OFFICE OF PROCUREMENT
ICE STORAGE MODULES REPLACEMENT, TAKOMA PARK/SILVER SPRING CAMPUS
RFP NO.: 625-005
RFP CLOSING DATE AND TIME: DECEMBER 6, 2024 @ 2:00 PM

ADDENDUM #3
Issued: NOVEMBER 26, 2024

THE PURPOSE OF ADDENDUM IS TO PROVIDE ANSWERS TO THE REQUEST FOR CLARIFICATIONS TO THE RFP DOCUMENTS.

Question 1: Is the existing CMU wall grouted solid?
Answer: Existing drawings furnished by the College indicate that wall is reinforced @ 8" oc and fully grouted to 2'-0" above the ice storage slab. Above this point the corners and every 4th cell are reinforced and grouted. There is also a reinforced and grouted bond beam at all door and louver openings. This information is based on the existing structural drawings and has not been verified in the field.

Question 2: Could we provide two smaller openings (approx. 16' wide x 11' high) in front of Modules 2 & 5 in lieu of the 30'-6" wide x 20' high opening?
Answer: NO- bid as designed.

Question 3: Do we need to provide GPR scanning of the CMU wall before saw cutting?
Answer: Not a structural requirement if the wall is removed full height as indicated on the drawings.

Question 4: At the pre-bid site walk there was discussion, due to equipment lead times and load on the system of shutting the plant down entirely in the Fall/Winter of 2025 to complete the work in the Ice Store Module plant.
Answer: The final construction schedule shall be coordinated with The College and the awarded contractor.

Question 5: It was also discovered that Modules 1 & 6 are offline. That will impact the original schedule sequencing as detailed in the specifications as it will not allow for 3 modules to stay online at a given time.
Answer: The contractor shall coordinate the ice module outages with The College. The allowable number of tanks to remain online shall be based on the final construction schedule.

Question 6: Please confirm Fall/Winter 2025 as the time frame to complete the project.
Answer: The College intends to issue a letter of "Intent to Award" to the successful bidder prior to the bid award by the Board of Trustees in January/February, 2025. This will provide ample opportunity for the successful bidder to purchase the ice modules with an intended delivery date of May/June and an installation of Summer 2025.

MONTGOMERY COLLEGE

OFFICE OF PROCUREMENT
ICE STORAGE MODULES REPLACEMENT, TAKOMA PARK/SILVER SPRING CAMPUS
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Question 7: Two of the existing tanks are no longer operational, one has definitely has been cut open and drained, the other is assumed drained. As such, these two units (~790 gallons each) will require new glycol. Please confirm this is required.

Answer: Yes, this is required. The contractor shall assume new glycol in order to turn over the complete system.

Question 8: Is there a passivation requirement for the tank? Please provide requirements and who is responsible.

Answer: Per 236510 Section 3.1, K; the tanks shall be pretreated with a factory authorized method to passivate the tanks and provide protection from corrosion and biological attack. Tanks shall be pretreated by the chemical treatment vendor or onsite by the factory.

Question 9: For the Inline Refractometers, is the intent to provide one per tank or one for the entire system?

Answer: Provide one inline refractometer installed on the main piping header.

All other specifications, terms and conditions remain unchanged.

Sections or Portions Reissued in Entirety
NONE

Drawings
NONE

Sketches
NONE

Items Issued for Informational Purposes
NONE

Patrick Johnson, MBA
Director of Procurement

OFFICE OF PROCUREMENT
ICE STORAGE MODULES REPLACEMENT, TAKOMA PARK/SILVER SPRING CAMPUS
RFP NO.: 625-005
RFP CLOSING DATE AND TIME: DECEMBER 6, 2024 @ 2:00 PM

ADDENDUM #3
Issued: NOVEMBER 26, 2024

Please **sign** below to acknowledge receipt of this Addendum and return with the **Technical Proposal submission.** Failure to return this Acknowledgement of Addendum may deem a proposal nonresponsive.

NOTE: ACKNOWLEDGEMENT OF RECEIPT OF RFP ADDENDA WILL NOT BE ACCEPTED BY FACSIMILE OR E-MAIL.

_____	_____
Company Name	Authorized Signature
_____	_____
Date	Printed/Typed Signature

OFFICE OF PROCUREMENT
ICE STORAGE MODULES REPLACEMENT, TAKOMA PARK/SILVER SPRING CAMPUS
RFP NO.: 625-005
RFP CLOSING DATE AND TIME: DECEMBER 6, 2024 @ 2:00 PM

ADDENDUM #2
ISSUED: NOVEMBER 25, 2024

THE PURPOSE OF ADDENDUM IS TO CORRECT REQUEST FOR CLARIFICATION SECTION OF THE RFP DOCUMENT:

Request for clarifications from perspective Offerors must be submitted in writing no later than **5:00 p.m., on Monday, November 25, 2024**. All questions related to this solicitation shall be directed to Yu (Judy) Zhu, Purchasing Manager via email to yu.zhu@montgomerycollege.edu. Only answers provided via a written addendum issued by the College will be binding.

All other specifications, terms and conditions remain unchanged.

Sections or Portions Reissued in Entirety
NONE

Drawings
NONE

Sketches
NONE

Items Issued for Informational Purposes
NONE

Patrick Johnson, MBA, CPPB
Director of Procurement

Please **sign** below to acknowledge receipt of this Addendum and return with the **Technical Proposal submission.**

Failure to return this Acknowledgement of Addendum may deem a proposal nonresponsive.

NOTE: ACKNOWLEDGEMENT OF RECEIPT OF RFP ADDENDA WILL NOT BE ACCEPTED BY FACSIMILE OR E-MAIL.

_____	_____
Company Name	Authorized Signature
_____	_____
Date	Printed/Typed Signature

OFFICE OF PROCUREMENT
ICE STORAGE MODULES REPLACEMENT, TAKOMA PARK/SILVER SPRING CAMPUS
RFP NO.: 625-005
RFP CLOSING DATE AND TIME: DECEMBER 6, 2024 @ 2:00 PM

ADDENDUM #1
ISSUED: NOVEMBER 12, 2024

THE PURPOSE OF ADDENDUM IS TO MAKE THE CHANGE TO THE RFP DOCUMENTS:

Item 1-1 Section Part 2.1.A Manufacturers, Page 236510-2, delete "or approved equal" after "Baltimore Air Coil Thermal Storage Unit".

All other specifications, terms and conditions remain unchanged.

Sections or Portions Reissued in Entirety
NONE

Drawings
NONE

Sketches
NONE

Items Issued for Informational Purposes
NONE

Patrick Johnson

Patrick Johnson, MBA, CPPB
Director of Procurement

Please **sign** below to acknowledge receipt of this Addendum and return with the **Technical Proposal submission.**

Failure to return this Acknowledgement of Addendum may deem a proposal nonresponsive.

NOTE: ACKNOWLEDGEMENT OF RECEIPT OF RFP ADDENDA WILL NOT BE ACCEPTED BY FACSIMILE OR E-MAIL.

_____ _____
Company Name Authorized Signature

_____ _____
Date Printed/Typed Signature

Request for Proposal

RFP No.: 625-005
Ice Storage Modules Replacement
Takoma Park/Silver Spring Campus

Project No.: FP19-154

Issue Date: November 6, 2024
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

TABLE OF CONTENTS

DRAWING INDEX

APPENDIX A

APPENDIX B

END OF TABLE OF CONTENTS

MONTGOMERY COLLEGE

Procurement Office, Central Services
9221 Corporate Boulevard
Rockville, Maryland 20850
Phone: (240) 567-5292

REQUEST FOR PROPOSAL

No. **625-005**

DATE ENTERED	BID CLASS	PAGE of

THIS IS NOT AN ORDER

MONTGOMERY COLLEGE

REQUEST FOR PROPOSAL
RFP NO.: 625-005

ICE STORAGE MODULES REPLACEMENT
TAKOMA PARK/SILVER SPRING CAMPUS
(State of Maryland Prevailing Wage Requirements Apply)

It is the intent of this Request for Proposal (RFP) to provide Montgomery College with construction services to replace the six (6) existing ice storage modules at the West Garage building on the Takoma Park/Silver Spring campus, located at 7600 Takoma Avenue Takoma Park, MD 20912, in accordance with the terms, conditions, and specifications described herein.

This RFP will be conducted by using a single step two-envelope bidding procedure. Offerors shall submit their Technical Proposals (Part A) and Price Proposals (Part B) in two separate and sealed envelopes/boxes simultaneously. One original hard copy of the complete Technical Proposal submission with original ink signatures, plus one electronic version of complete Technical Proposal submission saved as PDF on a separate clearly marked USB flash drive; and one original and one hard copy of Price Proposal submission are required.

Complete SEALED offers comprising Technical Proposals and Price Proposals must be delivered and received by the Montgomery College Procurement Office located at **9221 Corporate Blvd., Rockville, Maryland 20850** on or before **2 p.m. on December 6, 2024**. Proposals will not be accepted if sent by facsimile or electronic mail, or if received after the closing date and time.

Proposals must remain valid for **ninety (90) days** from the proposal closing date and prior to contract award. Upon contract award, prices must remain firm for the duration of the overall contract term.

All required submissions must accompany each proposal. Incomplete proposals may be deemed non-responsive and will not be considered further.

An electronic PDF version of RFP documents can be downloaded from the Montgomery College Procurement website at http://www.montgomerycollege.edu/procure/ on or after **November 6, 2024.**

A Pre-Proposal Conference will be held at 10:00 a.m. on November 12, 2024, in **Room 422, Health Sciences Center (HC), 7600 Takoma Avenue Takoma Park, Maryland 20912.** Attendance by Contractors is strongly encouraged. **A site inspection opportunity will be provided right after the Pre-Proposal meeting.** Site examination is **mandatory** and verification of the examination by a College representative is required.

Request for clarifications from perspective Offerors must be submitted in writing no later than **5:00 p.m., on November 2024**. All questions related to this solicitation shall be directed to Yu (Judy) Zhu, Purchasing Manager via email to yu.zhu@montgomerycollege.edu. Only answers provided via a written addendum issued by the College will be binding.

Proposal submission will be evaluated by a College Evaluation Committee. Evaluation will be based on the substantiated ability of the Offerors to perform the required construction services described in the RFP documents, and the Offeror's responsiveness to Technical Proposal and Price Proposal requirements. Technical Proposals will be opened first and reviewed. Price Proposals from only those Offerors deemed qualified following the review of the Technical Proposals, will then be opened and reviewed. Price Proposals from those Offerors deemed not qualified by the College after the review of the Technical Proposals will not be opened. An award will be recommended in the best interest of the College to the Offeror

achieved the highest combined scores of technical and price proposal evaluations, who can meet or exceed the terms, conditions, and specifications of this solicitation, including project delivery requirements.

Bid and Performance Security Requirements apply as follows:

Bid Bond Requirements:	**not less than 5% of the total bid amount, including all add alternates, but excluding all deduct alternates is required for bidding, if the total base bid amount exceeds $100,000.**
Performance, Labor and Material Bonds requirements:	**100% Performance and 100% Labor and Material Payment Bonds** upon signature of the Contract.

Insurance certificate and other required documents after the contract award, and prior to start of any work.

State of Maryland Prevailing Wage law requirements are applicable to the project.

Minority firms are encouraged to respond to this solicitation.

IMPORTANT: YOUR PROPOSAL WILL BE JEOPARDIZED IF ANY PORTION OF THIS INQUIRY IS NOT COMPLETE. NO PROPOSAL WILL BE ACCEPTED AFTER THE DATE AND TIME STATED ABOVE.

Judy Zhu on behalf of

Patrick L. Johnson, MBA, CPPB
Director of Procurement

NOTE: Prospective Offerors who have received this document from a source other than the Procurement Office should immediately contact the Procurement Office and provide their name and e-mail address so that amendments to the Bid/RFP or other communications can be sent to them. Failure to contact the Procurement Office may result in non-receipt of important information.

REGISTRATION OF CORPORATIONS NOT REGISTERED IN THE STATE OF MARYLAND Pursuant to 7-202 et. Seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201 before doing any interstate or foreign business in this State. **Corporations must be registered, and in good standing no later than proposal submittal deadline date**. A copy of the registration or application for registration may be requested by the College.

CONDITIONS AND INSTRUCTIONS

1. ADDITIONAL ORDERS: Unless it is specifically stated to the contrary in the bid response, the College reserves the option to place additional orders against a contract awarded as a result of this solicitation at the same terms and conditions, if it is mutually agreeable.

2. APPLICABLE LAW: This contract shall be construed and interpreted according to Maryland law.

3. ASSURANCE OF NON-CONVICTION OF BRIBERY: The bidder hereby declares and affirms that, to its best knowledge, none of its officers, directors or partners and none of its employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery or conspiracy to bribe under the laws of any state or the Federal government.

4. AUDIT: Bidder shall permit audit and fiscal and programmatic monitoring of the work performed under any contract issued from this solicitation. The College shall have access to and the right to examine and/or audit any records, books, documents and papers of bidder and any subcontractor involving transactions related to this Agreement during the term of this Agreement and for a period of three (3) years after final payment under this Agreement.

5. AWARD CONSIDERATIONS: Awards of this bid will be made to the lowest responsible bidder conforming to specifications with consideration being given to quantities involved, time required for delivery, purpose for which required, responsibility of bidder and its ability to perform satisfactorily with consideration to any previous performance for Montgomery Community College. A bid may be awarded at the sole discretion of the College in the best interest of the College. Prompt payment discounts will not be considered in bid evaluation. All discounts other than prompt payment are to be included in bid price.

6. BID AND PERFORMANCE SECURITY: If bid security is required, a bid bond or cashier's check in the amount indicated on the bid cover must accompany each bid and be made payable to Montgomery Community College. Corporate or certified checks are not acceptable. Bonds must be in a form satisfactory to the College and underwritten by a company licensed to issue bonds in the State of Maryland. If bid security fails to accompany the bid, it shall be deemed unresponsive, unless the Director of Procurement deems the failure to be nonsubstantial. Such bid bonds or checks will be returned to all except the three (3) lowest bidders within five (5) days after the opening of bids, and the remaining checks or bid bonds will be returned to all but successful bidder(s) within forty-eight (48) hours after award of contract. If a performance bond is required, the successful bidder must submit an acceptable performance bond in the designated amount of the bid award, prior to award of contract. All bid bonds will be returned to the successful bidder(s) within fortyeight (48) hours after receipt of the performance bond.

7. BRAND NAMES: Brand name materials used in these specifications are known and acceptable. Bids including proposals to use alternate brands are invited as long as they are of equal type and equal or better quality. The burden of proof that alternate brands are in fact equal or better falls on the bidder, and proof must be to the College's satisfaction.

8. COMPLIANCE WITH LAWS: Bidder agrees to comply, at no additional expense, with all applicable Executive orders, Federal, State, bi-county, regional and local laws, ordinances, rules and regulations in effect as of the date of this Agreement and as they may be amended from time to time, including but not limited to the equal employment opportunity clause set forth in 41 CFR 60-250.4.

9. CONTINGENT FEES: Bidder hereby declares and affirms that neither it nor any of its representatives has employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the bidder, to solicit or secure a contract, and that it has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or any other consideration contingent on the making of a contract as a result of this solicitation.

10. DELIVERY AND PACKING: All prices quoted must include delivery. All goods delivered under this contract shall be packed in accordance with accepted trade practices. No charges may be made over and above the bid price for packaging, or for deposits or containers unless specified in the bid. No charge will be allowed for cartage unless by prior written agreement. Complete deliveries must be made by the successful bidder to the designated location as indicated on the Montgomery Community College purchase order. A packing slip shall be included in each shipment. All deliveries must be prepaid and must be delivered to each location designated on purchase order at no additional cost. DELIVERIES MUST BE MADE TO THE SPECIFIED LOCATION. NO COLLECT SHIPMENTS OR SIDEWALK DELIVERIES WILL BE ACCEPTED.

11. DELIVERY OF BIDS: Sealed bids must be received in the Procurement Office by the date and time specified in the bid in order to be considered. NO LATE BIDS OR PROPOSALS WILL BE ACCEPTED. Late bids will be returned to the bidder unopened. Bids submitted by mail must be addressed to the Procurement Office, Montgomery College, P.O. Box 1006, Rockville, Maryland 20850, and clearly marked to indicate the bid number, title and opening date. Hand delivered bids will be accepted only at the Procurement Office, Montgomery College Central Administrative Center, located at 9221 Corporate Boulevard, Rockville, Maryland 20850.

12. DISPUTES: Any dispute arising under a contract awarded as a result of this bid which is not disposed of by agreement shall be decided by the President of the College or designee. Pending the final decision of the dispute, contractor shall proceed with the contract performance. Nothing hereunder shall be interpreted to preclude the parties from seeking after completion of the contract any and all remedies provided by law.

13. ERRORS IN BIDS: Bidders are assumed to be informed regarding conditions, requirements, and specifications prior to submitting bids. Failure to do so will be at the bidder's risk. Bids already submitted may be withdrawn without penalty prior to bid opening. Errors discovered after bid opening may not be corrected. In the case of an error in price extension, the unit price will govern. The intention of the bidder must be evident on the face of the bid.

14. HAZARDOUS AND TOXIC SUBSTANCES: Bidder must comply with all applicable Federal, State, County and bi-county laws, ordinances and regulations relating to hazardous and toxic substances, including such laws, ordinances and regulations pertaining to access to information about hazardous and toxic substances, and as amended from time to time. Bidder shall provide the College with a "Material Safety Data Sheet" or in the case of a controlled hazardous waste substance, a hazardous waste manifest for all hazardous chemicals listed or subsequently added to the Chemical Information List in compliance with applicable laws, ordinances and regulations.

15. INSPECTION OF PREMISES: If a site visit is recommended or required, each bidder is responsible to visit the site(s) prior to submitting a bid in order to observe the existing conditions affecting the work, and to obtain precise dimensions of the area(s) involved. No allowance will be made to the successful bidder, at a later date, for additional work required because of his or her failure to visit the site and/or to obtain the exact dimensions. Discrepancies, if any, must be reported to the College.

16. INSURANCE: If a contract results from this bid, the contractor shall maintain such insurance as will indemnify and hold harmless the College from Workmen's Compensation and Public Liability claims for property damage and personal injury, including death, which may arise from the contractor's operations under this contract, or by anyone directly or indirectly employed by him/her.

17. MARYLAND PUBLIC INFORMATION ACT: Bidder recognizes that the College is subject to the Maryland Public Information Act, Title 10 of the State Government Article of the Annotated Code of Maryland. Bidder agrees that it will provide any justification as to why any material, in whole or in part, is deemed to be confidential, proprietary information or trade secrets and provide any justification of why such materials should not be disclosed pursuant to the Maryland Public Information Act.

18. NON-ASSIGNMENT AND SUBCONTRACTING: Bidder shall not assign any contract or any rights or obligations hereunder without obtaining prior written consent of the College. No contract shall be made by bidder with any other party for furnishing the services to be performed under a contract issued from this solicitation without the written approval of the College. These provisions will not be taken as requiring the approval of the contract of employment between bidder and its personnel.

19. NON-COLLUSION: Bidder certifies that it has neither agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the bid or offer being submitted herewith; bidder also certifies that it has not in any manner, directly or indirectly, entered into any agreement, participated in any collusion to fix the bid price or price proposal of the bidder or offeror herein or any competitor, or otherwise taken any action in restraint of free competitive bidding in connection with the contract for which the within bid or offer is submitted.

20. NON-DISCRIMINATION: Bidder assures the College that, in accordance with applicable law, it does not, and agrees that it will not discriminate in any manner on the basis of sex, race, age, color, creed, national origin, religious belief, handicap, marital status, or status as a disabled veteran or veteran of the Vietnam era. Bidder further agrees to post in conspicuous places notices setting forth the provisions of the nondiscrimination clause and to take affirmative action to implement the provisions of this section. Bidder further assures the College that, in accordance with the Immigration Reform and Control Act of 1986, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or in the case of a citizen or intending citizen, because of such individual's citizenship status.

21. PATENTS: Bidder guarantees that the sale and/or use of the goods offered will not infringe upon any U.S. or foreign patent. Bidder will at his/her own expense, indemnify, protect and save harmless the College, its trustees, employees, agents and students with respect to any claim, action, cost or judgment for patent infringement, arising out of the purchase or use of these goods.

22. PREPARATION OF BID: Bids submitted must be hand signed by an authorized agent of the company submitting the bid. Notification of award will be made by "Notice of Intent to Award" and/or purchase order. A bidder may attach a letter of explanation to the bid for clarification. Bidders will be required, if requested by Montgomery Community College, to furnish satisfactory evidence that they are, in fact, bona fide manufacturers of or dealers in the items listed, and have a regularly established place of business. The College reserves the right to inspect any bidder's place of business prior to award of contract to determine bidder responsibility.

23. PRODUCT TESTING DURING TERM OF CONTRACT: Goods delivered under any contract resulting from this Request for Bid may be tested for compliance with specifications stipulated herein. Any shipment failing to meet or comply fully with the specification requirements will be rejected. The cost of testing a representative sample of an order or shipment for acceptance shall be borne by the College unless the order is rejected for failure to meet specifications or purchase description. In such cases of rejection, the cost of testing will be charged back to the vendor.

24. RECORD RETENTION: If awarded a contract, vendor shall maintain books and records relating to the subject matter of this Agreement, including but not limited to all charges to the College, for a period of three (3) years from the date of final payment under this Agreement.

25. REJECTIONS AND CANCELLATIONS: Montgomery Community College reserves the right to accept or reject any or all bids in whole or in part for any reason. The College reserves the right to waive any informalities and to make awards in the best interest of the College. The College also reserves the right to reject the bid of any bidder who has previously failed to perform adequately on a prior award for furnishing goods and/or services similar in nature to those requested in this bid. The College may cancel this solicitation in whole or in part, in its sole discretion.

26. RIDER PROVISION FOR MONTGOMERY COUNTY PUBLIC SCHOOLS AND MONTGOMERY COUNTY: The bidder agrees when submitting the bid that it will make available to every office and department of the Montgomery County Public Schools and the Montgomery County Government the same bid prices, terms and conditions offered during the term of contract. Orders will be placed directly by these agencies. There will be no penalty if bidder notes exception to this provision in the bid offered.

27. SAMPLES AND CATALOG CUTS: If samples are required, bidder shall be responsible for delivery of samples to location indicated. All sample packages shall be marked "Sample for Procurement Office, Bid No. ___" and each sample shall be tagged or marked. Failure of the bidder to clearly identify samples as indicated may result in rejection of bid. The College reserves the right to test any materials, equipment or supplies delivered to determine if the specifications have been met. Samples will not be returned.

28. SIGNATURE: Each bid must show the full business address and telephone number of the bidder and be signed by the person or persons legally authorized to sign such contracts. All correspondence concerning the bid and contract, including the bid summary, copy of contract, and purchase order, will be mailed or delivered to the address shown on the bid. NO BID WILL BE ACCEPTED WITHOUT ORIGINAL SIGNATURE.

29. TAXES: The College is exempt from Federal and Maryland taxes. Exemption Certificates are available upon request. Bidder shall be responsible for the payment of any and all applicable taxes resulting from any award and/or any activities hereunder, including but not limited to any applicable amusement and/or sales taxes.

30. TERMINATION BASED ON LACK OF FUNDING: Any contract awarded as a result of this solicitation will be subject to funding and continued appropriation of sufficient funds for the contract. For purposes of this solicitation, the College's appropriating authority is deemed to be the Board of Trustees of Montgomery Community College. Insufficient funds shall be grounds for immediate termination of this solicitation.

31. TERMINATION FOR DEFAULT: If an award results from this bid, and the contractor has not performed or has unsatisfactorily performed the contract, payment shall be withheld at the discretion of the College. Failure on the part of the contractor to fulfill contractual obligations shall be considered just cause for termination of the contract and the contractor is not entitled to recover any costs incurred by the contractor up to the date of termination.

32. TERMINATION FOR THE CONVENIENCE OF THE COLLEGE: The performance of the work or services under a contract as a result of this solicitation may be terminated in whole or in part, whenever the President of Montgomery Community College shall deem that termination is in the best interest of the College. Such determination shall be in the sole discretion of the President. In such event, the College shall be liable only for payment in accordance with the payment provisions of the contract for work or services performed or furnished prior to the effective date of termination. Termination hereunder shall become effective by delivery to contractor of written notice of termination upon which date the termination shall become effective.

33. WARRANTY: Bidder expressly warrants that all articles, material and work offered shall conform to each and every specification, drawing, sample or other description which is furnished to or adopted by the College and that they will be fit and sufficient for the purpose intended, merchantable, of good material and workmanship, and free from defect. Such warranty shall survive a contract and shall not be deemed waived either by the College's acceptance of said materials or goods, in whole or in part, or by payment for them, in whole or in part. The bidder further warrants all articles, material and work performed for a period of one year, unless otherwise stated, from date of acceptance of the items delivered and installed, or work completed. All repairs, replacements or adjustments during the warranty period shall be at bidder's sole expense.

INSTRUCTIONS TO CONTRACTORS

PART 1 - RFP AND AWARD SCHEDULE

1.1 REQUEST FOR PROPOSAL SCHEDULE

It is the College's intent to administer the Request for Proposal process for this project according to the schedule dates outlined below. The College reserves the right to alter schedule dates as may be determined necessary in the College's best interests.

November 6, 2024	Advertised on eMaryland Marketplace and RFP Documents Available on the College Procurement Website
November 12, 2024	Pre-Proposal Meeting and Site Visit
November 22, 2024	Last Date to Submit Requests for Information by 5:00 p.m.
December 6, 2024	**Submission of Technical Proposal and Price Proposal due at 2:00 p.m.**
January 22, 2025	Proposal Evaluation Process Concludes and Recommendation of Award to be approved by the College Board of Trustees

1.2 AWARD SCHEDULE

It is the College's intention to seek approval of award recommendation by the College Board of Trustees at the **January 22, 2025** meeting, and the award is subject to approval by the Board of Trustees.

Notice to proceed will be timely provided upon receipt of documentation and information required from the Contractor before the start of work including, but not limited to, performance, payment, labor and material payment bonds and Insurance certificates.

Notwithstanding these expectations, the College may require additional time to administer the contract award or other processes. To accommodate this possibility, prices must remain firm for ninety (90) days from the proposal due date. Anticipated Contract Award date, Notice to Proceed date and project scheduling expectations may be adjusted in concert with this provision. It is the Contractor's sole responsibility to ensure their price proposal response accommodates this requirement.

PART 2 - PRE-PROPOSAL CONFERENCE

2.1 A Pre-Proposal Conference will be held at **10:00 am, November 12, 2024,** in **Room 422 of Health Sciences Center (HC)** on the Takoma Park/Silver Spring Campus located at 7600 Takoma Avenue Takoma Park, Maryland 20912**.** Attendance by Contractors is strongly encouraged but is not required. A mandatory site inspection opportunity will be provided immediately following the Pre-Proposal Conference. Contractors will be able to satisfy the required Verification of Examination of Site Conditions obligation associated with this proposal by attending that site inspection.

A campus map showing the location of the Pre-Proposal meeting is in Appendix A.

It is each Offeror's responsibility to become familiar with all information necessary to prepare a proposal. Failure to do so will not relieve the successful Offeror of the obligation to carry out the provisions of the Contract. Data in the RFP documents pertaining to existing conditions and site locations is for convenience only to inform Offerors of the existing building conditions.

PART 3 - RFP DOCUMENTS

3.1 RFP documents include the Invitation Letter of RFP, Instructions to Contractors, Supplementary Instructions to Contractors, Required Submissions, Information Available to Contractors, ,Technical Proposal Form, Price Proposal Form and attachments thereto, Bid Bond, Verification of Examination of Site Conditions, Contractor's Qualification Statement, Subcontractor Information Form, Minority Participation Form, Procurement Office Questionnaire, Conflict of Interest Statement, Non-Debarment Acknowledgement, Montgomery College Standard Performance Bond, Labor and Material Payment Bonds, Application and Certificate for Payment, Montgomery College Standard Form of Contract, Montgomery College General Conditions of the Contract, Montgomery College Supplementary Conditions of the Contract, Specifications, Drawings, State of Maryland Prevailing Wage Rates Determination and all Addenda if applicable.

3.2 An electronic PDF of the RFP documents can be downloaded from the College Procurement website at http://www.montgomerycollege.edu/procure/ .

3.3 Montgomery College is not responsible for content of and/or information obtained from sources not listed in the RFP. Only information obtained through the College's Procurement Office, on its website or from sources listed in the RFP should be considered reliable. It is highly recommended that Offerors obtain all information pertaining to this RFP from the College's Procurement website at http://www.montgomerycollege.edu/procure/ and those sources referred to in the RFP document. It is the Offeror's responsibility to assure that accurate information has been used in preparation of their proposal response.

PART 4 - SITE EXAMINATION

4.1 A site examination opportunity will be provided at the project site on **November 12, 2024**, right after the Pre-Proposal Meeting. Additional site visit may be accommodated no later than **November 22, 2024** by contacting Alan Yanaway, Project Manager, via email to Alan.yanaway@montgomerycollege.edu

4.2 Potential Contractors shall thoroughly examine and investigate existing site conditions that may affect their pricing proposals, prior to proposal submission. Site examination is mandatory and verification of the examination by a college representative is required. The price proposal shall be firm and final, no adjustments shall be granted at a later date, if contractors fail to account for site variances.

4.3 Contractors MUST attach the Verification of Examination of Site Conditions form, which is included in Section 004400 and is to be signed by an authorized College Representative upon the completion of site examination and include it in the Technical Proposal (Part A) submission.

4.4 Proposal submission shall serve as verification that, at the time of receipt of the proposal by the College, the Contractor has inspected the site and has read and is thoroughly familiar with the RFP documents (including all Addenda); has examined and finds the Specifications and the Drawings adequate; and agrees that given what the Specifications and Drawings require, in any part of the Work, the required result can be produced. Failure or omission of a Contractor to inspect the site or to

examine any form, instrument or document shall in no way relieve a Contractor from obligations with respect to their Proposal.

4.5 Data in the RFP documents pertaining to existing conditions is for convenience only and does not supplant obtaining first-hand information at the site. Submission of proposals shall constitute acceptance by the Contractor of existing site conditions as a part of the requirements for this work.

PART 5 - INTERPRETATION OR CORRECTION OF RFP DOCUMENTS

5.1 The RFP documents should be examined carefully. Should any Contractors find discrepancies or omissions in the solicitation documents, or be in doubt as to the meaning of any item(s), Request for Clarification related to RFP documents shall be submitted to Yu (Judy) Zhu, Purchasing Manager, via email to yu.zhu@montgomerycollege.edu.

5.2 Contractors shall be responsible for reviewing and coordinating the submission of clarifications requested by Subcontractors or Vendors. Clarification requests made directly by Subcontractors or Vendors will not be accepted by the College.

5.3 Request for Clarifications must be submitted by email no later than **5:00 p.m. on November 22, 2024.**

5.4 No oral interpretation of the meaning of the RFP documents will be made to any Contractor, and oral responses or oral interpretations will not be binding in any way to modify or change any requirement in the RFP documents.

5.5 The College will review the written questions and requests for clarification, if any, and all such interpretations and any supplemental instructions will be issued in the form of written Addenda to the RFP. Any issued Addenda may be obtained by downloading the file from the College's Procurement website http://www.montgomerycollege.edu/procure at no charge.

5.6 All Addenda shall become part of the RFP documents.

5.7 Notification regarding addenda posted at the above referenced website will be provided by email, to all Contractors who are known by the College to have received a complete set of Proposal Documents by downloading the RFP from the College's Procurement website and who have provided an accurate current e-mail address. To ensure that an accurate notification attempt can be made, and is delivered to the appropriate contact person, the College requests the Contractor register one person's contact information with the College's website. The College will make a good faith, one-time, attempt to e-mail the notification to that contact person, but cannot be held responsible for unsuccessful delivery if an incorrect e-mail address is provided and/or technical difficulties are experienced in the transmission.

5.8 It is the Offeror's sole responsibility to ensure receipt of all Addenda. It is highly recommended that all Offerors check the College's website for all posted Addenda prior to submitting their proposals. All Addenda shall become part of the Request Proposal documents.

5.9 Failure of any Offeror to receive any such Addenda or interpretation shall not relieve the Offeror from any obligation or requirement provided for in the Addenda or issued interpretation.

PART 6 – PROPOSAL PREPARATION AND SUBMISSION

6.1 A submittal consisting of the Technical Proposal and the Price Proposal is required when responding to this RFP.

6.2 Offerors are required to submit:

- **One (1) original hard copy of Technical Proposal including all attachments,** with original ink signatures; plus, one electronic copy of complete Technical Proposal submission saved as one PDF file on clearly marked USB flash drive.

- **One (1) original and one photocopy of Price Proposal submission including all attachments.** The cover page of each copy should be clearly marked "original" or "copy" accordingly.

It is the sole responsibility of the Offerors to make sure that the electronic copy of Technical Proposal shall be identical to the original hard copy.

6.3 The hardcopy of Technical Proposals and Price Proposals must each be submitted in separately sealed envelope/box, one containing the Technical Proposal (Part A) submission and the second containing the Price Proposal (Part B) submission.

6.4 Proposals must be submitted on the enclosed Proposal Forms and must include all the attachments listed. Offers may use their own forms if any required submission forms are not provided in the RFP documents. Proposals must be signed by an authorized officer of the firm. Blank spaces must be filled in, either in ink or typewritten, both in words and figures. The person signing the Proposals must initial all erasures on or changes to the forms.

6.5 Submitted proposal responses, will not be returned to the Offerors. Proposals must include all required information. All proposal packages submitted in response to this RFP shall be certified, signed, and dated by a bona-fide agent of the Offeror, and include minority classification, if applicable.

6.6 Offerors must copy the package sample label below and paste it on the outside of each sealed proposal package. It is mandatory that the proposal envelope labels are used, or this exact information is provided on the envelopes of the sealed proposal. Failure to do so may cause the proposal to be rejected.

PROPOSAL ENVELOPE LABELS

PART A - TECHNICAL PROPOSAL

RFP No.:	625-005 (Part A)
Proposal Due Date and Time:	2:00 PM on December 6, 2024
Offeror's Name:	_____
Offeror's Address:	_____
Project Title:	Ice Storage Modules Replacement Takoma Park/Silver Spring Campus

PART B – PRICE PROPOSAL

RFP No.:	625-005 (Part B)
Proposal Due Date and Time:	2:00 PM on December 6, 2024
Offeror's Name:	_____
Offeror's Address:	_____
Project Title:	Ice Storage Modules Replacement Takoma Park/Silver Spring Campus

6.7 Any proposal received after the closing time and date specified, or at a different location other than specified above will not be opened or given any consideration.

6.8 Oral, emailed, or faxed proposals are invalid and will not be accepted or considered.

6.9 All costs incurred by responding firms associated with the preparation, submission, presentation or proposals and attendance at meetings, including but not limited to, costs related to transportation, meals, lodging, bonding, and other related expenses, if applicable, will be the sole responsibility of the Offerors, and will not under any circumstances by reimbursed by the College.

PART 7 - DELAYED OPENING

7.1 No proposal will be accepted after the stated closing date and time. In the event the College is closed on the RFP closing date due to an unforeseen circumstance, the RFP will close at the stated time on the next open business day, unless the Contractor is notified otherwise.

PART 8 - ERRORS IN PROPOSALS

8.1 With the submission of their proposals, Contractors assure the College that they are fully informed regarding conditions and requirements of the project site and the RFP documents prior to submitting proposals. Contractors are responsible for seeking proper information and making the necessary investigations. Failure to do so is at the Contractor's sole risk.

PART 9 - WITHDRAWAL OF PROPOSALS

9.1 Offerors may not withdraw or modify the Proposals for ninety (90) calendar days after the Proposal closing date and time.

9.2 The College may require additional time to administer College, County and/or State contract award or other regulatory processes. To accommodate this possibility, prices must remain firm for ninety (90) days from the price proposal due date. Anticipated Contract Award date, Notice to Proceed date and project scheduling expectations may be adjusted in concert with this provision. It is the Contractor's sole responsibility to ensure that their price proposal response accommodates this requirement.

PART 10 - EVALUATION OF PROPOSALS

10.1 The evaluation of proposals includes both Technical Proposal (Part A) and Price Proposal (Part B) evaluation.

10.2 The contract will be awarded in consideration of Technical Proposal and Price Proposal and the substantiated ability of the apparent highest overall scoring Offeror to perform the required construction services described in the RFP documents.

10.3 Technical Proposals will be opened first and evaluated by the College Evaluation Committee based on the substantiated ability of the Offeror to perform the required construction services described in the RFP documents and the Offeror's responsiveness to the Technical Proposal requirements. Price Proposals from only those Offerors who are deemed qualified following the review of the Technical Proposals, will then be opened, and reviewed. Price Proposals from those Offerors deemed not qualified after the review of the Technical Proposals will not be opened.

10.4 Evaluation Criteria

A. Technical Proposal (Part B): 60% of Total Score

Offeror's Technical Proposal will be evaluated by the College Technical Evaluation Committee based on Offeror's responsiveness to the following key areas:

- Contractor Qualification Statement including Financial Statements
- Relevant Project Experience
- Subcontractor's Information Form(s)
- Professional Qualifications and Technical Competence of Proposed Project Team
- Project Approach Statement
- Quality Control Program
- Administrative Process Methodology
- Proposed Project Schedule Outline
- Verification of Examination of Site Conditions
- Exceptions to the General and Supplementary Conditions of the Contract, Montgomery College Standard Form of Contract, and/or any other deviations to the RFP documents, if applicable
- Conflict of Interest Form
- Non-Debarment Acknowledgement

B. Price Proposal (Part B): 40% of Total Score

Price Proposals from only those Offerors who are deemed qualified following the review of the Technical Proposals, will then be opened, and examined for responsiveness and responsibleness by the College Procurement Office. To be considered for the award, Offeror must bid all line items in the Price Proposal Form and fill out all blanks. Failure to do so may deem an offer non-responsive.

Contractor's Price Proposal will be evaluated based on the following:

a. Base Price Total plus accepted, if any, Add Alternates
b. Submission of an acceptable Bid Bond (required if the total bid amount exceeds $100,000)
c. Bonding Company Letter Guaranteeing the Required 100% Performance, Labor and Material Payment Bonds

Offeror's Price Proposal will be evaluated with the lowest responsive and responsible proposal price awarded the highest point score. Other proposal prices will be awarded reduced point scores, determined by ratio comparing the proposed price to the lowest responsive and responsible proposal price.

PART 11 - AWARD CONSIDERATIONS

11.1 An award will be recommended in the best interest of the College to the Offeror achieved the highest combined scores of technical and price proposal evaluations, who can meet or exceed the terms, conditions, and specifications of this solicitation, including project delivery requirements. It is the College's intention to seek approval of award of this contract at the College's Board of Trustees **on January 22, 2025 and** is subject to approval by the Board of Trustees. Only alternates submitted by the recommended Contractor may be reviewed and considered by the College. The College reserves the right to negotiate the pricing, and to accept or reject any alternate pricing.

11.2 The award will be made subject to the availability of public funds and only if it is in the best interest of the College to award the project. The College reserves the rights to exercise the following rights at the College's sole discretion.

PART 12 – COLLEGE'S RIGHTS

12.1 The College reserves the following rights to be exercised at the College's sole discretion:

A. To make such investigation as deemed necessary to determine the qualifications of the Contractor and to determine the ability of the Contractor to perform the work. The Contractor shall furnish to the College all such information and data as the College may request. The College reserves the right to reject any proposal if the evidence submitted by, or investigation of, such Contractor fails to satisfy the College that such Contractor is properly qualified to carry out the obligations of the contract and to complete the work contemplated herein.

B. Conditional proposals will not be accepted.

C. To reject any or all proposals and to make awards in the best interest of the College, in the name of the Board of Trustees. The College also reserves the right to cancel the RFP.

D. To accept or reject any item of price proposal or any alternate prices in the priority order established by the Price Proposal Form.

E. To consider informal, any proposal not prepared or submitted in accordance with the provisions hereof. The College may at its sole discretion waive any informality. A waiver of any provision of the RFP Documents shall not constitute a waiver of any subsequent breach.

F. To defer award of the Contract for a period of up to ninety (90) calendar days after closing of the proposals. Anticipated Contract Award date, Notice to Proceed date and project scheduling expectations may be adjusted in concert with this provision. It is the Contractor's sole responsibility to ensure their proposal response accommodates this requirement. Upon Award, prices must remain firm for the duration of the contract.

G. If no award or other disposition is made, the expiration of the ninety (90) calendar days will constitute rejection of all proposals without any further action by the College.

H. The Contractor deemed most responsible and responsive with the highest combined scores in technical and price proposal evaluation will be recommended for contract award to the College's Board of Trustees.

PART 13 - REGISTRATION OF CORPORATIONS NOT REGISTERED IN THE STATE OF MARYLAND

13.1 Pursuant to 7-202 et. Seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201 before doing any interstate or foreign business in this State. **Corporations must be registered, and in good standing no later than proposal submittal deadline date**. A copy of the registration or application for registration may be requested by the College.

PART 14 – PUBLIC RECORD AND PROPRIETARY INFORMATION

14.1 As a public entity, the College is subject to the disclosure requirements in the Maryland Public Information Act ("MPIA"), Title 4 of the General Provisions Article of the Annotated Code of Maryland. Information that is deemed to be confidential commercial or financial information, as defined by the MPIA, may be exempted from disclosure. Offeror's must clearly identify each part of the Offer that it believes contains confidential commercial or financial information by stamping the top right-hand corner of each pertinent page with large red bold letters stating the words "confidential" or "proprietary". It is not sufficient to preface your proposal with a proprietary statement, or to use a page header or footer that arbitrarily marks some or all pages as confidential. General claims of confidentiality or similar blanket designations shall not be effective. Each Offeror must submit a proprietary and confidential redacted copy of its proposal to be used in responding to MPIA requests upon request.

14.2 Offeror agrees that upon request from the College, it will provide justification as to why any material, in whole or in part, should be considered confidential, proprietary information or trade secrets and provide any justification of why such materials should not be disclosed pursuant to a request under the MPIA. The College, by law must apply the MPIA requirements for public information disclosure deemed proprietary and/or confidential; therefore, even the information marked as such by the Offeror may still require public disclosure. Offeror agrees that any portion of the proposal that is not stamped as proprietary or confidential is not proprietary or confidential and shall be disclosed upon request under the MPIA.

PART 15 – CONFIDENTIALITY

15.1 The Contractor agrees to maintain in strict confidence Montgomery College's confidential information as listed herein. The Contractor may use the College's confidential information solely to perform the services required, as listed herein and may not disclose such information to any person or entity without the expressed written consent of Montgomery College.

15.2 The information contained in Offeror's proposals submitted for the College's consideration will be held in confidence until all evaluations are concluded and an award has been made. Pricing and other information that is an integral part of the offer cannot be considered confidential after an award has been made. Offeror's must clearly mark any information considered proprietary and confidential. The College will honor requests for confidentiality for information of a proprietary nature. Pricing may not be deemed confidential.

PART 16 - MULTIPLE/ALTERNATIVE PROPOSALS

16.1 Multiple and/or alternate Proposals will not be accepted.

PART 17 – POST AWARD DEBRIEFINGS

17.1 Debriefing of an unsuccessful Offeror will be conducted upon written request submitted to the purchasing agent within ten (10) days of the announcement of the recommended award. This debriefing will be oral and be limited to a discussion of the unsuccessful firm's proposal only and will provide information on areas in which it was deemed weak or deficient.

END OF INSTRUCTIONS TO CONTRACTORS

SUPPLEMENTARY INSTRUCTIONS TO CONTRACTORS

PART 1 – PRELIMINARY PROJECT SCHEDULE

1.1 Preliminary schedule instructions apply to the project as follows:

A. The College offers classes during traditional Fall and Spring academic semesters, as well as during a winter intersession and two summer session periods. Contractor is reminded that they may be asked to refrain from noisy work during the associated testing periods when tests are scheduled in adjoining buildings. Specific calendars and constraints will be provided by the College when available. Calendars are subject to adjustment in the event that inclement weather, or other cause, closes the College.

B. The College offers Spring 2025 credit classes on campus or fully online. Many non-credit classes are back on campus, although some are still online or hybrid.

C. The College anticipates that the project will be complete and fully operational by the following milestone dates administered by the College, concurrent with the Contractor's completion of the project as follows:

1) Notice to Proceed: February 17, 2025
2) Substantial Completion: September 30, 2025
3) Final Completion: October 31, 2025

PART 2 – PREVAILING WAGES

2.1 With regard to General Condition 3.3.1.3, **please note that this project is subject to State of Maryland DLLR Prevailing Wage Rate requirements.**

2.2 The State of Maryland Prevailing Wage Rates requirements and reporting procedures apply to this Project. Pursuant to Annotated Code of Maryland State Finance and Procurement, Section §17-201 through 17-226, it is mandatory upon the successful Offeror and any subcontractor under him/her, to pay not less than the specific rates to all workers employed by them in executing contracts in this locality**.** A copy of State of Maryland DLLR Prevailing Wage Determination for this Project is enclosed in Appendix B of the RFP documents.

2.3 Any questions concerning Prevailing Wage requirements should be directed to the State of Maryland Department of Labor, Licensing and Regulation, Prevailing Wage Division, 410-767-2342.

PART 3 – MINORITY PARTICIPATION

3.1 Pursuant to Section 16-311(7) of the Education Article and Board Resolutions #87-82 and #87-83, adopted on July 20, 1987, it is the policy of Montgomery College to encourage the participation of responsible certified minority business enterprises to provide goods and services for the performance of College projects. "Minority business enterprise" has the meaning stated in Section 14-301 of the State Finance and Procurement Article and means a legal entity, except a joint venture, that is: (1) organized to engage in commercial transactions; (2) at least 51% owned and controlled by one or more individuals who are socially and economically disadvantaged; and (3) managed by, and the daily business operations which are controlled by, one or more of the socially and economically disadvantaged individuals who own it. A "socially and economically disadvantage individual" means a citizen or lawfully admitted permanent resident of the United States who is in any of the following minority groups: African American, American Indian/Native American, Asian, Hispanic, physically

or mentally disabled, women, or a group (e.g., LGBTQIA+) otherwise found by the certification agency to be a socially and economically disadvantaged individual.

3.2 All Offerors must submit an updated Minority Participation Form and include in the Technical Proposal submission.

3.3 If the Contractor is not a minority business entity, the Contractor is encouraged to develop a plan that, at a minimum, will award **15% of the total contract value** to subcontractors and/or vendors that are minority businesses.

3.4 Non-minority Contractors are advised that following contract award, within three business days of request by the College, the Contractor shall provide a list indicating minority subcontractor and/or vendor participation anticipated for the project. The Contractor shall provide the College with routine updates should any changes in subcontractor or vendor status occur during the contract term.

PART 4 – BONDS

4.1 If Contractor's total bid amount exceeds $100,000, Contractor is required to furnish a Bid Bond and a Letter of Intent from its Bonding Company for Ice Storage Modules Replacement, Takoma Park/ Silver Spring Campus with the Price Proposal (Part B) as required below.

4.1.1 Contractor shall submit **one original and one copy of a Bid Bond** from a surety company authorized to do business in the State of Maryland, acceptable to the College, made payable without condition to the College, or a cashier's check, in the amount of **not less than 5% of the total base bid amount, including all bid alternates, but excluding all deduct alternates.** Bid Bond shall be prepared and submitted on **AIA Form A310-2010, "BID BOND".**

4.1.2 Contractor shall submit **one original and one copy of a letter from the Contractor's bonding company** stating that it guarantees to furnish the required 100% performance and labor and material payment bonds if the Contractor is recommended for contract award. Letter provided shall not be generic but must be written specifically for this project.

4.2 Prior to the execution of this Contract, the successful Contractor is required to furnish a performance bond, properly executed on the **Montgomery College Standard Performance Bond**, a copy of which is included in the Request for Bid documents, and a labor and material payment bond executed on **AIA Document A312-2010, "PAYMENT BOND",** for 100% of the amount of the Contract.

4.3 Upon failure or refusal to execute and deliver the Contract and bonds required within five (5) days (Saturdays, Sundays and legal holidays excluded) after having received notice of acceptance of its proposal, the Contractor shall forfeit to the College, as liquidated damages for such failure or refusal, the bid security included with its proposal.

4.4 After the College and the successful Contractor have executed a contract, or if no contract has been executed within ninety (90) calendar days after the proposal due date, and Contractor has not been notified of acceptance of its bid, Contractor may request return of his Bid Bond.

4.5 If at any time, the bonding Company becomes insolvent, files for bankruptcy or for any reason whatsoever loses its right to do business in the state of Maryland, the Contractor shall, within ten (10) calendar days after notice from the College to do so, substitute an acceptable Bond (or bonds) in such form and sum and signed by such other Bonding Company as may be satisfactory to the College.

4.6 Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond, a certified and effectively dated copy of their power of attorney.

PART 5 – INSURANCE

5.1 Prior to start of any work, the successful Contractor must provide sufficient evidence of insurance showing adequate coverage as defined in the RFP documents.

PART 6 – FORM OF CONTRACT

6.1 The Contract Agreement between the successful Offeror and the College for the Ice Storage Modules Replacement on the Takoma Park/Silver Spring Campus project will be executed on the College Standard Form of Contract, a copy of blank form is included in the RFP documents.

6.2 Any exceptions to the Montgomery College General and Supplementary Conditions of the Contract, College Standard Form of the Contract, and/or any other deviations to the RFP requirements must be included in the Technical Proposal (Part A) submission to initiate further consideration by the College. An exception submitted by the Contractor are considered the request for information by the College.

6.3 The College makes no implicit or explicit statement as to any willingness to deviate from all requirements set forth in the RFP documents.

6.4 Unless explicitly stated by the Contractor in the proposal submission that an exception to the Montgomery College General and Supplementary Conditions of the Contract, College Standard Form of the Contract, and/or any deviation to the RFP requirements are a condition of the proposal, the College does not consider such exceptions provided by the Contractor to be the submission of a conditional proposal.

PART 7 – LIST OF SUBCONTRACTORS (UPON REQUEST)

7.1 Within three (3) business days from request by the College, Contractor shall provide names, addresses, Maryland registration/license number, and indication of minority status (if applicable), for all the Subcontractors proposed to be retained by the Contractor for this project, regardless of anticipated contract value.

PART 8 – VENDOR QUALIFICATIONS (UPON REQUEST)

8.1 The College's intent with regard to verification of Vendor qualifications, and financial stability is that it is the Contractor's responsibility to evaluate the qualifications, financial viability and solvency of all vendors used for the project.

8.2 Within three (3) business days from the request by the College, Contractor shall submit to the College a Qualification Statement for each Principal Vendor, herein defined as those Vendors whose contract value is anticipated to exceed $ 100,000, to include the following:

a) Name
b) Address
c) Type of Work Performed
d) Years in Business
e) Representative Project List (including at least three projects of similar size, scope and complexity)

f) References (list at least three references, including contact name and telephone number)
g) Copy of Maryland registration/license number, if applicable

8.3 The College reserves the right to reject any Vendor.

PART 9 – TAXES

9.1 In the event of a conflict between General Conditions and any other provision in the Request for Proposal documents relating to taxes, Article 3.5 of General Conditions in Section 007200 shall prevail.

