipment provided.

Provide Equipment List that includes make/model, serial numbers, and where applicable, MAC addresses, and network addresses of all installed equipment.

TRAINING

General

Coordinate and schedule training with Agency selected team members and AV system installer design team.

Training shall be conducted at the project site using the project equipment for each unique system.

Training sessions will be recorded and turned over to the Owner with Operations & Maintenance manuals.

Training must cover, at minimum, the following items:

User Manual:
The manual outlined in Part 1, Maintenance and Operating Manuals, detailing the system functions.

Control Systems Programmer operations for each AV system.

Technical User:
Operations training on equipment and software use.

Maintenance User:
Updates and physical maintenance (cleaning of displays, bulb changes, filter cleaning, filter changing, etc.).

END OF SECTION

Eqpt. ID	Mfg.	Model #	Description	QTY	Notes
DISPLAY/PROJECTION					
FPD/1	NEC	M491	49" 4K Flat Panel Display	1	OFOI
	Chief	PNRUB	Articulating Wall Mount	1	OFOI
	SurgeX	SA-82	Surge Eliminator	1	OFOI
VIDEO					
IMB/1	Logitech	Rally Bar Huddle	Integrated Media Bar	1	OFOI
	Logitech		Display Mount	1	OFOI
AIP/1	Extron	WPD 160	AV Interface Panel	1	OFOI
AUDIO					
CONTROL/MISC					
BASEBUILDING AV					

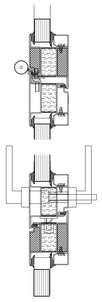
Eqpt. ID	Mfg.	Model #	Description	QTY	Notes
DISPLAY/PROJECTION					
FPD/1	NEC	M491	49" 4K Flat Panel Display	1	OFOI
	Chief	PNRUB	Articulating Wall Mount	1	OFOI
	SurgeX	SA-82	Surge Eliminator	1	OFOI
VIDEO					
IMB/1	Logitech	Rally Bar Huddle	Integrated Media Bar	1	OFOI
	Logitech		Display Mount	1	OFOI
CAM/1	Vaddio	ConferenceSHOT ePTZ	Interview Recording Camera	1	OFOI
AIP/2	Extron	CPM 101	AV Interface Panel	1	OFOI
	Extron	70-617-13	HDMI Pass Through	1	OFOI
	Extron	70-312-21	USB 2.0 Pass Through	1	OFOI
	Extron	70-1242-03	USB-C Pass Through	1	OFOI
	Extron	70-315-21	Blank Plate	1	OFOI
AUDIO					
CONTROL/MISC					
BASEBUILDING AV					

Eqpt. ID	Mfg.	Model #	Description	QTY	Notes
DISPLAY/PROJECTION					
~~FPD/1,2~~	~~NEC~~	~~C981Q~~	~~98" UHD Flat Panel Display~~	~~0~~	~~OFOI~~
	~~NEC~~	~~WMK-3298T~~	~~Wall Mount - Tilting~~	~~0~~	~~OFOI~~
FPD/1,2	Samsung	QB98T	98" UHD Flat Panel Display	2	OFOI
	Chief	XTM1U	Wall Mount - Tilting	2	
VIDEO					
CAM/1	Cisco	QuadCam	Video Conferencing Camera	1	OFOI
	~~Sound Control~~	~~RCM-UNI~~	~~Mounting Hardware~~	~~0~~	~~OFOI~~
AVS/1	AMX	SDX-414-DX	4x1 AV Switcher	1	OFOI
	Chief	CSPH	Hinged Undertable Mount	1	OFOI
	Sound Control	RTK-PRO	Remote Table Kit Pro with:	1	OFOI
TPX/1	Sound Control	RTK-TX	Twisted Pair Transmitter		OFOI
TPR/1	Sound Control	RTK-RX	Twisted Pair Receiver		OFOI
	Sound Control	RCC-H001-1.0M	1m HDMI Cable		OFOI
	Sound Control	RCC-H016-1.0M	1m UTP Cable		OFOI
	Sound Control	RM-PRO	Male TRRS to Euro-Block Adaptors		OFOI
	Sound Control	WPS-12	12V Power Supply		OFOI
VC/1	Cisco	Codec EQ	Integrated Codec	1	OFOI
	Cisco		Rack Mount Kit	1	OFOI
AIP/5	Extron	Cable Cubby 1402	Connection Compartment with:	1	OFOI
	Extron	AC+USB 314 US	US Dual Power Module	2	OFOI
	Extron	70-1219-02	Dual HDMI Input Plate	1	OFOI
	Extron	70-402-11	RJ45 Input Plate	1	OFOI
	Extron	70-267-01	Cable Pass Through	1	OFOI
	Extron	70-270-01	Cable Pass Through	1	OFOI
	Extron	70-090-11	Blank Plate	3	OFOI
	Extron	70-1040-03	Bracket Kit	2	OFOI
	Extron	70-1067-xx	Cable Collar Kit	2	OFOI
AIP/6	Extron	Cable Cubby 1402	Connection Compartment with:	1	OFOI
	Extron	AC+USB 314 US	US Dual Power Module	2	OFOI
	Extron	70-1219-02	Dual HDMI Input Plate	1	OFOI
	Extron	70-267-01	Cable Pass Through	1	OFOI
	Extron	70-270-01	Cable Pass Through	1	OFOI
	Extron	70-090-11	Blank Plate	3	OFOI
	Extron	70-1067-xx	Cable Collar Kit	1	OFOI
	Extron	HDMI Ultra/15	15' HDMI Cable	2	OFOI
AUDIO					
AMP/1	Extron	MPA 601	60W/70V Amplifier	1	OFOI
	Extron	RSU 126	Rack Mount Kit	1	OFOI
S2	Extron	SF 26T	Loudspeaker	2	OFOI
ALX/1	Listen Technologies	LT-800-072	Assistive Listening Transmitter	1	OFOI
	Listen Technologies	LA-123	Helical Antenna	1	OFOI
	Listen Technologies	LA-326	Rack Mount Kit	1	OFOI
	Listen Technologies	LR-5200-072	Assistive Listening Receiver	1	OFOI
	Listen Technologies	LA-405	Ear Buds	1	OFOI
	Cisco	CS-MIC-TABLE-J=	Microphone	3	OFOI
USBI/1	Focus Rite	Scarlett Solo Gen3	USB Interface	1	OFOI