PART 10 – LAWS AND REGULATIONS

10.1 The Contractor's attention is directed to the fact that all applicable Federal and State laws, County, Bi-County, local, and municipal ordinances, and the orders, rules and regulations of all authorities having jurisdiction over this work shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

PART 11 – DEBARMENT

11.1 Any Offeror as an individual or as an organization, presently debarred, suspended, proposed for debarment by any County, State, or Federal departments or agencies will be declared ineligible to respond to the proposed contract. The Contractor shall not enter into any subcontract with any individual, firm or organization debarred from doing business with government agencies.

11.2 Submission of a signed proposal in response to this solicitation is certification that an Offerer (or any sub-contractors) is not currently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any County, State, or Federal departments or agencies. Submission is also the agreement that the College will be notified of any change in this status.

END OF SUPPLEMENTARY INSTRUCTIONS TO CONTRACTORS

REQUIRED SUBMISSIONS

TO: PROSPECTIVE OFFERORS

FROM: PROCUREMENT OFFICE
MONTGOMERY COLLEGE

A submittal consisting of the Technical Proposal and the Price Proposal is required when responding to this RFP. Offerors are required to submit:

- **One (1) original hard copy of Technical Proposal including all Attachments,** with original ink signatures; plus, one electronic version of complete Technical Proposal submission saved as one PDF file on clearly marked USB flash drive.

- **One (1) original and one photocopy of Price Proposal, including all Attachments, each marked "original" or "copy" accordingly.**

Technical Proposal and Price Proposal submission must be submitted **in two separately sealed envelopes/ boxes**, one containing the Technical Proposal (Part A) submission and the second containing the Price Proposal (Part B) submission. Each envelope/box must be clearly marked Technical Proposal or Price Proposal, Offeror's name and address, RFP number and descriptions, as well as RFP closing date and time; and be addressed to:

Office of Procurement
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

Proposals shall be submitted on the enclosed Proposal Forms with required attachments, if any and properly signed. Offerors may use their own forms if any required submission forms are not provided in the RFP documents. It is the responsibility of the Offerors to make sure that electronic version of technical proposal shall be identical to the original hard copy. Failure to include any of the required submission may render the proposal non-responsive and the Offer may be rejected.

PART 1 - ITEMS REQUIRED FOR TECHNICAL PROPOSAL (PART A) SUBMISSIONS

Technical proposal submission shall include and be organized as follows:

1.1 Technical Proposal Form, Section 004213 A

1.2 Attachments specified in Technical Proposal Form Section 004213A, including:

a) Contractor's Qualification Statement, Section 004513

b) Financial Statements as required in Contractor's Qualification Statement

Contractor is required to provide copies of financial statements for the last two years, preferably audited, including your organization's balance sheet and income statement showing Current Assets, Net Fixed Assets, Other Assets, Current Liabilities and Other Liabilities. Include name and address of firm preparing attached financial statement(s), and date(s) thereof.

Information provided in the Financial Statements is for the express purpose of assisting Montgomery College in its assessment of the Contractor's suitability for providing services as a Contractor for the referenced project.

c) A copy of Contractor's business license

d) Subcontractor Information Form(s), Section 004513 I

1) Contractor shall use Subcontractor Information Form per Section 004513 I and submit up to **three perspective key principal subcontractor** information per each trade category.

The key principal trade is as follows:

- HVAC/Mechanical

2) Subcontractor Information collected will be used as a basis of discussion during evaluation of Contractor's Technical Proposal to amplify the College's understanding of the Contractor's approach to assembling an appropriately qualified and experienced project team for the work.

3) Submission of Subcontractor Information does not obligate the successful Contractor to restrict subcontract award to one of the subcontractors named on each Form.

4) The College reserves the right to reject any Subcontractor.

e) Contractor's Relevant Project Experience

1) Submit a list of the major projects your organization has completed in the last three years, giving the name of the project, owner, architect, the contract amount, date of completion and percentage of cost of the work performed with your own forces. Two of the projects included shall be within the Metropolitan Baltimore-Washington region. Document successful completion of projects of similar size, scope and complexity, within the last three years, such as:

- Demonstrated experience with projects whose construction value is between $1,000,000 and $5,000,000
- Demonstrated experience with comparable projects
- Demonstrated experience managing projects with finite schedule requirements

2) Submit three (3) of the above relevant project references of similar scope, size and complexity completed within the past three years. Two (2) of the project references shall be within the Metropolitan Baltimore-Washington areas.
Provide a brief description of the scope of work and list each project's size, relevant features, construction cost (including general conditions, OH&P), change order value (excluding or annotating Owner directed scope changes), anticipated schedule, actual

schedule and an Owner's reference contact person's name and current telephone number. Please make sure the references and contact persons are current. Use separate sheets if necessary and include these with the submission.

f) Proposed Project Management/Supervisory Personnel List (including Construction Superintendent) and their Professional Qualifications and Technical Competence

Contractor shall list the names and describe previous experience by the overall Construction Superintendent and the personnel who will be assigned to the College's project in providing project management and supervision services for construction projects of similar size, complexity and scope together with a statement as to the extent to which these personnel will be full-time or part-time.

1) Submit resumes and/or other relevant information demonstrating the qualifications and technical competence of proposed project team members working onsite including, at a minimum:

- Project Manager (30%)
- Project Superintendent (30%)
- Foreman/Leadman (100%)
- Quality Control Supervisor (20%)

2) Demonstration that team members have prior work experience together is preferred.

3) Demonstration that team members have prior work experience on comparable projects for academic institutions and/or with electric infrastructure projects is preferred.

4) Indicate expected percentage (or range) of time each team member will devote to the project.

g) Project Approach Statement

1) Submit a statement outlining your anticipated approach to the project.

2) Explain allocation of management responsibilities and clarity of that organization.

3) Explain your approach to site mobilization and sequencing of the work.

4) Identify special areas of concern you feel may merit additional monitoring during construction and explain how you would provide for those special needs.

h) Quality Control Program

1) Submit a statement outlining the process by which you will assure compliance with the Proposal Documents.

2) Explain how your site housekeeping and maintenance procedures, management of temporary conditions and/or constraints and sequencing of trades affect quality control outcomes.

i) Administrative Process Methodology

1) Submit a statement outlining your standard administrative processes.

2) Expand the roles and responsibilities of team members, if not sufficiently addressed in above items (e) or (f).

3) Indicate preferred mechanics for:
- preparing schedules and schedule updates
- managing and monitoring submittals
- managing and monitoring requests for information
- maintaining accurate records on-site
- documenting change events
- preparation of applications for payments and change orders
- punch list preparation and monitoring punch list completion
- compilation and submission of closeout materials

j) Acknowledgement of Proposed Project Schedule

Include a letter acknowledging review and acceptance of the Proposed Project Schedule as outlined in Part 1 of Section 002213, Supplementary Information to Contractors. Submit an alternative outline schedule for the project if not in agreement with this proposed schedule.

k) Verification of Examination of Site Conditions, Section 004400-1

l) Minority Participation Form per Section 004539

m) Conflict of Interest Form, Section 004541

n) Non-Debarment Acknowledgement, Section 004542

o) Proposed exceptions to the Montgomery College General and Supplementary Conditions of the Contract, Form of Contract, and/or any other deviations to the RFP requirements, if applicable.

p) Acknowledgement of Receipt of Addenda, if applicable

PART 2 – ITEMS REQUIRED FOR PRICE PROPOSAL FORM (PART B) SUBMISSIONS

2.1 Price Proposal Form, per Section 004213B

2.2 AIA Document A310-2010, Bid Bond

a) Contractor shall submit a Bid Bond from a surety company authorized to do business in the State of Maryland, acceptable to the College, made payable without condition to the College or a cashier's check, not less than 5% of the amount of the Base Price Total, including all add alternates, but excluding deduct alternates. Bid Bond shall be prepared and submitted on AIA Form A310-2010, "BID BOND".

2.3 Bonding Company Letter Guaranteeing the Required 100% Performance, Labor and Material Payment Bonds

a) Contractor shall submit a letter from the Contractor's bonding company stating that it guarantees it will furnish the required 100% performance and labor and material payment bonds if the Contractor is recommended for contract award. Letter provided shall not be generic, but must be written specifically for this project.

END OF REQUIRED SUBMISSIONS

INFORMATION AVAILABLE TO CONTRACTORS

1.1 GENERAL PROVISIONS

A. College records include documentation that is made available as information to Contractors to illuminate likely project conditions.

B. Reports, investigations, data, As-Built documentation, and all information related thereto included as Information Available to Contractors are not a part of the Contract Documents.

C. The College, Architect and Engineers do not guarantee continuity of conditions indicated and are not responsible for information contained or not contained in the Information Available to Contractors.

D. Contractors shall employ their own experts to analyze available information. Contractors shall be responsible for the consequences of acting on conclusions obtained from examination and analysis of available information.

E. Contractors will be responsible for any and all costs associated with obtaining copies of existing record or As-Built drawings. Costs associated with any request for this documentation will be determined by the College at the time of the request, and these costs must be paid for, prior to the release of any documentation to the Contractors.

1.2 BUILDING DOCUMENTATION

Contractors are advised that As-Built documentation is available as reference documents for all project worksites. Documentation may be examined by submitting a written request to:

Alan Yanaway, Project Manager
Email: Alan.yanaway@montgomerycollege.edu

END OF INFORMATION AVAILABLE TO CONTRACTORS

TECHNICAL PROPOSAL FORM

To: Montgomery College

Re: RFP No.: 625-005
Ice Storage Modules Replacement
Takoma Park/Silver Spring Campus

Attn.: Procurement Office
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

From: _____
(Provide Your Company's Name)

PART 1 - Offeror must submit one original hard copy and one electronic copy of the Technical Proposal Form (Part A) and all Attachments. Electronic copy of the technical proposal submittal must be saved as one PDF file on clearly marked USB flash drive.

It is the responsibility of the Contractors to make sure that electronic version of technical proposal submission shall be identical to the original hard copy.

PART 2 - Please read the questions, note what is requested, then provide appropriate responses. Failure to answer any of the applicable questions contained in this section will make the proposal non-responsive and be grounds for rejection of the entire proposal. Conditional proposals will not be accepted.

PART 3 - Contractor acknowledges receipt of the following Addenda:

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

PART 4 – The Contractor proposes to provide all of the necessary labor, materials, equipment, insurance and bonds for the Ice Storage Modules Replacement on the Takoma Park/Silver Spring Campus located at 7600 Takoma Avenue, Takoma Park, Maryland 20912, as specified in the RFP documents. The work to be performed by the Contractor shall include all items accepted by the College as part of the Contractor's submittal. It is understood that Montgomery College (hereinafter referred to as College) will be the sole judge as to the acceptance of the proposals and award of the contract. All work shall be done in accordance with the accompanying Technical Specifications and Drawings for the amount listed on the Price Proposal Form, and accepted Alternates, if any, as applicable in accordance with the terms of the RFP documents**.** The Contractor is reasonably expected, given the existing conditions and required construction, to complete the Work within the completion date stated in the RFP documents**.**

PART 5 – TECHNICAL PROPOSAL SUBMITTAL ATTACHMENTS

Technical Proposal Form and all Attachments include:

A. Contractor's Qualification Statement, including Financial Statements

B. Copy of Contractor's Maryland Business Registration

C. Key Principal Subcontractor Information Form

D. Relevant Project Experience

E. Key Supervisory Personnel

F. Project Approach Statement

G. Quality Control Program

H. Administrative Process Methodology

I. Project Schedule Statement

J. Verification of Examination of Site Conditions, Section 004400-1

K. Minority Participation Form, Section 004539-1

L. Conflict of Interest Form, Section 004541

M. Non-Debarment Acknowledgement, Section 004542

N. Any exceptions to the Montgomery College General and Supplementary Conditions of the Contract, Standard Form of Contract, and/or any deviations to the other requirements of the RFP, if applicable

O. Acknowledgement of Receipt of Addenda, if applicable

PART 6 – The undersigned agrees, if selected as the Contractor, to execute a Contract in accordance with the terms of this Request for Proposal and Contract documents**,** within five (5) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the College.

PART 7 - The undersigned further certifies under the penalties of perjury that this proposal is in every respect bona-fide, fair and made without collusion or fraud with another person, joint venture, corporation, partnership or other business or legal entity**.**

PART 8 - The undersigned acknowledges the right of the College in its sole discretion to accept any Proposal or to reject any or all Proposals.

PART 9 - SIGNATURES:

_____ _____
(Date) **(Company Name)**

_____
(Address)

_____
(Telephone Number)

_____
(Facsimile Number)

By: _____
SEAL IF A CORPORATION **Authorized Agent & Title (Print)**

_____
Signature

_____
(F.E.I.N.)

_____
(Contractor License Number)

_____
(Contact E-mail Address)

BE SURE TO SIGN YOUR PROPOSAL

PRICE PROPOSAL FORM

To: Montgomery College

Re: RFP No.: 625-005
Ice Storage Modules Replacement
Takoma Park/Silver Spring Campus

Attn.: Procurement Office
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

From: _____
(Provide Your Company's Name)

PART 1 - Contractor must submit **one (1) original plus one photocopy,** marked "Original " or "Copy" accordingly, of the Price Proposal Form and all attachments.

PART 2 - Please read the questions, note what is requested, then provide appropriate responses. Failure to answer any of the applicable questions contained in this section will make the proposal non-responsive and be grounds for rejection of the entire proposal. **Conditional proposals will not be accepted**. In order to be considered for the award, Contractor must bid all items and fill out all the following blanks. Failure to do so may deem a Contractor non-responsive.

PART 3- Contractor acknowledges receipt of the following Addenda:

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

PART 4 - BASE PRICE TOTAL (State amounts in both words and numbers where indicated)

The proposed total contract amount to complete the construction services for the **Ice Storage Modules Replacement project on the Takoma Park/Silver Spring Campus**, per terms, conditions, drawings and specifications, including all costs associated with the requirements specified in the RFP documents, and having examined both the site of the Work and all matters referred to in the RFP documents, is:

(In Words): _____Dollars

(In Numbers): $ _____

Item #	Description	Dollar Amount ($)
1	Division 01 General Conditions	
2	Division 02 Existing Conditions	
3	Division 23 HVAC	
4	Profit and Overhead	
5	Insurance, Performance & Payment Bonds	
6	**Base Price Total**	

PART 5 - SPECIAL PRICING REQUIREMENTS (State amounts in both words and numbers)

A. ALLOWANCES – NOT USED

B. UNIT PRICES - NOT USED

C. ALTERNATES - NOT USED

D. SEPARATELY IDENTIFIED PRICES – NOT USED

PART 6 - BID SURETY

A. The bid surety attached in the sum of _____ Dollars ($_____) is to become the property of the College in the event the Contract and Bond are not executed with the time set forth, as liquidated damages for the delay and additional expense to the College caused thereby**.**

B. The undersigned includes the following submissions as part of the Price Proposal Form**:**

- Bid Bond (AIA Document A310-2010, "Bid Bond") if the total bid amount exceeding $100,000.
- Bonding Company Letter

PART 7 – PRICE PROPOSAL SUBMITTAL ATTACHMENTS

A. AIA Document A310-2010, Bid Bond or Certified Check in an amount **not less than 5%** of the Total Bid Amount, including all add alternates, but excluding all deduct alternates, if applicable.

B. Bonding Company Letter Guaranteeing the Required 100% Performance, Labor and Material Payment Bonds.

PART 8 – The undersigned agrees, if selected as the Contractor, to execute a Contract in accordance with the terms of this Request for Proposals and the Contract Documents**,** within five (5) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the College.

PART 9 – Upon contract award, the undersigned agrees to hold prices firm for the duration of the overall contract term.

PART 10 - The undersigned acknowledges the right of the College in its sole discretion to accept any Proposal or to reject any or all Proposals.

PART 11 - The undersigned further certifies under the penalties of perjury that this proposal is in every respect bona-fide, fair and made without collusion or fraud with another person, joint venture, corporation, partnership or other business or legal entity**.**

PART 12 - SIGNATURES:

_____ _____
(Date) **(Company Name)**

_____
(Address)

_____
(Telephone Number)

_____
(Facsimile Number)

By: _____
SEAL IF A CORPORATION **Authorized Agent & Title (Print)**

_____
Signature

_____
(F.E.I.N.)

_____
(Contractor License Number)

_____
(Contact E-mail Address)

BE SURE TO SIGN YOUR BID

BID BOND

Ice Storage Modules Replacement
Takoma Park/Silver Spring Campus

Use AIA Document A310-2010, Bid Bond

VERIFICATION OF EXAMINATION OF SITE CONDITIONS

This form must be completed and included with the Technical Proposal submission.

The undersigned hereby certifies the completion of examination of the site conditions on _____, 2024.

_____ _____

Date **Company Name**

_____

Address

_____

Telephone Number

_____

Facsimile Number

_____

Name & Title (Print)

_____

Email Address

_____

Signature

Site examination inspection confirmed by College Representative:

_____ _____

Date **College Representative Name & Position**

_____

Signature

CONTRACTOR'S QUALIFICATION STATEMENT

Use **AIA Document A305, Contractor's Qualification Statement**, latest edition, or Montgomery College's "**Contractor's Qualification Statement**", unless otherwise indicated. A copy of the Montgomery College form and the supplemental instructions are included with this section.

Contractor's Qualification Statement

Preparing the Contractor's Qualification Statement for Review by Montgomery College

Most contractors maintain a generic AIA A305 form. The effort contractors spend adapting the document to our specific interests is noticed and appreciated. The suggestions provided here are intended to help improve your chances of being responsive to our requests for technical information. Our preferences are fairly specific and adherence to these preferences will expedite the review process.

Contractor qualification statements are generally reviewed by a panel consisting of five members. The purpose in using our own form is to obtain objective data in a consistent format that can be easily processed by our panel members. Unfortunately, it has been our experience that many contractors attempt to use the AIA A305 as a way to direct us to a variety of attachments that are in a unique format which are inconsistent or non-responsive to the type of information we are seeking. So, for example when the form requests the value of the contractor's current work (part 3), a somewhat typical response is "see attachment 6" which is a list of projects that may or may not be tabulated. Actually, what we are looking for in that particular space is a dollar amount, not a list. The numbers are certainly not the full story regarding contractor qualifications, but when we ask for a number, our panel members would like to see a current and accurate number in that space.

Where we do ask for project lists, we have found that some lists are more helpful than others. Although we do not require contractors to provide information in a specific format, we do expect the lists to respond to our request for certain basic information. The preferred format and content for our purposes is as follows:

1. A short, descriptive project title, e.g. "new" student center, or "addition to" or "repairs to library building", etc.
2. Owner and location of the work.
3. The name of the architect/engineer.
4. The construction contract value.
5. The year when the project was completed.

The following should be taken into consideration when compiling the project lists:

a) Since we are a college, we are particularly interested in academic institutional project experience. Highlighting those types of projects is beneficial.
b) If your project involvement was other than as the sole general contractor or construction manager, please make that clear. Thus, if you are one of multiple primes, or a member of a joint venture, or a subcontractor on the project, please make that distinction in the project title and contract value. Do not claim credit for the entire work.
c) The project lists serve as client references for our purposes. References are more highly valued when the client is a college, university or other public entity. Local references and recent references are the most relevant.
d) Project experience becomes increasingly less relevant as the projects become remote in time or distance. We would prefer a short, current and relevant project list.
e) Failure to provide the requested financials is frequently a cause for disqualification.
f) We encourage all companies to provide full and accurate information which best presents their qualifications, but please be concise. Too much data or poorly organized data can impede our review and will ultimately be counterproductive.

Finally, the presentation of material including tabs, indexes, and logical organization makes a difference to panel members who are struggling with a large volume of paper. So prepare the submittal accordingly.

Office of Facilities
Montgomery College

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading. Information provided in this statement is for the express purpose of assisting Montgomery College in its assessment of the Offeror's suitability for providing services as a General Contractor for the referenced project.

SUBMITTED TO: Office of Procurement
MONTGOMERY COLLEGE

ADDRESS: 9221 Corporate Boulevard
Rockville, Maryland 20850

SUBMITTED BY:
TITLE:

COMPANY NAME:
ADDRESS:

NAME OF PROJECT: **Ice Storage Modules Replacement**
Takoma Park/Silver Spring Campus

Type of Work (select one):
[ ] General Construction
[ ] HVAC
[ ] Electrical
[ ] Plumbing
[ ] Other (please specify)

1.0 ORGANIZATION

1.1 How many years has your organization been in business as a Contractor?

1.2 How many years has your organization been in business under its present business name?

1.2.1 Under what other or former names has your organization operated?

1.3 Describe the form of your organization (i.e. corporation, partnership, individual, or other) and name the principal(s):

2.0 BUSINESS REGISTRATION & LICENSING

2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business:

2.2 Provide a copy of your business registration and applicable license(s) as an attachment to this form.

3.0 EXPERIENCE

3.1 List the categories of work that your organization normally performs with its own forces:

3.2 On a separate sheet, list the similar construction projects your organization has completed in the last three years, giving the name of the project, owner, architect, the contract amount, date of completion and percentage of cost of the work performed with your own forces.

3.3 State average annual amount of construction work performed in the last three years:

3.4 Has your organization ever failed to complete any work awarded to it?

[ ] NO [ ] YES *(attach details)*

3.5 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

[ ] NO [ ] YES *(attach details)*

3.6 Has your organization filed any law suits or requested arbitration with regards to construction contracts within the last five years?

[ ] NO [ ] YES *(attach details)*

3.7 Has your organization ever been debarred from bidding on State Contracts by the Board of Public Works, or on any other Local, Municipal, County, State or Federal project?

[ ] NO [ ] YES *(attach details)*

3.8 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

[ ] NO [ ] YES *(attach details)*

3.9 Has your organization ever filed for bankruptcy, receivership or any other similar legal protection to protect it from default? (If the answer is yes, please attach details.)

[ ] NO [ ] YES *(attach details)*

3.10 Include a brief description of **three (3) projects** in Section 3.2 listing each project's size, relevant features, construction cost (including general conditions, OH&P), change order value (excluding or annotating Owner directed scope changes), anticipated schedule, actual schedule and an Owner's reference contact person's name and current telephone number.

4.0 FINANCIAL STATUS

4.1 Financial Statement

Attach copies of financial statements for the **last two years**, preferably audited, including your organization's balance sheet and income statement showing Current Assets, Net Fixed Assets, Other Assets, Current Liabilities and Other Liabilities. Include name and address of firm preparing attached financial statement(s), and date(s) thereof.

5.0 SIGNATURE

5.1 Dated this ____ day of _____, 2024.

Name of Organization:

_____

By:

Title:

6.0 NOTARY

6.1 _____ being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this _____ day of _____, 2024.

_____

Notary Public:

My Commission Expires:

SUBCONTRACTOR INFORMATION FORM

Trade: _____

Name: _____

Address: _____

_____

Telephone: _____

Contact: _____

Average Annual Work performed, in dollars, in the last three years: _____

List three representative projects of comparable size, scope and complexity, completed within the last five years. For each project, indicate client name, project location, completion date, size, cost and major features:

Project # 1 _____

_____

_____

_____

_____

Project # 2 _____

_____

_____

_____

_____

Project # 3 _____

_____

_____

_____

_____

MINORITY PARTICIPATION FORM

CONTRACTORS SHALL COMPLETE THE FOLLOWING:

I HEREBY REPRESENT THAT OUR/MY FIRM IS _____

IS NOT _____

IF YES, SELECT MINORITY CLASSIFICATION FROM THE LIST BELOW (check one):

_____ African American _____ Hispanic _____ Native American

_____ Alaskan American _____ Asian _____ Pacific Islander

_____ Woman _____ Disabled _____ Veteran

_____ LGBTQIA+ _____Other: _____

INDICATE EXPECTED MINORITY PARTICIPATION FROM SELF-PERFORMED WORK, AND/OR WORK PERFORMED BY SUBCONTRACTORS AND/OR VENDORS AS A PERCENTAGE OF TOTAL CONTRACT PRICE:

Minority Participation Expectation: _____ % of Base Price Total

I hereby certify that the above information is true and correct, to the best of my knowledge and belief.

_____
Firm Name

_____
Signed Date

_____
Type or Print Name

_____
Title

PROCUREMENT OFFICE QUESTIONNAIRE

RFP Number: 625-005

RFP Title: Ice Storage Modules Replacement
Takoma Park/Silver Spring Campus

Please be advised that our company **does not** wish to submit a proposal in response to the above-captioned Request for Proposal for the following reasons:

- ☐ Too Busy at this time
- ☐ Not engaged in this type of work
- ☐ Project too large/ small
- ☐ Cannot meet mandatory specifications (Please specify below)
- ☐ Other (Please specify)

_____

_____
SIGNATURE

_____
PRINTED NAME

_____
TITLE

_____
DATE

_____
COMPANY

_____
Address

Please return to:

Montgomery College
Procurement Office
9221 Corporate Boulevard
Rockville, Maryland 20850

CONFLICT OF INTEREST STATEMENT

The undersigned hereby affirms and attests that to the best of its knowledge, no Montgomery College trustee, or employee, or spouse, parent, child, brother, sister of the trustee or employee, own assets in this business, and of this date are NOT employed by Montgomery College.

Company Name:	
Printed Name:	
Title:	
Signature:	
Date:	

NON-DEBARMENT ACKNOWLEDGEMENT

_____ I acknowledge that my firm has NO pending litigation and/or debarment from doing business with the State of Maryland or any of its subordinate government units and/or federal government within the past five (5) years.

_____ I acknowledge that my firm has **pending litigation or has been debarred** from doing business with the State of Maryland or any of its subordinate government units and/or federal government, within the past five (5) years. If so, please provide an attachment describing the pending litigation or debarment **(if you do not have any pending litigation mark "N/A" or "No")**.

_____ I acknowledge none of this company's officers, directors, partners, or its employees have been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any state or federal government; and that no member of the Montgomery College Board of Trustees or any employees of the College has any interest in the bidding company except as follows:

_____

_____

_____

As the duly authorized representative of the Offeror, I hereby certify that the above information is correct and that I will advise Montgomery College should there be a change in status.

By (Signature) _____

Name and Title _____

Witness Name and Title _____

CONTRACT
BETWEEN
MONTGOMERY COLLEGE
AND
_____

Board of Trustees
Montgomery College
Rockville, Maryland 20850

Project Title: **Ice Storage Modules Replacement**
Takoma Park/Silver Spring Campus

Contract No.: _____

Account No.: _____

This **AGREEMENT** made this _____ day of _____ , 2025, by and between the Board of Trustees of **MONTGOMERY COLLEGE**, a public institution of higher education, hereinafter called the "College", and _____, a _____, registered in the State of _____, located at _____ , hereinafter called the "Contractor".

WITNESSETH, that the College and the Contractor for the consideration named agree as follows:

1 QUALIFICATIONS OF THE CONTRACTOR

The Contractor hereby assures the College that the Contractor is qualified to perform the services provided for in this Agreement in accordance with all applicable laws, orders, rules and regulations. The Contractor further assures the College that the Contractor is free from any financial interests which may conflict with the proper performance of this Agreement.

2 DEFINITION OF THE PROJECT

The Contractor agrees to provide all of the necessary labor, materials, equipment and insurance to perform all of the Work described in the Contract Documents. The Work to be performed by the Contractor shall include all items accepted by the College as part of the Contractor's bid submittal, base bid and alternate prices.

3 TIME OF COMPLETION

The Work to be performed under this Agreement shall be in accordance with the Preliminary Project Schedule contained in the Contract Documents. It is agreed that time is of the essence and therefore the College will suffer substantial damages if the Work is not completed within the time stated in the Preliminary Project Schedule contained in the Contract Documents.

4 LIQUIDATED DAMAGES

It is agreed that time is of the essence and therefore the College will suffer substantial damages if the Work is not completed within the time stated in the Preliminary Project Schedule contained in the Contract Documents. If the Contractor fails to achieve Substantial Completion of its Work on or before the date set for Substantial Completion of the Contract and as a result causes the Project to be completed after the date set for Substantial Completion of the Project as set forth in the Preliminary Project Schedule, liquidated damages shall be assessed against the Contractor in the amount of **$ 1,000** per day for each calendar day that the Contractor delays Substantial Completion of the Project. These assessed damages shall not be considered as a penalty but as mutually agreed upon as the ascertained damages suffered by the College because of the delay. Where, under the contract, additional time is allowed for the completion of the work, the new time limits will be the essence of the contract.

5 CONTRACT DOCUMENTS

The Contract Documents are the Agreement, the Request for Bid/Proposal, Instructions for Bidders/Offerors, the General Conditions of the Contract, Supplementary Information and Conditions, Preliminary Project Schedule, Drawings, Specifications, Addenda issued prior to execution of the Contract, Modifications issued after execution of the Contract, the Performance Bond, the Labor and Material Payment Bond, the Contractor's Bid Form and all attachments thereto received from the Contractor. The term "Contract" when used in the Specifications or Drawings shall be considered as synonymous with the term "Contract Documents".

6 CHANGES TO THE CONTRACT

The College may make any alterations, deviations, additions or omissions to the Contract Documents which it deems to be in the best interest of the College without otherwise affecting the obligations of the Contractor or making void this Agreement. Any alterations, deviations, additions or omissions shall be processed as a change order in the Work and shall be prepared in accordance with the procedure set forth for issuing changes in the Work in the Contract Documents.

7 CONTRACT SUM

The College shall pay the Contractor the Contract Sum of _____Dollars ($ _____.00) for the Work performed strictly in accordance with the requirements of this Agreement. All invoices submitted for Work performed under this Agreement shall include the College's project title, contract number and account number. The Contract Sum is a firm lump sum paid in accordance with the General Conditions of this Agreement.

8 PROGRESS PAYMENTS

Payments shall be made to the Contractor on a monthly basis provided that the Contractor submits Applications for Payments which are prepared in accordance with the General Conditions and supported by such data as the College may reasonably require. The College shall have the right to audit the Contractor's records to verify the payment request. Payment shall be made within thirty (30) calendar days after the requisition, properly prepared and authorized by the College representative, is received in the Finance Office.

9 ACCEPTANCE AND FINAL PAYMENT

9.1 Upon receipt of written notice from the Contractor that the Work is ready for final inspection and acceptance, the College and/or its representatives shall promptly make such final inspection. When the College Representative finds the Work fully acceptable under the Agreement and the Agreement fully performed, the College Representative shall issue a final certificate stating that the Work provided for in this Agreement has been completed and is acceptable under the terms and conditions thereof and that the entire balance found to be due to the Contractor and noted in the final certificate is due and payable. Before issuance of a final certificate, the Contractor shall submit such evidence the College deems necessary to ensure that all payrolls, materials bills and other indebtedness connected with the Work have been paid. Final payment shall be made within (15) fifteen calendar days after the issuance of a final certificate from the College's Representative that the Work has been fully completed and the Agreement fully performed.

9.2 Neither the acceptance by the College or any representative of the College nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by the College, shall operate as a waiver of any portion of the Agreement or of any power reserved to the College or any right to recover damages. The waiver of any breach of the Agreement shall not be held to be a waiver of any other prior or subsequent breach.

10 NOTICES

Any notice to be provided shall be sent by first class mail and shall be addressed as follows or as may be later designated in writing:

a) For the College:

Mr. Sherwin A. Collette
Sr. Vice President for Administrative and Fiscal Services
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

b) For the Contractor:

_____
_____
_____
_____
_____

11 INTERPRETATION OF CONTRACT

This Agreement is a contract under seal and shall be construed and interpreted according to the laws of the State of Maryland, without regard to principles of conflicts of law.

12 COMPLIANCE WITH LAWS

The Contractor agrees to comply, at no additional expense, with all applicable Executive Orders, Federal, State, county, bi-county, regional and local laws, ordinances, rules and regulations in effect as of the date of this Agreement and as they may be amended from time to time, including but not limited to the equal opportunity clause set forth in 41 CFR 60-250.4 as amended. The Contractor shall further agree to comply with any special provisions or requirements, including more stringent provisions, mandated by any entity having jurisdiction.

13 INDEPENDENT CONTRACTOR

The Contractor shall perform the Contract as an independent contractor and shall not be considered as an agent of the College nor shall any employee or agent of the Contractor be considered subagents of the College. Nothing in this Contract shall be construed as constituting a partnership, joint venture, or agency between the College and Contractor. Other than duties of the Construction Manager based on authority granted to the Construction Manager by the College, no acts performed or representations, whether oral or written, made by or with respect to third parties and the Contractor shall be binding on the College.

14 NONDISCRIMINATION

14.1 The Contractor assures the College that, in accordance with applicable law, it does not, and agrees that it will not discriminate in any manner on the basis of sex, race, age, color, creed, national origin, religious belief, pregnancy, handicap, marital status or status as a disabled veteran or veteran of the Vietnam era. The Contractor further agrees to post in conspicuous places notices setting for the provisions of the non-discrimination clause and to take affirmative action in accordance with applicable law to implement these provisions.

14.2 The Contractor further assures the College that, in accordance with the Immigration Reform and Control Act of 1986, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or in the case of a citizen or intending citizen, because of such individual's citizenship status.

14.3 The College is committed to providing a work and study environment that is free from discrimination and harassment on the basis of sex, race, age, color, creed, national origin, religious belief, pregnancy, handicap, marital status or status as a disabled veteran or veteran of the Vietnam era. Behavior contrary to this philosophy, which has the purpose or effect of creating an intimidating, hostile, or offensive environment, will not be tolerated by the College, and it is the Contractor's responsibility to ensure that such behavior by its employees, agents and subcontractors does not occur.

14.4 This policy extends to maintaining an environment free from sexual harassment. Therefore, sexual advances or sexual remarks, requests for sexual favors, and other verbal or physical conduct of a sexual nature must not be condoned or permitted by the Contractor. This prohibition extends to such harassment within the employment context as well as harassment of students, staff and visitors of the College. It should be assumed that all sexual behavior by the Contractor's employees, agents and subcontractors on any campus or facility of the College is improper and unwelcome.

15 COMPLIANCE WITH THE IMMIGRATION REFORM AND CONTROL ACT OF 1986

The Contractor warrants that both the Contractor and/or any subcontractor of the Contractor do not and shall not hire, recruit or refer for a fee, for employment under this Agreement or any subcontract, an alien knowing the alien is an unauthorized alien and hire any individual without complying with the requirements of the Immigration Reform and Control Act of 1986 (hereinafter referred to as "IRCA"), including but not limited to any verification and record keeping requirements. The Contractor agrees to indemnify and save the College, its employees and/or trustees harmless from any loss, costs, damages or other expenses suffered or incurred by the College, its employees and/or trustees by reason of the Contractor's or any subcontractor of the Contractor's noncompliance with "IRCA." The Contractor agrees to defend the College, its employees and/or trustees in any proceeding, action or suit brought against the College, including but not limited to administrative and judicial proceedings, arising out of or alleging noncompliance of the Contractor with "IRCA." The Contractor recognizes that it is the Contractor's responsibility to ensure that all certifications and verifications as required by law are obtained and maintained for the applicable time period.

16 ASSURANCE OF NONCONVICTION OF BRIBERY

The Contractor hereby declares and affirms that, to its best knowledge, none of its officers, directors or partners and none of its employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery or conspiracy to bribe under the laws of any state or the Federal Government.

17 CONFLICT OF INTEREST

No employee of the College or of the State of Maryland, or any department, commission, agency or branch thereof whose duties as such employee include matters relating to or affecting the subject matter of this Agreement shall, until such time as the Contractor receives final payment, become or be an employee of the party or parties hereby contracting with the College, the State of Maryland, or any department, commission, agency or branch thereof.

18 ASSIGNMENT AND SUBCONTRACTING

18.1 Neither the College nor the Contractor shall sell, transfer, assign or otherwise dispose of this Agreement or any portion thereof, or its right, title or interest therein, or its obligations there under, without the written consent of the other. A change in membership of the Contractor’s firm of one or more officers shall not constitute an assignment.

18.2 The Contractor shall not make any contracts for professional services with any other party for furnishing any of the work or services to be performed under this Agreement without the written approval of the College; however, this provision shall not be taken as requiring the approval of the contract of employment between the Contractor and its personnel assigned for the purposes of performing this Agreement.

19 INSURANCE

19.1 The Contractor shall maintain in force at all times during the term of this Agreement, with an insurance carrier licensed to do business in the State of Maryland acceptable to the College, the following minimum insurance coverage. This insurance must be kept in full force and effect during the term of this contract, including all extensions. The insurance must be evidenced by a certificate of insurance, and if requested by the College, the proposed awardees/Contractor shall provide a copy of the insurance policies. The Contractor's insurance shall be primary.

a) Worker's Compensation Insurance covering the Contractor's employees as required by State of Maryland law with the following minimum limits:

Bodily Injury by Accident	$ 100,000 each accident
Bodily Injury by Disease	$ 500,000 policy limit
Bodily Injury by Disease	$ 100,000 each employee.

b) Commercial General Liability Insurance, excluding automobiles owned or hired by the Contractor, with limits as follows

Bodily Injury and Property Damage:	$ 10,000,000 combined single limit of bodily injury and property damage per occurrence

c) Comprehensive Automobile Liability Insurance, providing bodily injury and property damage coverage for owned vehicles, hired vehicles and non-owned vehicles with limits as follows:

Bodily Injury:	$ 1,000,000 each person $ 2,000,000 each occurrence
Property Damage:	$ 2,000,000 each occurrence

d) Builder’s Risk Insurance, providing property damage coverage and theft replacement coverage for goods provided and services rendered during construction. For renovation projects, when custody of the building is turned over to the Contractor, the Builder’s Risk policy must additionally include building replacement value.

e) Insured - The College, its elected and appointed officials, officers, consultants, agents and employees must be named as additional insured and loss payee on Contractor's Commercial and Excess/Umbrella Insurance for liability arising out of Contractor's products, goods and services provided under this Agreement.

19.2 At the time this Agreement is made, the Contractor shall provide the College with evidence of payment for the above insurance coverage as resulted by this Agreement. Any request for extension of time of this Agreement shall also include evidence of payment for the above insurance coverage as required by an extension of time for this Agreement.

19.3 These coverages and limits are to be considered minimum requirements under this Agreement and shall in no way limit the liability or obligations of the Contractor. The insurance shall provide that policy coverage will not be canceled, altered or materially changed without sixty (60) calendar days’ prior notice to the College by registered or certified mail. The insurance shall not be limited to claims made only while the policy is in effect.

19.4 The Contractor shall furnish the College with a certificate of insurance as evidence of the required coverage. The certificates of insurance must name the College as an additional insured.

19.5 In the event that the Contractor's insurance is terminated, the Contractor shall immediately obtain other coverage and any lack of insurance shall be grounds for immediate termination of this Agreement.

19.6 For the purposes of this article, the word "licensed" shall be deemed to mean an insurance carrier either licensed or approved to do business in the State of Maryland.

20 SAVE HARMLESS

20.1 The Contractor shall be responsible for any property damage, loss, personal injury, death and/or any other damage which may occur by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor agrees to indemnify and save harmless the College and its respective employees, volunteers, students, and trustees, as applicable, (the “Indemnitees”) from any claims, loss, costs, damages or other expenses suffered or incurred by the Indemnitees, including attorney’s fees and costs, by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor at its own expense shall defend the Indemnitees in any action or suit brought against any of the Indemnitees arising out of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. Any acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement on the part of any agent, servant, employee or Subcontractor of the Contractor, or any Subcontractor's agent, servant or employee, are deemed to be the Contractor's acts, negligence, willfulness or failure to perform any of the obligations defined by this Agreement.

20.2 In claims against any person or entity indemnified under subsection 21.1 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under subsection 21.1 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers or workmen's compensation acts, disability benefit acts or other employee benefit acts.

20.3 The College may retain such moneys due or to become due the Contractor under this Agreement as it considers necessary until such suits or claims for damages have been settled or otherwise disposed of and satisfactory evidence to that effect has been furnished to the College.

20.4 The provisions of this Article shall survive the termination of this Agreement.

21 DISPUTES

Any dispute concerning a question of fact arising under this Agreement which is not disposed of by agreement shall be decided by the President of the College or his designee. Pending the final decision of the dispute, the Contractor shall proceed diligently with the Agreement performance. Nothing hereunder shall be interpreted to preclude the parties from seeking, after completion of the Agreement, any and all remedies provided by law.

22 TERMINATION FOR THE CONVENIENCE OF THE COLLEGE

The performance of the work or services under this Agreement may be terminated by the College, in whole or in part, whenever the President of the College shall deem that termination is in the best interest of the College. In such event, the College shall be liable only for payment in accordance with the payment provisions of this Agreement for work or services performed of furnished prior to the effective date of termination, plus reasonable costs of termination, if any, which costs shall be specifically approved by the College in writing. The Contractor shall not be reimbursed for anticipatory profits. Termination hereunder shall become effective by delivering to the Contractor a written notice of termination upon which date the termination shall become effective.

23 TERMINATION FOR DEFAULT

The performance of the work or services under this Agreement may be terminated by the College, in whole or in part, from time to time, effective upon receipt of notice, whenever the Contractor shall default in the performance of this Agreement and fails to make progress in the prosecution of the contract work or endangers such performance and shall fail to cure such default within ten (10) calendar days period after receipt of written notification from the College specifying the default. Should the Agreement be terminated by the College for failure to perform on the part of the Contractor, no additional compensation shall be paid.

24 DELAY

24.1 In the event the performance of work or services under this Agreement is delayed by causes beyond the control of and without the fault or negligence of the Contractor, the College shall have the option to:

a.) Terminate the Agreement, or

b.) Allow the President of the College or his designee to extend the time for performance. No monetary compensation will be awarded for the time extension.

24.2 Any changes made in this Agreement as a result of delay shall be in writing. In the event the time for performance of this Agreement is extended beyond the term provided for, all other terms and conditions shall remain in full force and effect.

25 WORK UNDER CONTRACT

Work may not commence under this Contract until all conditions for commencement are met, including execution of the Contract by both parties, compliance with insurance requirements and issuance of any required notice to proceed.

26 CONTINGENT FEES

The Contractor hereby declares and affirms that neither it nor any of its representatives has employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Contractor, to solicit or secure this Agreement, and that it has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or any other consideration contingent on the making of this Agreement.

27 CAPTIONS

The captions and headings contained herein are solely for convenience and reference and do not constitute a part of this Agreement.

28 ENTIRE AGREEMENT

This Agreement and the other items identified as Contract Documents constitute the entire agreement between the parties except that any change orders issued by the College shall automatically be deemed to be part of this Agreement. Any other changes or additions hereto shall not become binding upon any parties until reduced to writing and signed by both parties.

29 AUDIT

The Contractor shall permit audit and fiscal and programmatic monitoring of the Work performed under this Agreement. The College shall have access to and the right to examine and/or audit any records, books, documents and papers of Contractor and any Subcontractor involving transactions related to this Agreement during the term of this Agreement and for a period of three (3) years after final payment under this Agreement, whether or not disputes (including litigation) exist between the parties.

30 REGISTRATION FOR CORPORATIONS NOT INCORPORATED IN THE STATE OF MARYLAND

Pursuant to 7-201 et seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201, before doing any interstate or foreign business in this State. By signing this agreement, the Contractor certifies that it has qualified with the Department of Assessments and Taxation.

31 SEVERABILITY

If any provision of this Agreement shall be held illegal, unenforceable, or in conflict with any law governing this Agreement, the validity of the remaining portions shall not be affected thereby.

IN WITNESS WHERETO, the Contractor and the College have hereunto set their hands and seals the day and year first above written.

Montgomery College

_____
Witness

By: _____
Dr. Jermaine F. Williams
President

Date: _____

Contractor

_____
Witness

By: _____

Date: _____

Fed Tax I.D. No.: _____

This contract is executed by the Montgomery College Board of Trustees pursuant to Board Resolution No. _____, dated _____.

Certify that this Contract has been prepared in accordance with College Policy and Procedures and certify as Account Manager for this account.

Certify that funds are available for this Contract.

Contract No.
Account No
Amount:

_____
Sherwin A. Collette
Sr. Vice President for Administrative and Fiscal Services

_____
Date

End of Form of Contract

Montgomery College
Standard Performance Bond

Any singular reference to Contract, Surety, Owner or Other Party shall be considered plural where applicable.

CONTRACTOR (*Name and Address)*:

SURETY *(Name and Principle Place of Business)*:

OWNER *(Name and Address)*:

CONSTRUCTION CONTRACT
Date:
Amount:
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Dated):
Amount:
Modifications to this Bond: ☐ None ☐ See Page 3

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

(Any additional signatures appear on the last page)

(FOR INFORMATION ONLY – Name, Address and Telephone)

AGENT or BROKER:

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

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

2 If the Contractor performs the Construction Contract in accordance with its terms, the Surety and the Contractor shall have no obligation under this Bond.

3 Whenever the Contractor shall be declared by the Owner to be in default under the Contract, the Surety shall, at its sole expense, within 15 days after Owner having mailed to Surety a copy of the notice of default sent to Contractor, take one of the following actions:

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

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

3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and

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

.2 Deny liability in whole or in part and notify the Owner citing reasons therefor.

4 If the Surety does not proceed as provided in Paragraph 3, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 3.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

5 After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 3.2 or 3.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract. The Surety is obligated without duplication for:

5.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

5.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 3;

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

5.4 All other costs and damages permitted to be recovered by the Owner under the Construction Contractor at law.

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

7 Any proceeding, legal or equitable, under this Bond may be instituted only in the Circuit Court for Montgomery County, Maryland and the Surety waives venue in any other court.

8 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

9 This Bond had been furnished to comply with a statutory or other legal requirement of the State of Maryland. Any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

10 DEFINITIONS

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

10.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

10.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

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

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

PAYMENT BOND

Ice Storage Modules Replacement
Takoma Park/Silver Spring Campus

RFP No.: 625-005

Use AIA Document A312-2010, Payment Bond

APPLICATION AND CERTIFICATE FOR PAYMENT

Use AIA Document G702, Application and Certificate for Payment, latest edition, and relevant attachments, unless otherwise indicated.

MONTGOMERY COLLEGE
GENERAL CONDITIONS OF THE CONTRACT

TABLE OF CONTENTS

ARTICLE 1 – GENERAL PROVISIONS

1.1. DEFINITIONS

1.1.1. The "Agreement" is the written contract between the College and the Contractor.

1.1.2. The "College" is Montgomery Community College or Montgomery College Foundation, Inc.

1.1.3. The "Contractor" is the person or organization having a direct contractual relationship with the College for the execution of the Work under the Contract Documents.

1.1.4. The “Contract Documents” are the Agreement, the Request for Bid or Request for Proposal, Instructions to Bidders/Offerors, Supplementary Instructions, the General Conditions, Supplementary Conditions, Preliminary Project Schedule, Drawings, Specifications, Addenda issued prior to execution of the Contract, Modifications issued after execution of the Contract, the Performance Bond, the Labor and Material Payment Bond, accepted Contractor's Bid or Proposal Form(s) and all attachments thereto received from the Contractor. The term "Contract" when used in the Specifications or Drawings shall be considered as synonymous with the term "Contract Documents".

1.1.5. The "Specifications" are the portion of the Contract Documents included in the Project Manual consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.6. The "Drawings" are those enumerated in the Specifications and those incorporated in the Contract Documents as the Work progresses.

1.1.7. The "Project Manual" is the volume that includes the Specifications as well as Bidding or Proposal Requirements, Contract Form, General Conditions and Supplementary Conditions.

1.1.8. The term "Work" means all of the obligations undertaken by the Contractor pursuant to the Contract Documents. Work includes, unless specifically excepted, the furnishing of all material, labor, equipment, supplies, plant, tools, scaffolding, transportation, supervision, insurance, taxes and all other services, facilities and expenses necessary for the full performance and completion of the requirements of the Contract Documents. "Work" also means that which is produced, constructed, or built pursuant to the Contract Documents.

1.1.9. The term “Project” is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the College or by separate contractors.

1.1.10. The term "Subcontractor" means any individual, partnership, firm, corporation or business entity other than an employee of the Contractor, who has a contract with the Contractor to furnish labor, or labor and materials for the Work. The term also includes Subcontractors of a Subcontractor. The term does not include vendors who furnish materials not worked to a special design according to the Drawings and Specifications.

1.1.11. The term "Site" or "Premises" means the area or areas indicated and such additional areas or locations upon which or in which Work under this Contract is being performed together with such areas adjacent thereto, as may be designated for the Contractor's use for a specified, limited period of time by the College.

1.1.12. The "Architect/Engineer" is the person commissioned by the College to design the Work and/or provide construction-phase architectural or engineering services. If the design was performed by the College, "Architect/Engineer" shall refer to the College.

1.1.13. The term "Contract Time" or "Time" and "Completion Date" is the number of calendar days (including weekends and holidays) shown in the Contract Documents as the time allowed for completion of the Work. If a calendar date of completion is shown in the Contract Documents in lieu of the number of calendar days, the Work shall be completed on or before that date.

1.1.14. The term "Contract Sum" refers to the total sum, including authorized adjustments, allotted in the Contract Documents for the services performed by the Contractor for satisfactory completion of all of the Work required by the Contract Documents.

1.1.15. “Shop Drawings" are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

1.1.16. “Product Data" are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate materials or equipment for some portion of the Work.

1.1.17. “Samples" are natural materials, fabricated items, equipment, devices, appliances or parts thereof as called for in the Specifications, and any other samples as may be required by the College to determine whether the kind, quality, construction, workmanship, finish, color and other characteristics of the materials, etc., proposed by the Contractor conform to the requirements of the Contract Documents. Samples shall establish the kind, quality and other required characteristics of the various parts of the Work, and all Work shall be in accordance with the accepted samples.

1.1.18. The term "Request for Information" refers to a written instrument submitted by the Contractor requesting that a clarification with respect to the Contract Documents be provided by the Architect/Engineer.

1.1.19. The term "Change Order" refers to a written instrument signed by the College which describes a directive by the College which is a change in the Work.

1.1.20. The "College's Representative" is the Vice President of Facilities & Public Safety or their designee.

1.1.21 The “College’s Project Manager” is(are) the person(s) or entity(ies) employed or retained by the College to provide project and construction management services, including administration of the Contract as described in Article 2. The College may exercise any power or authority of the College’s Project Manager under the Contract.

1.1.22. "Day" means a calendar day unless otherwise designated.

1.1.23. "Notice to Proceed" means a written notice to the Contractor of the date on which it shall begin the prosecution of the Work. The Contract Time shall begin to run from the starting date established in the Notice to Proceed. Notice to Proceed will be timely provided upon receipt of Contractor materials required before the start of work, including but not limited to performance, payment, labor and material bonds and insurance certificates.

1.1.24. "Written Notice" means giving of notice under the Contract by one party to the other. Unless otherwise indicated in the Contract Documents, Written Notice shall be deemed to have been duly served on the Contractor if delivered in person to the individual or to the member of the firm or to an office of the corporation to whom it is directed, or if delivered by regular or certified mail to the last business address known to the College. Written Notice shall be deemed to have been given to the College upon actual receipt of Written Notice by the College.

1.2. CONTRACT DOCUMENTS

1.2.1. Correlation and Intent of Contract Documents

1.2.1.1. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Their intent is to include in the scope of the Contract, at no additional cost to the College, all Work necessary for proper completion of the Work ready for continual efficient operation that is reasonably inferable from the Documents.