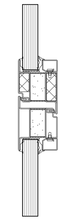
Eqpt. ID	Mfg.	Model #	Description	QTY	Notes
CONTROL/MISC					
CP/1	Cisco	CS-T10-TS+	Control Panel	1	OFOI
MC/1	Extron	IPCP Pro 350 xi	Master Control Processor	1	OFOI
	Extron	RSU 126	Rack Mount Kit	1	OFOI
	Salamander Designs	C-42920	3-bay Credenza Frame	1	OFOI
	Middle Atlantic	PD-915R	15A Power Distribution Unit	1	OFOI
AIP/4	AVSC	Custom	AV Input Panel	1	OFOI
BASEBUILDING AV					

Eqpt. ID	Mfg.	Model #	Description	QTY	Notes
DISPLAY/PROJECTION					
~~FPD/1~~	~~NEC~~	~~C860Q~~	~~86" UHD Flat Panel Display~~	~~0~~	~~OFOI~~
	~~NEC~~	~~WMK-3298T~~	~~Wall Mount - Tilting~~	~~0~~	~~OFOI~~
FPD/1	Samsung	QB85R-B	85" UHD Flat Panel Display	1	OFOI
	Chief	XTM1U	Wall Mount - Tilting	1	OFOI
VIDEO					
	Sound Control	RTK-PRO	Remote Table Kit Pro with:	1	OFOI
TPX/1	Sound Control	RTK-TX	Twisted Pair Transmitter		OFOI
TPR/1	Sound Control	RTK-RX	Twisted Pair Receiver		OFOI
	Sound Control	RCC-H001-1.0M	1m HDMI Cable		OFOI
	Sound Control	RCC-H016-1.0M	1m UTP Cable		OFOI
	Sound Control	RM-PRO	Male TRRS to Euro-Block Adaptors		OFOI
	Sound Control	WPS-12	12V Power Supply		OFOI
	Middle Atlantic	CSPH	Under Table Mount	1	OFOI
VC/1	Cisco	CS-KIT-S-M-UNIT+	Integrated Codec	1	OFOI
AIP/4	AVSC	Custom	AV Input Panel	1	OFOI
AIP/5	Extron	Cable Cubby 1402	Connection Compartment with:	1	OFOI
	Extron	AC+USB 314 US	US Dual Power Module	2	OFOI
	Extron	70-1220-02	HDMI.RJ45 Input Plate	1	OFOI
	Extron	70-090-11	Single Blank Plate	1	OFOI
	Extron	70-1067-xx	Cable Collar Kit	4	OFOI
	Extron	HDMI Ultra/15	15' HDMI Cable	1	OFOI
AUDIO					
AMP/1	Extron	MPA 601	60W/70V Amplifier	1	OFOI
	Extron	MBU 125	Mounting Kit	1	OFOI
S1	Extron	FF220	Loudspeaker	2	OFOI
ALX/1	Listen Technologies	LT-800-072	Assistive Listening Transmitter	1	OFOI
	Listen Technologies	LA-123	Helical Antenna	1	OFOI
	Listen Technologies	LA-326	Rack Mount Kit	1	OFOI
	Listen Technologies	LR-5200-072	Assistive Listening Receiver	1	OFOI
	Listen Technologies	LA-405	Ear Buds	1	OFOI
	Cisco	CS-MIC-TABLE-J=	Microphone	2	OFOI
CONTROL/MISC					
CP/1	Cisco	CS-T10-TS+	Control Panel	1	OFOI
BASEBUILDING AV					

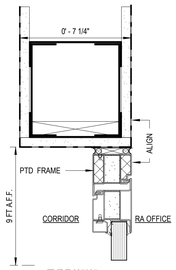
Eqpt. ID	Mfg.	Model #	Description	QTY	Notes
DISPLAY/PROJECTION					
FPD/1	NEC	M651	65" Flat Panel Display w/Tuner	1	OFOI
	Chief	PNRUB	Articulating Wall Mount	1	OFOI
	SurgeX	SA-82	Surge Eliminator	1	OFOI
VIDEO					
DSP/1			Digital Signage Player	1	OFOI
AUDIO					
CONTROL/MISC					
BASEBUILDING AV					



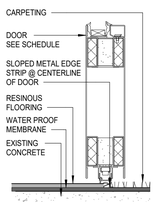
TYPE J5B
FIRE RATED GLAZING AND DOOR



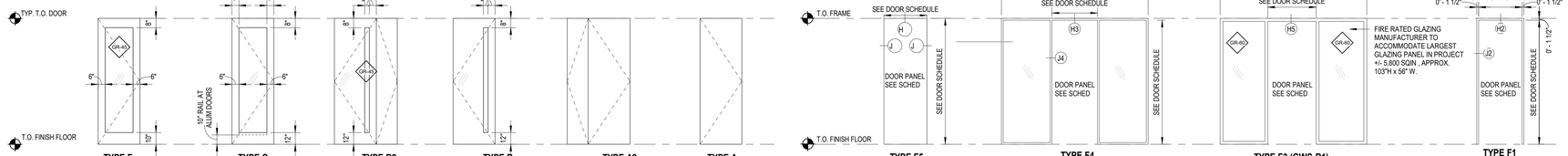
TYPE H5B
FIRE RATED DOOR WITH TRANSOM



TYPE H5/J5
FIRE RATED GLAZING AND DOOR



TYPE S6
FIRE RATED DOOR - RA OFFICES



TYPE F
FIRE RATED FULL GLASS DOOR INTEGRAL TO FIRE RATED GLASS PARTION SYSTEM

TYPE C
FULL GLASS

TYPE B2
SLOT GLASS FIRE RATED

TYPE B
SLOT GLASS

TYPE A2
SOLID DOOR

TYPE A
SOLID DOOR

TYPE F5
FRAMELESS ELECTRICAL PANEL DOOR

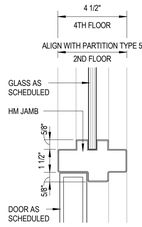
TYPE F4
HM INTERIOR GLASS WALL SYSTEM (GWS-1)

TYPE F3 (GWS-R1)
1 HR RATED GLASS PARTITION WITH INTEGRAL RATED DOOR

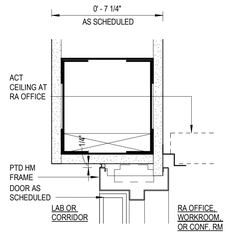
TYPE F1
HM FRAME

A031 DOOR PANEL TYPES
SCALE: 1/4" = 1'-0"

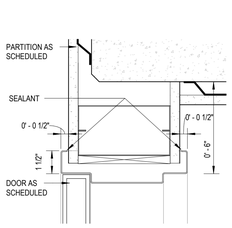
A031 DOOR FRAME TYPES
SCALE: 1/4" = 1'-0"



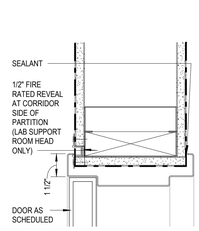
TYPE J4
HM DOOR TO INTERIOR GLASS WALL SYSTEM



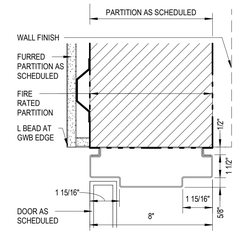
TYPE H3/J3
HM DOOR TO GWB



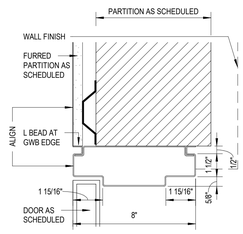
TYPE H2A/J2A
HM FRAME AT TOILET ROOM



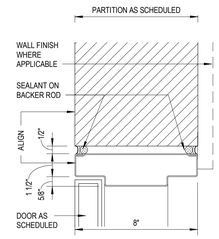
TYPE H2/J2
HM FRAME AT PARTITION
FIRE RATED AT LAB SUPPORT ROOMS



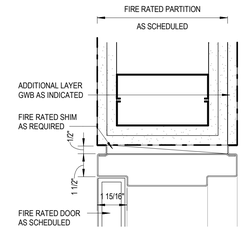
TYPE H1D/J1D
FIRE RATED HM FLUSH FRAME
AT FURRED CMU / CONCRETE WALL



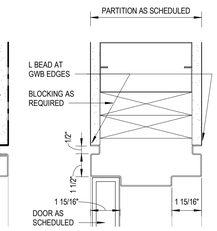
TYPE H1D/J1D
HM FLUSH FRAME
AT FURRED CMU / CONCRETE WALL