1.2.1.2. Prior to submitting its price, the Contractor shall obtain from the College, clarification of all questions which may have arisen as to the intent of the Contract Documents, or any conflict between two or more items in the Contract Documents. Should the Contractor fail to obtain clarification, then the College may direct that the Work proceed by any method indicated, specified or required by the Contract Documents, in the judgment of the College. The direction by the College shall not constitute the basis for a claim for extra costs by the Contractor. The Contractor acknowledges that it had the opportunity to request clarification prior to submitting its price to the College and that it is not entitled to claim extra costs as a result of failure to request such clarification.

1.2.1.3. The College's Project Manager shall make recommendations regarding the amount, quality, acceptability and fitness of the several kinds of Work and materials which are to be paid for under this Contract and shall make recommendations regarding all questions which may arise in relation to the Work and the construction thereof. The College's decision, based on the College's Project Manager's recommendation, shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties relative to the Contract Documents, the determination or decision of the College shall be a condition precedent to the right of the Contractor to receive payment for the Work under the Contract related to such questions.

1.2.1.4. In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the more restrictive condition in consideration of following priorities:

(1) The Request for Bid or Request for Proposal
(2) Any modifications to the Contract Documents executed after the date of the Contract, with the Modifications having the latest date having the greatest authority.
(3) The Contract.
(4) Supplementary Conditions.
(5) General Conditions.
(5) Drawings and Specifications.
(6) The Contractor's Proposal accepted by the College.

In the event of a conflict or discrepancy within the Specifications or the Drawings, or between the Drawings and the Specifications, the better quality or greater quantity of Work shall be provided in accordance with the College's interpretation.

1.2.1.5. The College's Project Manager and Architect/Engineer shall make recommendations to the College to clarify the meaning and intent of the Specifications and the Drawings where the same may be found unclear or be in dispute.

1.2.1.6. The Contractor is responsible for coordinating and completing the various parts of the Work. No part of the Work shall be left in an unfinished or incomplete condition because of a disagreement between the Contractor and Subcontractors, or between Subcontractors and the Contractor as to where the Work of one begins and ends in relation to the Work of the other. Any adjustments due to differences or conflicts which may arise between the Work of the Contractor under this Contract and the work of other contractors performing work for the College shall be determined by the College and the College's Project Manager.

1.2.1.7. Generally, the Specifications describe Work which cannot be readily indicated on the Drawings and indicate types, qualities and methods of installation of the various materials and equipment required for the Work. The Specifications are not intended to mention every item of Work which can be adequately shown on the Drawings. The Drawings are not intended to show all items of Work described or required by the Specifications even if they are of such nature that they could have

been shown thereon. All materials or labor for Work which are shown on the Drawings, or are reasonably inferable there from as being necessary to produce a finished Work, shall be provided by the Contractor whether or not the Work is also expressly covered in the Specifications.

1.2.2. Specification Format

1.2.2.1. The Specifications are separated into titled sections for convenience only and not to identify the trade or craft responsible to perform the Work. The titled section shall not operate to make the College an arbitrator for the division of responsibility between Contractor and its Subcontractors, and between its Subcontractors, nor shall such sections relieve the Contractor from the responsibility for the satisfactory completion of the entire Work regardless of the division.

1.2.2.2. The General Conditions are a part of each and every section of the Specifications.

1.2.2.3. The Specifications may be abbreviated and include incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "shall be", etc., are intentional; nevertheless, the requirements of the Specifications are mandatory. Omitted words or phrases shall be supplied by inference in the same manner, as they are when a "note" occurs on the Drawings.

1.2.2.4. Words in the singular shall include the plural whenever applicable, or the context so indicates.

1.2.2.5. Where "as shown", "as indicated", "as detailed" or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where "as directed", "as required", "as permitted", "as authorized", "as approved", as accepted", "as selected", or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance or selection by the College is intended unless otherwise stated. As used herein, "provide" means "provided complete in place", that is, furnished and installed and ready for operation and/or use.

1.2.3. Standard Specifications

1.2.3.1. Any reference to standard specifications of any society, institute, association or governmental authority is a reference to the standard specifications of such organization and to their methods of installation of the various materials and equipment required for the Work which are in effect at the time prices are due. It is not intended to mention every item of work described or required by the standard specifications even if they are of such nature that they could have been shown thereon. All materials or labor for work which are inferable there from, as the Contractor shall provide being necessary to produce a finished job at the date of the Contractor's price. If such specifications are revised prior to completion of any part of the work to which such revision would pertain, the Contractor may, if acceptable to the College, perform such work in accordance with the revised specifications.

1.2.3.2. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications.

1.2.4. Ownership

1.2.4.1. The Drawings, Specifications and other documents prepared by the Architect/Engineer, are owned by the College. Copies thereof furnished to the Contractor, are for use solely with respect to this Project.

ARTICLE 2 – COLLEGE AND COLLEGE'S AGENTS

2.1. AUTHORITY OF COLLEGE'S PROJECT MANAGER

2.1.1. The College's Project Manager has the authority to perform all of the College's functions pertaining to the conduct and administration of the Work, except as indicated in 2.1.2.

2.1.2. Unless otherwise indicated in the Contract Documents, the College's Project Manager is NOT authorized to make determinations (as opposed to recommendations) that:

2.1.2.1. Alter or modify the Contract Documents;
2.1.2.2. Alter the Contract schedule;
2.1.2.3. Approve Contract change orders;
2.1.2.4. Terminate or cancel the Contracts.

2.1.3. Unless otherwise indicated in the Contract Documents, recommendations made by the College's Project Manager, pertaining to determinations listed in 2.1.2, are changes in the work that require review, approval and further authorizing action from the College as indicated in Article 6.

2.2. RESPONSIBILITIES OF THE COLLEGE'S PROJECT MANAGER

2.2.1. The College's Project Manager shall be an agent of the College to the extent set forth in the Contract Documents. Any non-College employee in such role shall not be deemed to be the employee of the College for any purpose in connection therewith. Subject to subsection 2.1.2, the College's Project Manager shall have full authority to act, or to cause others to act, on behalf of the College to assure that the Work is carried out in full compliance with the requirements of the Contract, and to otherwise generally protect the College's interests.

2.2.2. The College's Project Manager will determine in general that the Work of the Contractor is being performed in accordance with the Contract Documents, and will use his best efforts to guard the College against defects and deficiencies in the Work of the Contractor.

2.2.3. The College's Project Manager shall provide administrative management and related services as required to coordinate the Work of the Contractor and separate contractors with each other and with the activities of the Architect/Engineer to complete the Project in accordance with the College's objectives for cost, time and quality.

2.3. RESPONSIBILITIES OF THE COLLEGE DEPARTMENT OF ENVIRONMENTAL SAFETY

2.3.1. The Montgomery College Office of Facilities and Public Safety Department of Environmental Safety is responsible for promoting a safe and healthful work environment for the Project and for verifying the Contractor's compliance with Federal and State environmental protection regulations and College safety and health practices. To carry out these responsibilities, the Department of Environmental Safety is authorized to inspect the Project, all work done and being done, and all material to be furnished and being furnished. In the event that the Department learns of an unsafe condition, the Environmental Safety Manager is authorized to suspend work (after notice to the College Project Manager and the Office of Facilities Management) until the unsafe condition is cured by the Contractor. "Unsafe condition" means any practice that represents a significant risk of injury or health hazard to College employees, a significant adverse environmental impact, or a physical hazard which could result in damage to College property and/or the public. The authority of Department of Environmental Safety is in addition to any other rights of the College set forth herein.

2.4. RESPONSIBILITIES OF THE ARCHITECT/ENGINEER

2.4.1. Architect/Engineer's Status

2.4.1.1. The College may maintain staff personnel from the Office of Facilities and Public Safety, or as separate architectural and/or engineering services retained by the College, at the site of the Work for field observation and day-to-day monitoring of the Work.

2.4.1.2. The Architect/Engineer shall assist the College during the construction period and with the College's Project Manager shall observe the Work in process on behalf of the College. The Architect/Engineer will not be responsible for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work. The Architect/Engineer shall have authority to act on behalf of the College only to the extent expressly provided in the Contract Documents or otherwise in writing.

2.4.1.3. With the College's Project Manager the Architect/Engineer may advise the College with respect to claims of the College or the Contractor, on matters relating to the execution and progress of the Work and on the interpretation of the Contract Documents.

2.4.1.4. Together with the College's Project Manager the Architect/Engineer shall certify applications for progress payments and final payment that the Contractor has complied with the requirements of the Contract Documents.

2.4.1.5. Together with the College's Project Manager the Architect/Engineer shall determine Contractor's achievement of Substantial Completion and Final Completion milestones, and issue relevant certificates, in accordance with the requirements of the Contract Documents.

2.5. COLLEGE'S RIGHT TO STOP OR SUSPEND WORK

2.5.1. Stopping of the Work

2.5.1.1. Subject to concurrence by the College, the College's Project Manager may stop all or part of the Contractor's Work, if in the opinion of the College's Project Manager the Contractor has performed Work not in conformance with the Contract Documents. The Work may be stopped until such time that the defective conditions have been corrected. All costs related to the stoppage of the Work shall be borne by the Contractor.

2.5.2. Suspension of the Work

2.5.2.1. The College unilaterally may order the Contractor in writing to suspend, delay or interrupt all or any part of the Work for a period of time as it may determine to be appropriate.

2.5.2.2. If the performance of all or any part of the Work is for an unreasonable period of time suspended, delayed or interrupted by an act or omission of the College in the administration of the Contract, an adjustment shall be made for any increase in the cost of performance of the Contract (excluding profit) necessarily caused by an unreasonable suspension, delay or interruption and the Contract modified in writing accordingly. No adjustment shall be made under this subsection for any suspension, delay or interruption to the extent (1) that performance would have been so suspended, delayed or interrupted by any other cause, including the fault or negligence of the Contractor; or (2) for which an equitable adjustment is provided for or excluded under any other provision in this Contract.

ARTICLE 3 – CONTRACTOR

3.1. RESPONSIBILITIES OF THE CONTRACTOR

3.1.1. The Contractor shall furnish all labor, materials, equipment, tools, construction equipment, machinery, plant, supplies, utilities, telephone, transportation, supervision, temporary construction, permits, insurance, taxes, bonds, contributions and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work, as described in the Contract Documents.

3.1.2. Montgomery County or City of Rockville Complex Structures processes may apply to the Project. When applicable, Contractor shall fulfill any necessary obligations related to that process.

3.2. CONTRACTOR'S ADMINISTRATION AND SUPERVISION OF THE WORK

3.2.1. Staff

3.2.1.1. The Contractor shall furnish a competent, qualified and adequate staff as necessary to administer coordinate, supervise and superintend the Work; to organize the procurement of all materials and equipment so that they will be available at the time they are needed for the Work; and to keep an adequate force of skilled workers on the job to complete the Work in accordance with all requirements of the Contract Documents and to the entire satisfaction of the College's Project Manager. Key members of the staff shall not be changed without the consent of the College's Project Manager.

3.2.1.2. Prior to commencement of the Work, the Contractor shall select a project representative who will have full responsibility for the prosecution of the Work, with full authority to act in all matters as necessary for the proper coordination, direction and technical administration of the Work and who shall attend meetings at such place or places as determined by the College's Project Manager in order to render reports on the progress of the Work.

3.2.2. Supervision

3.2.2.1. The Contractor shall efficiently supervise the Work, using its best skill and attention. It shall carefully study and compare all drawings, specifications and other instructions and shall at once report to the College's Project Manager any error or omission which it may discover, and shall subsequently proceed with the Work in accordance with instructions from the College's Project Manager concerning such error or omission.

3.2.2.2. The Contractor shall assign to the Project throughout its duration a well-qualified, competent superintendent and any necessary assistants, all of whom must be satisfactory to the College's Project Manager. The superintendent shall represent the Contractor in its absence and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case.

3.2.2.3. The College's Project Manager shall not supervise the Work. The means, methods, techniques, sequences, procedures and safety measures utilized in the performance of the Work are the sole responsibility of the Contractor, subject to overall coordination of the College's Project Manager. Any means, method, techniques, sequences or procedures set forth in the Contract Documents are solely to specify the desired end product; and if the means, methods, techniques, sequences or procedures will not result in the desired end product or is unsafe or illegal because of some inherent defect in the Specifications or the particular conditions under which the Work is being performed, it is the Contractor's responsibility to select a correct means, method, technique, sequence or procedure. Nothing in the College's Project Manager's review of the general quality and progress of the Work, including acceptance of submittals and Work, shall be construed as the assumption of authority or supervision over the performance of the Work, or relieves the Contractor from its obligation to comply with the requirements of the Contract Documents.

3.2.3 Subcontracts

3.2.3.1. The Contractor shall, prior to the execution of the Contract, notify the College in writing of the names of Subcontractors, if any, proposed for the principal parts of the Work and for such other parts of the Work as the College's Project Manager may direct. The Contractor shall not employ any Subcontractor that the College may, within a reasonable time, object to for any reason.

3.2.3.2. The Contractor is as fully responsible to the College for the performance, management, acts and omissions of its Subcontractors and of persons either directly or indirectly employed by them, as it is for the performance, management, acts and omissions of persons directly employed by it.

3.2.3.3. Nothing contained in the Contract Documents shall create any contractual obligation between any Subcontractor and the College.

3.2.3.4. The Contractor agrees to bind every Subcontractor, and every Subcontractor agrees to be bound by the terms of the Contract, the Drawings and the Specifications as far as applicable to its Work, including the following provisions, unless specifically noted to the contrary in a subcontract approved in writing as adequate by the College.

3.2.3.5. The Subcontractor agrees:

(1) To be bound to the Contractor by the terms of the Contract, the Drawings and the Specifications, and to assume toward the Contractor all the obligations and responsibilities that it, by those documents, assumes toward the College.
(2) To submit to the Contractor applications for payment in such reasonable time as to enable the Contractor to apply for payment.

3.2.3.6. The Contractor agrees to place in its subcontracts with Subcontractors:

(1) To be bound to the Subcontractor by all the obligations that the College assumes to the Contractor under the Contract, the Drawings and the Specifications, and by all the provisions thereof affording remedies and redress to the Contractor from the College.
(2) To pay the Subcontractor, upon the payment of certificates, if listed in the Schedule of Values the amount allowed to the Contractor on account of the Subcontractor's Work to the extent of the Subcontractor's interest therein.
(3) To make no demand for liquidated damages for delay in any sum in excess of such amount as may be specifically named in the subcontract.
(4) That no claims for services rendered or materials furnished by the Contractor to the Subcontractor shall be valid unless written notice thereof is given by the Contractor to the Subcontractor during the first ten days of the calendar month following that in which the claim originated.
(5) To give to the Subcontractor an opportunity to be present and to submit evidence in any decision involving its rights.

3.2.4. Behavior of Contractor's Employees, Agents and Subcontractors

3.2.4.1. The College is committed to providing a work and study environment that is free from discrimination and harassment on the basis of race, color, religious creed, ancestry, national origin, age, sex, marital status, handicap, pregnancy or status as a disabled veteran or veteran of the Vietnam Era. Behavior contrary to this philosophy, which has the purpose or effect of creating an intimidating, hostile, or offensive environment, will not be tolerated by the College, and it is the Contractor's responsibility to ensure that such behavior by its employees, agents and Subcontractors does not occur.

3.2.4.2. This policy extends to maintaining an environment free from sexual harassment. Therefore, sexual advances, sexual remarks, requests for sexual favors, and other verbal or physical conduct of a sexual nature must not be condoned or permitted by the Contractor. This prohibition extends to such harassment within the employment context as well as harassment of students, staff and visitors of the

College. It should be assumed that all sexual behaviors by the Contractor's employees, agents or subcontractors on any campus or facility of the College, whether owned, operated, maintained or leased by the College, is improper and unwelcome.

3.2.4.3. Montgomery College is a tobacco free institution. Use of tobacco products is prohibited in all indoor and outdoor College-owned facilities and facilities leased and controlled by the College as well as at meetings or conferences sponsored by the College. This use prohibition extends to Contractors' employees, agents, subcontractors and vendors.

3.3. MATERIALS, LABOR, EQUIPMENT AND PROCESSES

3.3.1. Proposals

3.3.1.1. Proposals shall be based upon the materials, equipment or processes specifically named, implied in or reasonably inferable from the Contract Documents.

3.3.1.2. In cases where Work is to be performed in an existing building, proposals shall be based on Contractor's review of existing conditions by means including but not limited to: site inspection and review of existing College documentation, if any, including data from the Environmental Safety Office. Failure or omission of the Contractor to inspect the site and examine available documents shall in no way relieve the Contractor from obligations with respect to its price, nor constitute grounds for a subsequent claim.

3.3.1.3. Certain Project proposals shall be based on Prevailing Wage Rate schedule provided by and the reporting requirements of the State of Maryland's Department of Labor, Licensing and Regulation (DLLR). If guidance regarding applicability of Prevailing Wage Rates is not otherwise included in the Contract Documents, Contractor shall request a determination of applicability from the College prior to submitting a proposal.

3.3.2. Labor, Materials and Equipment

3.3.2.1. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract.

3.3.2.2. The Contractor shall furnish sufficient forces to ensure the prosecution of the Work within the time stated in the Contract.

3.3.2.3. The Contractor shall comply with the provisions of Sections 17208 entitled Prevailing Wage Rates, when applicable, and 17301 through and including 17306 of the State Finance and Procurement Article of the Annotated Code of Maryland (as amended from time to time) entitled "Steel Procurement for Public Works."

3.3.2.4. Unless otherwise specified, all materials and equipment to be permanently installed in the Work shall be new and shall be of such quality as required to satisfy the standards of the Contract Documents. The Contractor shall, if required, furnish satisfactory evidence as to kind and quality of all materials and equipment.

3.3.2.5. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. All labor shall be performed by workers skilled in their respective trades, and Work produced shall be of good quality so that first class Work in accordance with the standards of construction set forth in the Contract Documents will result.

3.3.3. Use of Named Materials

3.3.3.1. Where materials are specified by a name, or several names are specified, without the words 'or equal' following such name(s) the Contractor shall use and/or supply the named material that meets all the requirements of the Specifications.

3.3.4. Use of Equivalent Materials

3.3.4.1. Where the words ‘or equal’ are included, at the Contractor's sole risk, the Contractor may submit a material it considers to be equal in quality, capacity, size, or other determining criteria. The burden of submitting adequate information to the College to prove equality of materials shall be the responsibility of the Contractor. A direct comparison of features and fit with the specified item must be included. Whether an equal or specified product is proposed, all of the units of a given type required for and used in the Work must be the same in material and manufacture. The decision of the College with regard to quality of materials shall be final. The College may reject a proposed equal without cause and the Contractor shall not be entitled to additional compensation.

3.3.5. Substitutions

3.3.5.1. Substitutions requests will be considered only under the following circumstances:

(1) When the specified product is not available; or
(2) When, if a certain product or process is specified and a guarantee of performance is required and, in the judgment of the Contractor, the specified product or process will not produce the desired results; or
(3) When a substitution, in the opinion of the College is in its best interest.

3.3.5.2. Requests for substitutions of products, materials or processes other than those specified shall be submitted in writing to the College’s Project Manager and be accompanied by evidence that the proposed substitution: (1) is equal in quality and service-ability to the specified item; (2) will not entail changes in details and construction of related work; and (3) will be acceptable in consideration of the required design and artistic effect. The Contractor will furnish with its request such drawings, specifications, samples, performance data and other information as may be required of it to assist the College in determining whether the proposed substitution is acceptable. A direct comparison of features and fit with the specified item must be included. The substitution request shall state the credit or extra, if any, involved with the use of such material. The burden of proof shall be upon the Contractor.

3.3.5.3. Regardless of the evidence submitted or any review or independent investigation by the College, a request for a substitution of products, materials or processes is a warranty by the Contractor to the College that (1) the requested substitution is equal in quality and serviceability to the specific item; (2) will not entail changes in details and construction of related work; (3) will be acceptable in consideration of the required design and artistic effect; (4) will not involve any additional cost to the College other than that specified in an accompanying request for a change order; and (5) the Contractor will provide the same or better warranty for the substitution that the Contractor would for that specified.

3.3.5.4. The College’s acceptance of a substitution does not relieve the Contractor of responsibility for any unforeseen consequences and/or costs associated with the substitution.

3.3.5.5. The College may reject a proposed substitution without cause.

3.3.6. Required List of Materials and Equipment

3.3.6.1. Unless otherwise indicated in the Contract Documents, the Contractor shall submit to the College’s Project Manager a comprehensive list of the manufacturer's products proposed for this Work

as soon as practicable and within thirty (30) calendar days after receipt of notice to proceed. The list shall include information on materials, equipment and fixtures as may be required for the College's Project Manager's preliminary review; partial lists will not be considered. Acceptance of this list of products shall not be construed as a substitute for the shop drawings, manufacturer's descriptive data and samples which are required by the Contract Documents, but rather as a base from which more detailed submittals shall be developed for the College's final review.

3.3.7. Tariffs

The Contractor's Contract Sum shall be presumed to include all tariffs levied on materials, supplies, equipment or other property incorporated into or used on the Project, whether the tariff is imposed before or after the Contract is signed.

3.4. WARRANTY/GUARANTEES

3.4.1. Except to the extent that the Contract Documents impose greater warranty obligations on the Contractor for all or any part of the Work, the Contractor warrants:

3.4.1.1. That the materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents;

3.4.1.2. That the Work contains no faulty or imperfect material or equipment or any imperfect, careless or unskilled workmanship;

3.4.1.3. That all mechanical and electrical equipment, machines, devices, etc., shall be adequate for the use to which they are intended and shall operate with ordinary care and attention in a satisfactory and efficient manner; and

3.4.1.4. That the entire Work shall be watertight and leak proof in every particular.

3.4.1.5. Unless otherwise indicated in the Contract Documents, for a period of one year commencing on the date of Substantial Completion or such other date agreed upon, the Contractor shall schedule, manage and monitor all warranty call-backs requested by the College and re-execute, correct, repair, or remove and replace with proper Work, without cost to the College, any Work found not to be as guaranteed by this section or otherwise not in conformity with the Contract and that it will make good all damages or cost to other Work or materials in the process of complying with this section in accordance with Article 10, Correction of Work. The Contractor shall pay for tests and inspections made necessary by faulty Work. The correction period shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation shall survive Final Completion of the Work under the Contract and the Contract Close Out.

3.4.2. Nothing contained in Subsection 3.4.1.5 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of time period of one year as described in Subsection 3.4.1.5 relates only to the specific obligation of the Contractor to correct the Work and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

3.4.3. The Contractor shall cause to be assigned to the College all warranties/guarantees furnished by manufacturers and suppliers of equipment and supplies for the Work. The assignment shall not affect Contractor's warranty obligations to the College.

3.5. TAXES

3.5.1. The College is not exempt from payment of Maryland State Sales Tax and Municipal Occupation (Sales) and/or Use Taxes on materials purchased for this Work.

3.5.2. The Contractor and Subcontractors shall pay sales, consumer, use, unemployment, old age pension and/or other taxes imposed by local, state and/or the Federal government, except taxes and assessments on the real property comprising the Work site. The Contractor is to include such expenses in its proposal.

3.6. PERMITS AND LICENSES

3.6.1. The College will file for the building permit, if one is necessary, with the local authority. The Contractor shall obtain and pay for any and all permits (other than the building permit), and for all licenses and certificates of inspection necessary for the execution and completion of the Work as called for in the Contract Documents. The Contractor will be required to pay all necessary fees to local authorities for permits and inspections and it shall include the cost of the fees in its base price. The College shall not be responsible for the actions or interpretations of county, municipal or other local agencies or officials with respect to the application of Federal, State or local laws, rules, ordinances, regulations, codes or policies to the Work.

3.6.2. The Contractor must be licensed as required by Title XVII, Subtitle VI or Title VIII of the Business Regulation Article, Annotated Code of Maryland.

3.7. PROSECUTION AND PROGRESS OF THE WORK

3.7.1. Notice to Proceed

3.7.1.1. After the Contract has been executed, the College's Project Manager will issue to the Contractor a "Notice to Proceed" and this notice will stipulate the date on or before which the Contractor is expected to begin Work. The specified Contract time shall begin on the starting date stated in the "Notice to Proceed." Any Work started or materials ordered before the starting date stated in the "Notice to Proceed" shall be at the risk of the Contractor.

3.7.1.2. Notice to Proceed will not be issued until the College receives from the Contractor performance, labor and material payment bonds, insurance certificates and other documents which are required by the Contract. The Contractor is prohibited from performing any Work on the site until proof of the insurance required by the Contract is provided to the College.

3.7.2. Hours of Work

3.7.2.1. The Work shall be performed during regular working hours except in the event of emergency, or when required to complete the Work within the time stated in the Contract. What constitutes regular working hours will be agreed upon at the preconstruction conference.

3.7.2.2. The Work shall be suspended on the College's Commencement Day (typically the third Friday in May) unless otherwise agreed to by the College.

3.7.2.3. The Work may be performed on night shifts, overtime, Sundays and holidays when permission to do so has been obtained from the College, at no additional cost to the College, and provided that Contractor complies with any additional regulations regarding off-hours work mandated by regulatory authorities.

3.7.3. Construction Schedule

3.7.3.1. Time

(1) All time limits in the Contract Documents are of the essence of the Contract. Contractor

and the College agree that the time stated in the Contract for the completion of the Work is a reasonable time, considering the usual climatic range and the usual business conditions prevailing in the locality of the Project. The Contract time shall be the full time allowed or required for completion of every task involved in completion of the Work, including lead-time for ordering and fabrication of equipment and materials.

(2) The College is not obligated (a) to accept an early completion schedule from the Contractor, or (b) to accept the Project prior to the completion date stated in the Contract. The College will not be liable for any claims based on the Contractor's assertion of an intention to finish early.

3.7.3.2. Preliminary Schedule

(1) The Contractor shall agree to comply with the Preliminary Project Schedule prepared by the College and included in the Contract Documents or with the Contractor's Proposed Project Schedule, if one was required as part of the Contractor's proposal submission. Agreement by the Contractor to comply with the Preliminary Project Schedule or Contractor's Proposed Project Schedule also means agreement by the Contractor to comply with subsequent reasonable updates prepared or requested by the College.

(2) Within 14 days of the execution of the Contract, Contractor must submit for approval, Preliminary Schedule information outlining all activities for the Contractor's work as may be reasonably requested by the College's Project Manager. Coordinate schedule information with milestones indicated in the Preliminary Project Schedule. This preliminary information must be approved prior to the first Application for Payment being processed. Include each significant construction activity, coordinate each activity with other activities and schedule each construction activity in proper sequence. The College's Project Manager may decline to issue a Notice to Proceed until Contractor has submitted the required schedule information and it is approved by the College's Project Manager. Nothing in this section shall be construed to require the College's Project Manager to issue a Notice to Proceed when the required schedule information has been submitted and approved.

(3) With submission of the preliminary schedule information, include a listing by date of submission of all submittals required. Identify those required to maintain orderly progress of the Work, and those required early because of long lead time for manufacture or fabrication.

3.7.3.3. Completion Schedule

(1) Within 30 days after Contract execution and at such other times as required by subsections 3.7.3.4 and 3.7.3.8, the Contractor shall submit for approval, updated schedule information indicating the time allocated by the Contractor for the performance of each portion of the Work and the submittal information required by subsection 3.7.3.2 (3), properly and reasonably sequenced for achieving each task shown on the schedule. Coordinate schedule with milestones indicated in the Preliminary Project Schedule.

(2) The Contractor's construction schedule shall begin with the date of issuance of Notice to Proceed and conclude with the required date of final completion of the project as stated in the Contract Documents. Float or slack time available in the schedule at any time shall not be for the exclusive use or benefit of either the Contractor or the College, but is jointly owned.

(3) The Contractor's schedule information shall include a complete itemized breakdown of the Work, listed by activity or event number, including items related to the General Conditions, all necessary dates for submittal, review and response, and re-submittal (if necessary), and for each activity shall show at a minimum: (1) a sequence of operations; (2) the dates of commencement and completion of each item of the Work; and (3) delivery for material and equipment. Unless otherwise indicated in the Contract Documents or agreed upon by the College's Project Manager the duration of each activity shall be twenty-one calendar days or less.

(4) Contractor shall submit with each Application for Payment revised schedule information accurately updated to reflect all: (1) revisions to the schedule (2) changes made or planned in the construction sequence; (3) actual construction activities to date including (i) commencement and completion dates for activities started or completed during the reporting period; and (ii) current progress of activities started in prior reporting periods including completion dates for activities completed during the reporting period; (4) delays and their effects on the critical path; (5) extensions of time granted by the College and (6) the Contractor's planned schedule or recovery schedule for completing remaining activities. This required schedule information update shall be furnished monthly whether or not Contractor submits an application for payment in that month.

(5) In the event that there are change orders, they shall be reflected as new activities, or as changes in logic and/or time framing of existing activities. They shall be introduced at the next updating after receipt of a change order, and shall be subject to the approval of the College's Project Manager. Change order logic shall affect only those intermediate activities and performance dates directly concerned. Adjustments required in completion dates for those intermediate dates, or for the Contract as a whole, will be considered only to the extent that there is not sufficient remaining float to absorb the additional time which may be authorized for completion of individual activities.

(6) Whenever the Project shall be behind schedule or alleged by either party to be behind schedule, the College may require the Contractor to furnish, at no additional cost to the College revised schedule information (hereinafter called a "recovery schedule") showing how the Contractor will finish their work by the Contract completion date.

(7) All of Contractor's schedule information, including monthly schedule information updates and any recovery schedule information required shall be subject to review and approval by the College's Project Manager.

(8) The Contractor shall cooperate with the College's Project Manager in scheduling and performing the Contractor's Work to avoid conflict, delay in or interference with the Work of other contractors or the construction or operation of College's own forces. The Contractor shall participate with other contractors and the College's Project Manager and College in reviewing schedules when directed to do so. The Contractor shall make any revisions to their construction schedule information deemed necessary after a joint review.

(9) Approval by the College's Project Manager of any schedule information submitted shall constitute approval of the schedule information only for general conformity with Contract requirements and shall not constitute approval, acceptance or admission of the reasonableness, accuracy, achievability, or feasibility of the schedule information or of the Contractor's ability to meet the schedule, or waiver or excuse of default or delay by the Contractor, extension of the time for completion, waiver or modification of Contract requirements, admission of fault or responsibility for delay on the part of the College or acceptance or admission on the part of the College of any liability or responsibility for the schedule or for acceleration or other costs or delay damages of the Contractor which are inferable from the Contractor's schedule information or update.

(10) The College is not obligated to pay the Contractor for Work completed until proper, accurate schedule information, and updates are furnished as required and it is not liable for and Contractor is not entitled to damages, compensation, or time extensions for delays starting, occurring or continuing during the period when an accurate and reasonable schedule information or update was due but not furnished by the Contractor.

3.7.3.4. All schedule information, including initial schedule information, recovery schedule information and monthly updates, shall be submitted in three (3) paper copies and one (1) electronic copy in Portable Document Format (PDF), unless otherwise indicated.

3.7.4. Progress Meetings

3.7.4.1. Contractor shall plan and participate in routine Project progress meetings to brief College's

Project Manager and Architect/Engineer on the status of the Project. Frequency of meetings shall be determined at a preconstruction conference, but shall typically occur not less than every two weeks. Primary agenda topics shall include reporting status of: Regulatory Approvals, Submittals, RFIs, Commissioning, Safety, Security and Housekeeping, Schedule, Contracts/Finance and Close-Out. Unless otherwise indicated in the Contract Documents, record meeting minutes will be prepared by the Contractor.

3.7.4.2. Contractor shall provide reasonable advance notice to the College's Project Manager and Architect/Engineer regarding scheduling of pre-construction and pre-installation conferences with subcontractors. At a minimum, Contractor should anticipate College's participation in conferences related to underground work, demolition work, primary structural work, all building enclosure work, MEP and telecommunications, AV and security systems work.

3.7.5. Progress Meeting Documentation and Reports

3.7.5.1. Contractor shall prepare, maintain, monitor and make available to the College, reasonable Project progress documentation including, but not limited to:

(1) Contractor's Daily Reports: listing weather conditions, trades on site, manpower, brief description of activities underway, quality control issues raised, commissioning activities underway and any safety or security issues encountered. Append Daily Reports from Subcontractors to the Contractor's Daily Report.
(2) Minutes from Pre-Construction and Pre-Installation conferences.
(3) Minutes from Contractor's Subcontractor and/or Foreman's meetings: including agenda topics, brief summary of issues discussed resolutions discussed and issues requiring attention.
(4) Inspection reports provided by Independent Testing Agencies and/or Laboratories, when applicable.
(5) Inspection reports provided by any authorities having jurisdiction on the Project.

3.8. REFERENCE DOCUMENTS FOR THE WORK

3.8.1. Conformance Documents

3.8.1.1. The College may issue conformance documents, incorporating all Addenda issued during the bid/proposal period into the Contract Documents, for the Contractor's convenience at the start of Work. It is the Contractor's sole responsibility to verify the accuracy of the conformance documents. At the Contractor's election, conformance documents may serve as the basis for Progress Documents. Use of such documentation shall not in any way relieve the Contractor from its responsibility to perform the Work in accordance with the Contract Documents. In the event of a discrepancy between the conformance documents and the Contract Documents, the Contract Documents shall govern.

3.8.2. Progress Documents

3.8.2.1. The Contractor shall keep one complete set of all Drawings, Specifications, Construction Progress Schedule, and shop drawings at the job-site current and in good order. As the Work progresses, the Contractor shall keep a complete and accurate record of all changes or deviations from the Contract Documents, indicating the Work as actually installed. All underground utility locations associated with the scope of work, or revealed during the conduct of the work, shall be recorded by the Contractor's surveyor and referenced to a campus benchmark provided by the College. All such changes shall be neatly and correctly shown on black line prints of the drawings affected, or in the Specifications, with appropriate supplementary notes. This record set of prints of Drawings, shop drawings and Specifications shall be kept at the job site for inspection by the College's Project Manager and Architect/Engineer.

3.8.3. Record Documents

3.8.3.1. At the completion of the Work, the Contractor shall certify by endorsement thereof, that each

of the revised prints of the Drawings and Specifications is complete and accurate. Prior to the Contractor's Application for Final Payment, and as a condition to its approval by the College, the Contractor shall assemble its record drawings and specifications, review them for completeness and submit them to the College's Project Manager. The Contractor shall provide suitable transfer cases and deliver the records therein, indexed and marked for each division of the Work.

3.8.3.2. No review or receipt of such records by the College's Project Manager shall be a waiver of any deviation from the Contract Documents or the Shop Drawings or in any way relieve the Contractor from its responsibility to perform the Work in accordance with the Contract Documents and the Shop Drawings to the extent they are in accordance with the Contract Documents.

3.9. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.9.1. After checking and verifying all field measurements and after complying with applicable procedures specified in the Contract Documents, Contractor shall submit to the College's Project Manager and Architect/Engineer, in accordance with the Contractor's schedule, Shop Drawings and other submittals which will bear a stamp or specific written indication that the Contractor has satisfied its responsibility under the Contract Documents with respect to the review of such submissions. The data on the Shop Drawings or submittal must be complete with respect to quantities, dimensions, specified performance and/or design criteria, materials and similar data to enable the Architect/Engineer to review the information as required. These documents shall be prepared in conformity with the best practice and standards for the trade concerned. Due regard shall be given to speed and economy of fabrication and erection.

3.9.2. Obtaining electronic documentation to aid in the preparation of Shop Drawings and submittals shall be the sole responsibility of the Contractor and may be subject to certain terms and conditions required by the Architect/Engineer and/or College. The College cannot guarantee that electronic documentation prepared by the Architect/Engineer will be made available to the Contractor. If provided, Contractor shall not be entitled to rely on such documentation for accuracy and use of such documentation shall not in any way relieve the Contractor from its responsibility to perform the Work in accordance with the Contract Documents.

3.9.3. The Contractor shall prepare and routinely update a submittal log indicating the status of submittals.

3.9.4. Unless otherwise indicated in the Contract Documents or agreed to by the College in writing, the Contractor shall send the College one copy of all Shop Drawings and product data coincident with the initial and any subsequent submissions to the Architect/Engineer. The College will forward any comments it desires to make to the Architect/Engineer within the designated review time.

3.9.5. In addition to the items noted in the Specifications as requiring Shop Drawings or other details, Shop Drawings and details shall be required for all items which are specifically fabricated for the Work or when the assembly of several items is required for a working unit.

3.9.6. The College's Project Manager and Architect/Engineer will examine the Shop Drawings and product data submittals with reasonable promptness. The College's Project Manager and Architect/Engineer will note whether they are approved, approved with corrections and/or conditions, or rejected. The Architect/Engineer will return the Shop Drawings and project data submittals with the final action to the Contractor and also provide one copy each to the College and College's Project Manager.

3.9.7. The Contractor must allow the Architect/Engineer, College's Project Manager at least fourteen calendar days following receipt of each submittal or re-submittal of Shop Drawings and product data submittals to review the documents and respond to the Contractor. Items requiring longer than fourteen calendar days of review time will be identified in the Specifications. The minimum time allowed for the Architect/Engineer, College's Project Manager to review the submittal shall be increased to the extent that additional time for review is needed due to the fault or the responsibility of the Contractor or its Subcontractors and suppliers. The Contractor will be notified of the cause of the delay and advised of how

long it will take to complete the review; provided, however, that mere failure to give the Contractor such notice shall not entitle the Contractor to compensation or a time extension.

3.9.8. When the Architect/Engineer, College's Project Manager or the College desires corrections, or rejects the Shop Drawings, the Contractor shall resubmit the Shop Drawings with the required corrections in a timely manner.

3.9.9. Unless the Contractor has, in writing, at the time of the submissions, expressly notified the Architect/Engineer, College's Project Manager and the College to the contrary, the College and the Architect/Engineer may assume that Shop Drawings and other submittals from the Contractor are in conformity with the Contract Documents and do not involve any change in the Contract price, or any change which will alter the space within the structure, or alter the nature of the building or Work from that contemplated by the Contract Documents, or constitute a substitution of material or equipment or a change in the Contract or the scope of Work. If the Contractor fails to give notice strictly in accordance with this subsection, approval of any Shop Drawing or submittal shall not be binding on the College.

3.9.10. The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, product data, samples and similar submittals until the respective submittal has been approved by the Architect/Engineer. Such Work shall be in accordance with accepted submittals. Work performed without approval shall be at the Contractor's risk.

3.9.11. Shop Drawings, product data, samples and similar submittals shall be marked, tagged, or otherwise properly identified with the name of the Contractor, the name of the Project, the purpose for which the samples are submitted, and the date and shall be accompanied by a letter of transmittal containing similar information, together with the Specification section number for identification of each item. Each tag or sticker shall have clear space for the stamps of the Contractor, College's Project Manager and the Architect/Engineer.

3.9.12. Samples of materials which are generally furnished in containers bearing the manufacturers' descriptive labels and printed application instructions shall, if not submitted in the standard containers, be supplied with such labels and application standards.

3.9.13. Should the Contractor consider any rejection or notation on the Shop Drawings or other submittals by the College's Project Manager or Architect/Engineer or any other action or inaction of the College's Project Manager or the Architect/Engineer to cause a change in the scope of the Work from that required by the Contract Documents, whether or not such change may affect contract price or time, then the Contractor shall desist from further action relative to the item in question and shall in writing (1) immediately notify the Architect/Engineer, the College and College's Project Manager requesting clarification; and (2) furnish them, within seven (7) days, with a notice explaining the nature of the change and whether increased or decreased cost and/or time is anticipated. No Work concerning the Shop Drawing or other submittal in question shall be executed until the entire matter is clarified and the Contractor is ordered by the College to proceed. Failure of the Contractor to serve written notice as required above shall constitute a waiver of any claim in relation thereto.

3.10. SITE INFORMATION, ACCESS, USE AND RESTRICTIONS

3.10.1. Site Information

3.10.1.1. Contractor shall review existing conditions and related College record information to become completely familiar with site and adjacent conditions. Contractor shall make arrangements to review available documentation and undertake explanatory site visits with College's Project Manager and Campus Facilities Office.

3.10.2. Campus Coordination Requirements

3.10.2.1. Contractor shall furnish a Site Mobilization Plan to the College's Project Manager for review and approval prior to the start of Work. Plan shall indicate features including proposed construction delivery route, materials and trash storage areas, site office and toilet facility locations, fencing, erosion control measures, tree and plant protection, temporary lighting, temporary traffic control measures and signage.

3.10.2.2. Contractor shall meet with Campus Facilities and Security Offices prior to the start of Work to review Contractor's proposed Site Mobilization Plan, and to coordinate Project needs with Campus Operations and Maintenance, House and Grounds-keeping and Security operations.

3.10.2.3. In the event that Contractor's operations affect or disrupt campus access roads and/or building entrances or exits, Contractor shall coordinate maintaining or re-directing access in accordance with the Contract Documents and following the direction and policies of the Campus Security Office and any affected emergency service providers.

3.10.2.4. Contractor shall meet with College's Environmental Safety Office prior to the start of Work for projects where Hazardous Materials Abatement or use of Hazardous or Toxic Substances is expected.

3.10.2.5. Any Utility shut down required must be scheduled with relevant utility Owner and Campus Facilities at least 5 days in advance.

3.10.2.6. Unless otherwise indicated in the Contract Documents, vehicular and pedestrian access to properties shall be maintained operational to the maximum possible extent. Driveways to private properties shall not be blocked. Sidewalks and crossings shall be kept open for the passage of pedestrians. Streets shall not be unnecessarily obstructed and, unless the College shall authorize the complete closing of a street, the Contractor shall take such measures as may be necessary to keep the street open for traffic. The Contractor shall provide and maintain suitable and sufficient provisions, including but not limited to flag persons, barricades, warning signs and detour signs, necessary for the protection of the work and safety of the public. All barricades, obstructions and signage shall be illuminated from sunset to sunrise, daily.

3.10.2.7. Parking at all campus locations is limited. Other than one or two spaces for supervisory personnel, parking space for construction site personnel in campus parking lots should not be anticipated. For Projects where Work is confined within a site construction fence, Contractor may provide limited parking for construction personnel within that fenced area as long as parking does not impede progress of the Work or impede access by emergency or campus service vehicles.

3.10.3. Coordination where Work is in or adjacent to an Occupied Existing Building

3.10.3.1. In cases where Work is scheduled to take place in or adjacent to occupied existing buildings, Contractor shall coordinate the Work as reasonably directed by the College's Project Manager to reduce impact of construction operations on building occupants.

3.10.3.2. Noise that disrupts classes cannot generally be tolerated. The Contractor shall notify the College's Project Manager before starting any Work which might disrupt classes. Notification shall be given well in advance of any such situation in order that the Contractor and College's Project Manager together can reach a mutually agreeable time in which the Work can be accomplished. Noise of a brief/infrequent nature may not be found necessary to reschedule. Always contact the College's Project Manager if in doubt. Any rescheduling required due to noise aversion will not be a cause for either a delay or cost claim.

3.10.3.3. When requested, Contractor shall provide a detailed adjacent Work coordination plan indicating information including schedule of activities, limits of disturbance, sequence of construction, access points and their management, barriers, interface with controls such as fire alarm, security or

building automation systems operation, for areas that directly interface with or are affected by the Work.

3.10.4. Temporary Facilities

Unless otherwise indicated in the Contract Documents:

3.10.4.1. The Contractor shall be responsible for arranging with the College's Project Manager for general services and temporary facilities as required for the proper and expeditious prosecution of the Work; including but not limited to: use of toilets; temporary storage; temporary electrical power; and temporary water.

3.10.4.2. The Contractor shall, at its own expense, make all temporary connections to utilities and services in locations acceptable to the College's Project Manager and local authorities having jurisdiction thereof; furnish all necessary labor and materials, and make all installations in a manner subject to the acceptance of such authorities and the College's Project Manager; separately meter and pay for utilities (electricity, water, sewer, and telephone) consumed; maintain such connections; remove the temporary installation and connections when no longer required; restore the services and sources of supply to proper operating conditions.

3.10.4.3. The Contractor shall supply and maintain an office trailer or shed and a telephone, telefax, and/or computer on the site for the purpose of facilitating construction coordination and communication.

3.10.4.4. At the completion of the Work, Contractor's onsite facilities shall be removed, and the site restored to conditions that meet or exceed those existing at the start of Work.

3.10.5. Existing Utilities

3.10.5.1. The attention of the Contractor is directed to the likely presence of existing underground utilities and overhead utilities and poles located within the Work site. The Contractor is cautioned that some utilities may not be catalogued on College or utility service provider record documents. Further, due to depth and/or types of materials used, some utilities may not be identifiable using traditional utility service locating methods.

3.10.5.2. Where any underground services are expected to be encountered during construction, prior to the start of work, the Contractor shall:

(1) Review College record documents pertaining to affected underground services.
(2) Interview Campus Facilities office with regard to affected underground services.
(3) Call "Miss Utility" at least 48 hours in advance of construction for marking of public utilities.
(4) Be responsible for costs and coordination of utility locator services necessary to locate and mark any private utility services within the Work site, whether or not indicated on record or Contract Documents.
(5) Notify the College's Project Manager, Campus Facilities office, electric utility company, natural gas supplier, providers of communications, and any affected utility or other organization with a right-of way in or immediately adjacent to the Work area at least one week prior to starting work in the areas in which services are located and cooperate with any organization who elects to have a representative present during the conduct of the Work.

3.10.5.3. The Contractor shall exercise special care not to damage or disturb the utility infrastructure in any way.

3.10.5.4. The Contractor shall carefully hand dig representative test pits across the full width of anticipated trenches to confirm utility locations and to reveal any unknown utility conditions for

assessment prior to permitting use of mechanical excavation equipment.

3.10.5.5. All underground utility locations associated with the scope of Work, or revealed during the conduct of the Work, including the location, size and material of all water, sanitary sewer, storm sewer, gas, electric, telephone, data, fiber, cable television, duct banks, steam and chilled water utilities within the project area, shall be recorded by the Contractor's surveyor and referenced to a campus benchmark provided by the College, which is in Maryland State Plane NAD83(NSRS2007) horizontal datum; NAVD88 vertical datum.

Indicate rim and invert elevation of sanitary sewers, storm sewers and storm water management structures. For all sub-surface utility lines on the site, locate the first connection to the off-site system. The horizontal and vertical location of all subsurface utilities must be measured directly prior to backfill. Locations shall be recorded on project progress documents. Electronic record documentation, in AutoCAD format, is required at project close-out.

3.10.5.6. Contractor shall maintain utility paint marks and flags, showing utility location and depth, until work is complete and survey information is transferred to project progress documents.

3.10.5.7. Contractor shall notify the College's Project Manager and Campus Facilities Office when underground utilities are discovered that are not identified by prevailing industry standard marking methods (e.g. color-coded tape and trace wires for non-metallic utilities). Campus Facilities Office will coordinate proper marking of utilities prior to Contractor's completion of the Work.

3.10.5.8. In the event that utility service is damaged during the conduct of the Work, Contractor shall notify the College's Project Manager and Campus Facilities and Security Offices. Repair of damages resulting from Contractor's actions shall be the responsibility of the Contractor. Regardless of responsibility, Contractor shall immediately undertake necessary repairs, including conducting Work off-hours and/or on weekends, to ensure prompt restoration of service in order to minimize impact of unplanned utility outages on College operations.

3.10.6. Erosion Control

3.10.6.1. The Contractor shall incorporate all permanent erosion control features, where applicable, into the Work at the earliest practicable time and shall maintain them in proper condition during the course of the Contract.

3.10.6.2. Temporary measures shall be used to control conditions that develop prior to installation of permanent control features, or that are needed to temporarily control erosion resulting from normal construction practices. Temporary controls may include off site control measures where such Work is necessary as a direct result of Contractor's construction activity.

3.10.7. Tree and Plant Protection

3.10.7.1. Unless otherwise shown in the Contract Documents, the Contractor shall protect all trees and plants which are liable to injury by construction operations and/or site mobilization plan.

3.10.7.2. Trees may not be used for any attachment or anchorage. Tree root zones shall be protected from overburden from construction traffic or storage of materials.

3.10.8. Snow and Ice Removal

3.10.8.1. Contractor shall provide snow and ice removal from within the project site area and from pedestrian or vehicular routes providing immediate access to or routing around the project site.

3.10.8.2. When the College is officially closed due to snow and ice conditions and the Contractor

plans to work, it is the Contractor's responsibility to provide additional snow and ice removal, including removal beyond the site project limits, as necessary to provide access required by its Workers, Subcontractors and/or suppliers.
3.10.8.3. At all times, Contractor shall cooperate and coordinate his snow and ice removal activities with College's snow and ice removal activities.

3.10.9. Trash Removal: Salvage and Recycling

Unless otherwise indicated in the Contract Documents:

3.10.9.1. Salvage rights belong to the Contractor when the Project scope of Work includes demolition and removal of existing materials or equipment.

3.10.9.2. Contractor shall implement best recycling practices as part of its trash removal protocol, with particular attention to sorting and recycling corrugated cardboard packaging materials, wood pallets, paper products and metal products.

3.10.10. Project Signage

3.10.10.1. Contractor may place his identification signage for promotional purposes at the Project site, subject to review and approval by the College's Project Manager.

3.11 HAZARDOUS AND TOXIC SUBSTANCES

3.11.1. Hazardous and Toxic Substances

3.11.1.1. The Contractor shall comply with all applicable federal, state, bi-county and local laws, ordinances and regulations relating to hazardous and toxic substances, including such laws, ordinances and regulations pertaining to access to information about hazardous and toxic substances, in effect on the date of the Contract and as amended from time to time. The Contractor shall further comply with any special provisions or requirements, including more stringent provisions, mandated by any entity having jurisdiction, including but not limited to the Montgomery County Department of Environmental Protection.

3.11.1.2. At least ten (10) calendar days prior to commencing any on-site Work required by these Contract Documents, the Contractor shall compile, maintain and submit to the College's Project Manager a "Chemical Information List" which shall contain the following information for each hazardous and toxic substance used, manufactured, processed, formulated, packaged, repackaged, handled, reacted, transferred, or stored at the job site: the common name, the chemical name, and identification of the Work area in which the hazardous chemical is found. A copy of this list shall be posted at all times at the Contractor's on-site project office. This list shall be updated and maintained in a current status by the Contractor as to the hazardous and toxic substance used, manufactured, processed, formulated, packaged, repackaged, handled, reacted, transferred or stored at the job site. The Contractor shall submit to the College's Project Manager an updated Chemical Information List at least 48-hours prior to the introduction of any additional hazardous and toxic substance not listed on the current Chemical Information List which is to be used, manufactured, processed, formulated, packaged, repackaged, handled, reacted, transferred or stored at the job site.

3.11.1.3. The Contractor shall provide the College's Project Manager at least 48-hours prior to commencing Work requiring the use of a hazardous and toxic substance with a "Material Safety Data Sheet" or, in the case of a controlled hazardous waste substance, a hazardous waste manifest, for each hazardous and toxic substance listed or subsequently added to the Chemical Information List in compliance with applicable laws, ordinances and regulations.