TYPE H1C/J1C
HM FLUSH FRAME
AT CMU / CONCRETE WALL

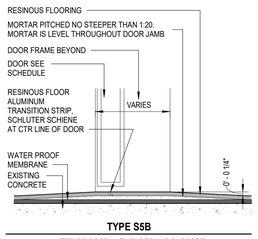


TYPE H1B/J1B
HM FIRE-RATED FLUSH FRAME

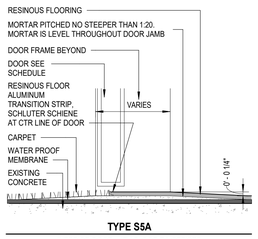


TYPE H1/J1
HM FLUSH FRAME

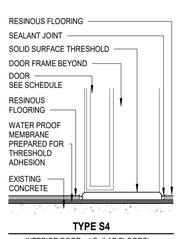
A031 DOOR FRAME DETAILS
SCALE: 3" = 1'-0"



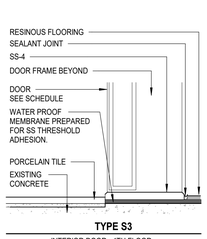
TYPE S5B
INTERIOR DOOR - 4TH FLOOR LAB SUPPORT AND LAB ENTRY FROM CORRIDOR



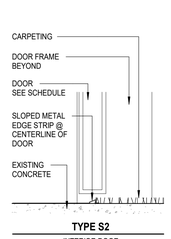
TYPE S5A
INTERIOR DOOR - 4TH FLOOR RA OFFICES (NO MORTAR PITCH AT SIM. CONDITIONS)



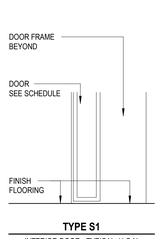
TYPE S4
INTERIOR DOOR - J.C. (LAB FLOORS)



TYPE S3
INTERIOR DOOR - 4TH FLOOR TOILET ROOMS



TYPE S2
INTERIOR DOOR



TYPE S1
INTERIOR DOOR - TYPICAL, U.O.N.

A031 THRESHOLD DETAILS
SCALE: 3" = 1'-0"

DOOR SCHEDULE - UW 4th & 2nd Floor

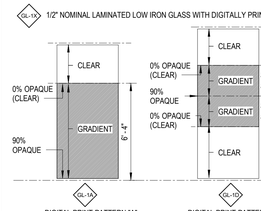
DOOR NUMBER	ROOM NAME	WIDTH	HEIGHT	DOOR TYPE	DOOR MATERIAL	FINISH	GLASS TYPE	FRAME TYPE	FRAME MATERIAL	Door Head	Door Jamb	FRAME FINISH	FIRE RATING	DOOR HARDWARE	REMARKS
2ND FLOOR-DANIELS															
2370	ENTRY	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1	F4	HM	H1	J4	PTD	-	109	
2370A	MEETING ROOM	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1A	F4	HM	H1	J1/J4	PTD	-	114	
2370B	WORK ROOM	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1	F4	HM	H1	J1/J4	PTD	-	114	
2370C	OFFICE	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1A	F4	HM	H1	J1/J4	PTD	-	114	
2370D	OFFICE	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1	F4	HM	H1	J4	PTD	-	106	
2370E	OFFICE	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1	F4	HM	H1	J4	PTD	-	106	
2370F	OFFICE	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1A	F4	HM	H1	J1/J4	PTD	-	114	
2370G	WORK ROOM	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1	F4	HM	H1	J1/J4	PTD	-	115	
2370H	MEETING ROOM	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1A	F4	HM	H1	J1/J4	PTD	-	114	
2370J	MEETING ROOM	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1A	F1	HM	H1	J1	PTD	-	115	
2370K	STORAGE	3' - 0"	7' - 10 1/2"	A	HM	PTD	-	F1	HM	H1	J1	PTD	-	117	
2370L	OFFICE	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1	F4	HM	H1	J4	PTD	-	106	
2370M	OFFICE	3' - 0"	7' - 10 1/2"	C	HM	PTD	GL-1	F4	HM	H1	J4	PTD	-	106	
4TH FLOOR-TOWER															
4400C	STAIR & LIFT	3' - 6"	7' - 0"	B	HM	PTD	GR-180	F1	HM	H1D	H1D	PTD	180 MIN	100	AUTOMATIC OPERATOR, CR
4400TA	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		120	
4400TB	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		118	
4400TC	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		119	
4400TD	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		120	
4400TE	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		120	
4400TF	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		118	
4400TG	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		119	
4400TH	CORRIDOR	4' - 3"	8' - 11 1/2"	A	WD	PTD	-	F5	-	SIM. 1/A038	SIM. 2/A038	-		120	
4403	LAB SUPPORT	4' - 6"	8' - 10"	B2	HM	PTD	GR-45	F1	HM	H2	J2	PTD	45 MIN	101	
4405A	OFFICE	3' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5	J5B	PTD	45 MIN	111	
4405B	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J3/J4	PTD	-	112	
4407	LAB SUPPORT	4' - 6"	8' - 10"	B2	HM	PTD	GR-45	F1	HM	H2	J2	PTD	45 MIN	101	
4409A	OFFICE	3' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5	J5B	PTD	45 MIN	111	
4409B	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J3/J4	PTD	-	112	
4410	R.O. WATER	4' - 6"	8' - 10"	A2	HM	PTD	-	F1	HM	H2	J2	PTD	-	102	
4415	LABORATORY	6' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5B	J5/J5B	PTD	45 MIN	99	
4417A	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1A	F4	HM	H3	J4	PTD	-	107	
4417B	WORK ROOM	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J4	PTD	-	106	
4419A	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1A	F4	HM	H3	J4	PTD	-	107	
4419B	WORK ROOM	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J4	PTD	-	106	
4421A	CONFERENCE ROOM	3' - 0"	8' - 10"	F	HM	PTD	GL-1D	F4	HM	H1	J4	PTD	-	108	
4421B	CONFERENCE ROOM	3' - 0"	8' - 10"	F	HM	PTD	GL-1D	F4	HM	H1	J4	PTD	-	108	
4423A	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1A	F4	HM	H3	J4	PTD	-	107	
4423B	WORK ROOM	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J4	PTD	-	106	
4424	STAIR & LIFT	4' - 0"	7' - 0"	A2	HM	PTD	-	F1	HM	H2A	J2	PTD	-	103	
4425A	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1A	F4	HM	H3	J4	PTD	-	107	
4425B	WORK ROOM	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J4	PTD	-	106	
4428	STORAGE	3' - 0"	7' - 0"	A	HM	PTD	-	F1	HM	H2A	J2	PTD	-	104	
4429	LABORATORY	6' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5B	J5/J5B	PTD	45 MIN	99	
4429A	LABORATORY	3' - 0"	8' - 10"	B	HM	PTD	GR-45	F1	HM	H2	J2	PTD		113	
4429B	LABORATORY	3' - 0"	8' - 10"	B	HM	PTD	GR-45	F1	HM	H2	J2	PTD		113	
4431A	OFFICE	3' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5	J5B	PTD	45 MIN	111	
4431B	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J3/J4	PTD	-	112	
4433	LAB SUPPORT	4' - 6"	8' - 10"	B2	HM	PTD	GR-45	F1	HM	H2	J2	PTD	45 MIN	101	
4435	LAB SUPPORT	4' - 6"	8' - 10"	B2	HM	PTD	GR-45	F1	HM	H2	J2	PTD	45 MIN	101	
4436	WOMEN	3' - 0"	8' - 10"	A	HM	PTD	-	F1	HM	H2A	J2A	PTD		116	10" SSTL KICK PLATE
4439A	OFFICE	3' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5	J5B	PTD	45 MIN	111	
4439B	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J4	PTD	-	112	
4440	MEN	3' - 0"	8' - 10"	A	HM	PTD	-	F1	HM	H2A	J2A	PTD	-	116	10" SSTL KICK PLATE
4443	LAB SUPPORT	4' - 6"	8' - 10"	B2	HM	PTD	GR-45	F1	HM	H2	J2	PTD	45 MIN	101	
4444A	CONFERENCE ROOM	3' - 0"	8' - 10"	F	HM	PTD	GL-1D	F4	HM	H3	J3/J4	PTD	-	110	
4444B	CONFERENCE ROOM	3' - 0"	8' - 10"	F	HM	PTD	GL-1D	F4	HM	H3	J3/J4	PTD	-	110	
4445A	OFFICE	3' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5	J5B	PTD	45 MIN	111	
4445B	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J4	PTD	-	112	
4448	JANITOR	3' - 6"	8' - 10"	A	HM	PTD	-	F1	HM	H2	J2	PTD	-	105	
4449A	OFFICE	3' - 0"	8' - 9"	F	HM	PTD	GR-45	GWS-R1	MFR.SYSTEM	H5	J5B	PTD	45 MIN	111	
4449B	OFFICE	3' - 0"	8' - 10"	C	HM	PTD	GL-1	F4	HM	H3	J4	PTD	-	112	
4451	LAB SUPPORT	4' - 6"	8' - 10"	B2	HM	PTD	GR-45	F1	HM	H2	J2	PTD	45 MIN	101	
E-4400A	STAIR 8	3' - 0"	8' - 10"	A-ETR	HM/ETR	PTD	-	EXISTING	HM/ETR	EXISTING	EXISTING	PTD	90 MIN	117/ ETR	EXISTING DOOR TO REMAIN. PAINT DOOR AND FRAME.
E-4400B	STAIR 9	3' - 0"	8' - 10"	A-ETR	HM/ETR	PTD	-	EXISTING	HM/ETR	EXISTING	EXISTING	PTD	90 MIN	117/ ETR	EXISTING DOOR TO REMAIN. PAINT DOOR AND FRAME.
E-4432	ELECTRICAL	3' - 0"	8' - 10 1/2"	A-ETR	HM/ETR	PTD	-	EXISTING	HM/ETR	EXISTING	EXISTING	PTD	90 MIN	117/ ETR	EXISTING DOOR TO REMAIN. PAINT DOOR AND FRAME.
E-4434	TELE-DATA	3' - 0"	8' - 10 1/2"	A-ETR	HM/ETR	PTD	-	EXISTING	HM/ETR	EXISTING	EXISTING	PTD	90 MIN	117/ ETR	EXISTING DOOR TO REMAIN. PAINT DOOR AND FRAME.