3.11.2. Asbestos-Containing Materials

3.11.2.1. The Contractor shall not use, install, or apply any asbestos-containing building materials on any Work. Any exception to this requirement must be requested in writing by the Contractor with an explanation of Work requirements. The College will review any such request and must approve in writing the use of any asbestos-containing building materials on any Work prior to use, installation or application. Upon completion of the Project and before final acceptance is issued by the College, the Contractor shall provide the College's Project Manager with written and notarized certification that it did not use, install or apply asbestos-containing materials.

3.11.3. Environmental Litigation

3.11.3.1. If the performance of all or any part of the Work is suspended, delayed or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation as defined below, or by the order of any state or federal agency or official enforcing applicable laws, such expense, delay or interruption shall be considered as if ordered by the College under Article 2, College's Right To Stop Or Suspend Work. If it is determined that the suspension, delay, or interruption is due wholly or in part to acts or omissions of the Contractor or breach or violation of the terms of this Contract or acts of the Contractor not required by this Contract, the Contractor shall be responsible for all additional costs and delays resulting from such acts or omissions. The term "environmental litigation" as used herein means a complaint filed in court alleging that the Work will have an adverse effect on the environment and that the College has not duly considered, either substantively or procedurally, the effect of the Work on the environment.

3.12. CUTTING AND PATCHING

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

3.12.2. The Contractor shall not damage or endanger a portion of the Work or other construction of the College or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the College or a separate contractor except with written consent of the College and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the College or a separate contractor the Contractor's consent to cutting or otherwise altering its Work.

3.13. CLEANING

3.13.1. Progress Cleaning

3.13.1.1. The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract, and shall remove and dispose of waste materials or rubbish prior to the end of each working day.

3.13.1.2. If the Contractor fails to clean up as provided in the Contract Documents, the College's Project Manager may do so and the cost thereof shall be charged to the Contractor.

3.13.2. Final Cleaning

3.13.2.1. At completion of the Work the Contractor shall remove from and about the Work waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

3.13.2.2. Contractor shall wet clean all floors and surfaces or otherwise clean any equipment and materials installed in accordance with manufacturer's instructions.

3.14. ROYALTIES, PATENTS AND LICENSE FEES

3.14.1. The Contractor assumes the risk that any materials, equipment, processes or other items required under the Contract or furnished by the Contractor are subject to any patent, copyright, mark, secret or other property right of another. The Contractor shall pay for all royalties and license fees and shall obtain all necessary licenses or permits to permit use of any such item by the College. Contractor shall defend all suits or claims of infringement of any patent, copyright, mark, secret or other property right of another and shall save the College harmless from loss or expense on account thereof.

3.14.2. When an item specified by the College or furnished by the Contractor infringes or is alleged to infringe any patent, copyright, mark, secret or other property right of another, the Contractor will, at its option, and at no additional cost to the College, (1) procure for the College the right to use the item; (2) replace the item with an approved, non-infringing equal; or (3) modify the item so that it becomes non-infringing and performs substantially the same as the original item.

3.14.3. The review by the College of any method of construction, invention, appliance, process, article, device or material of any kind shall be for its adequacy for the Work, and shall not be an approval of the use thereof by the Contractor in violation of any patent or other rights or any third person.

3.15. INDEMNIFICATION

3.15.1 The Contractor shall be responsible for any property damage, loss, personal injury, death and/or any other damage which may occur by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor agrees to indemnify and save harmless the College and its respective employees, volunteers, students, and trustees, as applicable, (the “Indemnitees”) from any claims, loss, costs, damages or other expenses suffered or incurred by the Indemnitees, including attorney’s fees and costs, by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor at its own expense shall defend the Indemnitees in any action or suit brought against any of the Indemnitees arising out of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. Any acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement on the part of any agent, servant, employee or Subcontractor of the Contractor, or any Subcontractor's agent, servant or employee, are deemed to be the Contractor's acts, negligence, willfulness or failure to perform any of the obligations defined by this Agreement.

3.15.2 In claims against any person or entity indemnified under subsection 3.15.1 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under subsection 3.15.1 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers or workmen's compensation acts, disability benefit acts or other employee benefit acts.

3.15.3. The College may retain such moneys due or to become due the Contractor under this Agreement as it considers necessary until such suits or claims for damages have been settled or otherwise disposed of and satisfactory evidence to that effect has been furnished to the College.

3.15.4. The provisions of this Article shall survive the termination of the Agreement.

ARTICLE 4 – ADMINISTRATION OF THE CONTRACT

4.1. CLARIFYING INSTRUCTIONS

4.1.1. The College shall be the final interpreter of the Contract Documents. Through the College’s Project Manager, the College will furnish, with reasonable promptness, such clarifications as it may deem necessary for the proper execution of the Work. Except as otherwise expressly provided in the Contract Documents, all recommendations by the Architect/Engineer and/or College’s Project Manager with cost or schedule ramifications are subject to approval by the College. The Work shall be executed in conformity therewith and the Contractor shall do no Work without proper drawings and instructions. The Architect/Engineer and/or

College's Project Manager have no authority to waive or change the requirements of the Contract Documents except to make minor changes in the Work which do not result in a claim for extra cost or time, and which are consistent with the intent of the Contract Documents.

4.1.2. Wherever typical parts or sections of the Work are completely detailed on the drawings and other parts or sections which are essentially of the same construction are shown in outline only, the complete details shall apply to the Work which is shown in outline.

4.1.3. Dimensions of Work shall not be determined by scale or rule. Figured dimensions shall be followed at all times. If figured dimensions are lacking on drawings, the Architect/Engineer shall supply them on request to the Contractor.

4.2. REQUESTS FOR INFORMATION

4.2.1. In the event that the Contractor requires clarifications on or discovers conflicts or discrepancies in the Contract Documents, the Contractor shall submit a "Request for Information", in a format suitable to the College's Project Manager and Architect/Engineer prior to proceeding with the Work.

4.2.2. Unless otherwise indicated in the Contract Documents, the Contractor shall prepare and routinely update an RFI log indicating the status of RFIs.

4.2.3. The Contractor must allow the Architect/Engineer, College's Project Manager and the College a reasonable time following receipt of each RFI to review the documents and respond to the Contractor. To the extent that additional time for review is needed to clarify the information submitted by the Contractor or its Subcontractors and suppliers, the Contractor will be notified of the cause of the delay and advised of how long it will take to complete the review; provided, however, that mere failure to give the Contractor such notice shall not entitle the Contractor to make a claim for additional compensation or a time extension. The Architect/Engineer will return the completed RFI response to the Contractor and also provide one copy each to the College and College's Project Manager.

4.2.4. The Contractor shall perform no portion of the Work requiring RFI response until the respective RFI response has been issued by the Architect/Engineer. Work performed without a response shall be at the Contractor's risk.

4.2.5. Should the Contractor consider any RFI response to cause a change in the scope of the Work from that required by the Contract Documents, whether or not such change may affect contract price or time, then the Contractor shall desist from further action relative to the item in question and shall in writing (1) immediately notify the Architect/Engineer, the College and College's Project Manager requesting clarification; and (2) furnish them, within seven (7) days, with a notice explaining the nature of the change and whether increased or decreased cost and/or time is anticipated. No Work related to the RFI shall be executed until the entire matter is clarified and the Contractor is ordered by the College to proceed. Failure of the Contractor to serve written notice as required herein shall constitute a waiver of any claim in relation thereto.

4.3. SITE VISITS AND OBSERVATIONS

4.3.1. The College's Project Manager, and Architect/Engineer, shall at all times have access to the Work wherever it is in progress. The Contractor shall provide proper and safe facilities for such access and for visits at the place of manufacture or elsewhere.

4.3.2. Inspections by the College's Project Manager, or Architect/Engineer, are for the sole benefit of the College. If the Contract Documents, the College Project Manager's, or Architect/Engineer's instructions, or laws, ordinances or any public authority require any Work to be specially tested or reviewed, the Contractor shall give the College's Project Manager timely notice of the Work's readiness for inspection. If the Work is scheduled to be inspected by an authority other than the College's Project Manager, and Architect/Engineer,

the Contractor shall inform the College's Project Manager of the date fixed for such inspection. Required certificates of inspection shall be secured by the Contractor. Inspections by the College's Project Manager and Architect/Engineer shall be made promptly and where practicable, inspections may be made at the source of supply.

4.3.3. If any Work has been covered up contrary to the requirements of the Contract Documents or instructions of the College's Project Manager or Architect/Engineer before it has been observed, such Work must, if required by the College's Project Manager and/or Architect/Engineer, be uncovered for observation and replaced and/or recovered, at the Contractor's expense.

4.3.4. If any questioned Work has been covered up which is not required to be observed by the College's Project Manager and/or Architect/Engineer prior to being covered, the College's Project Manager and/or Architect/Engineer may request to see the Work in question and it shall be uncovered by the Contractor as directed. If such Work is found to be in accordance with the requirements of the Contract Documents, the College shall reimburse the Contractor for the cost of such uncovering and recovering. Such reimbursement shall be limited to the direct cost incurred plus the Contract's approved percentage for overhead and profit. If the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall pay all costs associated with uncovering, correcting and recovering the Work.

4.3.5. The Contractor shall place its field engineers at the College's Project Manager's or Architect/Engineer's disposal for field checking during any inspection period. When layouts of the building and site work are to be made, the Contractor shall notify the College's Project Manager and Architect/Engineer in sufficient time so that the College's Project Manager and Architect/Engineer may be present.

4.3.6. Neither the presence nor the absence of the College's Project Manager or Architect/Engineer on the job shall relieve the Contractor from responsibility to comply with the provisions of the Contract Documents, nor from responsibility to remove and replace Work not in accordance therewith.

4.4. CLAIMS AND DISPUTES

4.4.1. Definition of Claim

4.4.1.1. A claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract. The term "claim" also includes other disputes and matters in question between the College and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate claims shall rest with the party making the claim.

4.4.2. Claims for Concealed or Unknown Conditions

4.4.2.1. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature which differ materially from those ordinarily found

to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then the Contractor shall give notice to the College's Project Manager promptly before conditions are disturbed and in no event later than fifteen (15) calendar days after first observance of the conditions. Upon receipt of such notice the College's Project Manager and Architect/Engineer will promptly investigate such conditions and if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work will determine an equitable adjustment in the Contract Sum or Contract time or both. No change in the Contract Sum or Contract time or both will be allowed except by formal approval of the College. If it is determined that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the College's Project

Manager shall so notify the Contractor in writing stating the reasons. Claims by Contractor which dispute such a determination must be made in accordance with subsection 4.4.5.

4.4.3. Claims for Extension of Time

4.4.3.1. If the Contractor is delayed at any time in the progress of the Work by any act or omission of the College, or its employees or by any other contractor employed by the College, or by changes ordered in the Work, or by strikes, lockouts, fire, unavoidable casualties, or any causes beyond the Contractor's control, or by delay authorized by the College pending a decision, or by any cause which the College shall decide to justify the delay, the time of completion shall be extended for such reasonable time as the College may decide.

4.4.3.2. The Contractor may be entitled to a time extension, but no additional compensation, if the delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, acts of the public enemy, acts of another contractor in the performance of a contract with the College, fires, floods, epidemics, quarantine restrictions, strikes, foreign embargoes, unusually severe weather, or delays of Subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the Subcontractor or suppliers, the time of completion shall be extended for such reasonable time as the College may decide.

4.4.3.3. Claims for extension of time will be considered by the College only if made in writing to the College. Any claim for an extension of time must be made within seven (7) calendar days of the occurrence of conditions which in the opinion of the Contractor warrant such an extension. Failure to submit a claim for an extension of time within seven (7) calendar days shall constitute a waiver of Contractor’s right to claim or receive a time extension. In the case of a continuing cause of delay, only one claim is necessary. Within thirty (30) days of filing a time extension claim notice, the Contractor shall submit a clear written statement and relevant supporting documentation substantiating the claim. The documentation shall include a revised schedule, which conforms to the schedules submitted each month with the payment requests and which shows the duration of the delay, its relation to other activities, and how the alleged delay was on the critical path. No time extension will be allowed except by formal approval of the College. The College with advice and assistance from the College’s Project Manager shall ascertain the facts and the extent of the delay and extend the time for completing the Work, when in the College's judgment the findings of fact justify such an extension. The College's findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in section 4.5 of this Contract.

4.4.4. Claims for Equitable Adjustment for Delay

4.4.4.1 If a delay in completion of the Work is caused by the College and compensation is not provided for under Changes in the Work otherwise negotiated, and the Contractor’s Work is materially affected by that delay, then the Contractor may be entitled to submit a claim for an equitable adjustment in compensation.

4.4.4.2 Schedule management within the Contract duration established at time of Bid/Proposal, including decisions that may alter sequencing of all or part the Work, does not constitute grounds for an equitable adjustment for delay claim from Contractor or its subcontractors or vendors. All prices are firm for the duration of the overall Contract term.

4.4.4.3 Only the following items may be recoverable by the Contractor as compensation or damages for delay:

(1) Direct costs, consisting of
   1. actual additional salaried and non-salaried on-site labor expenses;
   2. actual additional costs of materials;

3. actual additional equipment costs, based solely on actual ownership costs of owned equipment or actual reasonable costs of rented or leased equipment;
4. actual additional extended field office expenses, excluding those which are to be included in overhead;
5. actual additional reasonable costs of Subcontractor and suppliers at any tier for which the Contractor is liable;

(2) actual additional costs proven by clear and convincing evidence, resulting from labor or other inefficiencies but only if proven by clear and convincing evidence; and
(3) an additional percentage for overhead and profit of 15% for actual additional Work performed by the Contractor's own forces and 5% for actual additional Work performed by a Subcontractor.

4.4.4.4. No claim under this subsection shall be allowed for any costs incurred more than twenty days before the Contractor shall have notified the College in writing of the delay.

4.4.4.5. No other compensation or damages are recoverable by Contractor for compensable delays or extensions of the completion time except as expressly stated herein. In particular, the College will not be liable for the following (by way of example and not of limitation) whether claimed by the Contractor or by a Subcontractor or supplier at any tier: (a) profit in excess of that provided herein; (b) loss of profit; (c) home office or other overhead in excess of that provided herein; (d) overhead calculated by use of the Eichleay formula or similar formulae; (e) consequential damages of any kind, including loss of additional bonding capacity, loss of bidding opportunities, and insolvency; (f) indirect costs or expenses of any nature except those expressly provided for herein; and (g) attorneys fees, costs of claims preparation and presentation, and costs of litigation.

4.4.4.6. There shall be deducted from the compensation payable to the Contractor under this section for delay any and all costs, expenses, and overhead recovered or recoverable by the Contractor under change orders issued to the Contractor or otherwise recovered or recoverable by the Contractor.

4.4.4.7. Contractor shall not be entitled to compensation or damages for delay unless, within seven (7) calendar days of the act, omission, occurrence, event or other factor alleged to have caused the delay, the Contractor notifies the College in writing of (a) the alleged delay and its anticipated duration; and (b) the act, omission, occurrence, event or other factor allegedly causing the delay. Knowledge on the part of the College or College's Project Manager of the act, omission, occurrence, event, or other factor or of the delay allegedly resulting there from, shall not excuse Contractor's failure to give the College the written notice required by this subsection.

4.4.5. Claims and Disputes Procedure

4.4.5.1. Unless a lesser period is prescribed by the Contract, the Contractor shall file a written notice of claim relating to the Contract, to the College's Project Manager within fifteen days after the basis of the claim is known or should have been known, whichever is earlier. Contemporaneously with, or within thirty days of filing of a notice of claim, but, as approved by College's Project Manager, no later than the date that final payment is made, the Contractor shall submit the claim to the College's Project Manager. The claim shall be in writing and shall contain:

(1) an explanation of the claim, including references to all Contract provisions upon which it is based;
(2) the amount of the claim;
(3) the facts upon which the claim is based;
(4) all pertinent data and correspondence that the Contractor relies upon to substantiate its claim. The Contractor shall submit such additional information as may be requested by the College's Project Manager; and
(5) a certification by a senior official, officer or general partner of the Contractor or the Subcontractor, as applicable, that, to the best of the person's knowledge and belief, the

claim is made in good faith, supporting data are accurate and complete, and the amount requested accurately reflects the Contract adjustment for which the person believes the College is liable.

4.4.5.2. A notice of claim or a claim that is not filed within the time prescribed by subsection 4.4.5.1 or a lesser period prescribed elsewhere in the Contract shall be dismissed and the claim shall be considered to be waived.

4.4.5.3. Upon receipt of the Contractor's claim, the College's Project Manager, shall take steps deemed necessary to review and investigate the claim. These steps may include an investigation and review of the facts pertinent to the claim, requesting additional information or substantiation from the Contractor or anyone else and taking such other steps as the College's Project Manager may consider appropriate.

4.4.5.4. Following their investigation, the College's Project Manager shall issue a written opinion regarding the claim, which shall contain such information as they consider appropriate.

4.4.5.5. Pending resolution of a claim, the Contractor shall proceed diligently with the performance of the Contract in accordance with the College's Project Manager's opinion, order, finding or interpretation. The Contractor shall take all reasonable action to mitigate or to avoid costs or damages for which the College may be liable. The College Project Manager's decision shall be final and conclusive unless the Contractor files a written appeal to the Vice President of Facilities & Public Safety within fifteen days of the date of the College's Project Manager's opinion. The Contractor shall include in its appeal all of the information which it wants considered in the appeal. The Vice President of Facilities & Public Safety, in consultation with such other persons as deemed advisable, shall prepare and deliver a written decision to the Contractor. The Vice Presidents' response shall be the College's final decision.

4.4.5.6. If the Contractor does not appeal the College's Project Manager's decision to the Vice President of Facilities & Public Safety within the time required under subsection 4.4.5.5, then the College's Project Manager's opinion shall be considered to be final, conclusive and binding upon the Contractor and College. There shall be no further right of review either administratively or in the courts. If the Contractor's timely appeals the College's Project Manager's decision to the Vice President of Facilities & Public Safety, the Vice President of Facilities & Public Safety's decision shall be considered to be conclusive and final unless within thirty days from the date of the Vice President of Facilities & Public Safety' decision the Contractor requests submitting the dispute to non-binding mediation as a condition precedent to commencing an action in the Circuit Court for Montgomery County. If no action is commenced within thirty days after the date of the Vice President of Facilities & Public Safety's decision, the Vice President of Facilities & Public Safety's decision shall be considered to be final, conclusive and binding on the Contractor and the College and the Contractor's right to appeal to the courts shall be waived.

4.4.5.7. If a court action is contemplated, all claims, disputes and other matters in question arising out of or related to the Contract or breach thereof shall first be submitted to non-binding mediation. Such mediation shall be in the nature of settlement discussions and privileged. The location of the mediation shall be in Rockville, Maryland.

4.4.5.8. The timely filing of a claim and the receipt of an opinion by the Contractor from the College's Project Manager, receipt of a decision from the College's Vice President of Facilities & Public Safety and pursuit of non-binding mediation are conditions precedent to filing an action in court. Any action which may be commenced against the College shall be filed in the appropriate state court in Montgomery County, Maryland. The Contract and disputes arising out of it shall be governed by the laws of the State of Maryland without regard to conflicts of laws provisions.

4.4.5.9. Claims by the College against the Contractor may be commenced at any time in any

appropriate court without regard to the other provisions of the Contract Documents, including subsection 4.4. This right is in addition to all other rights which the College may have under the Contract Documents.

4.5. DELAYS AND DAMAGES

4.5.1. No Waiver of Delay

4.5.1.1. Except as may be expressly agreed otherwise by the College in writing, no action or inaction by the College or its Project Managers shall constitute a grant of an extension of the completion date or the waiver of a delay or other default by the Contractor, including: (1) schedule, a recovery schedule, or an anticipated completion date from Contractor; (2) allowance, approval or acceptance of any schedule; (3) failure to terminate for default at an earlier date; or (4) demand that the Contractor finish the project by the required completion date or by any subsequent date promised by the Contractor.

4.5.2. Mitigation of Delays and College Remedies.

4.5.2.1. If Contractor should at any time cause interference, stoppage or delay to the Project or any activity necessary to complete the Project by the time required by this Contract (collectively, “Delay”), Contractor shall take all reasonable action to avoid or mitigate the effects the Delays**,** including but not limited to: (1) rescheduling or re-sequencing the Work and (2) re-assigning personnel. When the Contractor is responsible for any Delay, the College may order the Contractor to accelerate construction, work overtime, add additional shifts or manpower, work on weekends, or to do anything else reasonably necessary in order to finish on time, at no additional cost to the College. The Contractor does not have the unilateral right to complete the Work late and pay liquidated or other damages.

4.5.2.2 If Contractor should at any time cause the Delays described in subsection 4.5.2.1, then in addition to any other remedies the College may have under the Contract, the College, after notifying Contractor that it has forty-eight (48) hours within which to cure the Delay, may attempt to remedy the Delay by whatever means the College may deem necessary or appropriate including, but not limited to, correcting, furnishing, performing or otherwise completing the Work, or any part thereof by itself or through others, (utilizing where appropriate, any materials and equipment previously purchased for that purpose by Contractor), or by supplementing the Contractor’s forces. The Contractor shall be liable to the College for all costs incurred by the College in attempting to remedy the Delay. The College may deduct the cost to remedy the Delay from any monies due or to become due to the Contractor.

4.5.3. Severe Weather Delays

4.5.3.1. "Unusually severe weather" is weather which is more severe than the historical average for the month as evidenced by the National Weather Service for the locality of the Work. Time extensions for unusually severe weather will be allowed on a tentative basis only and the final decision will be reserved until the Work is substantially completed. Weather conditions prevailing throughout the entire Contract period will be considered, including consideration for abnormally mild conditions to offset abnormally severe conditions. Extension of time due to abnormal weather conditions will be granted

on the basis of one (1) calendar day for each normal working day lost, or as mutually agreed upon by the College and the Contractor. No additional compensation will be provided to the Contractor.

4.5.3.2. The College and the Contractor shall use the following table labeled “Monthly Anticipated Adverse Weather Days (in workdays)” as the basis for determining the anticipated number of “unusually severe weather” workdays at the construction site:

Monthly Anticipated Adverse Weather Days (in work days)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4	5	4	5	5	3	3	3	2	4	4	4

A lost workday shall be considered a weather delay when unusually severe weather exists and when such weather conditions directly cause work to be delayed on the activity or activities which are on the critical path according to the latest accepted update of the schedule during that month. Weather-caused schedule losses shall be measured in half (0.5) workday increments if the unusually severe weather affects work at the site only for one half of a normal workday. If unusually severe weather occurs during the first half of a normal work and also delays work during the second half of the day (e.g., due to employees not being required to report to work due to unusually severe weather), the entire work day shall be considered a weather caused lost work day. The Contractor's request for weather caused time extensions during a given month shall be considered only for actual work days lost in excess of the number of work days listed in the table above and meeting the above criteria. The Contractor shall meet the submission and notification requirements and follow the procedures for requesting time adjustments to the schedule as described in Section 4.4.3.

4.5.4. Liquidated Damages

4.5.4.1. It is agreed that time is of the essence and therefore the College will suffer substantial damages if the Work is not completed within the time stated in the Preliminary Project Schedule contained in the Contract Documents. For each day that the Work shall be uncompleted after the date set for Substantial Completion, the Contractor may be liable for liquidated damages in the amount specified in the Contract Documents. Prior to and after expiration of the Contract completion time, the College may withhold an amount equal to liquidated damages whenever the progress of construction is such that, due to the fault or responsibility of the Contractor, the Contractor, in the judgment of the College is behind schedule so as not reasonably to be able to permit completion of the Project on time. Due account shall be taken of excusable delays, any extensions of time reasonably due the Contractor for completion of additional Work under change orders, and for delays for which the College is responsible, provided that the Contractor has properly requested time extensions therefore. After submission of a price, the Contractor may not contest the reasonableness of the amount of liquidated damages stated in the Contract. These assessed damages shall not be considered as a penalty, but as mutually agreed upon as the ascertained damages suffered by the College because of the delay.

4.5.5. Waiver of Consequential Damages

4.5.5.1 The Contractor waives claims against the College for consequential damages arising out of or relating to this Contract. The waiver includes but is not limited to damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit of any type.

This waiver is applicable, without limitation, to all consequential damages due to Contractor in accordance with Article 12 of this Contract.

ARTICLE 5 – CONSTRUCTION BY COLLEGE OR BY SEPARATE CONTRACTORS

5.1 SEPARATE CONTRACTS

5.1.1. The College reserves the right to let other contracts in connection with the Project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and for the execution of their work, and shall properly connect and coordinate its Work with theirs. The Contractor shall work harmoniously with other contractors. The Contractor is not entitled to overhead, profit, or other compensation for work done for the College by other contractors.

5.1.2. If any part of the Contractor's Work depends on the proper execution or completion of any other

contractor's work, the Contractor shall inspect and measure the work of the other contractor(s) and promptly report to the College's Project Manager any defects or discrepancies in such work. The Contractor's failure to inspect and make such a report shall constitute an acceptance of the other contractor's work as fit and proper for the proper execution of its Work, except as to latent defects.

5.1.3. The College's Project Manager will schedule and coordinate the Work of the Contractor with the work of all separate contractors on the Project including use of the site by the Contractor and the separate contractors. The College's Project Manager will keep the Contractor informed of the progress schedule to enable the Contractor to reasonably plan and perform its Work properly. The College's Project Manager may issue appropriate directions and require the Contractor to take such other measures as may be necessary to timely coordinate and progress the Work. Any neglect or refusal by the Contractor to comply with directions issued by the College's Project Manager shall constitute a failure to perform the Work in accordance with the Contract requirements and will justify action from withholding of payments otherwise due up to and including termination of the Contract.

5.1.4. The College and College's Project Manager do not guarantee the unimpeded operations of the Contractor. The Contractor acknowledges that the award of more than one contract for a Project necessitates the proper scheduling and sequencing of the Work with the work of all other contractors, and may lead to inherent delays in the progress of the Work. The Contractor agrees to re-sequence its Work as may be reasonably directed by the College's Project Manager from time to time. The Contractor hereby agrees to make no claim for delays caused by the presence or operations of other contractors engaged on the Project.

5.1.5. Should the Contractor sustain any damage through any act or omission of any other contractor having a contract with the College for the performance of work on the Project, or through any act or omission of a subcontractor of such other contractor, the Contractor shall make no claim against the College or its consultants (including but not limited to the Architect/Engineer and College's Project Manager) for such damage, but shall have a right to recover such damage from the other contractor under a provision similar to subparagraph 5.1.6 which has been or will be inserted in all contracts with such other contractors. The Contractor hereby releases the College, College's Project Manager and Architect/Engineer and their respective officers and employees from all damages to the Contractor caused by other contractors on the Project.

5.1.6. Should any other contractor under contract with the College for performance of work on the Project sustain any damage through any act or omission of the Contractor hereunder, or through any act or omission of a Contractor's subcontractor of any tier, the Contractor agrees to reimburse such other contractor for all such damages and to indemnify and hold the College, College's Project Manager and Architect/Engineer harmless from all such claims, including attorneys' fees, to the fullest extent permitted by law.

5.1.7. The Contractor agrees that in the event of a dispute as to cooperation or coordination with other contractors on the Project, the College's Project Manager will act as mediator and decisions made by the College's Project Manager will be binding.

5.1.8. The Contractor shall fully cooperate and coordinate its Work with other contractors working on separate projects for other buildings, road work, and the like in accordance with College's Project Manager's direction.

5.1.9. Wherever work being done by any contractors or subcontractors is contiguous to Work covered by the Contract Documents, the respective rights of the parties shall be established by the College's Project Manager to secure the completion of the various portions of the Work in general harmony.

5.1.10. If a dispute arises among the Contractor and other contractors as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in these General Conditions, the College's Project Manager may direct who shall perform the cleanup. The College's Project Manager reserves the right to clean up and allocate the cost in

a timely manner among those responsible as the College's Project Manager determines to be just.

ARTICLE 6 – CHANGES IN THE WORK

6.1. CHANGES IN THE WORK

6.1.1. Changes

6.1.1.1. The College unilaterally may, at any time, without notice to the sureties, if any, and without invalidating the Contract Documents, by written order designated or indicated to be an order, make any change in the Work including but not limited to changes in the Specifications, Drawings in the method or manner of performance of the Work, the College-furnished facilities, equipment, materials, services, or site or directing acceleration in the performance of the Work. Any other written order or an oral order, including a direction, instruction, interpretation, or determination from the College that causes or constitutes any such change shall be treated as a change order under this section provided that before performing the Work directed by the change that the Contractor gives the College's Project Manager written notice stating the date, circumstances and source of the order and that the Contractor regards the order as a change order. The Contractor shall not proceed to perform the Work described in the written or oral order unless the College's Project Manager acknowledges in writing to the Contractor that the order is a change order and that the Contractor is to proceed with the Work as a change.

6.1.1.2. If any change under this subsection causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the Work under the Contract, whether or not changed by an order, an equitable adjustment shall be made and the Contract modified in writing accordingly; provided, however, except for claims based on defective Specifications or Drawings, that no claim for any order under subsection 6.1.1.1 above shall be allowed for any cost incurred more than twenty days before the Contractor gives written notice as therein required. In the case of defective Specifications or Drawings for which the College is responsible, the equitable adjustment shall include any increased costs reasonably incurred by the Contractor in attempting to comply with such defective Specifications or Drawings. The Contractor shall submit to the College Project Manager within ten (10) days after every ninety (90) days from the order to proceed with the Work a detailed list of all costs incurred attempting to comply with defective Specifications or Drawings during the immediately preceding ninety (90) day period until the effect of the defects are overcome. Costs included more than ninety (90) days old in a detailed list of costs are waived and will not be paid.

6.1.1.3. If the Contractor intends to assert a claim for an equitable adjustment under subsection 6.1.1, it shall, within thirty days after receipt of an order for the furnishing of written notice under subsection 6.1.1.1 submit to the College's Project Manager a written statement setting forth the general nature of the monetary extent of the claim.

6.1.2. Disputed Work

6.1.2.1. In the event of a dispute between the College and the Contractor as to whether any Work is included in the scope of the Contract, such that the Contractor will be obligated to provide that Work at no additional cost to the College, the College's Project Manager may order the Contractor in writing under this section to perform the Work. If the Contractor considers such an order to be a change in the scope of the Contract entitling the Contractor to additional compensation, a time extension, or other relief, the Contractor must provide notice within seven days (7) from receipt of the College's Project Manager's written order under the section to perform the Work and to initiate a claim therefore in accordance with Contract requirements.

6.1.2.2. A request by the Contractor for additional time or additional costs caused by the impact of an order of the College on the critical path for completion must be accompanied by (a) a reasonably detailed description of the effect of the order on the adjusted critical path and (b) supporting

documentation. The mere existence of a change order does not entitle the Contractor to an extension of time, compensation for delay or damages or costs associated with delay. Contractor's entitlement thereto shall depend upon the effect of the change order on the adjusted critical path for completion and shall be subject to the requirements of Article 3.7, Prosecution and Progress of the Work.

6.1.2.3. Upon receipt of a signed written order of the College's Project Manager under this subsection, the Contractor shall comply with the order promptly, within the requirements of the completion schedule, whether or not the Contractor signs or accepts the change order. Failure to comply with the order in a timely manner shall constitute a breach of the Contract and grounds for termination for default or any other remedy available to the College.

6.1.3. Modification of Contract Sum

6.1.3.1. When changes in the Work may require a modification of the Contract Sum, the Contractor shall provide to the College's Project Manager, within thirty (30) days of its receipt of a proposal request, an itemized breakdown showing quantities, unit costs, hours and rates of labor, and other costs in such detail as may be required to allow the reasonableness of the cost to be established. Similar cost information covering Subcontractor's Work shall be included as part of the Contractor's proposal. Minimum charges for "handling" will not be acceptable. Charges for general supervision and management will not be acceptable.

6.1.3.2. Modification of the Contract Sum, when required, shall be determined as follows:

(1) When applicable unit prices are stated in the Contract or have been subsequently agreed upon, by application of such unit prices.
(2) A lump sum price agreed upon by the College and the Contractor.
(3) If job conditions or circumstances or the extent or nature of the change, or failure of the College and the Contractor to agree upon a lump sum price or the application of unit prices, prevent the determination of the cost of any proposed change, the Work shall be paid pursuant to subsection 6.1.3.4.
(4) If a change involves a credit to the College, unless the amount must be determined by the application of unit prices, the amount of the credit shall be the greater of (a) the alternate or other itemized price for such Work stated in Contractor's price or (b) a reasonable price, including profit and overhead.
(5) If the change involves both a credit and a debit, the sums shall be shown and the two sums balanced to determine the adjusted total cost or credit.
(6) The mark up allowable to the Contractor for combined overhead and profit for Work performed solely by the Contractor with its own forces shall be a reasonable amount, but not to exceed 15% of the Contractor's costs (excluding items includable in overhead).
(7) The mark up allowable to a Subcontractor for combined overhead and profit for Work performed solely with its own forces shall be a reasonable amount, but not to exceed 15% of the Subcontractor's cost of labor and materials and equipment. Mark ups for Sub-subcontractors or suppliers, if required, must be provided from within the markup allowance provided to the Subcontractor. No additional markup allowance will be allowed for Sub-subcontractors or suppliers. For Work performed by a Subcontractor solely with its own forces, the Contractor is entitled to a reasonable mark up for combined overhead and profit, but not to exceed 5% of the Subcontractor's labor, materials and equipment cost.

Sample Maximum Mark-Up Calculation:

A.	Subcontractor's cost (LME) *(includes direct costs of Subsubcontractors and/or suppliers)*	= A
B.	Subcontractor's combined OH&P	= 15% of A
C.	Subcontractor's Bonds and	

	Builder's Risk Insurance if required	= as a % of A+B
D.	Contractor's combined OH&P	= 5% of A
E.	Contractor's Bonds and Builder's Risk Insurance if required	= as a % of A+B+C+D
F.	Total Maximum Modification of Contract Sum:	= A+B+C+D+E

(8) The Contractor shall be allowed the actual, reasonable additional cost for rental of machine power tools or special equipment, including fuel and lubricants which are necessary to execute the Work required on the change, but no percentage shall be added to this cost.

(9) The Contractor and separately bonded subcontractors, if any, shall be allowed the actual, reasonable additional cost for Bonds and Builder's Risk Insurance, if required.

6.1.3.3. The allowable percentages for cost and overhead and profit as provided in subsections 6.1.3.2 (6) and (7) and elsewhere are deemed to include but not be limited to all costs and expenses of the following kinds: project management, supervision and coordination; job supervision and field office expenses required by the Contract; expenses for supervisors, superintendents, managers, timekeepers, clerks and watchmen; cost of correspondence of any kind; insurance not specifically mentioned herein; all expenses in connection with the maintenance and operation of the field office, use of small tools, cost of vehicles generally used for transporting either Workers, materials, tools or equipment to job location and incidental job burdens; and all expenses or maintenance for operation of Contractor's regularly established principle office, branch office, similar facilities and all other costs and expenses customarily classified as overhead or general conditions. The Contractor's entitlement to compensation or additional time for delays for which the College is responsible or for which an extension is due to the Contractor is also subject to section 4.5.

6.1.3.4. If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the College on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit as stated in subsection 6.1.3.2 (6) and (7). In such a case, the Contractor shall keep and present in such form as the College's Project Manager may prescribe an itemized accounting together with appropriate supporting data. The itemized accounting shall be prepared daily and presented to the College's Project Manager at the conclusion of each day. Unless otherwise provided in the Contract Documents, reimbursable costs to the Contractor shall be limited to the following:

(1) Costs of labor, including Social Security, old age and unemployment insurance, fringe benefits required by agreement or custom and Workers' compensation insurance;

(2) Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

(3) Rental costs of machinery and equipment exclusive of hand tools, whether rented from the Contractor or others; and

(4) Cost of premiums for all bonds and insurance and permit fees related to the Work, provided that, the penal sum of the surety bond has been increased and the surety has increased the premium cost to the Contractor.

(5) Pending final determination of the costs accumulated pursuant to subsection 6.1.3.4, amounts not in dispute may be included in an Application for Payment.

6.1.3.5. The College's Project Manager will review and make a recommendation regarding the adjustment in Contract Sum and/or Time proposed by the Contractor to the College. Only the College is authorized to approve adjustments in Contract Sum and/or Time. Approval by the College requires review and administrative processing, based on claim value, in accordance with the Board of Trustees Policy and Procedures, and the following schedule:

- Claims less than $ 99,999 require review and approval by the College's Vice President for Facilities & Public Safety.
- Claims between $ 100,000 and $ 249,999 require review and approval by the College's Vice President for Administrative and Fiscal Services.

- Claims $ 250,000 and greater require approval by the College's Board of Trustees as an action item at a monthly business meeting. Items requiring such approval must follow Board of Trustees agenda action item submission requirements. (Normally, action items are placed on the Board meeting agenda at least one month prior to the scheduled meeting date to allow time to conduct necessary internal administrative reviews prior to the Board meeting.)

6.1.4. Minor Changes in the Work

6.1.4.1. The College's Project Manager will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order of the College's Project Manager and shall be binding on the College and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 7 – PAYMENTS AND COMPLETION

7.1. SCHEDULE OF VALUES

7.1.1. To facilitate checking the Work performed, the Contractor shall furnish to the College's Project Manager a detailed Schedule of Values of the various parts of the Work, including quantities, aggregating to the Contract Sum. The schedule shall be divided so as to facilitate payments to Subcontractors, if any, made out in the form prescribed by the College's Project Manager, and, if required, supported by such evidence of its correctness as the College's Project Manager may direct. The Schedule of Values cost breakdown shall be used as a basis for Certificates of Payment unless it is found to be in error.

7.1.2. The Schedule of Values shall be submitted as soon as possible, but not less than fifteen (15) days prior to the first scheduled Application for Payment described in the General Conditions.

7.2. PROGRESS PAYMENTS

7.2.1. Application for Payment

7.2.1.1. No later than the 25th day of each month, the Contractor shall submit to the College's Project Manager an original and accurate Application for Payment dated the last day of the month in the form prescribed by the Contract Documents together with the supporting documentation listed herein. Applications for Payment received after the 25th day of each month, or not submitted on an original, or containing erroneous information, or missing the required supporting documentation, shall not be processed during that month's payment cycle. Payments shall be made on the value of Work expected to be completed up to and including the last day of the month based upon the labor and materials incorporated in the Work; and of materials suitably stored at the site; less the aggregate of any previous payments, retainages and amounts withheld under subsection 7.2.1.9. The Applications for Payment, including final payment, shall be reviewed and certified by the College's Project Manager. After reviewing and certifying the amounts due the Contractor, the College's Project Manager will

submit the Project Application and the Project Certificate for Payment, along with the Contractor's Applications and Certificates for Payment, to the Architect/Engineer. Based on the Architect/ Engineer's observations and valuations of Contractor's Applications for Payment, and the Certifications of the College's Project Manager, the Architect/Engineer will review and certify the amounts due the Contractor and will issue a Project Certificate for Payment.

(1) The Contractor shall promptly pay each Subcontractor, if any, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which each Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of the Subcontractor's Work. The Contractor may not withhold from the Subcontractor any

portion of the payment due to any cause unrelated to the Subcontractor's performance of the Work on the Project, notwithstanding any prior agreement between Contractor and Subcontractor to the contrary.

7.2.1.2. No later than the 25th day of each month, each Application for Payment shall be supported by the following documentation, each in a form prescribed by the College, or in the case no form is prescribed, on a form provided by the Contractor and approved by the College's Project Manager:

(1) Updated schedule information of Contractor's progress to date, including assessment of progress compared to scheduled completion date.
(2) Subcontractors' certificates, statements and affidavits showing that portions of the Work covered by the Application for Payment have been completed and material included therein have been and will be delivered.
(3) Affidavit from Contractor and Subcontractor on forms prescribed by the College, stating respectively that their work force, subcontractors, vendors and material suppliers have been paid from the proceeds of the last Application for Payment, and will be paid from the current Application for Payment, and that there are no outstanding claims for payment.

7.2.1.3. That part of the payment which is requested on account of materials delivered and suitably stored at the site or other approved location but not incorporated in the Work shall, if required by the College's Project Manager, be conditioned upon submission by the Contractor of bills of sale or upon such other procedure as will establish the College's title to such material or otherwise adequately protect the College's interest as determined by the College's Project Manager, including applicable insurance coverage and cost of transportation to the Project site for those materials and equipment stored off the site.

7.2.1.4. Provided that the Contractor has furnished acceptable payment and performance security equal to 100% of the Contract Sum, from each Application for Payment the College shall withhold as retainage no more than 5% of the amount earned. Unless otherwise agreed to by the College in writing, the retainage withheld shall be paid within 120 days after satisfactory completion of the Contract or within 120 days after resolution of a dispute or contract claim concerning the satisfactory completion of the Contract, whichever is later. The College reserves the right to withhold from payments otherwise due the Contractor any amount that the College reasonably believes necessary to protect its interest, including, but not limited to, the College concluding in its sole judgment that the Work may not be completed by the date required by the Contract or the Work is otherwise not in conformance with the requirements of the Contract Documents. Following Substantial Completion of the Project, the College in its sole discretion, may authorize reduction of retainage withheld to an amount not less than two (2) times the College's Project Manager's estimate of the value of the Contractor's punch list items.

7.2.1.5. Application for Payment shall be in the format required by the Contract Documents and the College's Project Manager. The Application shall include an itemized breakdown of the various items of the Work based on the previously submitted Schedule of Values.

7.2.1.6. The provisions for payment, withholding, retainage and Certificates of Payments are solely for the benefit of the College, and no other party (including sureties of the Contractor) may assert any claim for negligence or other action against the College, or anyone acting on behalf of the College for waiving or misapplying these provisions.

7.2.1.7. No Certificate issued nor payment made to the Contractor may be construed as an acceptance of the Work or be construed or relied upon as any indication that the labor or materials are in accordance with the Contract Documents or that the amounts paid or certified therefore represent the correct cost or value of the Work or that such amounts are in fact or law due the Contractor.

7.2.1.8. Any Application for Payment which is based on a pending claim for additional compensation may be certified by the College's Project Manager and the Architect/Engineer to the extent that it is determined that the payments yet to be made under the Contract and/or the retainage are sufficient

to protect the College. Nothing herein shall be construed as requiring the College's Project Manager and Architect/Engineer to certify such applications or to release retainage. All certifications and payments, including those pursuant to a pending claim, shall be tentative and conditional.

7.2.1.9. In addition to the College's general right to withhold payment as set forth in subsection 7.2.1.4, the College may withhold payment or, on account of subsequently discovered evidence, nullify or reduce the whole or part of any certificate or payment on account of:

(1) failure to update schedules properly as required by subsection 3.7;
(2) failure to furnish the documents required by subsection 7.2.1.1 and 7.2.1.2;
(3) liquidated damages which may be assessed under the Contract Documents or other damages or compensation due the College for claims of the College against the Contractor;
(4) the cost (measured by the contract value or fair market value whichever is greater) of completing unfinished or defective Work not remedied or deductions or amounts due the College under the Contract;
(5) failure of the Contractor to perform any material Contract requirements;
(6) claims filed or likely to be filed against the College for which the Contractor may be liable to the College;
(7) failure of the Contractor to make payments properly to Subcontractors or suppliers for material or labor or amounts claimed by the Contractor's surety or insurer under any right of subrogation;
(8) a reasonable doubt the Work can be completed for the residual balance of the Contract;
(9) damage to another Contractor;
(10) any claim of the College or debt owed to the College by the Contractor;
(11) failure to maintain as-built drawings; or
(12) the cost of completing unfinished warranty Work.

7.3. ACCEPTANCE OF THE WORK AND FINAL PAYMENT

7.3.1. Partial Acceptance

7.3.1.1. If, in its sole discretion, the College desires to occupy any portion of the Work, the College shall have the right to occupy and use those portions of the Work which in the opinion of the College can be used for their intended purpose; provided that the conditions of occupancy and use are established and the responsibilities for the Contractor and the College for maintenance, heat, light, utilities and insurance are mutually agreed to by the Contractor and the College. The College has no obligation to accept the Work in portions. Partial occupancy shall in no way relieve the Contractor of its responsibilities under the Contract.

7.3.1.2. When the College occupies the Work in portions or accepts the Work in portions, if the beneficial use of any accepted portion of the Work as a whole depends on Substantial Completion or beneficial use of any other portion, then, unless otherwise agreed to by the College in writing: (1) warranties on the accepted portions do not begin to run until substantial completion of all portions on which beneficial use of the whole Work depends, and (2) Substantial Completion of the whole Work shall not be deemed to be achieved until Substantial Completion of all portions on which beneficial use of the whole depends.

7.3.2. Substantial Completion and Final Inspection

7.3.2.1. When the Work is substantially completed, the Contractor shall notify the College's Project Manager and Architect/Engineer in writing that the Work will be ready for final inspection and testing on a definite date. Reasonable notice shall be given by the Contractor to permit the College's Project Manager and Architect/Engineer to schedule the final inspection.

7.3.2.1.1 “Substantial Completion” is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the College can occupy or utilize the Work for its intended use.

7.3.2.2. The inspection shall be conducted by the College’s Project Manager and the Architect/Engineer. On the basis of the inspection, if it is determined that the Work appears to be substantially complete and the Work appears to be ready for occupancy and usable for its intended purpose, the College’s Project Manager and Architect/Engineer shall establish the date of Substantial Completion, shall fix the times at which the warranties will begin, and the Architect/Engineer shall issue a Certificate of Substantial Completion.

7.3.2.3. If it is determined that Substantial Completion has been achieved, the College’s Project Manager shall fix the time within which the Contractor shall complete any remaining items of Work which will be indicated on a list (the "punch list"). If the Contractor fails to complete the remaining items so listed in the time stipulated, the College shall have the undisputed right to complete the Work at the Contractor's expense. The Contractor may be required to complete multiple punch lists until the Contract is performed in its entirety. Failure to complete punch list work in a timely manner shall constitute grounds for termination of the Contract for default. Final payment shall not be made until all Contract Work, including all punch list Work, is complete to the satisfaction of the College’s Project Manager.

7.3.2.4. Acceptance of the Work as substantially complete shall not excuse or waive any failure of the Contractor to complete the Contract as required by the Contract Documents. The Work shall not be considered substantially complete until (1) all electrical, mechanical, and life safety systems shall be completed and successfully tested and successfully inspected for conformity to all requirements of the Contract Documents and all applicable codes and standards, (2) a certificate of occupancy has been obtained for all parts of the Work and (3) all other requirements for Substantial Completion are met.

7.3.2.5. Upon completion of the Work, the Contractor shall forward to the College’s Project Manager a written notice that the Work is ready for final inspection and acceptance and shall also forward to the College’s Project Manager a final Application for Payment. The final Application for Payment shall be processed in accordance with Subparagraph 7.3.3. Upon receipt, the College’s Project Manager will forward the notice and Application to the Architect/Engineer who with the College’s Project Manager will promptly make such inspection. When the Architect/Engineer, based on the recommendation of the College’s Project Manager, finds the Work acceptable under the Contract Documents, the Architect/Engineer shall issue a Final Application and Certificate for Payment stating that the Work provided for in the Contract has been completed and is acceptable under the terms and conditions thereof and that the entire balance found to be due to the Contractor and noted in the final application is due and payable. The College’s Project Manager and Architect/Engineer may not issue the Final Certificate and Application for Payment until all Work is fully completed and all other obligations of the Contractor under the Contract Documents have been completed.

7.3.3. Application for Final Payment

7.3.3.1. Upon completion of the Work, the Contractor shall prepare and submit to the College’s Project Manager an Application for Final Payment. The College’s Project Manager and Architect/Engineer will promptly proceed to make any necessary final surveys, to complete any necessary computations of quantities, and to complete other activities necessary to determine the Contractor's right to final payment. The College’s Project Manager and Architect/Engineer will certify so much of the Contractor's Application for Final Payment as they consider due, The Contractor shall be informed of all deductions, damages, costs, back-charges, and other charges assessed against the Contractor by the College and the reasons therefore. Notwithstanding what is stated above, prior to or in the absence of a request from the Contractor for final payment, the College may determine the amount of the final payment it considers to be due to the Contractor.

7.3.3.2. If the Contractor disputes the amount determined by the College to be due it, it may initiate a claim under Article 4.4, Claims and Disputes.

7.3.3.3. Acceptance by the Contractor of any payment identified by the College as being a final payment shall operate as an accord and satisfaction and a general release of all claims of the Contractor against the College arising out of or connected with the Contract, except as may be expressly agreed otherwise in writing between the Contractor and the College. No claims by the Contractor may be asserted for the first time after the Contractor submits its Application for Final Payment or after final payment is made by the College.

7.3.3.4. Prior to final payment and before issuance of the College's Project Manager's and Architect/Engineer's final Certificates therefore, the Contractor shall fully comply with the following requirements:

(1) Cleanup the Work area in accordance with the Specifications and federal, state, bi-county, county and local rules and regulations.
(2) Provide a notarized affidavit stating that all monetary obligations to suppliers of material, services, labor and all Subcontractors have been completely fulfilled and discharged.
(3) Complete all punch list Work and furnish to the College's Project Manager all documents, manuals and record (as-built) documents, including all BIM documents, if any.

7.4. ASSIGNMENT OF CONTRACT MONIES

7.4.1. The Contractor shall not assign any monies due to it under the Contract without the consent of the College, and the assignee in such case shall acquire no rights against the College.

7.5. AUDIT

7.5.1. If the Contractor has submitted any claim or request for additional payment exceeding $50,000, or If the Contractor has submitted cost or pricing data in connection with the pricing of any modification to this Contract, the College shall have the right to examine and audit all books, records, documents, and other data of the Contractor (including computations and projections) related to negotiating, pricing or performing the modification or claim in order to evaluate the accuracy, completeness, and currency of the cost or pricing data. In addition to the above, the Contractor shall make available to the College the original project price estimate and backup takeoffs and records, and the actual monthly or periodic job cost records. If the Contractor fails or refuses to comply with applicable provisions concerning the Contract changes or claims, the College shall have no obligation to make payment to the Contractor for the change or claim.

7.5.2. The Contractor shall permit audit and fiscal and programmatic monitoring of the Work performed under this Contract. The Contractor shall make available at its office at all reasonable times, the materials described in subsection 7.5.1, for examination, audit or reproduction, for 3 years after final payment under the Contract.

7.5.3. If the Contract is completely or partially terminated, the records relating to the Work terminated shall be made available for 3 years after any resulting final termination settlement.

7.5.4. Records pertaining to claims, contract disputes, or to litigation or the settlement of claims arising under or relating to the performance of the Contract shall be made available until final disposition of such appeals, litigation, or claims.

ARTICLE 8 – PROTECTION OF PERSONS AND PROPERTY

8.1. SAFETY PRECAUTIONS AND PROGRAMS

8.1.1. The Contractor shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss.

8.1.2. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. Contractor shall comply and cooperate with College safety and security programs.

8.1.3. Except as otherwise directed by the Contract Documents, in the event the Contractor encounters on the site material reasonably believed to be hazardous, including but not limited to asbestos or polychlorinated biphenyl (PCB), which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the College's Project Manager in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the College's Project Manager and Contractor if in fact the material is hazardous and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of hazardous material.

8.2. PROTECTION OF PERSONS AND PROPERTY

8.2.1. The Contractor shall take all necessary precautions to ensure the safety of the public and of workers on the job, and to prevent accidents or injury to any persons on, about, or adjacent to the premises where the Work is being performed. The Contractor shall comply with the "Williams-Steiger Occupational Safety and Health Act of 1970, as amended, and all laws, ordinances, codes, rules and regulations relative to safety and the prevention of accidents, and shall also comply with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America and with the applicable provisions of the American Standard Safety Code for Building Construction, ANSI A 10 Series, unless prevention of accidents is regulated by a more stringent local, State or Federal code, ordinance or law. The Contractor shall erect and properly maintain at all times, as required by laws and regulations and the conditions and progress of the Work, proper safeguards, including minimum provision of six (6) foot fall protection, for the protection of Workers and the public and shall post signs and other warnings against the dangers created by openings, stairways, falling materials, open excavations and all other hazardous or unsafe conditions. It shall be the Contractor's exclusive responsibility to take all safety precautions which may be necessary to protect all persons and property from injury or damage.

8.2.2. Contractor shall request permission in writing of the College's Project Manager, and have received written permission from the College's Project Manager, prior to the storage, use, or transportation onto the campus of explosives or other hazardous materials or equipment required for the execution of the Work. The Contractor is prohibited from storing, using or transporting hazardous materials or equipment not required for the execution of the Work onto the campus. The Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel if such written permission has been granted.

8.2.3. All damage or loss to any property referred to in this section, caused in whole or in part by the Contractor, and Subcontractor, and sub-subcontractor, or anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable, shall be remedied by the Contractor, except damage or loss attributable solely due to faulty Drawings or Specifications or to the acts or omissions of the College or Architect/Engineer or anyone employed by either of them or for whose acts either of them may be liable, and not also attributable to the fault or negligence of the Contractor.

8.2.4. The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the College's Project Manager.

8.2.5. Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

8.2.6. In any emergency affecting the safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency Work shall be determined as provided for in these General Conditions.

8.2.7. The Contractor shall continuously protect the Work and the College's property from damage, injury or loss arising in connection with operations under the Contract Documents. It shall make good any such damage, injury or loss, except such as may be caused solely by agents or employees of the College.

8.2.8. The Contractor shall be solely responsible for all damage due to intrusion and for the proper protection of the Project site from damage due to fire, rain, wind or other causes. The Contractor shall provide sufficient security personnel as it deems necessary for proper protection of the Work and project site at all times. The Contractor shall provide temporary protection to prevent unauthorized persons from obtaining access to the site during the night and at other non-working hours.

8.2.9. The Contractor shall assume sole financial responsibility for vandalism or loss of materials and equipment not covered by Contractor’s Builder’s Risk insurance.

8.2.10. The Contractor shall protect all streets, sidewalks, light poles, hydrants and concealed or exposed utilities of every description affected by or adjacent to the Work and if such items are damaged by the Contractor or Subcontractors, the Contractor shall make all necessary repairs thereto or replacements thereof at no cost to the College.

8.2.11. Tight wood sheathing or plywood shall be laid under any materials that are stored on finished cement surfaces.

8.2.12. The Contractor shall at all times provide and maintain adequate protection against weather so as to preserve all Work, materials, equipment, apparatus and fixtures free from injury or damage.

8.2.13. The Contractor shall provide and maintain adequate protection for all properties adjacent to the site. When required by law or for the safety of the Work, the Contractor shall shore up, brace, underpin and protect as necessary, foundations and other portions of existing structures which are in any way affected by the operations under the Contract Documents. The Contractor, before commencement of any part of the Work, shall give any notices required to be given to an adjoining landowner or other parties.

8.2.14. The Contractor shall confine its construction equipment, the storage of materials and the operations of workers to the limits indicated by laws, ordinances, permits and as may be established by the College, and shall not unreasonably encumber the premises with construction equipment or material.

8.2.15. The Contractor shall enforce the College’s Project Manager’s instructions regarding signs, advertisements, fires and smoking.

8.3. FIRE PROTECTION

8.3.1. Adequate precautions shall be taken against fire throughout all the Contractor's and Subcontractors' operations. Flammable material shall be kept at an absolute minimum, and, if any, shall be properly handled and stored. Except as otherwise provided herein, the Contractor shall not permit fires to be built or open salamanders to be used in any part of the Work.

8.3.2. Construction practices, including cutting and welding, and protection during construction shall be in accordance with the published standards of the Industrial Risk Insurers and the National Fire Protection Association; provide a sufficient number of approved portable fire extinguishers, distributed about the project; and use non-freeze type in cold weather.

8.3.3. Gasoline and other flammable liquids shall be stored in and dispensed from Underwriters' Laboratories listed safety containers in conformance with the National Fire Protection Association recommendations. Storage of any flammable liquids, however, shall not be within buildings.

8.3.4. All tarpaulins that may be used for any purpose during construction of the Work shall be made of material which is resistant to fire, water and weather. All tarpaulins shall have the Underwriters' Laboratories

approval and shall comply with FS CCC-D-746.

8.3.5. The Contractor shall maintain emergency and fire exits from the Work area, or establish alternative exits satisfactory to the Fire Marshal.

8.3.6. Fire protection and safety during the execution of the Work are the exclusive responsibility of the Contractor.

8.4. EMERGENCIES

8.4.1. In an emergency affecting the safety of life, the Work or adjoining property, the Contractor, without special instructions or authorization from the College's Project Manager, is permitted to act at the Contractor's discretion to prevent such threatened loss or injury. In such an emergency the Contractor shall act prudently and expeditiously to prevent any threatened loss or injury and shall immediately notify the College's Project Manager and the Campus Security Office of such actions.

8.5. ACCIDENTS

8.5.1. The Contractor shall provide at the site, and make available to all workers, medical supplies and equipment necessary to supply first aid service to all persons injured in connection with the Work.

8.5.2. Contractor must promptly report in writing to the College's Project Manager and the Campus Security Office all accidents arising out of, or in connection with, the performance of the Work, whether on or off the site, which caused death, personal injury or property damage, giving full details and statements of witnesses. In addition, if death or serious damages are caused, the accident shall be reported immediately by telephone or messenger. If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the College's Project Manager and the Campus Security Office, giving full details of the claim.

ARTICLE 9 – INSURANCE AND BONDS

9.1. INSURANCE

9.1.1. Unless otherwise indicated in the Contract Documents, the Contractor shall maintain in force at all times during the term of this Agreement, with an insurance carrier licensed to do business in the State of Maryland acceptable to the College, the following minimum insurance coverage. This insurance must be kept in full force and effect during the term of this contract, including all extensions. The insurance must be evidenced by a certificate of insurance, and if requested by the College, the proposed awardees/Contractor shall provide a copy of the insurance policies. The Contractor's insurance shall be primary.

a) Worker's Compensation Insurance covering the Contractor's employees as required by State of Maryland law with the following minimum limits:

Bodily Injury by Accident	$ 100,000 each accident
Bodily Injury by Disease	$ 500,000 policy limit
Bodily Injury by Disease	$ 100,000 each employee.

b) Commercial General Liability Insurance, excluding automobiles owned or hired by the Contractor, with limits as follows:

Bodily Injury and Property Damage:	$ 10,000,000 combined single limit of bodily injury and property damage per occurrence

c) Comprehensive Automobile Liability Insurance, providing bodily injury and property damage coverage for owned vehicles, hired vehicles and non-owned vehicles with limits as follows:

Bodily Injury:	$ 1,000,000 each person
	$ 2,000,000 each occurrence
Property Damage:	$ 2,000,000 each occurrence

d) Builder's Risk Insurance, providing property damage and theft replacement coverage for goods provided and services rendered during construction. For building renovation projects, when custody of the building is turned over to the Contractor, the Builder's Risk policy must additionally include building replacement value.

e) Insured - The College, its elected and appointed officials, officers, consultants, agents and employees must be named as an additional insured and loss payee on Contractor's Commercial and Excess/Umbrella Insurance for liability arising out of Contractor's products, goods and services provided under this Agreement.

9.1.2. Prior to the College signing the Contract, the Contractor shall provide the College with evidence of payment for the above insurance coverage. Any agreement for an extension of time to the Contract shall also include evidence of payment for extending the above insurance coverage for that agreed upon period of time.

9.1.3. These coverages and limits are to be considered minimum requirements under this Agreement and shall in no way limit the liability or obligations of the Contractor. The insurance shall provide that policy coverage will not be canceled, altered or materially changed without sixty (60) calendar days' prior notice to the College by registered or certified mail. The insurance shall not be limited to claims made only while the policy is in effect.

9.1.4. The Contractor shall furnish the College with a certificate of insurance as evidence of the required coverage. The certificates of insurance must name the College as an additional insured.

9.1.5. In the event that the Contractor's insurance is terminated, the Contractor shall immediately obtain other coverage and any lack of insurance shall be grounds for immediate termination of this Agreement.

9.1.6. For the purposes of this article, the word "licensed" shall be deemed to mean an insurance carrier either licensed or approved to do business in the State of Maryland.

9.2. PERFORMANCE, LABOR AND MATERIAL BONDS AND MAINTENANCE BOND

9.2.1. The College may require the Contractor to furnish bonds. The bonds furnished by the Contractor shall be issued by a surety licensed to conduct business in the State of Maryland. The surety shall be approved by the College. The bonds furnished shall comply in all respects with the requirements of Maryland's Little Miller Act and shall be in the form prescribed by the College.

9.2.2. Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

9.2.3. If at any time, the surety becomes insolvent, files for bankruptcy or for any reason whatsoever loses its right to do business in the State of Maryland, the Contractor shall, as soon as practicable but no later than within five calendar days, inform the College of this occurrence in writing.

9.2.4. If at any time, the surety becomes insolvent, files for bankruptcy or for any reason whatsoever loses its right to do business in the State of Maryland, the Contractor shall, within ten (10) calendar days after notice from the College to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety as may be satisfactory to the College.

ARTICLE 10 – CORRECTION OF WORK

10.1. CORRECTION OF WORK

10.1.1. Correction of Work Before Final Payment

10.1.1.1. The Contractor shall promptly remove from the premises all materials, equipment (whether incorporated in the Work or not) and Work rejected by the College's Project Manager as failing to conform to the Contract Documents, and the Contractor shall promptly replace and re-execute all Work under its Contract in accordance with the Contract Documents and without expense to the College and shall bear the expense of making good all Work of other contractors destroyed or damaged by such removal or replacement.

10.1.1.2. If the Contractor fails to correct nonconforming Work and does not proceed with correction of such Work within a reasonable period fixed by written notice from College's Project Manager, the College's Project Manager may remove it and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within ten (10) calendar days after written notice, the College's Project Manager may upon ten (10) additional calendar days written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the College's Project Manager's and Architect/Engineer's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract sum shall be reduced by the deficiency. If payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the College.

10.1.2. Correction of Work after Substantial Completion of Work

10.1.2.1. If, within one year, or other time period established in the Contract Documents, after the date of Substantial Completion of the Work or designated portion thereof, any of the Work is found to not be in accordance with the Contract Documents, the Contractor, at its own expense shall correct it promptly after receipt of written notice from the College to do so. The Contractor shall pay for such tests and inspections made necessary by the faulty Work. The Contractor shall pay the costs incurred by the College for professional services and expenses, including but not limited to design professional and College's Project Manager fees, required as a result of Work found not in accordance with the Contract Documents, during the correction period. The correction period shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation shall survive Final Completion of the Work under the Contract and the Contract Closeout.

10.2. ACCEPTANCE OF NON-CONFORMING WORK

10.2.1. If, in the opinion of the College, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the Work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the College to be equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 11 – MISCELLANEOUS PROVISIONS

11.1. LEGAL OBLIGATIONS, RELATIONS AND RESPONSIBILITIES

11.1.1. Laws to be Observed

11.1.1.1. The Contractor shall keep fully informed of all Executive Orders, Federal, State, county, bi-

county, regional and local laws, ordinances, rules and regulations and all orders and decrees of bodies of tribunals having any jurisdiction or authority, which in any matter affect those engaged or employed on the Work, or which in any way effect the conduct of the Work. It shall at all times observe and comply with all such laws, rules, ordinances, regulations, orders and decrees; it shall protect and indemnify the College and its Project Managers against any such claim or liability arising from or based on the violation of any law, ordinance, regulation, order, or decree, whether by itself or its employees, Subcontractors or suppliers at any tier. Whenever the Contract Documents require the Contractor to comply with provisions of Federal, State or local laws, regulations, ordinances or codes, the Contractor must comply whether such laws, regulations, ordinances or codes are expressly incorporated into the Contract or not.

11.1.1.2. The Contractor must comply with the provisions of the Workers' Compensation Act and Federal, State and local laws relating to hours of labor.

11.1.1.3. This Contract shall be construed and interpreted according to the laws of the State of Maryland, without regard to principles of conflicts of law.

11.1.1.4. If the Contractor observes that the Contract Documents are at variance with any applicable law, ordinance or regulation, it shall promptly notify the College's Project Manager, and any necessary change shall be adjusted as provided in the Contract for changes in the Work. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice, it shall bear all costs arising therefrom.

11.1.2. Regulations

11.1.2.1. Wherever any provision of any section of the Specifications conflicts with any agreements or regulations of any kind at any time in force among members of any Associations, Unions or Councils, which regulate or distinguish what work shall or shall not be included in the work of any particular, the Contractor shall make all necessary arrangements to reconcile any such conflict without delay, damage or cost to the College and without recourse to the College.

11.1.2.2. In case the progress of the Work is affected by any undue delay in furnishing or installing any items of material or equipment required under the Contract because of a conflict involving any such agreement or regulation, the College's Project Manager and Architect/Engineer may require that other material or equipment of equal kind and quality be provided at no additional cost to the College.

11.2. INDEPENDENT CONTRACTOR

11.2.1. The Contractor shall perform the Contract as an independent contractor and shall not be considered as an agent of the College, nor shall any employee or agent of the Contractor be considered subagents of the College. Nothing in this Contract shall be construed as constituting a partnership, joint venture, or agency between the College and Contractor. Other than duties of the College's Project Manager based on authority granted to the College's Project Manager by the College, no acts performed or representations, whether oral or written, made by or with respect to third parties and the Contractor shall be binding on the College.

11.3. EQUAL OPPORTUNITY

11.3.1. During the performance of this Contract, and in accordance with applicable law, the Contractor shall not discriminate in any manner on the basis of age, sex, race, color, religious belief, national origin, creed, status as a qualified individual with a disability or handicap, pregnancy, marital status or status as a disabled veteran or veteran of the Vietnam era.

11.3.2. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated equally during employment without regard to their age, sex, race, color, religious belief, national origin, creed, status as a qualified individual with a disability or handicap, pregnancy, marital

status or status as a disabled veteran or veteran of the Vietnam era. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.

11.3.3. During the performance of this contract, the Contractor agrees that it shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants shall receive consideration for employment without regard to sex, race, age, color, creed, national origin, religious belief, handicap, marital status or status as a disabled veteran or veteran of the Vietnam era. The Contractor further assures the College that, in accordance with the Immigration Reform and Control Act of 1986, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or in the case of a citizen or intending citizen, because of such individual's citizenship status.

11.3.4. The Contractor shall comply with all provisions of Executive Order 11246, as amended and of the rules, regulations and relevant orders of the Secretary of Labor.

11.3.5. The Contractor shall furnish all information and reports required by Executive Order 11246, as amended and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and shall permit access to the Contractor's books, records and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

11.3.6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of the Contract or with any of such rules, regulations or orders, this contract may be canceled, terminated or suspended in whole or in part, or the College may take such other action as may be necessary to obtain compliance. If such noncompliance appears continuing, the College may suspend all Contract payments until the noncompliance has ceased. Any delay in completion of the Contract as the result of the College taking action to obtain compliance with the nondiscrimination clauses of this Contract shall not preclude the imposition and collection of the liquidated damages for each day of delay in completion of the Work as provided for elsewhere in the Contract Documents. The Contractor may also be declared ineligible for further contracts with the College in accordance with procedures authorized in Executive Order 11246, as amended. The College's conceptual rights and remedies provided under this section are in addition to any other rights and remedies as provided in Executive Order 11246, as amended or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law or under this Contract.

11.3.7. Subcontractors shall not be approved by the College without first agreeing to the above terms and conditions, and the Contractor shall include the provisions of subsections (1) through (7) of this section in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246, as amended, so that such provisions shall be binding upon each Subcontractor or vendor. The Contractor shall take such action with respect to any Subcontractor or purchase order as the College may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the College, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

11.4. COMPLIANCE WITH THE IMMIGRATION REFORM AND CONTROL ACT OF 1986

11.4.1. The Contractor warrants that both the Contractor and/or any subcontractor of the Contractor do not and shall not hire, recruit or refer for a fee, for employment under this Agreement or any subcontract, an alien knowing the alien is an unauthorized alien and hire any individual without complying with the requirements of the Immigration Reform and Control Act of 1986 (hereinafter referred to as "IRCA"), including but not limited to any verification and record keeping requirements. The Contractor agrees to indemnify and

save the College, its employees and/or trustees harmless from any loss, costs, damages or other expenses suffered or incurred by the College, its employees and/or trustees by reason of the Contractor's or any subcontractor of the Contractor's noncompliance with "IRCA." The Contractor agrees to defend the College, its employees and/or trustees in any proceeding, action or suit brought against the College, including but not limited to administrative and judicial proceedings, arising out of or alleging noncompliance of the Contractor with "IRCA." The Contractor recognizes that it is the Contractor's responsibility to ensure that all certifications and verifications as required by law are obtained and maintained for the applicable time period.

11.5. ASSURANCE OF NONCONVICTION OF BRIBERY

11.5.1. The Contractor hereby declares and affirms that, to its best knowledge, none of its officers, directors or partners and none of its employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery or conspiracy to bribe under the laws of any state or the Federal Government.

11.6. CONFLICT OF INTEREST

11.6.1. No employee of the College or of the State of Maryland, or any department, commission, agency or branch thereof whose duties as such employee include matters relating to or affecting the subject matter of this Agreement shall, until such time as the Contractor receives final payment, become or be an employee of the party or parties hereby contracting with the College, the State of Maryland, or any department, commission, agency or branch thereof.

11.7. ASSIGNMENT AND SUBCONTRACTING

11.7.1. Neither the College nor the Contractor shall sell, transfer, assign or otherwise dispose of this Agreement or any portion thereof, or its right, title or interest therein, or its obligations there under, without the written consent of the other. A change in membership of the Contractor’s firm of one or more officers shall not constitute an assignment.

11.7.2. The Contractor shall not make any contracts for professional services with any other party for furnishing any of the work or services to be performed under this Agreement without the written approval of the College; however, this provision shall not be taken as requiring the approval of the contract of employment between the Contractor and its personnel assigned for the purposes of performing this Agreement.

11.8. CONTINGENT FEES

11.8.1. The Contractor hereby declares and affirms that neither it nor any of its representatives has employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Contractor, to solicit or secure this Agreement, and that it has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or any other consideration contingent on the making of this Agreement.

11.9. MARYLAND PUBLIC INFORMATION ACT

11.9.1. The College is subject to the Maryland Public Information Act, Title 4 of the General Provisions Article of the Annotated Code of Maryland. Contractor agrees that it will provide any justification as to why any material, in whole or in part, is deemed to be confidential, proprietary information or secrets and provide any justification of why such materials should not be disclosed pursuant to the Maryland Public Information Act.

11.10. TESTING AND INSPECTION

11.10.1. The College may retain, or may require the Contractor to retain, the services of testing/inspection laboratories/firms to perform the tests and make the required inspections and reports during the course of the Work as specified in the various sections of the Specifications or as required by the College in case of

questions as to the strength or suitability of materials. However, for the purpose of preparing and testing design concrete mixes, the Contractor will retain the services of a testing laboratory which shall be other than that retained by the College. The Contractor shall also be responsible for all tests as indicated in the Specifications.

11.10.2. Testing/inspection laboratories/firms shall be responsible for conducting and interpreting the tests, shall state in each report whether or not the specimens tested conform to all requirements of the Contract Documents and shall specifically note deviations, if any, from said requirements. All testing/inspection laboratories/firms shall be subject to the College's approval.

11.10.3. The cost of testing services required solely for the convenience of the Contractor in its scheduling and performance of the Work, and the cost of testing services related to remedial operations performed to correct deficiencies in the Work shall be borne by the Contractor.

11.10.4. The Contractor shall furnish to the College's Project Manager samples of all materials and component parts of the Work required as test specimens in connection with the specified tests, and shall furnish labor and facilities at the site as necessary in connection with testing and inspection services whether such services are performed at the expense of the College or the Contractor.

11.10.5. The nature and scope of testing services performed by an agency retained by the Contractor shall be in accordance with requirements of governing authorities having jurisdiction over the Work and as otherwise specified, and shall be consistent with reasonable standards of engineering practice.

11.10.6. If, in the performance of any testing, control, balancing, adjusting or similar activities to be performed by the Contractor or an agent of the Contractor, it is the opinion of the College's Project Manager that the Contractor or said agent has failed to substantiate its ability to perform such work, the Contractor shall, at its expense, retain the services of a testing laboratory or service organization which is satisfactory to the College's Project Manager for the performance of such work.

11.11. NO WAIVER OF RIGHTS – COLLEGE'S REMEDIES CUMULATIVE – COLLEGE'S DAMAGES

11.11.1. The College shall not be precluded or estopped by any measurement, estimate, change order, contract modification, certificate of payment, or payment from showing the true amount and character of the Work furnished by the Contractor, or from showing that any measurement, estimate, change order, contract modification, certificate of payment, or payment is untrue or was incorrectly made, or from showing that the Work does not in fact conform to the Contract Documents. The College may recover from the Contractor or its sureties, or both, such damages, loss or additional expense incurred as a result of any such error or measurement, estimate, change order, contract modification, certificate of payment, or payment as a result of such failure to conform to the Contract Documents. The College's right in this respect shall not be waived or barred by any inspection, acceptance or approval of the Work, or by payment therefore, or by granting an extension of time, or by taking possession, or by execution of a change order based on the erroneous measurement, estimate, or change order, contract modification, certificate of payment or payment.

11.11.2. The activities of the College's Project Manager, Architect/Engineer and the College respecting this Contract, including inspection of the Work, review of submittals, monitoring of progress, and so forth, are for the benefit of the College only and are not for the benefit of the Contractor. The College's failure to bring to the attention of the Contractor deficiencies in the Work or in the Contractor's performance will not constitute a waiver or excuse of the Contractor's failure to comply strictly with contract requirements.

11.11.3. The waiver by the College of any breach of contract by the Contractor shall not operate as a waiver of any other or subsequent breach.

11.11.4. The rights and remedies of the College and the obligations of the Contractor under various provisions of the Contract Documents and under provisions of the law are cumulative and not exclusive.

11.11.5. For any claim or cause of action accruing to the College as a result of or arising out of this Contract,

the College may collect damages of any kind, including consequential damages, or damages for purely economic loss.

11.12 REGISTRATION FOR CORPORATIONS NOT INCORPORATED IN THE STATE OF MARYLAND

Pursuant to 7-201 et seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201, before doing any interstate or foreign business in this State. By signing this agreement, the Contractor certifies that it has qualified with the Department of Assessments and Taxation.

ARTICLE 12 – TERMINATION OF THE CONTRACT

12.1. TERMINATION FOR DEFAULT

12.1.1. The performance of the Work or services under this Contract may be terminated by the College, in whole or in part, from time to time, effective upon receipt of notice, whenever the Contractor shall default in the performance of this Agreement and fails to make progress in the prosecution of the contract work or endangers such performance and shall fail to cure such default within ten (10) calendar days period after receipt of written notification from the College specifying the default.

12.1.2. The College may terminate the Contract if the Contractor;

12.1.2.1. persistently or repeatedly refuses or fails to supply enough properly skilled Workers or materials;

12.1.2.2. fails to make payment to Subcontractors for materials or labor in accordance with their respective agreements between the Contractor and the Subcontractors;

12.1.2.3. persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction;

12.1.2.4. refuses or fails to prosecute the Work, or any separable part thereof with such diligence as shall ensure its completion within the time specified in the Contract or in the extension thereof;

12.1.2.5. fails to complete the Work within the time allotted by the Contract; or

12.1.2.6. is in breach of any material obligation of the Contract, including a breach which may occur after Substantial Completion.

12.1.3. If any of the above reasons exist, the College may without prejudice to any other rights or remedies of the College and after giving the Contractor and the Contractor's surety, if any, seven days written notice, terminate the employment of the Contractor and may, subject to any rights of the surety:

12.1.3.1. take possession of the site and all materials, equipment, tools, and construction equipment and machinery owned by the Contractor; and

12.1.3.2. finish the Work by whatever reasonable means the College may deem is in its interests.

12.1.4. When the College terminates the Contract for one of the reasons stated herein, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Sum exceeds the cost to finish the Work, such excess shall be applied to the Contractor’s unreimbursed costs, if any, accrued from the last payment prior to termination to time of termination. This amount shall become due to the Contractor. Any unreimbursed costs exceeding the difference of unpaid balance of the Contract Sum and the cost to finish the Work shall be lost to the Contractor. If the cost to

finish the Work exceeds the Contract Sum, the Contractor shall pay the difference to the College. The amount to be paid to the Contractor or College, as the case may be, shall survive termination of the Contract.

12.2. TERMINATION FOR CONVENIENCE

12.2.1. The College may, at any time, terminate the Contract in whole or in part for the College's convenience and without cause.

12.2.2. Upon receipt of written notice from the College of such termination for the College's convenience, the Contractor shall (1) cease operations as directed by the College in the notice; (2) take actions necessary, or that the College may direct, for the protection and preservation of the Work; and (3) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

12.2.3. In the case of such termination for the College's convenience, the Contractor shall be entitled to receive payment from the College for all expenses incurred by it for satisfactory work, including reasonable termination expenses. Upon satisfactory proof that the Contractor would have earned a profit for Work performed prior to the date of termination, the Contractor shall be paid a reasonable amount for profit not to exceed 10% of the Contractor’s costs incurred. Under no circumstances shall the Contractor be entitled to payment for anticipated but unearned profit, overhead, and damages. In no event shall the Contractor's cost of the Work and profit, if any, to be reimbursed exceed the Contract Sum as adjusted by approved change orders.

END OF GENERAL CONDITIONS

SUPPLEMENTARY CONDITIONS OF THE CONTRACT

PART 1 - COMPLEX STRUCTURES

1.1 Paragraph 3.1.2 of Section 007200, General Conditions of the Contract, Montgomery County Complex Structures process does not apply to this project.

PART 2 - PROJECT PROCEDURES

2.1 The Contractor shall coordinate with the College regarding site access.

2.2 The Contractor shall share site access and project site with other contractors performing work concurrently.

2.3 The Contractor shall accommodate mid-terms and final exams in the schedule and refrain from any noisy or disruptive work during this time. The College shall determine time frame for mid-term and final examinations.

PART 3 - PREVAILING WAGE RATES

3.1 With regard to Paragraph 3.3.1.3 of Section 007200, Montgomery College General Conditions of the Contract, Contractor is advised that this project is subject to the Maryland Prevailing Wage Law.

END OF SUPPLEMENTARY CONDITIONS

SECTION 230100 – BASIC HVAC REQUIREMENTS

PART 1 - GENERAL

1.1 CONTRACT DOCUMENTS

A. Unless otherwise modified, provisions of General Conditions, Supplementary Conditions and Division-01 govern work under the Mechanical Divisions.

B. Contract drawings for mechanical work are diagrammatic, intended to convey scope and general arrangement. Contractor shall review and coordinate routing of new work to clear existing piping, duct, electrical, structure, etc. at no cost to the Owner. All dimensions of existing conditions shall be considered approximate (for information only). All dimensions shall be verified prior to construction.

C. Contract Document Interpretation/Discrepancies:

1. Should the Contractor discover any discrepancies or omissions on the drawings or in the specifications, he shall notify the Architect/Engineer (A/E) of such conditions prior to the bid date. Otherwise, it will be understood that the drawings and specifications are clear as to what is intended and shall be as interpreted by the A/E.

2. In addition, should any contradiction, ambiguity, inconsistency, discrepancy or conflict appear in or between any of the Contract Documents, the Contractor, shall, before proceeding with the work in question, notify the A/E and request an interpretation. In no case shall he proceed with the affected work until advised by the A/E.

3. If the Contractor fails to make a request for interpretation of discrepancies or conflicts in the drawings or specifications, no excuse will be accepted for failure to carry out the work in a satisfactory manner, as interpreted by the A/E. In all cases, the Contractor will be deemed to have estimated the most stringent materials and methods (i.e. the highest quality materials and most expensive manner of completing the work) unless he has requested and obtained written authorization as to which methods or materials will be required.

4. Each and every trade or subcontractor will be deemed to have familiarized himself with all drawings of this project, including Site/Civil, Architectural, Structural, Mechanical, Electrical, Information Technology, etc. so as to avoid coordination errors, omissions, and misinterpretations. No additional compensation will be authorized for alleged errors, omissions, and misinterpretation, whether they are a result of failure to observe these requirements or not.

D. The complete set of Architectural, Structural, Civil, Mechanical, and Electrical drawings and specifications apply to this work.

1.2 SCOPE

A. The work in Division-23 includes furnishing and installing the mechanical systems complete and ready for satisfactory service.

B. Requirements specified govern work in all sections of Division-23.

1.3 REFERENCES

A. References to standards, codes, catalogs and recommendations are latest edition in effect on date of invitation to bid.

B. Refer to applicable contract drawings, specifications and addenda pertaining to other divisions for conditions affecting work.

C. Refer to Division-01 for description of alternates.

D. Refer to Division-01 for description of allowance items.

E. Refer to Division-01 for description of base bid items.

F. Refer to Division-01 for description of demolition items.

1.4 DEFINITIONS

A. Following are definitions of terms and expressions used in this Division:

1. "Approve" - to permit use of material, equipment or methods conditional upon compliance with contract document requirements.

2. "Concealed" - hidden from normal sight; includes work in crawl spaces, above ceilings, and in building shafts.

3. "Directed" - directed by Engineer.

4. "Ductwork" - includes ducts, fittings, housings, dampers, supports and accessories comprising a system.

5. "Equal, equivalent" - possessing the same performance qualities and characteristics and fulfilling the same utilitarian function.

6. "Exposed" - not concealed.

7. "Indicated" - indicated in Contract Documents.

8. "Piping" - includes pipe, fittings, valves, supports and accessories comprising a system.

9. "Provide" - furnish and install.

10. "Removable" - detachable from the structure or system without physical alteration of materials or equipment or disturbance to other construction.

11. "Review" - limited observation or checking to ascertain general conformance with design concepts and general compliance with contract document requirements. Such action does not constitute a waiver or alteration of the contract requirements. Verification of quantities and dimensions shall be the responsibility of the Contractor.

12. “Appurtenances” - a device or assembly installed in the referenced system which performs some useful referenced function in the operation, maintenance, servicing, economy or safety of the system. Some examples include, but are not limited to aerators, anchors, supports, gauges, backflow preventors, expansion tanks, filters, flow controls, heat exchangers, interceptors, meters, pressure reducing valves, relief valves, dampers, separators and similar devices.

13. “Record Documents” - drawings, plans and specifications that indicate the nature and location of work reported by Contractors, but not verified by Consultant. Record documents cannot be considered reliable; as they are based on information reported by the Contractor only and is not verified by the Architect or Engineer (A/E).

1.5 RIGGING REQUIREMENTS

A. Prior to bidding, the Contractor shall verify that all equipment can be physically rigged to the proposed location without disturbance or dismantling of any existing or new physical obstacles. Should the rigging of any new equipment appear to be an issue, the Contractor shall inform the Architect or Engineer (A/E) seven (7) days prior to the bid date that the rigging of the new equipment may present a problem. Otherwise, the Contractor shall, in accordance with the manufacturer’s approval and without voiding warranties and/or certifications, have the equipment “broken down” into sections as required to install the equipment in its proposed location without disturbance or dismantling of any existing or new physical obstacles.

B. Failure to inform the Architect or Engineer (A/E) seven (7) days prior to the bid of any rigging problems will result in the Contractor accepting full responsibility for all modifications to the equipment or the physical obstacles required to install the equipment in its proposed location without additional cost to the Owner.

1.6 CONTRACTOR'S INSTALLATION DRAWINGS

A. Prior to fabrication and installation, submit shop drawings (min. scale - 1/4" = 1' - 0") illustrating all ductwork, HVAC piping, plumbing piping, lighting fixtures, cable tray, conduit, expansion loops, supports, alignment guides and fire protection coordinated with each other and with the structure. Installation drawings shall be reviewed by Owner's representative prior to fabrication and installation of any new work and prior to the ordering of any mechanical equipment.

B. Should the Contractor not provide the coordinated installation drawings required above, the following shall apply:

1. The Contractor shall accept full and absolute responsibility for the coordination of all project materials and equipment to be installed as indicated on the contract documents.

2. Proposed change orders and/or time extensions will not be accepted for any additional work that results from coordination related changes.

3. A credit shall be issued to the Owner for the value of the coordinated installation drawings; the value of the credit to the Owner shall be as determined by the A/E.

C. Computer (CADD) files of mechanical drawings (HVAC, etc.) will not be made available to the Contractor for use in the preparation of coordinated drawings, shop drawings or any other use.

1.7 MATERIAL, EQUIPMENT AND SUBSTITUTION REQUIREMENTS

A. Use products of one manufacturer where two or more items of same kind of equipment are required.

B. Materials and equipment shall have a record of two (2) years successful field use.

C. Where a specific manufacturer is listed on the drawings, that manufacturer shall be considered the basis of design for that particular item of equipment. Only the basis of design manufacturer has been verified to meet the project requirements (i.e. dimensions, weights, service clearances, electrical requirements, etc.).

D. Where the drawings and/or specifications indicate more than one manufacturer for a particular item of equipment, only those listed may submit products and services to be included in the work; manufacturers other than those listed will not be acceptable. Should the contractor choose to use one of the specified manufacturers other than the basis of design, it shall be the responsibility of the contractor to verify that the equipment meets all project requirements including, but not limited to, verification of all dimensions, weights, service clearances, electrical requirements, etc. All changes incurred shall be the responsibility of the contractor and shall be provided at no additional cost to the owner.

E. Substitutions must be submitted for consideration seven (7) days prior to the original bid date. Consideration of substitutions shall be at the sole discretion of the Engineer. Substitution submittals shall include all information required in the "Submittals" paragraph of this specification section, as well as all other requirements indicated through the Division-23 specifications. Substitutions will not mitigate, in any way, the Contractor's responsibility in complying with the coordination, contract requirements or design intent. Any additional electrical, structural or special requirements, etc. shall be the responsibility of the Contractor.

Also, any additional cost incurred as a result of substitution shall be the responsibility of the Contractor.

F. Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

G. Where items of equipment are indicated as Base Bid on the bid form include in the Bid price the cost of providing the equipment upon which the specification is based. In addition, submit with bid for Owner's consideration the amount to be added or deducted from the base bid for other listed manufacturers' equipment. Owner will advise Contractor within forty-five (45) days after award of contract of his selection.

1.8 MATERIAL AND EQUIPMENT LIST

A. Within thirty (30) days after award of the contract, submit for Engineer's review a list of subcontractors' and manufacturers' names for items proposed for this project.

1.9 SUBMITTALS

A. Where the drawings and/or specifications indicate more than one allowable manufacturer for a particular piece of equipment and/or product, only those manufacturers indicated may submit products and services to be included in the work. Unless otherwise indicated, manufacturers other than those listed will not be acceptable.

B. Submit shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and obtain approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review.

C. Shop Drawings: Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment. Include equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted. All equipment and/or products shall be submitted by an authorized factory representative of that particular product.

D. Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

E. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters' Laboratories (UL), proof of such conformance shall be submitted to the Engineer for review. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable testing. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for review. The certificate shall identify the manufacturer, the product, and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.

F. Contractor shall thoroughly review and stamp all submittals to indicate compliance with contract requirements prior to submission and coordinate installation requirements for equipment submitted, including, a) the verification of equipment weights relative to the existing and/or new structural support system and b) the verification of equipment dimensions relative to existing and/or new architectural conditions. Contractor shall be responsible for correctness of all submittals.

G. Submittals will be checked only for general conformance with the design concept and are subject to the original contract documents, as well as any corrections and comments noted. Comments noted, if any, will not be considered a complete list of all omissions, deviations and corrections necessary to meet the requirements of the contract documents. The contractor will be responsible to confirm that the final product and installation will be in conformance with the contract documents in their entirety, including the responsibility to fully coordinate all work with other trades and to confirm the correctness of dimensions, quantities, and capacities. Submittal review does not authorize or constitute a change to the contract requirements and does not release the contractor of responsibility to conform to the contract requirements. Requirements of the contract are not waived by review of any and all substitutions. The contractor must fulfill the terms of the contract.

H. Compliance Review Form: Each equipment submittal must include a Compliance Review Form formatted as follows:

1. Section 1: Certify that the submittal is in complete compliance with the plans and specifications, except for the numbered and footnoted deviations and exceptions as defined herein. Deviations or exceptions taken in a cover letter or by contradiction or omission shall not constitute a release from the requirement that the equipment be in complete compliance with the plans and specifications.

2. Section 2: Provide a detailed paragraph by paragraph annotation of the specification with an individual "C", "D", or "E" noted in the margin, as follows:

   a. "C" shall mean compliance with no exceptions. Provide a numbered footnote (i.e. C1, C2, C3, etc.) for each comment or clarification.

   b. "D" shall mean compliance with deviations. For each deviation, provide a numbered footnote (i.e. D1, D2, D3, etc.) with a detailed explanation of how the intent of this specification is to be satisfied.

   c. "E" shall mean exception. The equipment offered is not in compliance with the specifications. For each exception, provide a numbered footnote (i.e. E1, E2, E3, etc.) with a detailed description of the exception.

I. Electronic Submittals: Should the contractor elect to submit electronic shop drawings/submittals, the procedure shall be as follows:

1. Provide a transmittal with the electronic shop drawing/submittal indicating that the document was transmitted electronically. Transmittal shall also include verification of the contractor's review indicating compliance with the contract documents in accordance with paragraph 1.09.F of this section.

2. Sequentially number all pages on the electronic shop drawing/submittal. The total number of pages shall be reflected in the transmittal.

3. Submittal review comments shall be transmitted electronically. Large documents will be scanned with comments as necessary and returned electronically.

4. All shop drawings such as, but not limited to: coordination drawings, ductwork shop drawings, fire alarm drawings, ductbank layouts, etc. shall be submitted in hard copy, full size format.

5. Provide hard copy of the shop drawing/submittal for each of the Operations and Maintenance Manuals.

6. Failure to comply with the above will result in the submittal being returned and marked "Not Reviewed".

J. Submittals will be reviewed for general compliance with design concept in accordance with contract documents. Dimensions, quantities, weights, or other details will not be verified by the A/E; this is the responsibility of the Contractor.

K. Acceptance will not constitute waiver of contract requirements unless deviations are specifically indicated and clearly noted.

L. Review Period: BKM shall be allotted two (2) weeks for the processing, review and return of all submittals. It shall be incumbent upon the Contractor to include this time period in their schedule.

1. Resubmittals: BKM shall be allotted an additional two weeks (14 days) for the review of each resubmittal. Again, it shall be the Contractor's responsibility to submit the appropriate materials in a timely fashion.

2. Contract Extension: No extension in contract time will be authorized as a result of the timeline addressed above.

M. Submittal Identifications:

1. Place a permanent label or title block on each submittal for identification.

2. Indicate name of firm or entity that prepared each submittal on label or title block.

3. Provide a space approximately 4 by 5 inches on label or beside title block to record contractor's review and approval markings and action taken by A/E.

4. Include the following information on label for processing and recording action taken:

a. Project name

b. Date

c. Name and address of A/E

d. Name and address of contractor

e. Name and address of subcontractor

f. Name and address of supplier

g. Name of manufacturer

h. Unique identifier, including revision number

i. Number and title of appropriate specification section

j. Drawing number and detail references, as appropriate

k. Other necessary identification

l. Example: 230700-01-0

1) 230700 references the spec section

2) 01 indicates this is the first submittal from this spec section

3) 0 indicates this is the original submittal (where 1 would indicate this is the first re-submittal)

N. The engineer will provide a maximum of two (2) submittal reviews per equipment submittal; the initial review plus one (1) re-submittal. Should the re-submittal be returned "Not Acceptable" or "Revise and Resubmit", the contractor shall provide the exact manufacturer and model indicated in the contract documents as the basis of design.

O. Resubmittals: Resubmittals shall comply with paragraph 1.09 of this section and the following additional requirements.

1. Resubmittals shall include a written response to each submittal comment. Provide a detailed comment by comment annotation of the submittal review comments with an individual "C", "D", or "E" as follows:

a. "C" shall mean compliance with no exceptions. Provide a numbered footnote (i.e. C1, C2, C3, etc.) for each comment or clarification.

b. "D" shall mean compliance with deviations. For each deviation, provide a numbered footnote (i.e. D1, D2, D3, etc.) with a detailed explanation of how the intent of this specification is to be satisfied.

c. "E" shall mean exception. The equipment offered is not in compliance with the specifications. For each exception, provide a numbered footnote (i.e. E1, E2, E3, etc.) with a detailed description of the exception.

1.10 MANUFACTURER'S RECOMMENDATIONS

A. Installation procedures are required to be in accordance with the recommendations of the manufacturer of the material being installed.

1.11 ACCESSIBILITY

A. Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices

requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing.

1.12 SAFETY REQUIREMENTS

A. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded in accordance with OSHA. High-temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein. Items such as catwalks, ladders, and guardrails shall be provided where required for safe operation and maintenance of equipment.

1.13 WORKMANSHIP

A. Remove and replace, at no extra cost, all work not orderly, reasonably neat, or workmanlike.

B. Coordinate all work and cooperate with other trades to facilitate execution of work.

1.14 SITE EXAMINATION/EXISTING CONDITIONS VERIFICATION

A. Failure to visit site and become familiar with existing conditions prior to bidding will not relieve the Contractor of responsibility for complying with the Contract documents.

B. Contractor shall field verify existing services and direction of flow of piping and ductwork prior to connection. Existing mechanical identification shall not constitute proper verification of service or direction of flow.

1.15 REGULATIONS AND PERMITS

A. Comply with all applicable codes and regulations.

B. All equipment provided shall be in accordance with all applicable local, state, and federal codes, guidelines and standards, as well as the authority having jurisdiction. Equipment and installation shall be in compliance with all applicable energy codes including the most current version of ASHRAE Standard 90.1.

C. Obtain and pay for all required permits.

1.16 CUTTING AND PATCHING

A. Unless otherwise directed, do all cutting and patching. Damaged work, including fireproofing and waterproofing shall be repaired by skilled mechanics of the trade involved.

B. Do not cut walls, floors, roofs, reinforced concrete or structural steel without structural Engineer's permission. Install services without affecting reinforcing steel.

C. In precast concrete plank drill all holes with a Carboloy tipped drill. Follow instructions of structural Engineer. Cut no reinforcing bars.

1.17 LINTELS

A. Under this Section provide all lintels not provided elsewhere which are required for openings for the installations of mechanical work. Lintels shall meet the requirements of the structural sections.

1.18 CLEANING UP

A. Keep premises free from accumulation of debris.

B. Remove tools, scaffolding, surplus material, debris, and leave premises broom clean.

C. On discontinuance of part of the work, place all debris in containers and promptly remove them from the Owner's property.

D. Leave all areas broom clean.

E. Final clean-up shall be performed.

1.19 AREAS REQUIRING SPECIAL FINISHES/PAINTING

A. In utility rooms paint as specified under Painting all exposed and uninsulated piping including valves, traps, strainers and appurtenant items; and exposed electrical work including conduit, boxes, switches starters and disconnects. Finish shall not be applied to nameplates, pushbuttons. Stainless steel housing and plates require no plating or paints.

B. Provide surface preparation, priming and painting of all mechanical and boiler room floors to provide a smooth, cleanable surface. Primer and paint shall be appropriate for concrete slab surfaces. Where painting over existing surfaces, coatings, or where the floor is soiled, degrease and follow manufacturer's recommendations for surface preparation, priming and painting. See specification sections "Painting" and “HVAC Related Work”, where applicable, for additional painting requirements. Color shall be selected by the A/E.

1.20 PROTECTION

A. Protect mechanical and electrical material and equipment from the elements or other injury as soon as delivered on premises.

B. Cap or plug openings in equipment, piping, duct, and conduit systems to exclude dirt and other foreign material. Rags, wool, cotton, paper, waste or similar materials shall not be used for plugging.

C. Unless approved by Owner, HVAC equipment shall not be used for temporary heating or ventilation during construction.

D. Contractor shall protect all existing mechanical, electrical and architectural equipment, materials, finishes, etc. located within or adjacent to the work environment. Contractor shall be responsible for restoration of all existing mechanical, electrical and architectural items to remain. All equipment to remain must be restored to its pre-existing condition prior to the start of work. Restoration and/or replacement shall be at no cost to the Owner.

E. Contractor shall provide temporary cooling and heating as required to protect all construction materials from the potential adverse effects of high or low temperature and humidity. Upon delivery of ceiling and other finish materials to a location within the building, environmental conditions in all spaces where the materials will be either stored or installed shall be permanently maintained at 75°F ($\pm$2°F) and 50% RH ($\pm$5%). Should the HVAC include a reheat system, the reheat system shall be energized to provide temperature and humidity control whenever the HVAC system is energized. Contractor shall pay for all utility, fuel, operational, maintenance and repair costs associated with providing the environmental conditions indicated above until the owner accepts occupancy of the building.

1.21 CLEANING OF SYSTEMS

A. After satisfactory completion of pressure tests and before permanently connecting fixtures, equipment, traps, strainers and other accessory items, thoroughly clean all systems. Blow out and flush piping until interiors are free of foreign matter.

B. Flush piping in recirculating water systems to remove all cutting oil, excess pipe joint compound and other foreign materials. Furnish necessary temporary pumping equipment to thoroughly clean the water piping. Do not use any system pump until after cleaning and flushing has been accomplished to the satisfaction of the Engineer. Employ chemical cleaners, including a non-foaming detergent, not harmful to system components. After cleaning operation, final flushing and refilling the residual alkalinity shall not exceed 300 parts per million. Work shall be performed or supervised by a qualified water treatment service company with personnel skilled in the safe and proper use of chemicals and in testing procedures. After completion, submit a certificate of completion to Engineer stating name of the service company used.

C. Leave strainers and dirt pockets in clean condition.

D. Clean fans, ductwork, enclosures, flues, registers, grilles and diffusers at completion of work.

E. Permanent air systems operated for temporary heating during construction shall only be operated with filters installed of equal efficiency to those specified. Prior to acceptance and after cleaning of system, replace with clean filters as specified. Return air openings shall be equipped with filter cloth to protect against debris entering the ductwork.

1. If upon periodic inspection, it is determined that the permanent ductwork has become contaminated with construction debris, then the contractor shall be required to procure the services of a professional duct cleaning agency prior to substantial completion, at no additional cost to the Owner.

F. Should any system become clogged with construction refuse after acceptance, the contractor shall pay for all labor and materials required to locate and remove the obstruction and replace and repair work disturbed.

G. Leave all systems clean, and in complete running order.

H. Equipment that has been subjected to the elements shall be cleaned of all rust, dirt and debris and repainted to match original finish.

1.22 FUNCTIONAL PERFORMANCE TESTING AND VERIFICATION

A. General: In addition to the tests required during and after installation of all mechanical systems, as well as any other formal commissioning requirements, the Contractor shall perform functional performance tests to verify that all systems are designed, installed, calibrated and adjusted to perform as required in the Contract.

B. Comply with all applicable specification sections including, but not be limited to, “Basic HVAC Requirements”, “Testing, Adjusting and Balancing”, “Automatic Temperature Controls” and “Commissioning”, where applicable.

C. Prior to functional performance testing, all indicating, recording and control devices shall be calibrated. A verification calibration report shall be provided with the final test report.

D. Provide functional performance testing to verify proper operation of each and every control sequence indicated throughout the contract documents.

E. Failure of Tests: Should any test, verification, or demonstration fail to meet the specification requirements, the component of the system causing the failure shall be repaired, replaced or readjusted. The failed test, verification, or demonstration shall then be repeated.

F. A “Functional Performance Test Verification Form” is included at the end of Section 230900. This form (electronic version is available upon request) shall be completed for all mechanical equipment provided under this contract. This shall include, but not be limited to each chiller, boiler, air handling unit, fan, pump, VAV terminal, fan coil unit, unit ventilator, DX cooling equipment, miscellaneous heating equipment, etc.

G. Test Report: Upon satisfactory verification of calibration and functional performance tests, a copy of the final test results shall be bound in the operations and maintenance manual. The final report shall also include a full compliance statement, on company letterhead, indicating that all systems are installed and functioning per the contract requirements including drawings, specifications, control sequences and accepted submittals.

H. The mechanical systems shall not be considered complete until all functional performance verification forms, calibration reports and compliance statement have been submitted and reviewed. Submit in accordance with the submittal requirements indicated elsewhere in these specifications.

1.23 OPERATING AND MAINTENANCE MANUAL

A. Submit Operation and Maintenance Manuals as follows:

1. Provide an electronic version for review by the Owner and A/E, including bookmarks of all section and subsections.

2. After acceptance of the electronic copy, produce hard copies in three-ring binders with each section separated by tab divider. Include protective plastic sleeves for any software or folded large documents submitted. Provide a minimum of two (2) copies to the Owner.

B. At a minimum, the manual shall contain the following:

1. Title page

2. Table of contents

3. Contractor and sub-contractor contact information

4. Supplier contact information for all mechanical equipment

5. Copies of manufacturer’s and contractor’s warranty information (project and equipment) for all mechanical equipment.

6. Submittal log for all mechanical equipment

7. One (1) reviewed copy of each shop drawing or submittal incorporating all A/E and owner submittal review comments.

8. Copy of inspector acceptance certificates / documents.

9. Provide an 11 x 17 fold-out drawing of each floor plan and indicate locations of the following:

a. System shutoff valves

b. Fire/smoke dampers

10. All duct, pipe and equipment pressure test reports complete with 11 x 17 fold-out drawing, indicating all systems tested.

11. Final Test and Balance (TAB) Reports. Do not include reports that have not been accepted by the A/E. Pencil or partial copies will not be acceptable.

12. Maintenance procedures for each item of mechanical equipment to include frequency and type of maintenance, spare parts and attic/stock list. This shall include the manufacturer's literature indicating operating and maintenance instructions, parts list, illustrations and diagrams.

13. An itemized list of all spare parts and specialty tools shall be transmitted to the Owner.

14. A report of the training procedures and content provided as well as the attendance log.

15. Valve tag chart

16. Mechanical systems functional performance verification forms, calibration reports and compliance statement indicating that all systems are installed and functioning per the contract requirements.

1.24 TOOLS AND LUBRICANTS

A. Furnish and turn over to the Owner, special tools not readily available commercially, that are required for disassembly or adjustment of equipment and machinery furnished.

B. Grease Guns with Attachments for Applicable Fittings: One for each type of grease required for each motor or other equipment.

C. Tool Containers: Hardwood or metal, permanently identified for intended service and mounted, or located, where directed by the Owner.