INTERIOR GLASS TYPES

- GL-1 — 1/2" NOMINAL LAMINATED GLASS WITH CLEAR INTERLAYER
- GR-45 — 45 MINUTE, CLEAR FIRE RATED GLASS
- GR-60 — 60 MINUTE, CLEAR FIRE-RATED GLASS
- GR-180 — 180 MINUTE, CLEAR FIRE-RATED GLASS
- AG-1 — 1/4" APPLIED GLASS BACK PAINTED
- AG-2 — 3/8" APPLIED GLASS BACKPAINTED ELEVATOR FRONTS
- AG-3 — 3/8" APPLIED GLASS, WRITEABLE AND MAGNETIC

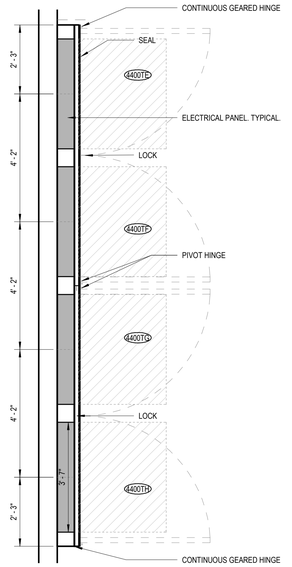
INTERIOR GLASS DIGITALLY PRINTED INTERLAYER

GL-1X — 1/2" NOMINAL LAMINATED LOW IRON GLASS WITH DIGITALLY PRINTED INTERLAYER

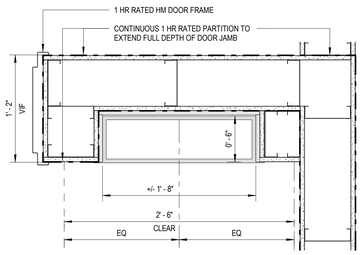


DOOR SCHEDULE GENERAL NOTES

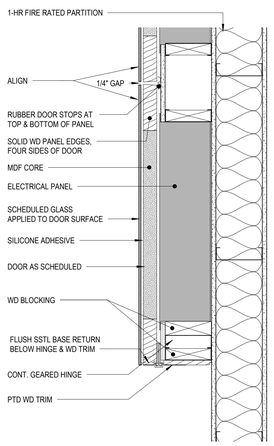
1. REFER TO DOOR SCHEDULE AND SPECIFICATION SECTION 08 71 00 FOR WIDTH, HEIGHT, FINISH AND ADDITIONAL INFORMATION.
2. COORDINATE ALL ROUGH-IN REQUIREMENTS FOR SECURITY AND ELECTRIFIED HARDWARE WITH DOOR AND FRAME MANUFACTURERS PRIOR TO CONSTRUCTION.
3. LOCATE SURFACE AND FRAME-MOUNTED CLOSERS ON NON-PUBLIC SIDE.
4. PROVIDE PAINTABLE SEALANT AT PERIMETER OF FRAMES.
5. HARDWARE NOT SHOWN. REFER TO SCHEDULE, HARDWARE SPECIFICATION 08 71 00 AND APPROVED MANUFACTURERS FOR ADDITIONAL INFORMATION.
6. PROVIDE CONCEALED REINFORCING AT ALL DOORS WITH CLOSERS AND/OR ELECTROMAGNETIC HOLD OPEN DEVICES. NO THRU-BOLT REINFORCING, CLOSERS OR DEVICES.
7. CONTRACTOR SHALL CONFIRM ALL PARTITION TYPES WITH PARTITION SCHEDULE AND FINISHES WITH FINISH SCHEDULE PRIOR TO FABRICATION IN COORDINATION WITH FULL FRAME/WALL ASSEMBLY DEPTHS, INCLUDING FINISHES.
8. NO EXPOSED FASTENERS OR KNOCK-DOWN FRAMES - ALL HOLLOW METAL FRAMES SHALL BE FULLY WELDED AND GROUND SMOOTH.
9. DOOR FRAMES TYPICALLY LOCATED 4" FROM MOST PROXIMATE ADJACENT PERPENDICULAR WALLS, U.O.N.
10. SEE A033 FOR INTERIOR GLASS WALL SYSTEMS.