D. Lubricants: A minimum of one quart (.9 L) of oil, and one pound (450 g) of grease, of equipment manufacturer's recommended grade and type, in unopened containers and properly identified as to use for each different application.

1.25 FIELD INSTRUCTION

A. Upon completion of work, instruct Owner's representative in the proper operation and maintenance of the mechanical and electrical systems.

B. Instruction periods specified below shall be in addition to instruction specified for certain items elsewhere in the specifications.

C. Instructions shall be given by persons expert in the following systems and equipment and shall include descriptions and demonstration of procedures, data logging, and analysis.

1. Heating Plant - including pumps, related equipment, safety controls. Provide . 4 . hours of instruction.

2. Cooling Plant - Including pumps, related equipment, safety controls. Provide . 4 . hours of instruction.

3. Air Systems - Including air handling units, heating and cooling coils, filters, fans, safety controls and other air handling equipment. Provide . 8 . hours of instruction.

4. Automatic Control - Including operating controls for all heating, cooling, ventilating systems, control centers, panels, compressed air system. Provide . 8 . hours of instruction.

5. General Instructions - Including review of written operating instructions and balancing report, miscellaneous instructions. Provide . 8 . hours of instruction.

D. Prepare statement(s) for signing by Owner's representative indicating date of completion of instructions and hours expended. Furnish copy of signed statement to Engineer.

E. Final mechanical demonstration of all mechanical equipment shall be recorded in DVD compatible format. Provide DVD’s to the Owner.

1.26 RECORD DOCUMENTS

A. The Contractor shall maintain a record set of mechanical prints at the project site and shall indicate thereon any changes made to the contract drawings, including, but not limited to addenda, field sketches, RFI responses, supplemental drawings, sketches, etc. Where changes are made that are reflective of supplemental instructions, revisions, RFI responses, etc., the Contractor shall make clear references to those changes.

B. A separate set of neat, legible mechanical contract prints shall be kept at the project site at all times during the construction of the work for the express purpose of showing any and all changes indicated in paragraph A. above. The prints shall be marked up daily showing all changes to the original documents. The prints shall be marked up in a neat, legible manner using a red pen. Periodic review of the Record Documents will be conducted by the Owner’s Representative or A/E. Should this review indicate that the Record Documents are deficient or not up to date, the Contractor shall immediately bring the documents into compliance and make the corrections.

C. Upon completion of the project and before final close-out, the Contractor shall be responsible for producing a final set of record documents in electronic CADD format. One (1) set of full size prints, one (1) CD of the electronic CADD drawings (in AutoCad and pdf format), along with the red-lined marked up field set shall be delivered to the owner upon completion. If requested, the electronic CADD documents shall be up-loaded to the owner's FTP site. The final CADD documents shall indicate in the title or revision block "RECORD DOCUMENTS" along with the date completed. The electronic format shall be compatible with the owner's preferred version of AutoCad. Coordinate with the owner before producing the CD or up-loading to the FTP site. Not acceptable are contractor installation drawings, shop drawings or multi-layers of work on a single drawing. The final as-built product shall mirror the contract bid documents using the project page layout, format and project title block.

D. Computer (CADD) files of mechanical drawings will be made available to the Contractor upon receipt of a signed waiver (available upon request). One CD will be made available to the general contractor or construction manager for distribution to the trades.

E. Should the Contractor's electronic Record Documents not be considered complete, they will be returned for completion and/or correction.

1.27 DEMOLITION

A. All demolition of existing mechanical and electrical piping, auxiliaries and equipment, shall be as specified under the Architectural "Demolition" section, of these specifications, as shown on the drawings, and as required to complete the new and renovated installations and shall be performed by the respective mechanical and electrical contractors.

B. This work shall include the disconnection and capping of existing services, relocation of certain equipment, and the removal of existing piping, wiring, fittings, equipment, including heat transfer units, air handling units, fans, electrical controls and panelboxes, ductwork, etc., not reused in the new work or required to complete the renovation work. Contractor shall note the drawings specify certain existing equipment to be reused.

C. Where supports and piping are removed, holes remaining in floors, walls and ceilings must be patched and refinished to match the adjoining original surfaces and finishes.

D. Any removed items requested by the Owner shall remain the property of the Owner. Contractor shall remove equipment and store on site as directed by the Owner. All other equipment or material shall become the property of the Contractor and shall be removed from the site. Contractor shall meet Federal EPA Laws, Regulations and Guidelines in regard to removal of asbestos insulation.

E. The contractor shall use care when performing selective building and site demolition. The contractor shall be responsible for damage inclusive of but not

limited to: building finishes, lighting (interior and exterior), furniture, structure, site, utilities (above and below ground), mechanical, plumbing, telecommunications and electrical equipment / systems. Should any damage occur or should any remedial work be required, the contractor shall be responsible to repair and or replace the damaged item(s) to the Owner's satisfaction at no additional cost. The contractor shall be responsible for surveying (including contacting Miss Utility), photo documenting and restoring the surrounding work site(s) to the original pre-demolition condition and / or to the Owner's satisfaction upon completion of the work at no additional cost.

1.28 OUTAGES

A. All mechanical outages which will interfere with the normal use of the building in any manner shall be done at such times as shall be mutually agreed upon by the Contractor and the Owner's Representative.

B. Unless otherwise specified, outages of any services required for the performance of this contract and affecting areas other than the immediate work area shall be scheduled at least ten (10) days in advance with the Owner's Representative. All such outages shall be performed during other than normal duty hours.

C. The Contractor shall include in his price the cost of all premium time required for outages and other work which interferes with the normal use of the building, which will be performed, in most cases, during other than normal work time and the convenience of the using agency.

1.29 GUARANTEE/WARRANTY

A. Each Contractor shall furnish a guarantee covering all labor and materials furnished by him for a period of two (2) years from the date of final acceptance of his work, and he shall agree to repair and make good at his own expense any and all defects which may appear in his work during that time if, in the judgment of the Engineer, such defects arise from defective workmanship and/or imperfect or inferior material.

B. The above shall not in any way void or abrogate equipment manufacturer's guarantee or warranty. Certificates of guarantee shall be delivered to the Owner.

C. Within the two (2) year warranty/guarantee period, manufacturer's recommended maintenance shall be provided by the Contractor.

D. In addition to the warranties indicated above, provide a five (5) year parts and labor warranty for each of the following:

1. Air-Cooled Chillers

2. All air conditioning unit related compressors (i.e. computer room air conditioning units, etc.).

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION 230100

SECTION 230200 – PROJECT CLOSEOUT HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This section provides a summary of the primary mechanical project closeout activities, however, this section does not attempt to address all project closeout requirements. Closeout activities referenced in this section include the following:

1. Pressure Testing
2. Start-up
3. Punch-out Procedures
4. Testing, Adjusting and Balancing
5. Functional Performance Testing and Verification
6. Operation and Maintenance Manuals (O & M Manuals)
7. Demonstration and Training
8. Record Documents
9. Close-out Documents

B. This Section shall not supersede any other close-out section or requirements of the Contract. Refer to other Divisions of the specifications and the General Requirements of the Contract for further instructions.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 PRESSURE TESTING

A. Piping: The Contractor shall perform pressure testing on all piping systems as indicated in Division-23 section “Testing, Adjusting and Balancing”, and elsewhere as indicated.

B. Ductwork: The Contractor shall perform pressure testing on all ductwork systems as indicated in Division-23 sections, “Testing, Adjusting and Balancing”, “Low Pressure Ductwork” and “High Pressure Ductwork” and elsewhere as indicated.

C. Air Handling Units: The Contractor shall perform factory and / or field pressure testing on all air handling units where required by the drawings or specifications.

D. Final pressure test results shall be submitted as a separate project submittal for review and included with the Test and Balance Report. Upon review for general conformance, include all pressure tests in the O & M Manual.

E. All factory performed equipment test results shall be included in the final O & M Manuals.

F. Where re-tests were required, indicate remedial action taken and submit in test report.

3.2 START-UP

A. The Contractor shall perform start-up on each piece of mechanical equipment as specified in each section of Division-23.

B. Where indicated in each section of Division-23, the services of a factory authorized and certified technician shall be required to perform the equipment start-up. Start-up by any other organization other than as required by the manufacturer is unacceptable.

C. Start-up reports shall be provided for all equipment and be included in the final O & M Manuals.

3.3 PUNCH-OUT PROCEDURES

A. Preliminary Punch-out:

1. Prior to requesting an inspection from the Owner, Engineer, or Permit Official, the General Contractor or Construction Manager (GC or CM) shall provide a preliminary punch-out of the area in question.

2. Once completed, their punch list shall be supplied to each trade for corrections and completion. The punch list shall also be provided to the Engineer for their use.

3. Upon being informed that the trade contractors have addressed all of the outstanding items, the GC / CM shall backcheck the work and update the punch list.

B. Final Punch-out:

1. Final punch-out by the engineer shall not commence until the GC or CM has exhausted their review and has signed off on all items.

2. A copy of the sign-off shall be provided to the Engineer for their record.

3. Once the above has been completed, the Engineer shall be notified that the work is substantially complete and ready for a final punch-out.

4. Depending on the size, schedule, and project complexity, punch-outs may be requested for specific areas or systems, rather than the facility as a whole. Examples of specific requests include the following:

a. Above ceiling

b. Mock-ups for any repetitive installation to confirm acceptance prior to continuing (editing suites, etc.)

c. Equipment rooms

C. Upon completion of any and all punch lists (i.e. above ceiling, final, partial, phased, factory review, or specific item) the contractor shall provide an item by item sign-off indicating the date and who completed the item. The sign-off shall be submitted to the A/E and owner before final payment is processed. Should the contractor disagree with any item, they shall provide a written exception giving reason for review.

3.4 TESTING, ADJUSTING AND BALANCING

A. Comply with all provisions of Division-23 Section, “Testing, Adjusting and Balancing” (TAB) for the systems listed, but not limited to, the following:

1. Building Automated Systems

2. Pumps

3. Chillers

4. Piping Systems

B. TAB reports shall be submitted as a separate project submittal for review. Upon review for general conformance, include the final TAB report in the O & M Manual.

C. Comply with testing, adjusting and balancing requirements as indicated in each section within Division-23.

3.5 FUNCTIONAL PERFORMANCE TESTING AND VERIFICATION

A. General: In addition to the tests required during and after installation of all mechanical systems, as well as any other formal commissioning requirements, the Contractor shall perform functional performance tests to verify that all systems are designed, installed, calibrated and adjusted to perform as required in the Contract.

B. Comply with all applicable specification sections including, but not be limited to, "Basic HVAC Requirements", "Testing, Adjusting and Balancing", "Automatic Temperature Controls" and "Commissioning", where applicable.

C. Prior to functional performance testing, all indicating, recording and control devices shall be calibrated. A calibration verification report shall be provided with the final test report.

D. Provide functional performance testing to verify proper operation of each and every control sequence indicated throughout the contract documents.

E. Failure of Tests: Should any test, verification, or demonstration fail to meet the specification requirements, the component of the system causing the failure shall be repaired, replaced or readjusted. The failed test, verification, or demonstration shall then be repeated.

F. A "Functional Performance Test Verification Form" is included at the end of Section 230900. This form (electronic version is available upon request) shall be completed for all mechanical equipment provided under this contract. This shall include, but not be limited to each chiller, boiler, air handling unit, fan, pump, VAV terminal, fan coil unit, unit ventilator, DX cooling equipment, miscellaneous heating equipment, etc.

G. Test Report: Upon satisfactory verification of calibration and functional performance tests, a copy of the final test results shall be bound in the operations and maintenance manual. The final report shall also include a full compliance statement, on company letterhead, indicating that all systems are installed and functioning per the contract requirements including drawings, specifications, control sequences and accepted submittals.

H. The mechanical systems shall not be considered complete until all functional performance verification forms, calibration reports and compliance statement have been submitted and reviewed. Submit in accordance with the submittal requirements indicated elsewhere in these specifications.

3.6 OPERATION AND MAINTENANCE MANUALS

A. Submit Operation and Maintenance Manuals as follows:

1. Provide an electronic version for review by the Owner and A/E, including bookmarks of all section and subsections.

2. After acceptance of the electronic copy, produce hard copies in three-ring binders with each section separated by tab divider. Include protective plastic sleeves for any software or folded large documents submitted. Provide a minimum of two (2) copies to the Owner.

B. At a minimum, the manual shall contain the following:

1. Title page

2. Table of contents

3. Contractor and sub-contractor contact information

4. Supplier contact information for all mechanical equipment

5. Copies of manufacturer's and contractor's warranty information (project and equipment) for all mechanical equipment.

6. Submittal log for all mechanical equipment

7. One (1) reviewed copy of each shop drawing or submittal incorporating all A/E and owner submittal review comments.

8. Copy of inspector acceptance certificates / documents.

9. Provide an 11 x 17 fold-out drawing of each floor plan and indicate locations of the following:

    a. System shutoff valves

    b. Fire dampers

10. All pipe and equipment pressure test reports complete with 11 x 17 fold-out drawing, indicating all systems tested.

11. Final Test and Balance (TAB) Reports. Do not include reports that have not been accepted by the A/E. Pencil or partial copies will not be acceptable.

12. Maintenance procedures for each item of mechanical equipment to include frequency and type of maintenance, spare parts and attic/stock list. This shall include the manufacturer's literature indicating operating and maintenance instructions, parts list, illustrations and diagrams.

13. An itemized list of all spare parts and specialty tools shall be transmitted to the Owner.

14. A report of the training procedures and content provided as well as the attendance log.

15. Valve tag chart

16. Mechanical systems functional performance verification forms, calibration reports and compliance statement indicating that all systems are installed and functioning per the contract requirements.

3.7 DEMONSTRATION AND TRAINING

A. Upon completion of work, instruct the owner's representative in the proper operation and maintenance of each mechanical system in accordance with applicable specification sections.

B. Instructions shall be given by persons expert in the operation and maintenance of each system / equipment.

C. Prepare statement(s) for signing by Owner's representative indicating the date of completion of instructions and hours expended. Furnish copies of signed statements to the A/E.

D. Final demonstration of all mechanical equipment shall be recorded in DVD compatible format.

1. The recordings shall be organized systemically from largest to smallest component.

2. The recordings shall include bookmarks to reference each type of equipment, all major components, and each component requiring regular maintenance.

3. No segment shall be unannotated longer than fifteen minutes.

4. Submit a digital link of the draft for review by the owner and A/E.

5. Submit two hardcopy DVDs of the final approved copy to the owner’s representative.

6. Submit a digital link of the final approved copy to the owner’s representative.

3.8 RECORD DOCUMENTS

A. The Contractor shall maintain a record set of mechanical prints at the project site and shall indicate thereon any changes made to the contract drawings, including, but not limited to addenda, field sketches, RFI responses, supplemental drawings, sketches, etc. Where changes are made that are reflective of supplemental instructions, revisions, RFI responses, etc., the Contractor shall make clear references to those changes.

B. A separate set of neat, legible mechanical contract prints shall be kept at the project site at all times during the construction of the work for the express purpose of showing any and all changes indicated in paragraph A. above. The prints shall be marked up daily showing all changes to the original documents. The prints shall be marked up in a neat, legible manner using a red pen. Periodic review of the Record Documents will be conducted by the Owner’s Representative or A/E. Should this review indicate that the Record Documents are deficient or not up to

date, the Contractor shall immediately bring the documents into compliance and make the corrections

C. Upon completion of the project and before final close-out, the Contractor shall be responsible for producing a final set of record documents in electronic CADD format. One (1) set of full size prints, one (1) CD of the electronic CADD drawings (in AutoCad and pdf format), along with the red-lined marked up field set shall be delivered to the owner upon completion. If requested, the electronic CADD documents shall be up-loaded to the owner's FTP site. The final CADD documents shall indicate in the title or revision block "RECORD DOCUMENTS" along with the date completed. The electronic format shall be compatible with the owner's preferred version of AutoCad. Coordinate with the owner before producing the CD or up-loading to the FTP site. Not acceptable are contractor installation drawings, shop drawings or multi-layers of work on a single drawing. The final as- built product shall mirror the contract bid documents using the project page layout, format and project title block.

D. Computer (CADD) files of mechanical drawings will be made available to the Contractor upon receipt of a signed waiver (available upon request). One CD will be made available to the general contractor or construction manager for distribution to the trades.

E. Should the Contractor's electronic Record Documents not be considered complete, they will be returned for completion and/or correction.

3.9 CLOSEOUT DOCUMENTS

A. Prior to Substantial Completion and /or Final Payment, the Contractor shall prepare and submit the following:

1. Final punch lists indicating completion of all items

2. All record drawings

3. All record specifications

4. Operation and Maintenance Manuals

5. Complete final cleaning

6. Remove temporary facilities and complete site restoration

END OF SECTION 230200

SECTION 230500 – BASIC HVAC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 CONTRACT DOCUMENTS

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

B. Requirements specified in Division-23 Section "Basic HVAC Requirements" apply to this Section.

1.2 SUMMARY

A. This Section includes limited scope general construction materials and methods for application with mechanical installations as follows:

1. Mechanical equipment nameplate data.

2. Firestopping: Provide seals for all openings (new and existing) through fire-rated walls, floors, or ceilings used as passage for mechanical and electrical components such as piping, ductwork, conduit, etc.

3. Selective demolition including:

a. Nondestructive removal of materials and equipment for reuse or salvage as indicated.

b. Dismantling mechanical materials and equipment made obsolete by these installations.

4. Miscellaneous metals for support of mechanical materials and equipment.

5. Wood grounds, nailers, blocking, fasteners, and anchorage for support of

6. Joint sealers for sealing around mechanical materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.

7. Access panels and doors in walls, ceilings, and floors for access to mechanical materials and equipment.

1.3 DEFINITIONS

A. The following definitions apply to excavation operations:

1. Additional Excavation: Where excavation has reached required subgrade elevations, if unsuitable bearing materials are encountered, continue

excavation until suitable bearing materials are reached. The Contract Sum may be adjusted by an appropriate Contract Modification.

2. Subbase: As used in this Section refers to the compacted soil layer used in pavement systems between the subgrade and the pavement base course material.

3. Subgrade: As used in this Section refers to the compacted soil immediately below the slab or pavement system.

4. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction from the Architect.

B. The following definitions apply to firestopping:

1. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.

2. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.

3. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire, gases and smoke.

4. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.

5. Construction Gaps: Gaps between adjacent sections of walls, exterior walls, at wall tops between top of wall and ceiling, and structural floors or roof decks; and gaps between adjacent sections of structural floors.

6. System: Specific products and applications classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.

7. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division-01 Specification Sections.

B. Product data for the following products:

1. Access panels and doors

2. Joint sealers

C. Firestopping: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures.

1. Provide details of each proposed assembly identifying intended products and applicable UL system number, or UL classified devices.

2. Provide drawings relating to non-standard applications as needed.

D. Shop drawings detailing fabrication and installation for metal fabrications, and wood supports and anchorage for mechanical materials and equipment.

E. Coordination drawings for access panel and door locations in accordance with Division-23 sections.

F. Samples of joint sealer, consisting of strips of actual products showing full range of colors available for each product.

G. Welder certificates, signed by Contractor, certifying that welders comply with requirements specified under "Quality Assurance" article of this Section.

H. Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of utility services and details for dust and noise control.

1. Coordinate sequencing with construction phasing and Owner occupancy specified in Division-01 Section "Summary of Work."

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an Installer for the installation and application of joint sealers, access panels and doors, and firestopping materials with at least two years' experience with installations.

B. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel."

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

C. Fire-Resistance Ratings: Where a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in the UL "Building Materials Directory" for rating shown.

1. Provide UL Label on each fire-rated access door.

D. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL firestop system numbers, or UL classified devices.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.7 PROJECT CONDITIONS

A. Conditions Affecting Selective Demolition: The following project conditions apply:

1. Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.

2. Locate, identify, and protect mechanical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.

B. Environmental Conditions: Apply joint sealers under temperature and humidity conditions within the limits permitted by the joint sealer manufacturer. Do not apply joint sealers to wet substrates.

1.8 SEQUENCE AND SCHEDULING

A. Coordinate the shut-off and disconnection of utility services with the Owner and the utility company.

B. Notify the Architect at least five (5) days prior to commencing demolition operations.

C. Perform demolition in phases as indicated.

PART 2 - PRODUCTS

2.1 MECHANICAL EQUIPMENT NAMEPLATE DATA

A. Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name,

model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

2.2 FIRESTOPPING

A. All penetrations through fire barriers (new and existing) shall be firestopped with an approved material that is capable of maintaining the fire resistance rating of the barrier. All firestop sealants shall conform to ASTM E 814, ASTM E 119, UL 1479, UL 2079 CAN/ULC S115, and CAN/ULC S101.

B. Firestop material shall be latex based, intumescent caulk intended for use for all thru-penetrations with piping, ducts, cable trays, conduit, and cables.

C. When exposed to high temperatures or fires, the caulk shall expand in volume to quickly close off voids left by melting or burning construction materials. Caulk shall be applied by a standard caulk gun and remain flexible after curing.

D. Acceptable products shall be limited to Johns Manville “Firetemp-C1;” Hilti “FS-One;” or 3M “CP25WB+.” Coordinate with General Contractor such that a single manufacturer/ product is utilized throughout the project for all fire and smoke stopping materials.

2.3 SMOKE STOPPING

A. All penetrations through smoke barriers, smoke partitions, or any other surface required to resist the passage of smoke (new and existing) shall be provided with a smoke stop sealant and/or system that has been independently tested to provide an acceptable smoke seal that will resist the passage of smoke. Smoke stop systems (including product and installation) shall conform to all applicable standards (including but not limited to ASTM, UL and NFPA), as well as all other local, state or federal requirements.

B. Acceptable manufacturers shall be limited to the manufacturers that may provide firestopping materials/systems (see paragraph 2.02 of this section). Coordinate with the General Contractor such that a single manufacturer/product is utilized throughout the project for all fire and smoke stopping materials.

2.4 MISCELLANEOUS METALS

A. Steel plates, shapes, bars, and bar grating: ASTM A 36.

B. Cold-Formed Steel Tubing: ASTM A 500.

C. Hot-Rolled Steel Tubing: ASTM A 501.

D. Steel Pipe: ASTM A 53, Schedule 40, welded.

E. Non-shrink, Non-metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout, recommended for interior and exterior applications.

F. Fasteners: Zinc-coated, type, grade, and class as required.

2.5 MISCELLANEOUS LUMBER

A. Framing Materials: Standard Grade, light-framing-size lumber of any species. Number 3 Common or Standard Grade boards complying with WCLIB or AWPA rules, or Number 3 boards complying with SPIB rules. Lumber shall be preservative treated in accordance with AWPB LP-2, and kiln dried to a moisture content of not more than 19 percent.

B. Construction Panels: Plywood panels; APA C-D PLUGGED INT, with exterior glue; thickness as indicated, or if not indicated, not less than 15/32 inches (12 mm).

2.6 JOINT SEALERS

A. General: Joint sealers, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application.

B. Colors: As selected by the Architect from manufacturer's standard colors.

C. Elastomeric Joint Sealers: Provide the following types:

1. One-part, nonacid-curing, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for masonry, glass, aluminum, and other substrates recommended by the sealant manufacturer.

2. One-part, mildew-resistant, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for glass, aluminum, and nonporous joint substrates; formulated with fungicide; intended for sealing interior joints with non-porous substrates; and subject to in-service exposure to conditions of high humidity and temperature extremes.

D. Acrylic-Emulsion Sealants: One-part, non-sag, mildew-resistant, paintable complying with ASTM C 834 recommended for exposed applications on interior and protected exterior locations involving joint movement of not more than plus or minus 5 percent.

E. Fire-Resistant Joint Sealers: Two-part, foamed-in-place, silicone sealant formulated for use in through-penetration fire-stopping around cables, conduit, pipes, and duct penetrations through fire rated walls and floors. Sealants and accessories shall have fire resistance ratings indicated, as established by testing identical assemblies in accordance with ASTM E 814, by Underwriters' Laboratories, Inc., or other testing and inspection agency acceptable to authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 FIRESTOP INSTALLATION

A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.

B. Seal new and existing holes or voids made by penetrations to ensure an effective smoke barrier.

C. Where floor openings without penetrating items are more than four inches (100 mm) in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.

D. Protect materials from damage on surface subject to traffic.

E. Place firestopping in annular space around fire dampers before installation of damper's anchoring flanges which are installed in accordance with fire damper manufacturer's recommendations.

F. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of opening with firestopping material tested for the application.

G. Install smoke stopping as specified for firestopping (new and existing).

H. Where rated walls are constructed with horizontally continuous air space, double width masonry, or double stud frame construction, provide vertical, 12 inch (300 mm) wide fiber dams for full thickness and height of air cavity at maximum 15 foot (4500 mm) intervals.

3.3 PREPARATION FOR JOINT SEALERS

A. Surface Cleaning for Joint Sealers: Clean surfaces of joints immediately before applying joint sealers to comply with recommendations of joint sealer manufacturer.

B. Apply joint sealer primer to substrates as recommended by joint sealer manufacturer. Protect adjacent areas from spillage and migration of primers, using masking tape. Remove tape immediately after tooling without disturbing joint seal.

3.4 SELECTIVE DEMOLITION

A. General: Demolish, remove, demount, and disconnect abandoned mechanical materials and equipment indicated to be removed and not indicated to be salvaged or saved.

B. Materials and Equipment to be Salvaged: Remove, demount, and disconnect existing mechanical materials and equipment indicated to be removed and salvaged, and deliver materials and equipment to the location designated for storage.

C. Disposal and Cleanup: Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged.

D. Mechanical Materials and Equipment: Demolish, remove, demount, and disconnect the following items:

1. Inactive and obsolete piping, fittings and specialties, equipment, ductwork, controls, fixtures, and insulation.

2. Piping and ducts embedded in floors, walls, and ceilings may remain if such materials do not interfere with new installations. Remove materials above accessible ceilings. Drain and cap piping and ducts that are allowed to remain.

3. Perform cutting and patching required for demolition in accordance with Division-1 Section "Cutting and Patching."

3.5 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS "Structural Welding Code."

3.6 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.7 APPLICATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.

1. Comply with recommendations of ASTM C 962 for use of elastomeric joint sealants.

2. Comply with recommendations of ASTM C 790 for use of acrylic - emulsion joint sealants.

B. Tooling: Immediately after sealant application and prior to time shinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

END OF SECTION 230500

SECTION 230510 – HVAC RELATED WORK

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of mechanical related work required by this section is indicated on drawings and/or specified in all other Division-23 sections.

B. Types of mechanical related work specified in this section include the following:

1. Concrete for Mechanical Work:

a. Lean concrete backfill to support mechanical work.

b. Encasement of mechanical work.

c. Underground structural concrete to accommodate mechanical work.

d. Tanks and vaults of mechanical work.

e. Basins and curbs for mechanical equipment.

f. Mechanical equipment foundations and housekeeping pads.

g. Inertia bases for isolation of mechanical work.

h. Rough grouting in and around mechanical work.

i. Patching concrete cut to accommodate mechanical work.

2. Painting of Mechanical Work:

a. Exposed concrete provided as part of mechanical work.

b. Exposed piping systems.

c. Exposed ductwork systems.

d. Exposed mechanical insulation.

e. Exposed mechanical equipment.

f. Louvers.

g. Color-coded work.

C. Access door requirements associated with mechanical work and mechanically related electrical components are specified in this section.

D. Quality control testing for concrete work is required as work of this section.

1.2 QUALITY ASSURANCE

A. Access Units Fire-Resistance Ratings: Where fire-resistance rating is indicated for construction penetrated by access units, provide UL listed-and-labeled Class B units, except for units which are smaller than minimum size requiring ratings as recognized by governing authority.

B. Concrete Work Codes and Standards: Comply with governing regulations and, where not otherwise indicated, comply with the following industry standards, whichever is the most stringent in its application to work in each instance:

1. ACI 301 "Specifications for Structural Concrete for Buildings".

2. ACI 311 "Recommended Practice for Concrete Inspection".

3. ACI 318 "Building Code Requirements for Reinforced Concrete".

4. ACI 347 "Recommended Practice for Concrete Formwork".

5. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".

6. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

C. Federal Specifications, Painting Work: In general and where applicable, comply with indicated Federal Specifications for paint quality, and use only paint from original containers which bear manufacturer's labels indicating compliance with required Federal Specifications.

1.3 SUBMITTALS

A. Product Data, Access Units: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.

B. Shop Drawings, Mechanical Concrete Work: Submit shop drawings for structural type concrete work (tanks, vaults, basins, foundations and other supports), showing dimensions of formed shapes of concrete; bending, placement, sizes and spacing of reinforcing steel; location of anchors, isolation units, hangers and similar devices to be integrated with concrete work; and piping penetrations, access openings, inlets and other accessories and work to be accommodated by concrete work.

C. Manufacturer's Data, Mechanical Concrete Work: Submit data on products, including cements, special aggregates, form-coating compound, admixtures, moisture barriers, waterstops, expansion joint fillers, sealants, and concrete curing products. Provide manufacturer's certification where indicated.

D. Laboratory Test Reports, Mechanical Concrete Work: Submit laboratory test reports for concrete work materials, and for tested samples of placed concrete (where required as work of this section).

E. Mixing Tickets, Mechanical Concrete Work: Submit ticket for each batch of mixed concrete used in work, indicating project identification, location where placed, date, mixing time, mix type, amount of water introduced, amount of concrete placed, and other significant or unusual data.

F. Manufacturer's Data, Paint for Mechanical Work: Submit manufacturer's technical information, including analysis of ingredients and application instructions for products used in painting work.

G. Samples, Paint for Mechanical Work: Submit 12" x 12" (300 mm x 300 mm) color samples of each required finish paint color (except black and white); prepared on 1/8" (3 mm) tempered hardboard, on smooth face where application is for smooth surfaces and on texture face for textured surface applications. Use actual paint materials to be applied, and label each sample to show materials and coats applied.

1.4 PROJECT CONDITIONS

A. Existing Utilities: Locate and protect existing utilities and other underground work in manner which will ensure that no damage or service interruption will result from excavating and backfilling.

B. Protect property from damage which might result from excavating and backfilling.

C. Protect persons from injury at excavations, by barricades, warnings and illumination.

D. Coordinate excavations with weather conditions, to minimize possibility of washouts, settlements and other damages and hazards.

E. Provide temporary covering or enclosure and temporary heat as necessary to protect bottoms of excavations from freezing and frost action. Do not install mechanical work on frozen excavation bases or subbases.

F. Environmental Conditions, Painting Work: Comply with governing regulations concerning use of and conditions for application of paint. Comply with manufacturer's recommendations and instructions. Do not apply paint in unfavorable conditions of temperature, moisture (including humidity) or ambient contamination (dust and other pollutants).

PART 2 - PRODUCTS

2.1 ACCESS TO MECHANICAL WORK

A. Access Doors - General: Where floors must be penetrated for access to mechanical work, provide types of access doors indicated, including floor doors if any. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.

B. Floor Door Construction: Except as otherwise indicated, fabricated floor door shall be of welded steel construction, reinforced for 300 lbs. per sq. ft. (14.4 kPa) loading, with exposed welds ground smooth; 1/4" (6 mm) thick steel angle or formed steel frames, and 1/4" (6 mm) steel raised-pattern floor plate; steel strap anchors for casting in concrete; 90-degree brass/bronze hinges with stainless steel pins, and spring-type operators with hold-open arms; snap-type inside latch with removable handle, and, where applicable, inside lever latch handle and door operating handle; factory-applied rust-inhibitive prime-coat paint finish.

1. Gasketed Construction: Where indicated as "Sealed", furnish manufacturer's gasketed-type door, with built-in protected cushion-type neoprene gasket, intended for reduction of noise, air and moisture penetration.

2. Drained Construction: Where indicated as "Drained", or where drainage pipe connection is shown, furnish manufacturer's gutter-type or watertight-type unit, complete with drainage slots or ports at floor surface, and with gutter all around with one or more drain pipe connections.

3. Double-Leaf Construction: Where opening width exceeds 3'- 0" (900 mm - 0 mm), furnish manufacturer's standard double-leaf unit construction.

4. Recessed Floor-Finish Construction: Where floor doors occur in areas of floor finish other than concrete or coated-concrete, furnish manufacturer's standard recessed-panel type construction of type and recess depth recommended to receive insets of floor finish indicated.

C. Removable Access Plates:

1. General: Where valves, control devices, cleanouts and similar elements of mechanical work are located within or behind wall, ceiling or floor construction or finishes, or below grade, and are not (cannot be), provided with integral removable access plates as specified in other Division-23 sections, provide removable access plates of types and sizes needed for access requirements, as indicated. Provide manufacturer's complete unit with anchorages, fasteners and standard factory-applied finishes.

2. Wall/Ceiling Unit Construction: Except as otherwise indicated, and where adaptable to substrate, provide manufacturer's standard frameless round formed stainless steel or chrome-plated brass low profile plate cover, with single exposed flush screw anchor, with bright polished finish.

3. Painted Finish: Where substrate is indicated for painted finish, provide steel units with prime-coat paint finish.

4. Floor Unit Construction: Except as otherwise indicated, provide manufacturer's standard round cast-iron units, with frame or body designed for casting flush in concrete; with removable plate secured with bronze screws, and surfaced with non-slip cast pattern; natural mill finish.

   a. Sleeve-Type: Where required floor opening or hand hole extends through thickness of cast floor slab, provide unit body of same depth as slab thickness, to act as form for casting opening.

   b. Square Units: Where square units are indicated, provide manufacturer's modular units of size which integrate as closely as possible with finish flooring unit sizes (if any).

   c. Recessed Units: Where finish of floor is other than concrete, provide recessed-panel type construction, of type and recess depth recommended to receive insets of floor finish indicated.

   d. Finish: Provide recessed units with exposed metal (exposed after inset has been installed) of nickel bronze, manufacturer's standard finish. Provide matching fasteners.

5. Units Set at Grade: Except as otherwise indicated, provide manufacturer's standard round or square cast-iron units, complete cast-iron pipe extension to protect mechanical element being accessed; designed to be set slightly above finish grade, and to be either supported by compacted soil or to be encased in concrete; secure plate to body with bronze screws; natural mill finish on plate and body.

2.2 MATERIALS OF CONCRETE WORK

A. Forms for Exposed Concrete: Plywood, smooth metal or other smooth panel type material; sized for minimum joint exposure, and reinforced to prevent visible deflections resulting from pressure of placed concrete; sufficiently heavy for construction to prevent leakage which would be harmful to either structural or visual quality of concrete.

   1. Plywood "BB (Concrete Form) Plywood", Class I, Exterior Grade, mill-oiled and edge sealed.

B. Forms for Unexposed Concrete: Smooth lumber, plywood or other easy-release material; reinforced to prevent excessive deflection or the possibility of failure

during placement of concrete; sufficiently heavy for construction to prevent leakage which would be harmful to structural quality of concrete.

C. Form Ties: For exposed concrete surfaces, provide snap-off type ties designed to snap off 1-1/2" (40 mm) below surface.

D. Exposed-Corner Chamfer Strips: Provide wood, metal, plastic or rubber chamfer strips in forms at exposed external corners of concrete work.

E. Form-Coating Compound: Commercially formulated compound which will prevent bond of concrete to forms. Provide compound recommended by manufacturer for application indicated, and which will not stain concrete or interfere with moisture curing of concrete or subsequent painting of exposed surfaces.

F. Reinforcing Materials:

1. Reinforcing Bars: Except as otherwise indicated, provide ANSI/ASTM A 615, deformed, Grade 40 for size numbers 3 through 18; ANSI/ASTM A 675, plain, Grade 60, for size number 2; sizes as shown.

2. Steel Wire: ANSI/ASTM A 82, plain, cold-drawn.

3. Welded Wire Fabric: ANSI/ASTM A 185; sizes and spacings of wires as shown; 6" x 6" (150 mm x 150 mm) x No. 10 x No. 10 where not otherwise indicated.

4. Reinforcement Supports: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Provide wire bar type supports complying with CRSI recommendations, unless otherwise indicated.

a. For on-grade work, provide supports with sand plates or horizontal runners.

b. At exposed surfaces, provide supports with legs that are stainless steel protected (CRSI, Class 2), or plastic protected (CRSI, Class 1).

G. Concrete Materials:

1. Portland Cement: ANSI/ASTM C 150, Type I, except as otherwise indicated.

2. Aggregates: ANSI/ASTM C 33, except as otherwise indicated.

a. Local aggregates not complying with ANSI/ASTM C 33, but which shown by special test or actual service to produce concrete of adequate strength and durability may be used.

b. For rough grouting, provide aggregate which is well graded and 100 percent passing through 3/8" (10 mm) sieve.

3. Water: Clean and free of substances harmful to concrete.

4. Air-Entraining Admixture: ANSI/ASTM C 260.

5. Water-Reducing Admixture: ANSI/ASTM C 494, Type A (normal range) and Type F (high-range, super plasticizer).

6. Set-Control Admixtures: ANSI/ASTM C 494, as follows:

a. Type B, Retarding.

b. Type C, Accelerating.

c. Type D, Water-reducing and Retarding.

d. Type E, Water-reducing and Accelerating.

e. Type G, High-Range Water-Reducing and Retarding (Super-plasticizer).

7. Calcium Chloride: Use not permitted.

2.3 DESIGN AND PROPORTIONING OF MIXES

A. General: Design mechanical work concrete as follows, for each 28-day compressive strength class:

1. 4000 psi (27580 kPa) Class: 565 lbs. of cement per cu. yd. (335 kg/m^3) (6.0 sacks), and 0.35 water/cement ratio.

2. 3000 psi (20685 kPa) Class: 500 lbs. of cement per cu. yd. (296 kg/m^3) (5.25 sacks), 0.46 water/cement ratio.

3. 2500 psi (17238 kPa) Class: 450 lbs. of cement per cu. yd.(268 kg/m^3) (4.75 sacks), and 0.54 water/cement ratio.

4. Backfill Class (Lean Concrete): 375 lbs. of cement per cu. yd., (223 kg/m^3) (4.0 sacks), and 0.60 water/cement ratio.

5. Rough Grouting Class: 565 lbs. of cement per cu. yd. (335 kg/m^3) (6.0 sacks), and 0.60 water/cement ratio.

B. Admixtures: Except as otherwise indicated, use is at Contractor's option. Comply in each instance with admixture manufacturer's recommendations and suggested limitations for required quality of concrete. Use water-reducing admixture (normal or high-range in all concrete).

C. Air Entrainment: Comply with the following limitations for resulting air entrainment:

1. Concrete Above Grade: Not less than 2%, nor more than 4%.

2. Concrete Below Grade: Not less than 2% nor more than 4%, except up to 6% where maximum aggregate size must be 3/4" (20 mm) or less.

3. Rough Grout Concrete: Not less than 4%, nor more than 8%.

4. Backfill Concrete: Not more than 7%.

D. Slump Limitations: Limit water content in design mixes to produce the following slumps at point of placement (but do not exceed specified water/cement ratios). Concrete containing high-range water-reducing admixture may have slump limit up to 8" (200 mm).

1. Reinforced Structural Concrete: For concrete which is reinforced (with more than shrinkage crack protection), or in strength class of 3000 psi (20685 kPa) and above, limit slump to range of 1" to 3" (25 mm to 75 mm).

2. Plain Concrete: For concrete which is not reinforced or reinforced only for shrinkage crack protection, and in strength class below 3000 psi (20685 kPa), limit slump to range of 2" to 5" (50 mm to 125 mm).

3. Rough Grout Concrete: Limit slump to range of 3" to 7" (75 mm to 175 mm).

4. Backfill Concrete: Limit slump to 5" (125 mm).

E. Mix for Patching: Where mechanical work requires patching of exposed concrete work which has been cut to accommodate mechanical work, provide concrete patching mix which is identical with mix of work being patched (same cement, aggregates, admixtures and proportioning).

2.4 CONCRETE MIXING

A. Job-Site Mixing: Mix materials for concrete in drum-type batch machine mixer. For mixers of 1.0 cu. yd. (.84 m^2), or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after all ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than 1.0 cu. yd. (.84 m^2), increase mixing time by 15 seconds for each additional cu. yd., or fraction thereof.

1. Prepare and submit batch ticket for each batch discharged and used in work.

B. Ready-Mix Concrete: Comply with requirements of ANSI/ASTM C 94, except as otherwise indicated.

1. Delete references for allowing additional water to be added to batch for material with insufficient slump. Addition of water to batch will not be permitted.

2. During hot weather, or under conditions contributing to rapid setting of concrete, mix each load for shorter period of time than specified in ANSI/ASTM C 94. When air temperature is between 85 and 90 degrees F (29.4 and 32.2 degrees C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 degrees F (32.2 degrees C), reduce mixing and delivery time to 60 minutes.

2.5 GENERAL PAINTING PRODUCT REQUIREMENTS

A. Pigments: Provide paint with pure, non-fading pigments, recognized to be safe, durable and environmentally acceptable, and containing not more than 0.5 percent lead (by weight in total dry film).

B. Vehicles and Thinners: Comply with governing regulations and recognized safe practices in handling, use and drying of paint vehicles and thinners. Compatibility of paint products is the Contractor's exclusive responsibility. Select paint products to ensure freedom from problems relating to vehicles and thinners of type and within limits recommended by paint manufacturer.

C. Undercoat Paints: Use paint produced by same manufacturer as paint to be used for finish coats.

D. Colors: Provide colors as indicated or established by the Owner by color schedule or by other indication or, where not otherwise indicated, as selected by the Owner from manufacturer's standard (non-premium cost) colors available for type of paint to be provided in each case.

E. Color-Coded Finishes: For finishes indicated to be color-coded for identification, provide paint complying with the color requirements of ANSI A13.1 "Scheme for the Identification of Piping Systems", except where another specific color requirement is indicated.

F. "Paint": As used herein means coating system materials, including primers, emulsions, enamels, sealers, fillers and other applied materials whether used as prime, intermediate or finish coats.

G. Standards: In the following designated paint systems (example: "IPS-22") the descriptions similar to "... (TT-P-55, Type II)..." refer to Federal Specifications of that number, and indicate required compliance with that publication as minimum

standard of quality for paint product as named. Product of recognized higher quality can be used, provided either label indicates compliance with required standard, or manufacturer submits proof and certification that product meets or exceeds standard in every significant measure of quality.

2.6 INTERIOR PAINT SYSTEMS

A. Concrete:

1. IPS-1: 1st Coat - Interior latex emulsion (TT-P-29).

2nd Coat - Interior latex emulsion (TT-P-29).

2nd Coat - Interior alkyd emulsion, odorless (TT-P-30).

2. IPS-2: 1st Coat - Interior latex emulsion (TT-P-29).

2nd Coat - Interior enamel undercoat (TT-E-543).

3rd Coat - Interior enamel, semi-gloss (TT-E-509).

Not less than 3.5 mils total dry-film thickness.

3. IPS-3: 1st Coat - Acrylic emulsion (TT-P-19).

2nd Coat - Acrylic emulsion (TT-P-19).

4. IPS-4: 1st Coat - Interior latex emulsion (TT-P-29).

2nd Coat - Polyester epoxy (TT-C-5451.

3rd Coat - Polyester epoxy (TT-C-545).

Not less than 4.0 mils dry-film thickness.

B. Cement:

1. IPS-9: 1st Coat - Interior latex emulsion (TT-P-29).

2nd Coat - Interior latex emulsion (TT-P-29).

C. Ferrous Metal:

1. IPS-19: 1st Coat - Red lead primer (TT-P-86).

2nd Coat - Interior latex emulsion (TT-P-29).

3rd Coat - Interior latex emulsion (TT-P-29).

First coat not required on items that are shop primed.

Not less than 2.5 mils dry-film thickness.

2. IPS-20: 1st Coat - Red lead primer (TT-P-86).

2nd Coat - Enamel undercoat (TT-E-543).

3rd Coat - Semi-gloss enamel (TT-E-509).

First coat not required on items that are shop primed.

Not less than 2.5 mils dry-film thickness.

3. IPS-21: 1st Coat - Red lead primer (TT-P-86).

2nd Coat - Enamel undercoat (TT-E-543).

3rd Coat - Gloss enamel (TT-E-506).

First coat not required on items that are shop primed.

Not less than 2.5 mils dry-film thickness.

D. Zinc-Coated Metal:

1. IPS-22: 1st Coat - Zinc dust-zinc oxide primer (TT-P-641).

2nd Coat - Interior latex emulsion (TT-P-29).

3rd Coat - Interior latex emulsion (TT-P-29).

Not less than 2.5 mils dry-film thickness.

2. IPS-23: 1st Coat - Zinc dust-zinc oxide primer (TT-P-641).

2nd Coat - Enamel undercoat (TT-E-543).

3rd Coat - Semi-gloss enamel (TT-E-509).

Not less than 2.5 mils dry-film thickness.

3. IPS-24: 1st Coat - Zinc dust-zinc oxide primer (TT-641).

2nd Coat - Enamel undercoat (TT-E-543).

3rd Coat - Gloss Enamel (TT-E-506).

Not less than 2.5 mils dry-film thickness.

PART 3 - EXECUTION

3.1 ACCESS TO MECHANICAL WORK

A. Comply with manufacturer's instructions for installation of floor doors, and removable access plates.

B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.

C. Adjust hardware and panels after installation for proper operation.

D. Remove or replace panels or frames which are warped, bowed, or otherwise damaged.

3.2 MISCELLANEOUS CONCRETE WORK

A. Concrete Grouting: Grout openings and recesses as indicated, in and around mechanical work and other work which penetrates or adjoins mechanical concrete work, using rough grouting class of concrete mix. Provide formwork where required, and tamp, screed and trowel surfaces. Cure grout as specified for concrete work.

B. Refer to individual equipment sections of these specifications for fine-grouting of equipment base plates on foundations (usually with non-shrinking grout), and similar grouting requirements not defined herein as concrete work.

3.3 QUALITY CONTROL TESTING

A. Engage testing laboratory to take samples, perform tests, and prepare and submit reports for concrete as it is placed.

1. Backfill Concrete: Quality control testing is not required for backfill concrete (lean concrete).

3.4 SURFACE PREPARATION FOR PAINTING

A. General: Clean surfaces before applying paint products. Remove oil and grease prior to mechanical cleaning. Comply with paint products manufacturer's instructions for surface cleaning and preparation. Remove surface-applied accessories which are not to be painted, and reinstall after completion of painting. Protect non-removable items not to be painted, by covering with paper or plastic material.

B. Cementitious Surfaces: Remove efflorescence, chalk, dust, and glaze to ensure good bond of paint products. Clean concrete with muriatic acid (1 part diluted with 6 to 8 parts water) and flush with water, where necessary to ensure good paint bond. Perform appropriate tests to determine that both alkalinity and moisture

content of concrete surfaces are below maximum allowable levels for painting, as recommended by paint manufacturer.

C. Ferrous Metal Surfaces: Remove mill scale and loose rust on surfaces which are not zinc-coated or shop/factory prime coated.

D. Clean shop-applied prime coats on metal surfaces, and repair (touch-up) prime coats wherever abraded or otherwise damaged, prior to application of paint system.

E. Zinc-Coated Surfaces: Clean with non-petroleum based solvent. Wash with copper sulfate solution and flush with water, unless surface has been pretreated, or unless treatment is not recommended by manufacturer of prime coat.

3.5 PAINT SYSTEM APPLICATION

A. Mixing: Comply with manufacturer's recommendations for mixing or stirring paint products immediately before application.

B. Application Limitations: Except as otherwise indicated, paint every accessible surface of each unit of work indicated to be painted, regardless of whether in location recognized as "concealed" or "exposed".

1. Omit painting on surfaces located in service shafts and above non-removable ceilings and in similar place where space is too limited or services are too congested to allow access for painting.

2. Omit painting of ductwork and insulated piping above removable ceilings, but apply paint system to uninsulated steel piping, exposed threads of galvanized piping, pipe hangers, duct hangers, exposed ductwork, and similar work.

3. Omit painting on machined sliding surfaces and rotating shafts of equipment, and on nonferrous finished metals including chrome plate, stainless steel, special anodized aluminum, brass/bronze and copper, and on plastics and similar finished materials, except where specifically indicated to be color-coded by painting.

4. Omit painting on required name plates, labels, identification tags, signs, markers, printed instructions, performance ratings, flow diagrams and similar text and graphics, located within the scope of work indicated to receive paint application.

5. Omit specified prime coat of paint system for metal surfaces where surface has shop-applied prime coat of equivalent quality. Apply prime coat on other surfaces to be painted; comply with paint manufacturer's instructions for prime coating where not otherwise indicated. Apply additional prime coats where suction spots or unsealed areas appear.

C. General Application Requirements: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate, for type of material being applied, and for ambient conditions. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Apply paint at edges, corners, joints, welds and exposed fasteners in manner which will ensure dry-film thickness equal to that of flat surfaces. Allow sufficient time between successive coats for proper drying (comply with manufacturer's drying instructions).

D. Number of Coats: Number indicated is minimum number; apply as many coats as are necessary to comply with dry-film thickness requirements.

E. Coating Thickness: Apply uniform coats to produce dry-film thickness indicated or, if not otherwise indicated, apply paint without thinning in application thickness recommended by manufacturer for each coat.

F. Smooth Finishes: Except as otherwise indicated, apply paint in smooth finish without noticeable texture, cloudiness, spotting, holidays, laps, brush marks, runs, sags, ripples, ropiness and other surface imperfections.

G. Textured Finishes: Where indicated, roll and redistribute paint of final coat to even texture. Match adjoining textured paint finishes if any, and roll to eliminate evidence of roller or lap marks and other unevenness and imperfections.

3.6 CLEAN-UP AND PROTECTION, PAINTING

A. General Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day. Retain paint containers from application of coatings on particular unit or area of work, until average dry-film thickness has been calculated.

B. Spattered Surfaces: Upon completion of painting work, clean paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting work. Correct damage by cleaning, repairing or replacing and repainting as directed. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings installed for protection of work not to be painted, after completion of painting operations. At completion of work by other trades, touch-up and restore damaged or defaced painted surfaces.

END OF SECTION 230510

SECTION 230515 – PIPING SPECIALTIES FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of piping specialties work required by this section is indicated on drawings and schedules and by requirements of this section.

B. Types of piping specialties specified in this section include the following:

1. Pipe Escutcheons
2. Pipeline Strainers
3. Dielectric Fittings
4. Mechanical Sleeve Seals
5. Penetration Seals
6. Drip Pans
7. Pipe Sleeves
8. Sleeve Seals
9. Flexible Connectors

C. Piping specialties furnished as part of factory-fabricated equipment, are specified as part of equipment assembly in other Division-23 sections.

D. Refer to requirements of Division-26.

1.2 QUALITY ASSURANCE

A. Codes and Standards:

1. FCI Compliance: Test and rate "Y" type strainers in accordance with FCI 73-1 "Pressure Rating Standard for "Y" Type Strainers". Test and rate other type strainers in accordance with FCI 78-1 "Pressure Rating Standard for Pipeline Strainers Other than "Y" Type".

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, including installation instructions, and dimensioned drawings for each type of manufactured piping specialty. Include pressure drop curve or chart for each type and size of pipeline

strainer. Submit schedule showing manufacturer's figure number, size, location, and features for each required piping specialty.

B. Shop Drawings: Submit for fabricated specialties, indicating fabrication, materials, and method of support.

C. Maintenance Data: Submit maintenance data and spare parts lists for each type of manufactured piping specialty. Include this data, product data, and shop drawings in maintenance manual.