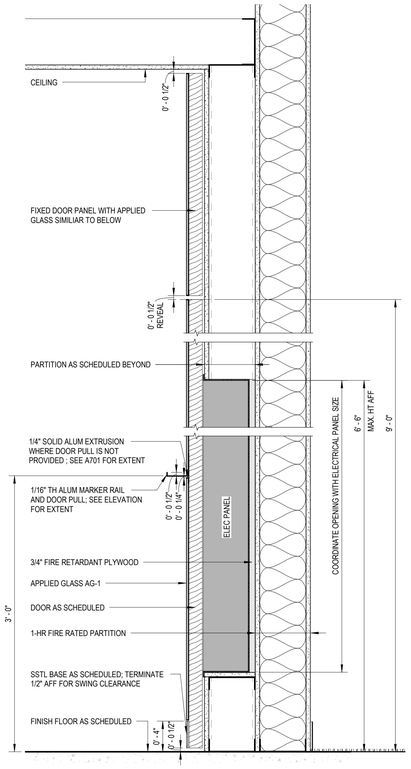
5 / A038 ELECTRICAL PANEL DOORS
SCALE: 1/2" = 1'-0"



3 / A038 ELEC. PANEL AT CORRIDORS
SCALE: 1 1/2" = 1'-0"



2 / A038 TYPICAL ELEC. PANEL DOOR
SCALE: 1 1/2" = 1'-0"



1 / A038 ELEC. PANEL DOOR PULL & BASE
SCALE: 1 1/2" = 1'-0"

STRANG
ARCHITECTURE
ENGINEERING
INTERIOR DESIGN
811 East Washington Ave, Suite 200
Madison, WI 53703
T/ 608.276.9200

Consultant:
ballinger
833 Chestnut Street / Suite 1400
Philadelphia, PA 19107
215.440.0800 / t
215.440.0801 / f
ballinger.com

KEY PLAN

The Board of Regents of the University of Wisconsin on behalf of the University of Wisconsin - Madison

Project Address:
Project Address

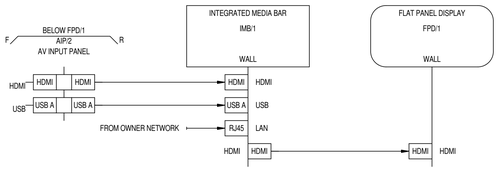
Project Title:
CHEMISTRY 2ND AND 4TH FLOOR LAB RENOVATION
Agency / Institution:
UNIVERSITY OF WISCONSIN-MADISON

Sheet Title:
DOOR SCHEDULE, TYPES, & DETAILS

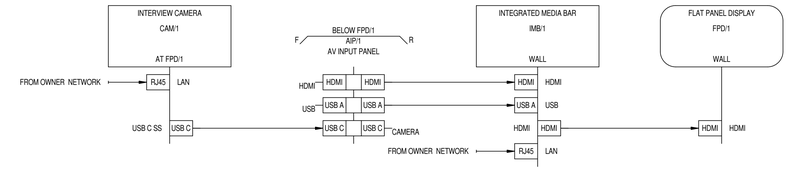
Revisions

No.	Date:	Description:
1	9/15/2023	ADDENDUM NO. 1

Graphic Scale	VARIES
UWS#	A-22-015
Set Type	BD
Date Issued	08/24/2023
Sheet Number	A038



2 AV609 **FACULTY WORK ROOMS - SYSTEM DIAGRAM**
SCALE: NTS



1 AV609 **DANIELS MEETING ROOMS - SYSTEM DIAGRAM**
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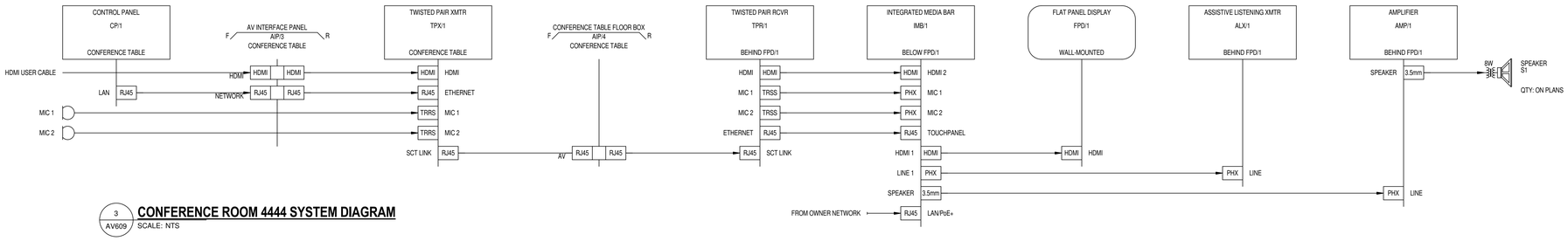

3 AV609 **CONFERENCE ROOM 4444 SYSTEM DIAGRAM**
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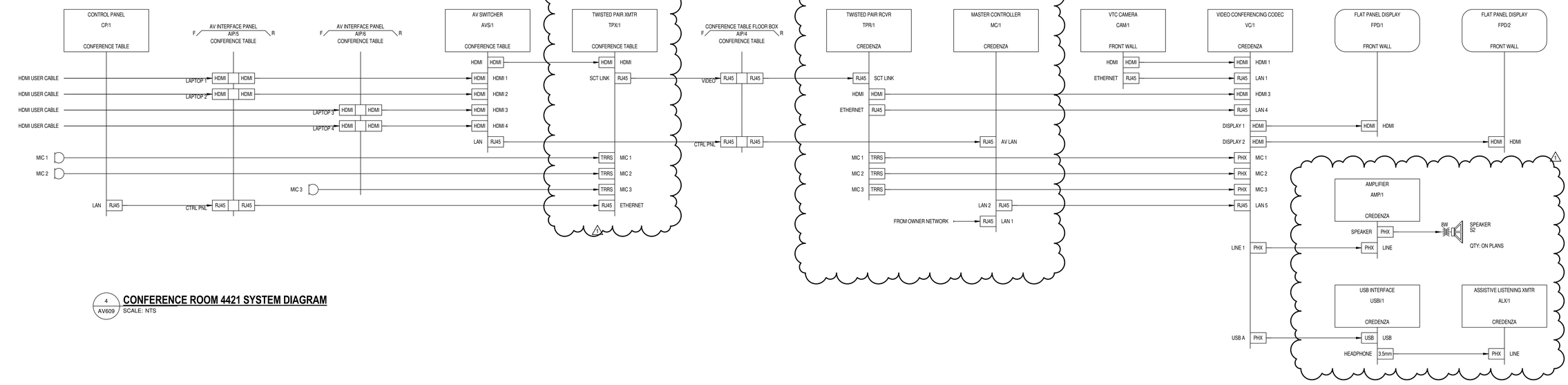

4 AV609 **CONFERENCE ROOM 4421 SYSTEM DIAGRAM**
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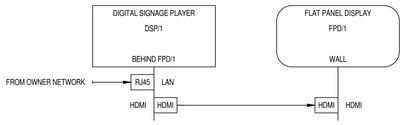

5 AV609 **DIGITAL SIGNAGE - SYSTEM DIAGRAM**
SCALE: NTS

STRANG
ARCHITECTURE
ENGINEERING
INTERIOR DESIGN
811 EAST WASHINGTON AVE
MADISON, WI 53703
T/ 608 276 9200

KEY PLAN

Consultant:
Affiliated Engineers
Affiliated Engineers, Inc.
5802 Research Park Boulevard
Madison, Wisconsin 53719
Tel 608.238.2616 Fax 608.238.2614

The Board of Regents of the University of Wisconsin on behalf of the University of Wisconsin - Madison

Project Address:
1101 UNIVERSITY AVENUE
MADISON, WI 53706-1322

Project Title:
CHEMISTRY 2ND AND 4TH FLOOR LAB RENOVATION
Agency / Institution:
UNIVERSITY OF WISCONSIN-MADISON

Sheet Title:
SYSTEM DIAGRAMS

Revisions

No.	Date:	Description:
1	09/15/2023	ADDENDUM #001

Graphic Scale	0 4 8
UWSA#	A-22-015
Set Type	BD
Date Issued	08/24/2023
Sheet Number	AV609

STRANG

UW Chemistry 2nd/4th Lab Renovation

Name	Firm	email	Discipline
Daniel Hale	Strang	dhale@strang-inc.com	Design
Dave Meinzer	AEI	dmeinzer@aeieng.com	Design
Melissa Christie	AEI	mchristie@aeieng.com	Design
Jim Gormley	NAMI	JGormley@NAMIINC.com	Plumbing
Kevin Powers	NAMI	KPowers@namiinc.com	HVAC
Nick Schuch	Vogel Bros.	NSchuch@VogelBldg.com	GC
Nick Wiesbrock	Pepper Con.	nwiesbrock@pepperconstruction.com	GC.
Mark Burt	Miron	mark.burt@miron-construction.com	GC
Jared McDaniel	Pepper Const	jmcdaniel@pepperconstruction.com	GC
Megan McBride	UW Facilities	megan.mcbride@wisc.edu	PM
Jeff Nielsen	UW Chemistry	jnielsen@chem.wisc.edu	Building Manager
John Moore	UW Chemistry	jwmoore@chem.wisc.edu	Professor
Lou Olson	Findorff	Lolson@findorff.com	GC
Will Kleckner	UW	Will.Kleckner@wisc.edu	
Ashley Scholz	Daniels	ashley.scholz@danielsco.com	GC