PART 2 - PRODUCTS

2.1 PIPING SPECIALTIES

A. General: Provide factory-fabricated piping specialties recommended by manufacturer for use in service indicated. Provide piping specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection to comply with installation requirements. Provide sizes as indicated, and connections, which properly mate with pipe, tube, and equipment connections.

2.2 PIPE ESCUTCHEONS

A. General: Provide pipe escutcheons as specified herein with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish for occupied areas, prime paint finish for unoccupied areas.

B. Pipe Escutcheons for Moist Areas: For waterproof floors, and areas where water and condensation can be expected to accumulate, provide cast brass or sheet brass escutcheons, solid or split hinged.

C. Pipe Escutcheons for Dry Areas: Provide sheet steel escutcheons, solid or split hinged.

2.3 LOW PRESSURE Y-TYPE PIPELINE STRAINERS

A. General: Provide strainers full line size of connecting piping, with ends matching piping system materials. Select strainers for 125 psi (850 kPa) working pressure, with Type 304 stainless steel screens, with perforations as follows:

1. Piping 2" (50 mm) and Smaller: 1/32" (.8 mm) diameter perforations.

2. Piping 2-1/2" (65 mm) and Larger: 3/64" (1.2 mm) diameter perforations for water systems.

B. Threaded Ends, 2" (50 mm) and Smaller: Brass body, screwed screen retainer with centered blowdown fitted with valve and pipe plug.

C. Threaded Ends, 2-1/2" (65 mm) and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with valve and pipe plug.

D. Flanged Ends, 2-1/2" (65 mm) and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with valve and pipe plug.

E. Butt Welded Ends, 2-1/2" (65 mm) and Larger: Schedule 40 cast carbon steel body, bolted screen retainer with off-center blowdown fitted with valve and pipe plug.

2.4 HIGH PRESSURE Y-TYPE PIPELINE STRAINERS

A. General: Provide strainers full line size of connecting piping, with ends matching piping system materials. Select strainers for 250 psi 1724 kPa) working pressure, with Type 304 stainless steel screens, with 3/64" (1.2 mm) perforations @ 233 per sq. in.

B. Threaded Ends, 2" (50 mm) and Smaller: Cast-iron body, screwed screen retainer with centered blowdown fitted with valve and pipe plug.

C. Threaded Ends, 2-1/2" (65 mm) and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with valve and pipe plug.

D. Flanged Ends 2-1/2" (65 mm) and Larger: Cast-iron body, bolted steel retainer with off-center blowdown fitted with valve and pipe plug.

E. Butt Welded Ends, 2-1/2" (65 mm) and Larger: Schedule 80 cast carbon steel body, bolted screen retainer with off-center blowdown fitted with valve and pipe plug.

2.5 DIELECTRIC FITTINGS

A. General: Provide assembly or fitting having insulating material to isolate dissimilar metals to prevent galvanic action and stop corrosion.

1. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig (1035 kPa or 2070 kPa) minimum working pressure to suit system pressures.

2. Dielectric Nipples: Electroplated steel nipple, having inert and non-corrosive thermoplastic lining, with combination of plain, threaded, or grooved end types and 300-psig (2070 kPa) working pressure at 225°F (107°C) temperature.

3. Dielectric unions shall NOT be acceptable.

2.6 MECHANICAL SLEEVE SEALS

A. General: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.7 PENETRATION SEALS

A. Provide seals for all openings through fire-rated walls, floors, or ceilings used as passage for mechanical piping. See Division-23 Section “Basic HVAC Materials and Methods” for penetration seals and firestopping requirements.

B. Provide seals for all openings through walls, floors or ceilings used as passage for mechanical components such as piping.

2.8 FABRICATED PIPING SPECIALTIES

A. Drip Pans: Provide drip pans fabricated from corrosion-resistant sheet metal with watertight joints, and with edges turned up 2-1/2" (65 mm). Reinforce top, either by structural angles or by rolling top over 1/4" (6 mm) steel rod. Provide hole, gasket, and flange at low point for watertight joint and 1" (25 mm) drain line connection.

B. Pipe Sleeves: Provide pipe sleeves of one of the following:

1. Sheet-Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gages: 3" (75 mm) and smaller, 20 gage (1.0 mm); 4" to 6" (100 mm to 150 mm), 16 gage (1.6 mm); over 6" (150 mm), 14 gage (2 mm).

2. Steel-Pipe: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.

3. Iron-Pipe: Fabricate from cast-iron or ductile-iron pipe; remove burrs.

2.9 FLEXIBLE CONNECTORS

A. Furnish and install braided stainless steel flexible connectors on the inlet and outlet of each pump, chiller, cooling tower, and all other piping connected to a vibrating piece of equipment. Construction shall be of annular corrugated stainless steel close-pitch hose with stainless steel overbraid.

1. The corrugated metal hose, braids, and a stainless steel ring-ferrule/band (material gauge not less than .048") (material gauge not less than 1.2 mm)

shall be integrally welded using a 100% circumferential, full-penetration TIG weld.

2. End fittings shall be flat-face plate steel flanges with 150#ANSI drilling and outside diameter. Fittings shall be attached using a 100% circumferential TIG/MIG weld.

3. Braided stainless steel connectors shall be suitable for operating temperatures up to 850˚F (454˚C).

4. The rated working pressure of braided metal hose shall have a minimum 4:1 safety factor based on an operating temperature of 70°F (20°C). Each braided stainless steel connector shall be individually leak tested by the manufacturer using air-under-water or hydrostatic pressure.

5. Flanged connectors shall be prepared for shipment using cut-to-length spacers, securely positioned between the flanges to prevent axial compression damage and maintain the manufactured length. Spacers must be removed prior to system start-up.

6. All braided stainless steel connectors shall be covered by a three (3) year warranty.

7. Minimum overall lengths shall be as follows:

Through 4" (100 mm) diameter:	9" (225 mm)
5" (125 mm), 6" 150 mm) diameter:	11" (275 mm)
Over 6" (150 mm) diameter:	1.5 times nominal diameter

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING SPECIALTIES

A. Pipe Escutcheons: Install pipe escutcheons on each pipe penetration thru floors, walls, partitions, and ceilings where penetration is exposed to view; and on exterior of building. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole, and is flush with adjoining surface.

B. Y-Type Strainers: Install Y-type strainers full size of pipeline, in accordance with manufacturer's installation instructions. Install pipe nipple and shutoff valve in strainer blow down connection, full size of connection, except for strainers 2" (50 mm) and smaller installed ahead of control valves feeding individual terminals. Where indicated, provide drain line from shutoff valve to drain, full size of blow down connection.

1. Locate Y-type strainers ahead of the following equipment, and elsewhere as indicated, if integral strainer is not included in equipment:

a. Pumps

b. Temperature control valves

c. Pressure reducing valves

d. Temperature or pressure regulating valves

e. Inlet to chillers

C. Dielectric Fittings: Install at each piping joint between ferrous and non-ferrous piping. Comply with manufacturer's installation instructions.

D. Mechanical Sleeve Seals: Provide mechanical sleeve seals for sleeves located in foundation walls below grade, or in exterior walls. Loosely assemble rubber links around pipe with bolts and pressure plates located under each bolt head and nut. Push into sleeve and center. Tighten bolts until links have expanded to form watertight seal.

3.2 INSTALLATION OF FABRICATED PIPING SPECIALTIES

A. Drip Pans: Locate drip pans under piping passing over or within 3' (0.9 m) horizontally of electrical equipment, and elsewhere as indicated. Hang from structure with rods and building attachments, weld rods to sides of drip pan. Brace to prevent sagging or swaying. Connect 1" (25 mm) drain line to drain connection, and run to nearest drain as indicated.

B. Pipe Sleeves: Install pipe sleeves of types indicated where piping passes through walls, floors, ceilings, and roofs. Do not install sleeves through structural members of work, except as detailed on drawings, or as reviewed by the Owner. Install sleeves accurately centered on pipe runs. Size sleeves so that piping and insulation (if any) will have free movement in sleeve, including allowance for thermal expansion; but not less than two (2) pipe sizes larger than piping run. Where insulation includes vapor-barrier jacket, provide sleeve with sufficient clearance for installation. Install length of sleeve equal to thickness of construction penetrated, and finish flush to surface; except floor sleeves. Sleeves through floors shall be flush with the floor, except for sleeves passing through equipment rooms, toilet rooms (and other wet areas) which shall extend 3/4" (20 mm) above the floor. Space between the pipe and sleeve shall be caulked. Escutcheons plates shall be constructed to conceal the ends of sleeves. Extend floor sleeves 1/4" (6 mm) above level floor finish and 3/4" (20 mm) above floor finish sloped to drain. Provide temporary support of sleeves during placement of concrete and other work around sleeves, and provide temporary closure to prevent concrete and other materials from entering sleeves.

1. Install sheet-metal sleeves at interior partitions and ceilings other than suspended ceilings.

2. Install iron-pipe sleeves at exterior and interior foundation wall penetrations, both above and below grade. Penetrations shall be sealed weathertight.

3. Install steel-pipe except as otherwise indicated.

3.3 INSTALLATION OF FLEXIBLE PIPE CONNECTORS

A. Provide flexible pipe connectors on the inlet and outlet of each pump, chiller, cooling tower and all other piping connected to a vibrating piece of equipment. Flexible connectors shall be full line size as indicated on the drawings and should be provided with control rods.

END OF SECTION 230515

SECTION 230519 – METERS AND GAUGES FOR HVAC PIPING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of meters and gauges required by this section is indicated on drawings and/or specified in other Division-23 sections.

B. Types of meters and gauges specified in this section include the following:

1. Temperature Gauges and Fittings:

a. Direct Mount Liquid Crystal Display (LCD) Thermometers

b. Thermometer Wells

2. Pressure Gauges and Fittings:

a. Pressure Gauges

b. Pressure Gauge Cocks

c. Pressure Gauge Connector Plugs

d. Magnehelic Pressure Gauges

3. Flow Measuring Meters:

a. Flow Meter Fittings

b. Flow Measuring Readout Kit

c. Permanently Mounted Flow Meters

d. BTU Meters

C. Meters and gauges furnished as part of factory-fabricated equipment are specified as part of equipment assembly in other Division-23 sections.

1.2 QUALITY ASSURANCE

A. Codes and Standards:

1. UL Compliance: Comply with applicable UL standards pertaining to meters and gauges.

2. ANSI and ISA Compliances: Comply with applicable portions of Instrument Society of America (ISA) standards pertaining to construction and installation of meters and gauges.

B. Certification: Provide meters and gauges whose accuracies, under specified operating conditions, are certified by manufacturer.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, including installation instructions for each type of meter and gauge. Include scale range, ratings, and calibrated performance curves, certified where indicated. Submit meter and gauge schedule showing manufacturer's figure number, scale range, location, and accessories for each meter and gauge.

B. Maintenance Data: Submit maintenance data and spare parts lists for each type of meter and gauge. Include this data in Maintenance Manual.

PART 2 - PRODUCTS

2.1 DIRECT MOUNT LCD THERMOMETERS

A. General: Provide direct mount LCD thermometers of materials designed and constructed for use in service indicated.

B. Type: LCD, universal angle.

C. Case: Drawn steel or brass, glass lens, 5" (125 mm) diameter. For gauges mounted above eight feet (2400 mm), 8" (200 mm) diameter gauge.

D. Adjustable Joint: Die cast aluminum, 180 degree adjustment in vertical plane, 360 degree adjustment in horizontal plane, with locking device.

E. Thermal Bulb: Copper with phosphor bronze bourdon pressure tube, one scale division accuracy.

F. Movement: Brass precision geared.

G. Scale: Digital display to one decimal point.

H. Stem: Copper plated steel, or brass, for separable socket, length to suit installation.

I. Range: Conform to the following:

1. Hot Water: 30°F - 240°F (-1°C - 116°C).

2. Chilled Water: 30°F - 120°F (-1°C - 49°C).

J. Manufacturer: Weiss.

2.2 THERMOMETER WELLS

A. General: Provide thermometer wells constructed of brass or stainless steel, pressure rated to match piping system design pressure. Provide 2" (50 mm) extension for insulated piping. Provide cap nut with chain fastened permanently to thermometer well.

B. Manufacturer: Weiss

2.3 PRESSURE GAUGES

A. General: Provide pressure gauges of materials designed and constructed for use in service indicated.

B. Type: General use, 1% accuracy, ANSI B 40.1 Grade A, phosphor bronze bourdon type, bottom connection.

C. Case: Drawn steel or brass, glass lens, 3" (75 mm) diameter. For gauges mounted above eight feet (2400 mm), 8" (200 mm) gauges shall be used.

D. Connector: Brass with 1/4" (6 mm) male NPT.

E. Scale: White coated aluminum, with permanently etched markings.

F. Range: Conform to the following:

1. Water: 0 - 100 psi (0 - 690 kPa).

G. Manufacturer: Weiss.

2.4 PRESSURE GAUGE COCKS

A. General: Provide pressure gauge cocks between pressure gauges and gauge tees on piping systems. Construct gauge cock of brass with 1/4" (6 mm) female NPT on each end, and "T" handle brass plug. Provide ¼” ball valve.

B. Syphon: 1/4" (6 mm) straight coil constructed of brass tubing with 1/4" (6 mm) male NPT on each end.

C. Snubber: 1/4" (6 mm) brass bushing with corrosion resistant porous metal disc, through which pressure fluid is filtered. Select disc material for fluid served and pressure rating.

D. Manufacturer: Weiss.

2.5 PRESSURE GAUGE CONNECTOR PLUGS

A. General: Provide pressure gauge connector plugs pressure rated for 500 psi (3448 kPa) and 200˚F (93˚C). Construct of brass and finish in nickel plate, equip with 1/2" (13 mm) NPS fitting, with self-sealing valve core type neoprene gasketed

orifice suitable for inserting 1/8" (3 mm) O.D. probe assembly from dial type insertion pressure gauge. Equip orifice with gasketed screw cap and chain. Provide extension, length equal to insulation thickness, for insulated piping.

2.6 MAGNEHELIC PRESSURE GAUGES

A. Provide direct reading magnehelic gauges indicating pressure drop across each filter assembly. The inlet and outlet of filter assembly shall be provided with remote dial type gauges of suitable ranges.

B. Manufacturer: Dwyer.

2.7 FLOW METER FITTINGS

A. Furnish and install venturi flow metering elements at each balancing valve location indicated on plans and drawings. Elements 2" (50 mm) and smaller shall be constructed of brass with threaded connections, 2-1/2" (65 mm) and larger shall be constructed of steel with butt weld or flanged connections.

B. Each primary element shall be selected to permit the design flow rate to fall between 20% to 80% of the full range on the linear scale of the meter. The permanent pressure loss shall not exceed 10% of the indicated flow rate differential.

C. The accuracy shall be $\pm$3% of flow rate in the flow range indicated on the tabulation as verified by a recognized Independent Laboratory specializing in the research, testing and application of fluid meters, valves and hydraulics.

D. Each element shall be complete with instrument shut-off valves each with quick disconnect connections and identification tag with a chain, pressure rated to 300 psi (2069 kPa), temperature rated to 250°F (121°C).

E. Flow meter fittings shall be as manufactured by Preso, Flow Design or Flowset.

2.8 FLOW MEASURING READOUT KIT

A. Provide portable flow meters with bellows type differential pressure element and minimum 5" (125 mm) diameter indicating dial.

B. Design pressure elements for full scale pressure differential of 50" or 100" water gauge (12.4 kPa or 24.9 kPa). Design shall incorporate rupture-proof metal beryllium or stainless steel bellows and torque tube drive requiring no lubrication. Design forged bodies for not less than 150% of maximum surge pressure, fully protected against surges, with full provision for venting and draining. Provide integral, adjustable pulsation dampers.

C. Dials of portable meters shall have square root scales not less than 12" (300 mm) in developed length. Dials shall read from 0 to 10 gpm (0 to .6 L/s) to which multiplier is to be applied, as required; also provide with uniform scale reading

from 0" to 10" w.g. (0 kPa to 2.5 kPa), to which multiplier of 10 is to be applied (100" at full scale) (2.5 m at full scale), or from 0" to 5" w.g. (0 kPa to 1.2 kPa), to which multiplier of 10 is to be applied (50" at full scale) (2.5 m at full scale).

D. Engineer and manufacture in accordance with ASME recommendations for flow meters. Provide portable meters with overall accuracy of ± 5%.

E. Provide flow meter with factory-fabricated carrying case with integral carrying handle. Case shall be fitted to hold meter and following accessories:

1. Two 10' (3 m) lengths of connecting hose with suitable female connectors for connecting to venturi tube pressure tap nipples. Design hose for operating pressure of minimum of 150% of maximum system operating pressure.

2. Completely assembled 3-valve manifold with 2 block valves and vent and drain valves shall be piped and mounted on base, which shall be designed for use laying flat on stationary base.

3. Bound set of descriptive bulletins, installation and operating instructions, parts list, and set of curves showing flow verses pressure differential for each orifice or venturi tube with which meter is to be used.

4. Metal instruction plate, secured inside cover, illustrating use of meter. Deliver meter with case to Owner.

2.9 BTU METERS

A. General: Provide BTU meters as indicated, pressure rated for 125 psi (850 kPa), consisting of turbine wheel flow meter, bronze housing, solid state calculator with internal battery pack, two (2) temperature sensors (one with 5' cable) (one with 1.5 m cable), integral stop valves on inlet and outlet, strainer, and magnetic trap.

B. Temperature Range: 40°F - 250°F (4°C - 121°C).

C. Power Input: 12 month operating life battery pack.

D. Data Output: 6-digit electromechanical counter with readout in kwh or btu.

E. Accuracy: ± 1% over range of 1 - 12 gpm (.061 L/s to .76 L/s); ± 1% of temperature difference of 5˚F (2.8˚C) and greater.

2.10 PERMANENTLY MOUNTED FLOW METERS

A. Provide permanently mounted meters consisting of bellows type differential pressure element and either indicating or recording and integrating element as noted in schedule or indicated on drawings.

B. Differential pressure elements and indicating or recording and integrating elements generally shall be direct-connected, but electronic transmission elements shall be used when particular installation precludes use of direct-connected units. Electric or electronic transmission elements shall be provided wherever pressure-sensing lines required for, direct transmission would exceed 150' (45 m) in length or cannot be graded properly. Connect each flow meter to primary element as specified and provide with all piping, wiring, and accessories required for complete installation. Provide flow metering equipment supplied by single manufacturer or coordinated by single supplier.

C. Permanently mounted meter installations (primary flow measuring element and flow meter) shall have overall accuracy of +2% of full scale flow over range of 20% to 100%of full scale flow. Engineer and manufacture primary elements of meters in accordance with ASME recommendations for flow meters.

D. Design bellows type differential pressure elements (meter bodies) for full scale pressure differential of 50" w.g. to 100" w.g. (12.5 kPa to 25 kPa). Design shall incorporate rupture-proof stainless steel or copper metal bellows and torque tube drive requiring no lubrication. Design forged meter bodies for not less than 150% of maximum system pressure and fully protect against surges, with provision for venting and draining. Provide meter bodies with integral, adjustable pulsation dampers.

E. Provide meter with complete copper tubing connections of approved sizes between differential pressure elements (meter bodies) and venturi tubes. Include necessary vent and drain valves as recommended by meter manufacturer.

F. Dials shall be flush type reading directly in gallons per minute.

G. Enclose recordings and integrating elements of each recording and integrating meter in dust-tight case. Arrange case for flush panel mount. Elements shall record flow continuously on 7 day, 12" (300 mm) diameter, linear chart. Integrators shall be of 7 figure direct reading type with either 15-second or continuous operating cycle. Furnish one-year supply of charts, pens and ink for each meter and deliver to Owner.

H. Design remote transmitters and receivers so that normal changes in air supply system pressure or in electric power supply system voltage or frequency will not affect accuracy of meters. Measuring circuits shall be relieved of all work required to move mechanical parts.

2.11 BTU METERS

A. General: Provide Onicon F-1200 BTU meters as indicated, pressure rated for 125 psi (850 kPa), consisting of turbine wheel flow meter, bronze housing, solid state calculator with internal battery pack, two (2) temperature sensors (one with 5' cable) (one with 1.5 m cable), integral stop valves on inlet and outlet, strainer, and magnetic trap.

B. Temperature Range: 40°F - 250°F (4°C - 121°C).

C. Power Input: 12 month operating life battery pack.

D. Data Output: 6-digit electromechanical counter with readout in kwh or btu.

E. Accuracy: ± 1% over range of 1 - 12 gpm (.061 L/s to .76 L/s); ± 1% of temperature difference of 5˚F (2.8˚C) and greater.'

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which meters and gauges are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF TEMPERATURE GAUGES

A. General: Install temperature gauges in vertical upright position, and tilted so as to be easily read by observer standing on floor.

B. Locations: Install direct mounted thermometers in the following locations, and elsewhere as indicated:

1. At inlet and outlet of each hydronic zone.

2. At inlet and outlet of each hydronic coil in air handling units.

3. At inlet and outlet of each hydronic heat recovery unit.

4. Supply, return, fresh air and mixed air for each air handling unit.

C. Thermometer Wells: Install in piping tee where thermometers are indicated, in vertical upright position. Fill well with oil or graphite, secure cap.

3.3 INSTALLATION OF PRESSURE GAUGES

A. General: Install pressure gauges in piping tee with pressure gauge cock, located on pipe at most readable position.

B. Locations: Install in the following locations, and elsewhere as indicated:

1. At inlet and outlet of each coil.

C. Pressure Gauge Cocks: Install in piping tee with 1/4" ball valve.

D. Pressure Gauge Connector Plugs: Install in piping tee where indicated, located on pipe at most readable position. Secure cap.

3.4 INSTALLATION OF BTU METERS

A. General: Install in piping where indicated, in hydronic supply line. Provide thermal well in return line for remote sensor. Mount meter on wall if accessible, if not provide bracket to support meter.

3.5 INSTALLATION OF PERMANENTLY MOUNTED FLOW METERS

A. General: Install flow measuring meters on piping systems as indicated.

3.6 ADJUSTING AND CLEANING

A. Adjusting: Adjust faces of meters and gauges to proper angle for best visibility.

B. Cleaning: Clean windows of meters and gauges and factory-finished surfaces. Replace cracked or broken windows and repair any scratched or marred surfaces with manufacturer's touch-up paint.

END OF SECTION 230519

SECTION 230523 – VALVES FOR HVAC PIPING

PART 1- GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of valves required by this section is indicated on drawings and/or specified in other Division-23 sections.

B. Types of valves specified in this section include the following:

1. Drain Valves

2. Ball Valves

3. Butterfly Valves

C. System Descriptions:

1. HVAC Piping: HVAC piping shall relate to chilled water and heating water systems.

D. Valves furnished as part of factory-fabricated equipment, are specified as part of the equipment assembly in other Division-23 sections.

1.2 QUALITY ASSURANCE

A. Valve Types: Provide valves of same type by same manufacturer.

B. Valve Identification: Provide valves with manufacturer's name (or trademark) and pressure rating and size clearly marked on valve body.

C. Codes and Standards:

1. MSS Compliance: Mark valves in accordance with MSS-25 "Standard Marking System for Valves, Fittings, Flanges and Unions".

2. ANSI Compliance: For face-to-face and end-to-end dimensions of flanged or welded-end valve bodies, comply with ANSI B16.10 "Face-to-Face and End-to-End Dimensions of Ferrous Valves".

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, including installation instructions for each type of valve. Include pressure drop curve or chart for each type and size of valve. Submit valve schedule showing manufacturer's figure number, size, location, and valve features for each required valve.

B. Shop Drawings: Submit manufacturer's assembly-type (exploded view) shop drawings for each type of valve, indicating dimensions, weights, materials, and methods of assembly of components.

C. Maintenance Data: Submit maintenance data and spare parts lists for each type of valve. Include this data, product data, and shop drawings in Maintenance Manual.

PART 2- PRODUCTS

2.1 VALVES – GENERAL

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work, shall be limited to the following, unless otherwise noted:

1. Keystone

2. DeZurik

B. Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by Installer to comply with installation requirements. Provide end connections which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Installer's option.

C. Size: Unless otherwise indicated, provide valves of same size as upstream pipe size. Pipe size reduction shall be made after valve assembly.

D. Valve Features: Provide the following as required:

1. General: Provide valves with features indicated and, where not otherwise indicated, provide proper valve features as determined by Installer for installation requirements. Comply with ASME B31.9 for building services piping, and ASME B31.1 for power piping.

2. Bypass: Comply with MSS SP-45, and except as otherwise indicated, provide manufacturer's standard bypass piping and valving.

3. Drain: Comply with MSS SP-45, and provide threaded pipe plugs.

4. Flanged: Full lug valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5, (steel), or ANSI B16.24 (bronze).

5. Threaded: Valve ends complying with ANSI B2.1.

6. Butt-Welding: Valve ends complying with ANSI B16.25.

7. Socket-Welding: Valve ends complying with ANSI B16.11.

8. Solder-Joint: Valve ends complying with ANSI B16.18.

9. Operators: Provide handwheels, fastened to valve stem, for valves other than quarter-turn. Provide lever handle for quarter-turn valves 6" (150 mm) and smaller. Provide gear operators for quarter-turn valves 8" (200 mm) and larger.

2.2 DRAIN VALVES

A. HVAC Piping:

1. 3” (75 mm) and Smaller: Class 125, bronze body ball valve with chrome plated ball, hose end with cap and chain. Appollo or Nibco (Threaded), Appollo or Nibco (Sweat).

2.3 BALL VALVES

A. Comply with the following standards:

1. Bronze Valves: MSS SP-110.

B. HVAC Piping:

1. 2” (50 mm) and Smaller: Valves shall be rated 150 psi (1035 kPa) SWP and 600 psi (4140 kPa) non-shock WOG and shall have 2-piece cast ASTM B 584 bronze bodies, TFE seats, full port, separate packing nut with adjustable stem packing, anti-blowout stems and stainless steel ball. Valve ends shall have full depth ANSI threads or extended solder connections and be manufactured to comply with MSS-SP110. Milwaukee BA100S (Threaded), BA150S (Sweat) with NSF compliance for potable water.

C. Where piping is insulated, ball valves shall be equipped with 2" (50 mm) extended handles of non-thermal conductive material. Also, provide a protective sleeve that allows operation of the valve without breaking the vapor seal or disturbing the insulation. Memory stops, which are fully adjustable after insulation is applied, shall be included.

2.4 BUTTERFLY VALVES

A. General: Comply with MSS SP-68. Butterfly valves shall be bubble tight, full lug body type valves suitable for dead end service. Provide double offset disc; on center disc will not be accepted. Valves shall be high performance with ANSI flange and Teflon seats.

B. HVAC Piping:

1. 2-1/2 “ (65 mm) to 6" (150 mm): 150 psi (1035 kPa), carbon steel or 316 stainless steel body, extended neck, 316 stainless steel disc, single piece

RPTFE seat with stainless steel spring insert, self-lubricating bearings, double shaft and manual lever and lock. Keystone or DeZurik.

2. All valves shall be capable of bubble tight dead end service in either direction without use of additional pinning, screws or mating flanges.

3. Valves shall have pressure energized type seats of RPTFE with seat energizing insert. EPDM rubber seats are not acceptable. Seats shall be field replaceable.

4. Provide packing gland with "V" type ring packing, externally adjustable. Packing gland, nuts and studs shall be constructed of stainless steel.

2.5 BALANCE VALVES

A. See Division-23 section “Hydronic Specialties” for balance valve specification, however all valves shall meet the requirements of this Section.

PART 3- EXECUTION

3.1 INSTALLATION

A. General: Except as otherwise indicated, comply with the following requirements.

1. Install valves where required for proper operation of piping and equipment, including valves in branch lines, service mains and all equipment connections. Locate valves so as to be accessible and so that separate support can be provided when necessary.

2. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.

B. Insulation: Where insulated, install extended-stem valves, arranged in proper manner to receive insulation.

C. Mechanical Actuators: Install mechanical actuators with chain operators where indicated. Extend chains to approximately five feet (1500 mm) above floor and secure to clips to clear aisle passage.

D. Selection of Valve Ends (Pipe Connections): Except as otherwise indicated, select and install valves with connections to match pipe fittings.

E. Renewable Seats: Install valves with renewable seats, where applicable.

F. Fluid Control: Except as otherwise indicated, install ball and butterfly valves to comply with ANSI B31.9. Where throttling is indicated or recognized as principle reason for valve, install ball or butterfly valves, as indicated.

3.2 ADJUSTING AND CLEANING

A. Valve Adjustment: After piping systems have been tested and put into service, but before final testing, adjusting and balancing, inspect each valve for possible leaks. Adjust or replace packing to stop leaks, replace valve if leak persists.

B. Valve Identification: Tag each valve in accordance with Division-23 section "Identification for HVAC Piping and Equipment".

C. Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

END OF SECTION 230523

SECTION 230529 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1- GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of hangers and supports required by this section is indicated on drawings and/or specified in other Division-23 sections.

B. Types of hangers and supports specified in this section include the following:

1. Horizontal-Piping Hangers and Supports
2. Vertical-Piping Clamps
3. Hanger-Rod Attachments
4. Building Attachments
5. Saddles and Shields
6. Spring Hangers and Supports
7. Miscellaneous Materials
8. Anchors
9. Equipment Supports

C. Hangers and supports furnished as part of factory-fabricated equipment are specified as part of equipment assembly in other Division-23 sections.

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of hangers and supports, of types and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Codes and Standards:

1. Code Compliance: Comply with applicable codes pertaining to product materials and installation of hangers and supports.
2. NFPA, UL, and FM Compliance: Provide products which comply with NFPA 13 listed and labeled by UL and FM where used for fire protection piping systems.
3. MSS Standard Compliance:

a. Provide pipe hangers and supports of which materials, design, and manufacture comply with MSS SP-58.

b. Select and apply pipe hangers and supports, complying with MSS SP-69.

c. Fabricate and install pipe hangers and supports, complying with MSS SP-89.

d. Terminology used in this section is defined in MSS SP-90.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing manufacturer's figure number, size, location, and features for each required pipe hanger and support.

PART 2- PRODUCTS

2.1 HORIZONTAL-PIPING HANGERS AND SUPPORTS

A. General: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with MSS SP-58, selected by Installer to suit horizontal-piping systems in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.2 VERTICAL-PIPING CLAMPS

A. General: Except as otherwise indicated, provide factory-fabricated vertical-piping clamps complying with MSS SP-58, selected by Installer to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated hangers and supports for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical

conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.3 HANGER-ROD ATTACHMENTS

A. General: Except as otherwise indicated, provide factory-fabricated hanger-rod attachments complying with MSS SP-58, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hanger-rod attachments to suit hanger rods. Provide copper-plated hanger-rod attachments for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.4 BUILDING ATTACHMENTS

A. General: Except as otherwise indicated, provide factory-fabricated building attachments complying with MSS SP-58, selected by Installer to suit building substrate conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods. Provide copper-plated building attachments for copper-piping systems. Provide copper-plated hangers and supports for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.5 SADDLES AND SHIELDS

A. General: Except as otherwise indicated, provide saddles or shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.

2.6 SPRING HANGERS AND SUPPORTS

A. General: Except as otherwise indicated, provide factory-fabricated spring hangers and supports complying with MSS SP-58, selected by Installer to suit piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select spring hangers and supports to suit pipe size and loading.

2.7 MISCELLANEOUS MATERIALS

A. Metal Framing: Provide products complying with NEMA STD ML 1.

B. Steel Plates, Shapes and Bars: Provide products complying with ASTM A 36.

C. Cement Grout: Portland cement (ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ASTM C 404, Size No. 2).

D. Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS standards.

PART 3- EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which hangers and supports are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF BUILDING ATTACHMENTS

A. Install attachments at required locations within concrete or steel for proper piping support. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi (17240 kPa) is indicated, install reinforcing bars through openings at top of inserts.

3.3 INSTALLATION OF HANGERS AND SUPPORTS

A. General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Install supports with maximum spacings complying with MSS SP-69. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.

C. Support fire-water piping independently of other piping.

D. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.

E. Provisions for Movement:

1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

F. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 Pressure Piping Codes are not exceeded.

H. Insulated Piping: Comply with the following installation requirements.

1. Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.

2. Shields: Where low-compressive-strength insulation or vapor barriers are indicated on chilled water piping, install coated protective shields.

3. Saddles: Where insulation without vapor barrier is indicated, install protection saddles.

4. For all insulated piping 2-1/2” (63 mm) and larger, provide insulated saddles as follows:

a. For chilled water, as well as heating water, provide the following:

1) Minimum 3.5 pcf, non-compressive, rigid, phenolic foam insulation. Fire and smoke rating shall be 25/50 or below per ASTM 84.

2) For cold applications below 75ºF (24ºC) a zero permeability abuse resistant vapor barrier shall be provided with matching butt strips. Apply a full coating of butyl joint sealant in addition to the butt strips for a completely sealed system.

3) The phenolic foam system shall have a K factor of 0.16 at a mean temperature for 75ºF (24ºC) and comply with ASTM Standard C1126.

4) Provide visible inspection sticker at the bottom of each saddle.

5) Pipe insulation saddles shall be Tru-Balance CoolDry Saddles as manufactured by Buckaroos, Inc.

I. Spacing: Hanger spacing for piping shall not exceed 8 feet (2400 mm) on centers for pipe 1-1/4" (32 mm) or smaller, and 10 feet (3 m) for pipe 1-1/2" (40 mm) and larger. Regardless of spacing, hangers shall be provided at or near all changes in direction, both vertical and horizontal, for all piping. For cast iron soil pipe, one hanger shall be placed at each hub or bell.

3.4 ADJUSTMENT OF HANGERS AND SUPPORTS

A. Adjust hangers and supports and place grout as required under supports to bring piping to proper levels and elevations.

3.5 EQUIPMENT SUPPORTS

A. Provide concrete housekeeping bases for all floor mounted equipment furnished as part of the work of Division-23. Size bases to extend minimum of 4" (100 mm) beyond equipment base in any direction; and 4" (100 mm) above finished floor elevation. Construct of reinforced concrete, roughen floor slab beneath base for bond, and provide steel rod anchors between floor and base. Locate anchor bolts using equipment manufacturer's templates. Chamfer top and edge corners.

B. Provide structural steel stands to support equipment not floor mounted or hung from structure. Construct of structural steel members or steel pipe and fittings. Provide factory-fabricated tank saddles for tanks mounted on steel stands.

3.6 PAINTING

A. All hangers, supports, clamps and assemblies shall be primed and painted with rust inhibitors.

END OF SECTION 230529

SECTION 230553 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-23 sections.

B. Types of identification devices specified in this section include the following:

1. Pipe and Duct Markers
2. Valve Tags
3. Engraved Plastic-Laminate Signs
4. Plastic Equipment Markers
5. Plasticized Tags

C. Refer to requirements of Division-26.

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Codes and Standards:

1. ANSI Standards: Comply with ANSI A13.1 or Owner standards for lettering size, length of color field, colors, and viewing angles of identification devices.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each identification material and device required.

B. Schedules: Submit valve schedule for each piping system, typewritten and reproduced on 8-1/2" x 11" (213 mm x 275 mm) bond paper. Tabulate valve number, piping system, system abbreviation (as shown on tag), location of valve (room or space), and variations for identification (if any). Mark valves which are intended for emergency shut-off and similar special uses, by special "flags", in margin of schedule. In addition to mounted copies, furnish extra copies for maintenance manuals.

C. Maintenance Data: Include product data and schedules in maintenance manuals.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers' products which may be incorporated in the work include the following:

1. Seton

2.2 MECHANICAL IDENTIFICATION MATERIALS

A. General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division-23 sections. Where more than single type is specified for application, selection is Installer's option but provide single selection for each product category.

2.3 PIPE MARKERS

A. Snap-on Type: Provide pre-printed, semi-rigid, snap-on color coded identification sleeves complying with ANSI A13.1. This type shall be used for insulated pipe sizes 2” and smaller.

B. Pressure Sensitive Type: Provide pre-printed, permanent adhesive, color coded, pressure sensitive, vinyl markers conforming to ANSI A13.1. This style marker shall be applied to all uninsulated piping; insulated piping 2-1/2” and larger, and all ductwork.

C. Flow Direction: Provide flow directional arrows either as part of markers, or separately attached to pipes and ducts.

2.4 VALVE TAGS

A. Brass Valve Tags: Provide 19-gage (1.2 mm) polished brass valve tags with stamp-engraved piping system abbreviation in 1/4" (6 mm) high letters and sequenced valve numbers 1/2" (13 mm) high, and with 5/32" (4 mm) hole for fastener.

1. Provide 1-1/2" (40 mm) diameter tags, except as otherwise indicated.

B. Valve Tag Fasteners: Provide manufacturer's standard solid brass chain (wire link or beaded type), or solid brass S-hooks of the sizes required for proper attachment of tags to valves, and manufactured specifically for that purpose.

2.5 ENGRAVED PLASTIC-LAMINATE SIGNS

A. General: Provide engraving stock melamine plastic laminate, complying with FS L-P-387, in the sizes and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color)

except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

1. Thickness: 1/16" (1.6 mm) for units up to 20 sq. in. (12900 mm^2) or 8" (200 mm) length; 1/8" for larger units.

B. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

C. Duty: Accident-prevention tags with appropriate wording including large-size primary wording (as examples; DANGER, CAUTION, DO NOT OPERATE).

2.6 PLASTIC EQUIPMENT MARKERS

A. General: Provide manufacturer's standard laminated plastic, color coded equipment markers.

B. Nomenclature: Include the following, matching terminology on schedules as closely as possible:

1. Name and schedule number

2. Equipment service

2.7 LETTERING AND GRAPHICS

A. General: Coordinate names, abbreviations and other designations used in mechanical identification work with corresponding designations shown on plans. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of mechanical systems and equipment.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.2 PIPING SYSTEM IDENTIFICATION

A. General: Install pipe markers on each system indicated to receive identification, and include arrows to show normal direction of flow.

B. Locate pipe markers as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) exterior non-concealed, locations, and concealed gas piping.

1. Near each valve and control device.

2. Near each branch, excluding short take-offs for terminal units; mark each pipe at branch, where there could be question of flow pattern.

3. Near locations where pipes pass through walls or floors/ceilings, or enter non-accessible enclosures.

4. Near major equipment items and other points of origination and termination.

5. Spaced intermediately at maximum spacing of 25 feet (7500 mm) along each piping run.

3.3 VALVE IDENTIFICATION

A. General: Provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory fabricated equipment units, HVAC terminal devices and similar rough-in connections of end-use units. List each tagged valve in valve schedule for each piping system.

1. Tagging Schedule: Comply with requirements of "Valve Schedule" of this section.

3.4 MECHANICAL EQUIPMENT IDENTIFICATION

A. General: Install engraved plastic laminate sign on or near each major item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device. Provide signs for the following general categories of equipment and operational devices:

1. Main control and operating valves, including safety devices.

B. Lettering Size: Minimum 1/4" (6 mm) lettering for name of unit where viewing distance is less than 2'- 0" (600 mm - 0 mm), 1/2" (13 mm) high for distances up to 6'- 0" (1800 mm - 0 mm), and proportionately larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 of size of principle lettering.

C. Text of Signs: In addition to name of identified unit, provide lettering to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.5 ADJUSTING AND CLEANING

A. Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

B. Cleaning: Clean face of identification devices, and glass frames of valve charts.

3.6 EXTRA STOCK

A. Furnish minimum of 5% extra stock of each mechanical identification material required, including additional numbered valve tags (not less than 3) for each piping system, additional piping system identification markers, and additional plastic laminate engraving blanks of assorted sizes.

3.7 IDENTIFICATION SCHEDULE

SERVICE	DESIGNATION
Glycol Water Supply	GWS
Glycol Water Return	GWR

END OF SECTION 230553

SECTION 230593 – TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of testing, adjusting, and balancing (TAB) work required by this section is indicated on drawings and schedules, and by requirements of this section, and is defined to include, but is not necessarily limited to, air distribution systems, hydronic distribution systems, and associated equipment and apparatus of mechanical work. The work consists of setting speed and volume (flow), adjusting facilities provided for systems, recording data, conducting tests, preparing and submitting reports to achieve the capacities or setpoints indicated on the contract documents, and recommending modifications to work as required to achieve the capacities or setpoints indicated on the contract documents.

B. Component types of testing, adjusting, and balancing specified in this section shall include, but not be limited to, the following as applied to mechanical equipment:

1. Building automated systems
2. Pumps
3. Chillers
4. Coils
5. Piping systems
6. Heat exchangers

C. Refer to requirements of Division-26.

1.2 QUALITY ASSURANCE

A. Tester's Qualifications: A firm certified by Associated Air Balance Council (AABC) who is not Installer of system to be tested.

1. AABC Compliance: Comply with the current AABC's Manual "AABC National Standards", as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus.
2. Industry Standards: Comply with AABC recommendations pertaining to measurements, instruments, and testing, adjusting, and balancing, except as otherwise indicated.
3. ASHRAE Standard 111: Comply with current edition of ASHRAE 111, “Measurement, Testing, Adjusting and Balancing of HVAC Systems”.

4. Independence: TAB contractor shall be independently owned and operated with no affiliation with the general contractor, mechanical contractor, sheet metal contractor, design engineer, etc.

5. Experience: Each technician shall demonstrate a minimum of three years of actual test and balance field experience.

B. Pipe Testing Procedures: Contractor shall pressure test all piping systems in accordance with the following:

1. ASME Code for Pressure Piping B31, most current edition.

2. National Fire Protection Association (NFPA), all applicable sections, most current edition.

1.3 SUBMITTALS

A. Qualification: TAB contractor qualifications shall be provided as a formal submittal for review to demonstrate conformance with all qualifications indicated throughout the contract documents.

B. Submit certified test reports, signed by the AABC Test and Balance technician who performed the TAB work. In addition, the report shall be certified by an AABC certified Test and Balance Engineer (T.B.E.) who is familiar with the project.

1. Include identification and types of instruments used, and their most recent calibration date with submission of final test report.

C. The Contractor shall maintain a copy of AABC standards on the site during all TAB work. Said document(s) shall be made available to Owner representatives for reference as to minimum requirements.

D. Maintenance Data: Include in maintenance manuals, copies of certified test reports, identification of instruments.

1.4 JOB CONDITIONS

A. Do not proceed with testing, adjusting, and balancing work until work has been completed, tested, operable, and all balancing devices indicated on the contract documents have been installed. Ensure that there is no residual work still to be completed on the equipment to be tested.

B. Do not proceed until work scheduled for testing, adjusting, and balancing is clean and free from debris, dirt and discarded building materials.

PART 2 - PRODUCTS

2.1 PATCHING MATERIALS

A. Except as otherwise indicated, use same products as used by original Installer for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.

1. Factory fabricated plastic plugs shall be used to patch drilled holes in ductwork and housings.

2.2 TEST INSTRUMENTS

A. Utilize test instruments and equipment for TAB work required, of type, precision, and capacity as recommended in the following TAB standards:

1. AABC's Manual "AABC National Standards".

2. Wherever permanently installed measuring equipment is provided, such as air volume monitors, flow meters, temperature and pressure gages, etc., these shall be used in addition to TAB instrumentation. Any discrepancies in accuracy shall be brought to the attention of the Owner. Where permanently installed instrumentation meets accuracy requirements for TAB work, they may be used provided TAB Contractor can verify calibration of installed instruments.

B. The Contractor shall employ manufactured enclosure type cones, capable of air volume direct readings, for all diffuser air flow measurements.

PART 3 - EXECUTION

3.1 FIELD WORK

A. Prior to the mechanical installation, the mechanical and TAB contractors shall review the design documents for “balanceability” to confirm that all devices required to properly balance each system are to be provided under this contract. Recommended modifications and/or additions shall be made directly to the engineer and a minimum of 30 days prior to the installation of mechanical equipment.

B. Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned, operable and accessible. Do not proceed with TAB work until unsatisfactory conditions have been corrected.

C. Test, adjust and balance environmental systems and components, as indicated, in accordance with procedures outlined in applicable AABC standards. All systems and components shall be balanced within $\pm$5% of design air and water flows.

D. Test, adjust and balance system during summer season for cooling and during winter season for heating systems, including operation at outside conditions within 3°F (2°C) wet bulb temperature of maximum summer design condition, and within 10°F (6°C) dry bulb temperature of minimum winter design condition. When seasonal operation does not permit measuring final temperatures, then take final temperature readings when seasonal operation does permit.

E. For fan systems, provide sheave replacements where required to achieve specified air flows.

F. Patch holes in insulation, ductwork and housings, which have been cut or drilled for test purposes, in manner recommended by original Installer.

3.2 REPORTS

A. Prepare report of test results, including instrumentation calibration reports, in format recommended by AABC standards. Provide a System Summary page(s) at the front of the report.

B. An interim/preliminary handwritten report shall be submitted to the Engineer for review prior to the formal submission of the report.

C. Test reports shall include, but not be limited to, the following information:

1. Air Handling Equipment Test:

a. Air handling equipment shall include, but not be limited to, all fans (supply, exhaust, return, relief, make-up, ventilation, etc.), air handling units, fan coil units, etc.).

b. Design Conditions: CFM, static pressure, motor h.p., outside air CFM (where applicable), fan and motor RPM and fan motor h.p. for each fan.

c. Installed Equipment: Manufacturer, size, arrangement, class, motor h.p., volts, phase, cycles, and full load amps.

d. Field Test Results: Fan CFM, fan RPM, fan motor voltage, fan motor operating amps, fan motor operating b.h.p., total static pressure for each fan. In addition, where applicable provide external static pressure, air pressure drop across each coil, filter bank, attenuator, etc. (ie. provide total static pressure profile of each system), as well as leaving air temperature, outside air conditions (dry bulb/wet bulb) at time of test, coil flow data (GPM), coil entering and leaving air temperatures, coil entering and leaving water temperatures, coil water pressure drop, VFD settings at final test conditions, and duct static pressure setpoint. Air temperature difference measurements will not be acceptable.

2. Air Distribution Test: Main and major branch ducts and individual supply, return and exhaust terminals (VAV terminals, terminal reheat units, diffusers, registers and grilles):

    a. Design Conditions: Ductwork: CFM, duct size. Air terminals, diffusers, registers, grilles: CFM, module size and inlet size.

    b. Field Test Results: Ductwork: CFM, duct size, number of velocity readings, average velocity reading. Air terminals, diffusers, registers, grilles: CFM, module size and inlet size.

3. Pump Test:

    a. Design Conditions: GPM, Head, RPM, motor h.p.

    b. Installed Equipment: Manufacturer, size, type drive, motor h.p., volts, phase and cycles, full load amps.

    c. Field Test Results: Shut-off head, discharge pressure, suction pressure, GPM, operating head, pump motor operating amps, pump motor operating b.h.p., VFD settings at final test conditions and differential pressure setpoint.

4. Heat Exchanger Test:

    a. Design Conditions: GPM, water pressure drop, entering and leaving fluid temperatures. For chillers provide flow, pressure drop and temperature differential for chilled and condenser water, as well as compressor power input readings.

    b. Field Test Results: GPM, water pressure drop, entering and leaving fluid temperatures and outside air conditions (dry bulb/wet bulb) at time of test. For chillers provide flow, pressure drop and temperature differential for chilled and condenser water, as well as compressor power input readings.

5. Miscellaneous Test Results:

    a. All Coils: Air pressure drop, water pressure drop, water flow (GPM), air flow (CFM), entering water temperature, leaving water temperature, entering air temperature, leaving air temperature and outside air temperature at time of test (where applicable) and BTU calculations. Air temperature difference methods will not be acceptable.

    b. Air Flow Monitors (AFM): Provide verification of AFM accuracy including set-up and adjustment required to verify proper operation and accuracy of each AFM system.

c. Sound Readings: Provide ten (10) sound power level readings at locations to be selected by the Engineer.

d. Balance Valves: All balance valves (including hydronic and domestic water) shall be adjusted and balanced to include water flow (GPM) and pressure drop (where applicable). Indicate manufacturer/model of each valve type.

D. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced; including, where necessary, modifications which exceed requirements of contract documents for mechanical work.

E. Record outdoor air temperature (dry bulb and wet bulb) at the time of testing air handling units, chillers, and any other equipment where performance is affected by outdoor air conditions.

F. Report shall include results of piping and ductwork tests indicated in paragraphs 3.03 and 3.04 of this section.

3.3 TESTS – PIPING

A. Prior to the balancing of systems by the AABC certified balancing contractor, the mechanical contractor shall air and/or hydrostatically test the following systems in accordance with the latest ASME B31 (ASME Code for Pressure Piping) and NFPA requirements.

1. Hydrostatic Test:

a. Chilled/Heating Water Supply and Return Piping

b. Perimeter Heating Water Supply and Return

B. Pressure tests shall also be performed prior to the installation of all insulation materials.

C. Hydrostatic Test: Provide temporary equipment for testing, including pump and gages. Test piping system before insulation is installed, wherever feasible and remove control devices before testing. Test each natural section of each piping system independently, but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with water and pressurize for indicated pressure and time.

1. Required test period is four (4) hours.

2. Hydrostatically test each piping system at 150% of operating pressure indicated, but not less than 100 psi (690 kPa) test pressure.

3. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds one percent (1.0%) of test pressure.

4. Upon completion of roughing-in and before setting fixtures, the entire new domestic water system shall be tested. Where a portion of the water piping system is to be concealed before completion, this portion shall be tested separately in a manner described for the entire system.

5. Prior to testing, verify the pressures listed above are in accordance with the latest ASME B31 code and NFPA. Should a discrepancy exist between the ASME B31 code, NFPA, and/or the pressures indicated above, contact the Engineer prior to testing.

D. Repair or replace refrigerant piping as required to eliminate leaks, and retest as specified to demonstrate compliance.

E. Refer to Division-23 section “Testing, Adjusting and Balancing” for additional specific test criteria and test form to be completed.

F. Sanitary Water Piping Systems:

1. All soil, waste and vent piping shall be tested by the Contractor and reviewed by the Architect before acceptance. All piping located underground shall be tested before backfilling. The costs of all equipment required for tests are to be included under the contract price.

2. The entire new drainage system and venting system shall have all necessary openings plugged and filled with water to the level of the highest vent stack above the roof. The system shall hold this water for four (4) hours without showing a drop in water level. Where a portion of the system is to be tested, the test shall be conducted in the same manner as described for the entire system, except a vertical stack 10 feet (3000 mm) above the highest horizontal line to be tested may be installed and filled with water to maintain sufficient pressure, or a pump may be used to supply the required pressure.

G. Drain test water from piping systems after testing and repair work has been completed.

H. Repair piping systems sections which fail required piping test, by disassembly and re-installation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

I. Contractor shall submit piping leakage test results to the A/E within 72 hours of completed tests. Only test results that meet the specified leakage requirements shall be submitted. Piping test results shall be recorded on the “Piping Leakage Test Summary Form (Hydronic and Air)” and “Piping Leakage Test Summary Form

(Plumbing)" located at the end of this section; no other forms will be accepted. In addition, the pipe leakage submittals shall include 11x17 drawing(s) as required to clearly indicate the full extent of the piping test section (each piping test section shall be numbered and color coded).

3.4 TESTS – DUCTWORK

A. Prior to the balancing of systems by the AABC certified balancing contractor, all high and low pressure systems shall be tested by the mechanical contractor for duct leakage. Duct leakage shall not exceed 1%. In addition, current SMACNA and AABC Standards shall apply, where applicable, to meet the maximum 1% leakage. Duct leakage shall not exceed 1% of design cfm for a duration of ten (10) minutes. Test pressures shall be not less than the following:

Ductwork systems less than 2.0 in. wg E.S.P.:

(Duct Pressure Class 2): Test to 2 in. wg

Ductwork systems between 2.0 in. wg and 5.0 in. wg E.S.P:

(Duct Pressure Class 6): Test to 4 in. wg

Insulation materials shall not be applied until systems have been witnessed, documented, and submitted to meet the above testing requirements.

B. The balance contractor shall witness and certify all duct pressure tests.

C. Contractor shall submit duct leakage test results to the A/E within 72 hours of completed tests. Only test results that meet the specified leakage requirements shall be submitted. Duct test results shall be recorded on the attached "Air Duct Leakage Test Summary Form" at the end of this section; no other forms will be accepted. In addition, the duct leakage submittals shall include 11x17 drawing(s) as required to clearly indicate the full extent of the duct test section (each duct test section shall be numbered and color coded).

D. All duct leakage test results shall be included with the final TAB report and the O&M manual. The orifice tube calibration chart shall also be included with the final duct leakage test report information.

3.5 TESTS – EQUIPMENT

A. The contractor shall verify calibration of all indicating, recording, controlling and controlled devices throughout the mechanical system. Verify the proper function of all installed equipment and devices and the interlocking of all new systems as required by the contract documents.

B. A report including successful calibration and function performance verification of all items indicated above shall be included in the Operations and Maintenance Manual.

3.6 FUNCTIONAL PERFORMANCE TESTING AND VERIFICATION

A. General: In addition to the tests required during and after installation of all mechanical systems, as well as any other formal commissioning requirements, the Contractor shall perform functional performance tests to verify that all systems are designed, installed, calibrated and adjusted to perform as required in the Contract.

B. Comply with all applicable specification sections including, but not be limited to, “Basic HVAC Requirements”, “Testing, Adjusting and Balancing”, “Automatic Temperature Controls” and “Commissioning”, where applicable.

C. Prior to functional performance testing, all indicating, recording and control devices shall be calibrated. A verification calibration report shall be provided with the final test report.

D. Provide functional performance testing to verify proper operation of each and every control sequence indicated throughout the contract documents.

E. Failure of Tests: Should any test, verification, or demonstration fail to meet the specification requirements, the component of the system causing the failure shall be repaired, replaced or readjusted. The failed test, verification, or demonstration shall then be repeated.

F. A “Functional Performance Test Verification Form” is included at the end of Section 230900. This form (electronic version is available upon request) shall be completed for all mechanical equipment provided under this contract. This shall include, but not be limited to each chiller, boiler, air handling unit, fan, pump, VAV terminal, fan coil unit, unit ventilator, DX cooling equipment, miscellaneous heating equipment, etc.

G. Test Report: Upon satisfactory verification of calibration and functional performance tests, a copy of the final test results shall be bound in the operations and maintenance manual. The final report shall also include a full compliance statement, on company letterhead, indicating that all systems are installed and functioning per the contract requirements including drawings, specifications, control sequences and accepted submittals.

H. The mechanical systems shall not be considered complete until all functional performance verification forms, calibration reports and compliance statement have been submitted and reviewed. Submit in accordance with the submittal requirements indicated elsewhere in these specifications.

3.7 FINAL TESTS, INSPECTION AND ACCEPTANCE

A. At time of final inspection, Contractor shall recheck, in presence of Owner's Representative, random selections of data (water and air quantities, air motion, and sound levels) recorded in Certified Report. In addition, courtrooms, auditoriums, and conference rooms shall be rechecked. [Laboratories shall be rechecked for satisfactory air flow and motion in vicinity of and through hoods.]

1. Points and areas for recheck shall be selected by Owner's Representative.

2. Measurement and test procedures shall be same as approved for work forming basis of Certified Report.

3. Selection for recheck (specific plus random), in general, will not exceed 25 percent of total number tabulated in report, except that special air systems may require a complete recheck for safety reasons.

B. Retests: If random tests elicit a measured flow deviation of 10 percent or more from, or a sound level of 2 db or more, greater than that recorded in Certified Report listings, at 10 percent or more of the rechecked selections, report shall automatically be rejected. In the event the report is rejected, systems shall be readjusted and tested, new data recorded, new Certified Reports submitted, and new inspection tests made, at no additional cost to the Owner.

C. Marking of Settings: Settings of valves, splitters, dampers, and other adjustment devices shall be permanently marked by the Contractor so that adjustment can be restored if disturbed at any time.

END OF SECTION 230593

AIR DUCT LEAKAGE TEST SUMMARY FORM

Project Name: _____ Project Number: _____ Page __of__

DESIGN DATA						FIELD TEST DATA RECORD								
Duct Test Section (No./Color)	Air System	Total System CFM	Test Section CFM	Allowable Leakage %	Allowable Leakage CFM	Diameter		Pressure (in. w.g.)		Actual Leakage CFM	Actual Leakage %	Test Result Pass/Fail	Test Performed By (initials)	Test Witnessed By (initials)
						Orifice	Tube	Duct (1)	Across Orifice					
				1.0%										
				1.0%										
				1.0%										
				1.0%										
				1.0%										
				1.0%										
				1.0%										
				1.0%										

Testing Performed By: _____

_____

(Company/Individual Name)

Witnessed/Certified By: _____

(Company/Individual Name)

(1) Duct test pressure shall be 6.0 in. w.g. for High/Medium Pressure ductwork, or 2.0 in. w.g. for Low Pressure ductwork.

PIPING LEAKAGE TEST SUMMARY FORM

(HYDRONIC AND AIR)

Project Name: _____ Project Number: _____ Page ____ of ____

System Tested	Sections Tested (1)	System Operating Pressure	Test Pressure (2)	Duration (3)	Pressure Drop (4)	Pass/Fail

Name of Testing Agency/Company: _____

Date of Test(s): _____

Test Conducted By (Print/Sign): _____

(1) Identified by an 11 x 17 numbered and color coded test section plan. Plan shall accompany this test report.

(2) 150% of operating pressure but not less than 100 psi (hydronic), 200 psi (air, gas and vacuum) and 400 psi (refrigerant).

(3) Four (4) hours minimum.

(4) Shall not exceed 0.0%.

SECTION 230700 – HVAC INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of mechanical insulation required by this section is indicated on drawings and schedules, by requirements of this section, and all other Division-23 sections.

B. Types of mechanical insulation specified in this section include the following:

1. Piping System Insulation:

a. Fiberglass

b. Flexible Unicellular

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of mechanical insulation products, of types and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Installer's Qualifications: Firms with at least five (5) years successful installation experience on projects with mechanical insulations similar to that required for this project.

C. Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of mechanical insulation. Submit schedule showing manufacturer's product number, k-value, thickness, and furnished accessories, and intended use for each mechanical system requiring insulation.

B. Maintenance Data: Submit maintenance data and replacement material lists for each type of mechanical insulation. Include this data and product data in maintenance manual.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver insulation, coverings, cements, adhesives, and coatings to site in containers with manufacturer's stamp or label, affixed showing fire hazard indexes of products.

B. Protect insulation against dirt, water, and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work, shall be limited to the following:

1. Owens Corning

2. Johns Manville

3. Armacell

2.2 PIPE INSULATION MATERIALS

A. Fiberglass Pipe Insulation: ASTM C 547-00, Type 1 (up to 850°F) (up to 454°C), maximum k-value of 0.23 BTU-in/hr-ft^2-deg F at a mean temperature of 75°F.

B. Flexible Unicellular Pipe Insulation: ASTM C 534, Type I (-40°F to 200°F) (-40°C to 93°C).

C. Jackets for Piping Insulation: Jacket assembly shall be ASTM C 1136, Type I with vapor retarder (0.02 perms). All service jackets shall have a polymer coated exterior facing, shall resist water staining and shall not support mold or mildew growth. All service jackets shall be Owens Corning ASJ Max with SSLII closure system, or equivalent.

1. All fittings shall be provided with pre-molded insulation with equivalent thickness and composition of insulation applied to the adjoining piping. Encase pipe fittings insulation with one-piece premolded PVC fitting covers, fastened as per manufacturer's recommendations.

2. Encase exterior piping insulation with 26 gauge embossed aluminum jacket with weather-proof construction.

D. Bands, Wires and Cement: As recommended by insulation manufacturer for applications indicated.

E. Adhesives, Sealer, and Protective Finishes: As recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which mechanical insulation is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 HVAC PIPING SYSTEM INSULATION

A. Cold Piping (40 Degrees F to ambient) (4 Degrees C to ambient):

1. Application Requirements: Insulate the following cold HVAC piping systems:

a. HVAC glycol water supply and return piping.

2. Insulate each piping system specified above with the following type and thickness of insulation:

a. Fiberglass: 1” (25 mm) thick for pipe sizes up to and including 1” (25 mm), 1-1/2” (40 mm) thick for pipe sizes 1-1/4” (32 mm) and 1-1/2” (40 mm), and 2” (50 mm) thick for pipe sizes 2” (50 mm) and larger. For interior glycol water applications, provide fiberglass insulation with Owens Corning ASJ Max with SSLII or equivalent.

B. Insulation of Piping Exposed to Weather: Protect outdoor insulation from weather by installing outdoor protective finish or jacketing as recommended by the manufacturer.

3.3 INSTALLATION OF PIPING INSULATION

A. General: Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

1. Insulation materials shall not be applied until systems have been witnessed, documented, and submitted to meet pressure testing requirements indicated throughout these specifications.

B. Install insulation on pipe systems subsequent to installation of heat tracing, testing, and acceptance of tests.

C. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other.

D. Clean and dry surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.

E. Maintain integrity of vapor-barrier jackets on pipe insulation, and protect to prevent puncture or other damage. Staples shall not be used.

F. Cover valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Provide factory molded insulation for all valves, fittings, unions, etc. Valve handles must be extended by the mechanical contractor to accommodate the insulation without reducing the thickness or integrity of the valve insulation.

G. All water test ports shall be accessible from the insulation. In addition, water flow measuring stations require access from insulation to verify sizes and model.

H. Extend piping insulation without interruption through pipe hangers, walls, floors and similar piping penetrations, except where otherwise indicated.

I. Butt pipe insulation against pipe hanger insulation inserts. For hot pipes, apply 3" (75 mm) wide vapor barrier tape or band over the butt joints. For cold piping apply wet coat of vapor barrier lap cement on butt joints and seal joints with 3" (75 mm) wide vapor barrier tape or band.

J. All exposed pipe insulation, including fittings, above 8'- 0" (2400 mm - 0 mm) of finished floor shall have 8 oz. (227 g) fire retardant canvas cover neatly cut and parted seams shall be sealed.

K. All exposed pipe insulation, including fittings, within 8' - 0" (2400 mm - 0 mm) of finished floor or within a stairwell, shall be provided with aluminum or PVC protective covers. All edges shall be hemmed and all seams shall be concealed.

L. All exterior piping shall be provided with an embossed aluminum jacket.

M. For all insulated piping 2-1/2” (63 mm) and larger, provide insulated saddles as follows:

1. For glycol water, provide the following:

   a. Minimum 3.5 pcf, non-compressive, rigid, phenolic foam insulation. Fire and smoke rating shall be 25/50 or below per ASTM 84.

   b. For cold applications below 75ºF (24ºC) a zero permeability abuse resistant vapor barrier shall be provided with matching butt strips. Apply a full coating of butyl joint sealant in addition to the butt strips for a completely sealed system.

   c. The phenolic foam system shall have a K factor of 0.16 at a mean temperature for 75ºF (24ºC) and comply with ASTM Standard C1126.

   d. Provide visible inspection sticker at the bottom of each saddle.

e. Pipe insulation saddles shall be Tru-Balance CoolDry Saddles as manufactured by Buckaroos, Inc.

3.4 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division-23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application, duct Installer for duct insulation application, and equipment Installer for equipment insulation application. Before preparing piping and ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

3.5 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

3.6 EXISTING INSULATION REPAIR/REPLACEMENT

A. Repair damaged sections of existing mechanical insulation, either previously damaged or damaged during this construction period. Insulation shall be as specified herein.

B. Provide new insulation on existing mechanical piping where existing insulation has been removed due to damage, repair or abatement of existing hazardous materials.

3.7 PROTECTION AND REPLACEMENT

A. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

B. Protection: Insulation Installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.

END OF SECTION 230700

SECTION 230800 – COMMISSIONING

PART 1 - GENERAL

1.1 COMMISSIONING AGENCY

A. The commissioning agency (CA) has been contracted directly with the owner for this project. The CA has overall responsibility for planning and coordinating the commissioning process. However, commissioning involves all parties to the design and construction process, including the contractor.

1.2 CONTRACTOR RESPONSIBILITY

A. This Section of the specifications defines the contractor's responsibilities with respect to the commissioning process. Each contractor and sub-contractor shall review this Section, and shall include in their bids for carrying out the work described, as it applies to each Division and Section of these specifications, individually and collectively.

1.3 DESCRIPTION OF WORK

A. The purpose of the commissioning process is to provide the owner/operator of the facility with assurance that the mechanical systems have been installed according to the contract documents, and operate within the performance guidelines set out in the design intent documents (DID) and these specifications. The CA will provide the owner with an unbiased, objected view of the system's installation, operation, and performance. The commissioning process does not take away or reduce the responsibility of the installing contractors to provide a finished product, installed and fully functional in accordance with the contract documents.

B. Commissioning is intended to enhance the quality of system start-up and aid in the orderly completion and transfer of systems for beneficial use by the owner. The CA will be the leader of the commissioning team, planning and coordinating all commissioning activities in conjunction with the design professionals, construction manager, subcontractors, manufacturers, and equipment suppliers.

C. The General Contractor, Mechanical Contractor, all Division-23 sub-contractors, and the Electrical Contractor shall be responsible for cooperating, and coordinating their work, with the CA. They shall also be responsible for carrying out all the physical activities required for installation of components and systems, and operating them during the commissioning process as required in this Section.

1.4 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions, general mechanical provisions and applicable Division 23 and 26 specification sections, apply to work of this section.

1.5 REFERENCES

A. Associated Air Balance Council Commissioning Guideline.

PART 2 - PRODUCTS

2.1 HVAC SYSTEMS TO BE COMMISSIONED

A. HVAC systems installed under this contract are to be inspected, tested signed off as complete and operational, and operated for commissioning agency verification as described in Part 3 of this Section. This includes, but is not necessarily limited to the work listed for each system. The foregoing includes all the following:

1. Hot Water, Glycol Solution, and Chilled Water Piping Systems: Work includes installation inspections and checks; pressure tests and documentation; expansion tanks; confirmation of flow balancing completion.

2. Duct and Air Handling Systems: Work includes installation inspections and checks; confirmation of flow balancing completion; leak testing as applicable; seismic restraints installation certification.

3. Chiller: Work includes installation inspections and checks (including seismic restraints installation certification); checkout and startup by manufacturer's representative; documented performance measurements including capacity, flows, motor amperage, controls operation and sound levels.

4. Pumps: Work includes documented checks on alignment, rotation, motor current draw, flows and pressures.

5. Supply, Return, Relief and Exhaust Fans: Work includes checks on installation (including seismic restraints, dampers and other accessories), rotation sound levels, motor current draw, and airflows and pressures.

6. Air Handling Units (both packaged and built-up): Work includes installation inspections and checks (including seismic restraints installation certification); checkout and startup by manufacturer's representative as specified; documented capacity tests for heating, cooling, air flow and static pressures; operation of all controls; sound levels.

7. Air Terminal Devices: Work includes installation inspections and checks; for VAV units, flow adjustments and calibration coordinated with controls and air balancing; controls operation including flow modulation, reheat, controls responses.

8. Fan-Coil Units: Work includes installation inspections and checks; performance and controls checks.

9. Direct Digital Controls System: Work includes inspections and checks of installation and operation of all devices; complete operation of all controls sequences, in coordination with commissioning of all controlled systems.

B. The contractor shall be responsible for carrying out all work required for commissioning these systems that is defined as a contractor responsibility in Part 3 of this Section.

2.2 SYSTEM VERIFICATION CHECKLISTS

A. This specification contains the system verification checklists as listed below:

1. SVC#1, Chiller
2. SVC#2, Pumps
3. SVC#3, Supply fan
4. SVC#4, Return fan
5. SVC#5, Exhaust fan
6. SVC#6, Coils
7. SVC#7, Air handling unit
8. SVC#8, VAV terminal units

2.3 FUNCTIONAL PERFORMANCE TEST CHECKLISTS

A. This specification contains functional performance test checklists as listed below:

1. FTP#1, Hot water hydronic distribution system
2. FTP#2, Chilled water system, hydronic distribution
3. FTP#3, VAV system, liquid heat/cool air handling unit
4. FPT#4, Air make-up and exhaust system

2.4 MEMBERS OF THE COMMISSIONING TEAM

A. The commissioning team will consist of representatives of the following:

1. Owner
2. End user (if applicable)
3. Architect
4. Mechanical design engineer

5. Electrical design engineer

6. Commissioning agency (CA)

7. General contractor

8. Mechanical (Division-23) contractor (M)

9. Electrical (Division-26) contractor (E)

10. Controls contractor (ATC)

11. Sheet metal contractor

12. Testing, adjusting and balancing agency (TAB)

13. Owner's O & M staff

B. During the commissioning process, participation of team members will generally be required as noted in the following table (with abbreviations as noted in brackets in the preceding list of team members). The mechanical contractor, indicated by "M", includes all mechanical sub-contractors or suppliers whose participation is required for commissioning a particular system or piece of equipment.

	TEAM MEMBERS				
EQUIPMENT/SYSTEM DESCRIPTION	CA	M	TAB	ATC	E
Chiller	X	X	X	X	X
Pumps	X	X	X	X	X
Supply fan	X	X	X	X	X
Return fan	X	X	X	X	X
Exhaust fan	X	X	X	X	X
Air handling unit	X	X	X	X	X
Coil (hot water or chilled water)	X	X	X	X	
VAV terminal unit	X	X	X	X	
Fan coil unit	X	X	X	X	X

PART 3 - EXECUTION

3.1 COMMISSIONING RESPONSIBILITIES – NON-CONTRACTOR TEAM MEMBERS

A. Introduction: As noted in Part 2, a multi-disciplinary team carries out the commissioning. The commissioning responsibilities of some non-contractor team members during the construction and acceptance phases of the project are provided here for information, to provide some context for the overall process.

B. Commissioning Agency Responsibilities: The commissioning agency will:

1. Plan, organize and implement the commissioning process as specified herein;

2. Prepare the commissioning plan, and ensure its distribution for review and comment;

3. Revise the commissioning plan as required during construction;

4. Chair commissioning meetings, and prepare and distribute minutes to all commissioning team members, whether or not they attended the meeting;

5. In conjunction with the General Contractor, coordinate commissioning activities among all contractors, sub-trades and suppliers;

6. Monitor system verification checks, and ensure the results are documented as the checks are done;

7. Monitor controls point-to-point checks done by the controls contractor, and ensure the results are documented as the checks are done;

8. Observe all start-ups and initial system operation tests and checks;

9. Direct the contractors to operate equipment and systems as required to ensure that all required functional performance tests are carried out for verification purposes;

10. Witness all functional performance tests and document the results;

11. Prepare and submit a Commissioning Report which documents all checks and tests done throughout the commissioning process, and the results obtained from each; and

12. Ensure all required O & M manuals, instructions and demonstrations are provided to the Owner's designated operating staff.

C. Mechanical Engineer Responsibilities:

1. The Mechanical Engineer will review the Commissioning Plan, and will participate, as appropriate, in on-site commissioning meetings.

2. During the acceptance phase of the commissioning process, the Mechanical Engineer may be on site to review commissioning documentation, to witness functional performance tests, and to analyze the installation and its performance.

D. Owner's Responsibilities:

1. The Owner will ensure the availability of operating staff for all scheduled instruction and demonstration sessions. This staff will possess sufficient skills and knowledge to operate and maintain the installation following attendance at these sessions.

2. The Owner will also ensure the appropriate involvement of the Electrical Engineer, Architect, and any other consultants as required, in the commissioning process.

3.2 COMMISSIONING RESPONSIBILITIES – GENERAL CONTRACTOR

A. The General Contractor has the responsibility to ensure the overall completion of the work. In this regard, he shall:

1. Participate as required in the HVAC commissioning process,

2. Ensure the Mechanical Contractor performs all assigned HVAC commissioning responsibilities as specified in 3.03,

3. Ensure the testing, adjusting and balancing agency performs HVAC commissioning responsibilities as listed in 3.04,

4. Ensure the Electrical Contractor performs all assigned HVAC commissioning responsibilities as specified in 3.06,

5. Ensure the cooperation and participation in the HVAC commissioning process of all other sub-contractors as applicable.

B. The General Contractor shall assign a representative to the commissioning team, and submit the person's name to the commissioning agency, within one (1) month of the award of the contract. The representative shall have the authority to make decisions on behalf of the General Contractor as they relate to the organization and scheduling of HVAC commissioning. The representative shall facilitate communications among all contractors and suppliers and other commissioning team members, and shall foster the necessary cooperative action. One specific responsibility shall be to attend commissioning meetings, and ensure action items arising from them are attended to as required to allow the commissioning process to proceed on schedule.

C. In the event that any scheduled equipment or system start-ups or functional performance tests are terminated because the CA or Mechanical Engineer discover deficient or incomplete work, or due to the non-attendance of required contractor or supplier personnel, the contractor or sub-contractors responsible for the termination shall also be responsible for paying reasonable costs of time and travel expenses of any or all of the following representatives who were physically present for the purpose of witnessing the start-up or the FPT: the CA, the Mechanical Engineer, the Electrical Engineer, and the Owner. The Owner may provide a statement to the General Contractor identifying the specific activity that was terminated, the scheduled date, and a list of those in attendance, along with their reasonable time and travel expense costs.

3.3 COMMISSIONING RESPONSIBILITIES – DIVISION-23 (MECHANICAL) CONTRACTOR

A. The mechanical contractor, and all the sub-contractors and suppliers within Division -23, shall cooperate with the commissioning agency (CA), and other commissioning team members, to facilitate the successful completion of the commissioning process.

B. The Contractor shall assign a representative to the commissioning team, and submit the person's name to the commissioning agency, within one (1) month of the award of the contract. The representative shall have the authority to make decisions on behalf of the mechanical contractor as they relate to the organization and scheduling of HVAC commissioning. The representative shall ensure communications between Division-23 contractors and suppliers and all other commissioning team members, and shall foster the necessary cooperative action. One specific responsibility shall be to attend commissioning meetings, and ensure action items arising from them are attended to as required to allow the commissioning process to proceed on schedule.

C. The Mechanical Contractor, and all mechanical sub-contractors and suppliers, shall cooperate with the Commissioning Agency in carrying out the HVAC commissioning process. In this context, the Mechanical Contractor shall:

1. Each contractor and sub-contractor in this division shall include in their quotes the cost of participating in the commissioning process as specified herein.

2. Ensure the automatic temperature controls (ATC) contractor performs HVAC commissioning responsibilities as listed in 3.05.

3. Provide instruction and demonstrations for the Owner's designated operating staff, in conjunction with the Commissioning Agency and Mechanical Engineer, and with the participation of qualified technicians from major equipment suppliers and the controls contractor.

4. Include requirements for submittal data, O & M data, and training information in each purchase order or sub-contract written.

5. Ensure cooperation and participation of specialty sub-contractors such as sheet metal, piping, refrigeration, and water treatment as applicable.

6. Ensure participation of major equipment manufacturing in appropriate start-up, testing and training activities.

7. Attend HVAC commissioning meetings scheduled by the CA.

8. Notify the CA a minimum of two (2) weeks in advance of scheduled equipment and system start-ups, so that the CA may witness system verifications, and equipment and system start-ups.

9. Provide sufficient personnel to assist the CA as required during system verification and functional performance testing.

10. Prior to start-up, inspect, check and confirm the correct and complete installation of all equipment and systems for which system verification checklists are included in the commissioning plan. Document the results of all inspections and checks on the checklists and sign them. If deficient or incomplete work is discovered, ensure corrective action is taken and re-check until the results are satisfactory and the system is ready for safe start-up.

11. Notify the CA a minimum of two (2) weeks in advance of the time for start of the TAB work. Attend the initial TAB meeting for review of the TAB procedures.

12. Provide equipment and systems start-up resources as specified and required. If during an attempted equipment or system start-up, deficient or incomplete work is discovered that would preclude safe operation, the start-up shall be aborted until corrective action has been taken. Ensure such action is taken and verified before re-scheduling a new start-up. Those responsible for deficient or incomplete work will be responsible for costs in accordance with 3.02 of the Section.

13. Carry out performance checks to ensure that all equipment and systems are fully functional and ready for the CA to witness formal functional performance tests (FPTs).

14. Operate equipment and systems for FPTs in accordance with the commissioning plan and as directed by the commissioning agency. If improper functionality, incomplete work, or other deficiencies affecting system performance are discovered, the FPTs will be stopped by the CA. Those responsible for deficient or incomplete work will be responsible for costs in accordance with 3.02 in this Section. Ensure that all corrections necessary for full and complete system operation as specified are completed; then with the ATC contractor and other applicable sub-contractors, carry out functional performance checks to confirm correct operation before applying to the CA to reschedule the FPTs for the system in question.

15. Prepare preliminary schedule for mechanical system orientation and inspections, O & M manual submission, training sessions, pipe and duct system testing, flushing and cleaning, equipment start-up TAB, and task completion for use by the CA. Update schedule as appropriate throughout the construction period.

16. Attend Initial O & M staff training session.

17. Conduct mechanical system orientation and inspection at the equipment placement completion stage.

18. Update drawings to as-built condition and review with the CA.

19. Gather O & M data on all equipment, and assemble in binders as required by the commissioning specification. Submit to CA prior to the completion of construction.

20. Participate in, and schedule vendors and contractors to participate in the O & M staff training sessions as set up by the CA.

21. Provide written notification to the General Contractor [or Construction Manager] and CA that the following work has been completed in accordance with the contract documents and the equipment, systems and sub-systems are operating as required.

    a. HVAC equipment including all fans, air handling units, dehumidification units, ductwork, dampers, terminals and all Division-23 equipment.

    b. Refrigeration equipment, pumping systems and heat rejection equipment.

    c. Fire stopping in the fire rated construction, including fire and smoke damper installation, caulking, gasketing and sealing of smoke barriers.

    d. Dedicated smoke control systems including stairway pressurization and atrium systems.

    e. Non-dedicated systems using the air handling units for smoke control.

    f. Fire detection and smoke detection devices furnished under other divisions of the specification as they affect the operation of the smoke control systems.

    g. That the building control system is functioning to control mechanical equipment and smoke control systems as specified.

22. Provide a complete set of as-built drawings and O & M manuals to the CA.

3.4 COMMISSIONING RESPONSIBILITIES – TAB AGENCY

A. With respect to HVAC commissioning, the TAB agency shall:

1. Include costs for HVAC commissioning requirement in the quoted price.

2. Attend commissioning meetings scheduled by the CA prior to, and during, on-site TAB work being done.

3. Submit proposed TAB procedures to the CA and Mechanical Engineer for review and acceptance.

4. Attend the TAB planning meeting scheduled by the CA. Be prepared to discuss the procedures that shall be followed in testing, adjusting and balancing the HVAC system.

5. At the completion of the TAB work, submit the final TAB report to the General Contractor with copies to the Owner, CA and Mechanical Engineer.

6. Participate in verification of the TAB report by the CA for verification of diagnostic purposes. This will consist of repeating a sample (normally 10% to 20%) of the measurements contained in the TAB report as directed by the CA.

7. Participate in O & M personnel training sessions as scheduled by the CA.

3.5 COMMISSIONING RESPONSIBILITIES – CONTROLS CONTRACTOR

A. With respect to HVAC commissioning, the controls contractor shall:

1. Include cost for commissioning requirements in the quoted price.

2. Review design for controllability with respect to equipment selected for the project:

a. Review and confirm in writing that a proper hardware specification exists to permit functional performance testing as required by specification and sequence of operation.

b. Review and confirm in writing that proper safeties and interlocks are included in design.

c. Ensure the proper sizing of control valves and actuators, based on design pressure drops. Ensure that control valve authority will result in capacity control as specified. Include valve sizing and authority information in submittal to Mechanical Engineer.

d. Ensure the proper sizing of control dampers. Ensure damper authority to control air flows as specified. Review and confirm in writing proper damper positioning for mixing to prevent stratification. Ensure correct actuator vs. damper movement for smooth operation. Include damper sizing, control authority and actuator selection data in submittal to Mechanical Engineer.

e. Ensure the proper selection of sensor ranges, and include data with submittal to Mechanical Engineer.

f. Clarify all questions concerning sequences of operation with the Mechanical Engineer.

1) Attend commissioning meetings scheduled by the CA.

2) Provide the following submittals to the CA for review:

a) Hardware and software submittals.

b) Control panel construction shop drawings.

c) Diagrams showing all control points, sensor locations, point names, actuators, controllers and where necessary, points of access, all superimposed on diagrams of the physical equipment.

d) Narrative description of all control sequences for each piece of equipment controlled.

e) Logic diagrams showing the logic flow of all control sequences.

f) A list of all control points, including analog inputs, analog outputs, digital inputs and digital outputs. Include the values of all parameters for each system point. Provide a separate list for each stand-alone control unit.

g) A complete control language program listing including all software routines employed in operating the control system. Also provide a program write-up, organized in the same manner as the control software. This narrative shall describe the logic flow of the software and the functions of each routine and sub-routine. It should also explain individual math or logic operations that are not clear from reading the software listing.

h) Hardware operation and maintenance manuals.

i) Application software and project applications code manuals

3. Inspect, check, and confirm the proper installation and performance of controls/BAS hardware and software provided by others.

4. Integrate installation and programming scheduling with construction and commissioning schedules.

5. Inspect, check and confirm the correct installation and operation of input and output field points and devices through documented and signed off point-to-point checkouts.

6. Provide thorough training to operating personnel on hardware operations and programming, and the application program for the system, in accordance with the O & M staff training program in the commissioning plan.

7. In conjunction with the mechanical contractor, demonstrate system performance to the CA including all modes of system operation (e.g. occupied, unoccupied, emergency) during the functional performance tests (FPTs). If improper functionality, incomplete work, or other deficiencies affecting system performance are discovered, the FPTs will be stopped by the CA. Those responsible for deficient or incomplete work will be responsible for costs in accordance with 3.02 in this Section.

8. Provide control system technician to assist during system verification and functional performance testing.

9. Provide support and coordination with TAB contractor on all interfaces between controls and TAB scopes of work. Provide, at no addition cost to the TAB and commissioning agencies, all devices, such as portable operator's terminals and all software for the TAB agency to use in completing TAB procedures.

3.6 COMMISSIONING RESPONSIBILITIES – ELECTRICAL (DIVISION-26) CONTRACTOR

A. With respect to HVAC commissioning, the electrical contractor shall:

1. Include cost for HVAC commissioning requirements in the quoted price.

2. Review design with respect to providing power to the HVAC equipment:

a. Verify that proper hardware specifications exist for functional performance and sequence of operation required by specification.

b. Verify that proper safeties and interlocks are included in the design of electrical connections for HVAC equipment.

3. Annual commissioning meetings scheduled by the CA.

4. Schedule work so that required electrical installations are completed, and systems verification checks and functional performance tests can be carried out on schedule.

5. Inspect, check and confirm in writing the proper installation and performance of all electrical services provided.

6. Provide electrical system technicians to assist during system verification and functional performance testing as required by the CA.

END OF SECTION 230800

SECTION 230100 – HYDRONIC PIPING

PART - 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of hydronic piping work is indicated on drawings and schedules, and by requirements of this section and all other Division-23 sections.

B. Applications for hydronic piping systems include the following:

1. glycol water supply and return

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of hydronic piping products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Installer's Qualifications: Firm with at least five (5) years of successful installation experience on projects with hydronic piping work similar to that required for project.

C. Codes and Standards:

1. ASME Compliance: Fabricate and install hydronic piping in accordance with ASME B31.9 "Building Services Piping".

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for hydronic piping, materials and products.

B. Shop Drawings: Submit scaled layout drawings as required by Division-23 Section, “Basic HVAC Requirements”.

C. Record Drawings: At project closeout, submit record drawings of installed hydronic piping and piping products.

D. Maintenance Data: Submit maintenance data and parts lists for hydronic piping materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual.

PART - 2 PRODUCTS

2.1 MATERIALS AND PRODUCTS

A. General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not

indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with ASME B31.9 Code for Building Services Piping where applicable, base pressure rating on hydronic piping systems maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in hydronic piping systems. Where more than one type of materials or products is indicated, selection is Installer's option.

2.2 BASIC IDENTIFICATION

A. General: Provide identification complying with Division-23 section "Identification for HVAC Piping and Equipment".

2.3 BASIC PIPES AND PIPE FITTINGS

A. General: Provide pipes and pipe fittings complying with Division-23 section "Pipe, Tube and Fittings for HVAC Systems", in accordance with the following listing:

B. Hydronic Piping:

1. Tube Size 2" (50 mm) and Smaller: Copper tube; Type L, hard drawn temper; wrought-copper fittings with solder-joints.

2. Pipe Size 2-1/2" (65 mm) and Larger: Black steel pipe; Schedule 40; wrought-steel buttwelding fittings with welded joints.

3. Pipe Run within Concrete Construction: Copper tube; Type K, soft annealed temper; no joints or fittings allowed. Sleeve tube with continuous length of 3/8" (10 mm) minimum thickness of flexible unicellular insulation.

2.4 BASIC PIPING SPECIALTIES

A. General: Provide piping specialties complying with Division-23 section "Piping Specialties for HVAC Systems", in accordance with the following listing:

1. Pipe escutcheons

2. Pipeline strainers

3. Dielectric fittings

4. Drip pans

5. Sleeves

6. Sleeve seals

2.5 BASIC HANGERS AND SUPPORTS

A. General: Provide hangers and supports complying with Division-23 section "Hangers and Supports for HVAC Piping and Equipment", in accordance with the following listing:

1. Adjustable steel clevises, adjustable pipe saddle supports, single pipe rolls, and adjustable roller hangers, for horizontal piping hangers and supports.

2. Two-bolt riser clamps, for vertical-piping clamps.

3. Steel turnbuckles, for hanger-rod attachments.

4. Concrete inserts, C-clamps, malleable beam clamps, and steel brackets, for building attachments.

5. Protection saddles, for saddles and shields.

2.6 BASIC VALVES

A. General: Provide valves complying with Division-23 section "Valves for HVAC Piping", in accordance with the following listing:

1. Sectional Valves:

   a. 2" (50 mm) and Smaller: Ball valves.

   b. 2-1/2" (65 mm) and Larger: Butterfly valves.

2. Shutoff Valves:

   a. 2" (50 mm) and Smaller: Ball valves.

   b. 2-1/2" (65 mm) and Larger: Butterfly valves.

3. Balancing Valves:

   a. Combination shut-off/balance valve with venturi type flow meter fitting with integral readout ports and memory stop. Provide ball valve for 2” (50 mm) and smaller, butterfly valve for 2-1/2" (65 mm) and larger.

   b. See Division-23 section “Hydronic Specialties” for balance valve specification.

4. Drain Valves:

   a. 2" (50 mm) and Smaller: Ball valves.

5. Check Valves:

a. All sizes: Swing check valves.

2.7 BASIC EXPANSION COMPENSATION

A. General: Provide expansion compensation products complying with Division-23 section "Expansion Compensation for HVAC Piping".

2.8 BASIC METERS AND GAUGES

A. General: Provide meters and gauges complying with Division-23 section "Meters and Gauges for HVAC Piping".

2.9 BASIC VIBRATION CONTROL

A. General: Provide vibration control products complying with Division-23 section "Vibration Isolation for HVAC Piping and Equipment".

PART - 3 EXECUTION

3.1 INSPECTION

A. General: Examine areas and conditions under which hydronic piping systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF BASIC IDENTIFICATION

A. General: Install mechanical identification in accordance with Division-23 section "Identification for HVAC Piping and Equipment".

3.3 INSTALLATION OF HYDRONIC PIPING

A. General: Install hydronic piping in accordance with Division-23 section "Pipe, Tube and Fittings for HVAC Systems".

B. Install eccentric reducers where pipe is reduced in size in direction of flow, with tops of both pipes and reducer flush.

C. Connect branch-feed piping to mains at horizontal center line of mains, connect run-out piping to branches at horizontal center line of branches.

D. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

3.4 INSTALLATION OF PIPING SPECIALTIES

A. Install piping specialties in accordance with Division-23 section "Piping Specialties for HVAC Systems".

3.5 INSTALLATION OF HANGERS AND SUPPORTS

A. Install hangers and supports in accordance with Division-23 section "Hangers and Supports for HVAC Piping and Equipment".

3.6 INSTALLATION OF VALVES

A. Install valves in accordance with Division-23 section "Valves for HVAC Piping".

B. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two (2) or more hydronic terminals or equipment connections, and elsewhere as indicated.

C. Shutoff Valves: Install on inlet and outlet of each mechanical equipment item, control valves, strainers and elsewhere as indicated.

D. Balancing Valves: Install on outlet of each hydronic terminal, and elsewhere as indicated.

E. Drain Valves: Install on each mechanical equipment item and locate to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain hydronic piping system.

3.7 INSTALLATION OF EXPANSION COMPENSATION PRODUCTS

A. Install expansion compensation products in accordance with Division-23 section "Expansion Compensation for HVAC Piping".

3.8 INSTALLATION OF METERS AND GAUGES

A. Install meters and gauges in accordance with Division-23 section "Meters and Gauges for HVAC Piping".

3.9 EQUIPMENT CONNECTIONS

A. General: Connect hydronic piping system to mechanical equipment as indicated, and comply with equipment manufacturer's instructions where not otherwise indicated. Install shutoff valve and union/flange connection on supply and return, and drain valve on drain connection.

B. Hydronic Terminals: Install hydronic terminals with hydronic terminal valve and union on inlet and outlet. Install manual air vent valve on element in accordance with manufacturer's instructions. Locate valves and balancing cocks behind valve access doors for ease of maintenance. Where indicated, install automatic temperature control valve with unions between valve and element on supply line.

3.10 FIELD QUALITY CONTROL

A. Piping Tests: Test hydronic piping in accordance with testing requirements of Division-23 section "Testing, Adjusting and Balancing."

3.11 CLEANING

A. Cleaning, Flushing, and Inspecting: Clean, flush, and inspect hydronic piping systems in accordance with requirements of Division-23 section "Pipe, Tube and Fittings for HVAC Systems".

END OF SECTION 232113

SECTION 232115 – HYDRONIC SPECIALTIES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of hydronic specialties required by this section is indicated on drawings and schedules, and by requirements of this section and all other Division-23 sections.

B. Types of hydronic specialties specified in this section include the following:

1. Balancing Valves

2. Air Vents

1.2 QUALITY ASSURANCE

A. Hydronic Specialty Types: Provide hydronic specialties of same type by same manufacturer.

B. Codes and Standards:

1. ASME Compliance: Manufacture and install hydronic specialties in accordance with ASME B31.9 "Building Services Piping".

2. UL and NEMA Compliance: Provide electrical components of hydronic specialties which are listed and labeled by UL, and comply with NEMA standards.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of hydronic specialty. Include pressure drop curve or chart for each type and size of hydronic specialty. Submit schedule indicating manufacturer's figure number, size, location, rated capacities, and features for each required hydronic specialty.

B. Shop Drawings: Submit manufacturer's assembly-type shop drawings indicating dimensions, weights, required clearances, and method of assembly of components.

C. Maintenance Data: Submit maintenance data and spare parts lists for each type of hydronic specialty. Include this data, product data, and shop drawings in Maintenance Manual.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include the following (unless otherwise noted):

1. Bell and Gosset

2. Amtrol

3. Flow Design, Inc.

2.2 HYDRONIC SPECIALTIES

A. General: Provide factory-fabricated hydronic specialties recommended for use in service indicated. Provide hydronic specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection as determined to comply with installation requirements. Provide sizes as indicated, and connections, which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Installer's option, but more than one type cannot be used on project.

2.3 BALANCING VALVES

A. General:

1. Manual balancing devices shall be venturi type as defined by ASHRAE. Devices shall have a precision machined throat and have a stated catalog accuracy of 3% full scale and have an actual accuracy of $\pm$5% of actual reading down to 10 in. w.c. pressure differential across the metering device. The induced differential reading (flow signal) shall be greater than two feet water column at the design flow with the valve in the wide open position. The permanent pressure loss at design flow shall not exceed two feet of water in the wide open position. The valves shall have differential readout ports fitted with check valve and protective cap, and are to have a memory stop to allow complete shut-off and return to set position without losing the setpoint.

B. Construction:

1. Valves 2” and Smaller: Brass full port ball valve, blowout proof stem, virgin Teflon seats, brass stems, stem seals and steel handles.

2. Valves 2-1/2” and Larger: Cast iron butterfly valve, full-lug type with EPDM seat, 416 stainless steel stem, bronze sleeve bearing and bronze disk. Valves 4” and smaller shall have manual lever. Valves 6” and larger shall have gear operated hand wheel.

C. Minimum Ratings:

1. Devices with sweat or NPT connections: 400 psig (2760 kPa) at 250°F (121°C).

2. Devices with flanged connections: 125 psig (862 kPa) at 250°F (121°C) suitable for the system for which it is installed.

D. Readout Meter Kit:

1. Provide a portable readout meter kit by the manufacturer of the balancing devices. The meter shall be permanently mounted in a durable case complete with two 10' (3 m) color coded hoses with shutoff valves at the end that connects to the balance valve so that water does not drain out between readings. Meter shall have a 6" (150 mm) diameter face and 1.75% full rated accuracy. Meter for the venturi type devices shall be provided with a removable transparent face indicating flow directly in GPM for each size device furnished. Meter shall have a three valve manifold for over-range protection.

E. Installation:

1. The straight pipe required to achieve 3% full scale accuracy shall be incorporated as an integral part of the venturi and valve assembly. No additional straight piping shall be required.

2. Install in accordance with the manufacturer's instructions.

3. Check connections after installation for leaks.

F. Balancing valves shall be Flow Set model UA (2" and smaller) or EF (2-1/2" and larger) as manufactured by Flow Design, or Nu-Tech.

2.4 AIR VENTS

A. Manual Air Vents: Provide manual vents designed to be operated manually with screwdriver or thumbscrew, 1/8" (3 mm) N.P.T. connection. Provide 1/4" ball valve.

B. Automatic Air Vents: Provide automatic vents at all high points of the heating and chilled water systems. All valves shall be cast brass, rated for 150 psig design pressure and 270°F operating temperature. Units to include non-ferrous floats, stainless steel linkage and a Viton seal which closes against a brass spring operated seat. Units shall come complete with a 20 year limited warranty against defects in materials and workmanship, which should be given to owner after installation. Automatic air vents shall be Spirotop as manufactured by Spirotherm.

PART 3 - EXECUTION

3.1 INSPECTION

A. General: Examine areas and conditions under which hydronic specialties are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Owner's representative.

3.2 INSTALLATION OF HYDRONIC SPECIALTIES

A. Balancing Valves: Install venturi type balance valves at all hydronic coils and terminals including, but not limited to, heating coils, cooling coils, etc.

B. Air Vents:

1. Manual Air Vents: Install manual vents on each hydronic terminal at highest point, and on each hydronic piping drop in direction of flow for mains, branches, and runouts, and elsewhere as indicated. In addition, provide 1/2" full port ball valve with hose end connection, cap and chain at all high points within the piping system to accommodate manual venting of trapped air.

2. Automatic Air Vents: Install automatic vents at top of each hydronic riser and elsewhere as indicated. Install shutoff valve between riser and vent valve, pipe outlet to suitable plumbing drain, or as indicated.

C. Low Point Drains: Provide a full port ball valve with hose end connection, cap and chain at all low points within the piping system to accommodated manual draining of water from the system. Drain valves shall be sized in accordance with the following criteria:

1. For pipes smaller than 3", provide 3/4" full port ball valve.

2. For pipes 3" – 6", provide 1" full port ball valve.

3. For pipes 8" and larger, provide 2" full port ball valve.

END OF SECTION 232115

SECTION 236510 – ICE STORAGE TANKS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Ice storage tanks

1.2 SUBMITTALS

A. Submit shop drawings under provisions of Division 01.

B. Submit shop drawings indicating components, assembly, dimensions, required clearances, and location and size of field connections. Indicate equipment, piping, connections, and valves required for complete system.

1. Submit complete shop drawing of manifold piping.

C. Submit product data under provisions of Section Division 1.

D. Submit product data indicating total latent and sensible capacities, weight, maximum operating temperature, factory test pressure, maximum operating pressure, specialties and accessories.

E. Submit manufacturer's installation instructions under provisions of Section Division 1.

1.3 OPERATION AND MAINTENANCE DATA

A. Submit operation data under provisions of Section Division 1.

B. Include start-up instructions, maintenance data and parts lists and accessories.

C. Submit maintenance data under provisions of Division 1.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery products to site provisions of Division 1.

B. Store and protect products under provisions of Division 1.

C. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

D. Protect units from physical damage. Leave factory shipping covers in place until installation.

1.5 WARRANTY

A. Provide factory warranty under provisions of Division 1 and as required as part of the section.

B. Warranty: Include coverage for heat exchanger, container and accessories.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Baltimore Air Coil Thermal Storage Unit or approved equal.

B. Warranty: Ten year warranty on tanks.

2.2 ICE THERMAL STORAGE UNITS

A. ~~The ICE CHILLER® Thermal Storage Unit(s) shall be Baltimore Air coil Company Model TSU.~~Each unit shall have a latent ton-hour storage capacity as shown on the schedule. Rated system performance shall be provided in the format recommended by the Air-Conditioning & Refrigeration Institute (ARI) Guideline T. The thermal storage units shall be modular in design. Unit design shall allow units of different sizes to be installed in order to optimize unit selection and minimize space requirements. Tanks sizes can be mixed due to internal piping arrangements that create a balanced flow due to uniform pressure drop through the coil circuits.

B. The tank shall be constructed of heavy-gauge galvanized steel panels and include double brake flanges for structural strength. The tank walls shall be supplied with a minimum of 4-1/2" of insulation that provides a total insulating value of R-18. The tank design shall utilize multiple liners. The primary liner, which forms the interior of the unit, shall be of single piece construction and be suitable for low temperature applications. The secondary liner/vapor barrier shall be separated from the primary liner by 1-1/2" of extruded polystyrene insulation. The tank bottom shall be insulated with 2" of expanded polystyrene insulation and 1" of extruded polystyrene insulation.

C. The ~~ICE CHILLER® t~~Thermal ~~S~~storage u~~U~~nit shall be provided with watertight, sectional covers constructed of hot-dip galvanized steel. The covers shall be insulated with a minimum of 2" of expanded polystyrene insulation.

D. Contained within the tank shall be a steel heat exchanger that is constructed of 1.05" O.D., all prime surface serpentine steel tubing encased in a steel framework. The coil, which is hot-dip galvanized after fabrication, shall be pneumatically tested at 190 psig and rated for 150 psig operating pressure. The coil circuits are configured to provide maximum storage capacity. The coil connections on the unit are galvanized steel and are grooved for mechanical coupling.

E. Each ~~ICE CHILLER®~~ t~~T~~hermal s~~S~~torage u~~U~~nit shall be provided with a sight tube. The sight tube, which shall be fabricated from clear plastic pipe, shall display the tank water level and corresponding ice inventory.

F. Operating controls, consisting of two float switches, shall be mounted on the outside of the tank. The high level float switch terminates the build cycle when the tank water level reaches the 100% ice build level. The high level switch shall also prevent re-initiation of the build cycle until approximately 15% of the ice has been discharged. The second float switch is a low water cutout. The cutout requires that the water level in the ~~ICE CHILLER®~~ t~~T~~hermal s~~S~~torage u~~U~~nit be at or above the 0% ice build level before the ice build cycle can begin. Operating control quantities vary based on project requirements. An optional differential pressure transmitter shall be available to supply an electrical output signal proportional to the amount of ice in inventory.

G. The heat transfer fluid shall be an industrially inhibited, 30% by weight, propylene glycol solution specifically designed for HVAC applications. The 30% (by weight) solution is designed to provide freeze/burst and corrosion protection as well as efficient heat transfer in water based, closed loop systems. Corrosion inhibitors shall be provided to keep pipes free of corrosion without fouling. ~~DOWFROST HD® are acceptable fluids.~~

H. Provide digital refractometer with output for BAS and install in glycol piping external to the tank. Output to be 4-20mA or 0-10V. Refractometer to be MISCO Inline Process Refractometer or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturers instruction.

B. Place modular tank units on concrete pad as indicated on the drawings. Care must be exercised so as not to drop and/or damage tanks. Tanks that are dropped or damaged to the extent that the warranty is voided shall be replaced at no cost to the owner.

C. Provide main header piping as indicated on the drawings.

D. Install inventory meter, air pumps, make-up water and other accessories indicated on the drawings.

E. Air pressure test tanks and headers to 90 PSI in accordance with manufacturer's instruction. Correct leaks and re-test until pressure test is successful.

F. After successful pressure test, insulate piping as required under section 230700.

G. Charge system with solution of seven parts water and three parts propylene glycol (30 percent mixture). Thoroughly mix solution in a separate container before charging into system. Remove all air from the system.

H. Use a propylene glycol manufacturered recommended by ~~DOW Chemical~~ the thermal storage unit manufacturer ~~(DOWFROST HD)~~ or an approved equal. Add the manufacturer recommended amount anti-foaming agents.

I. After the system is fully charged, circulate for 24 hours. Test the solutions glycol concentration by using a refractometer or equivalent methods. Draw off a sufficient amount of the solution and add propylene glycol or water as required to achieve a 30 percent propylene glycol solution.

J. Adjust and verify that inventory meters perform manufacturer's instructions.

K. Provide factory authorized pretreatment of tank. Pretreatment should passivate the galvanized surfaces and provide protection from corrosion and biological attack.

3.2 DEMONSTRATION

A. Demonstrate system operation and maintenance to owner's representative under provisions of Section 230593 and Division 1.

END OF SECTION 236510

DPS ELECTRONIC STAMP:

MONTGOMERY COLLEGE

WEST GARAGE (WG) ICE MODULE REPLACEMENT

Takoma Park / Silver Spring Campus
901 Jessup Drive
Silver Spring, MD 20910

bkm

A. MORTON THOMAS & ASSOCIATES, INC.
CIVIL ENGINEERS

700 KING FARM BLVD.
SUITE 300
ROCKVILLE, MD 20850
PHONE: 310-881-2545
www.amt.com

BURDETTE, KOEHLER, MURPHY & ASSOCIATES, INC.
MECHANICAL/ ELECTRICAL/ PLUMBING ENGINEERS

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A+F ENGINEERS
STRUCTURAL ENGINEERS

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WASHINGTON DC 20036
PHONE: 202-628-1600
www.af-engineers.com

FP# 19-154
BKM PROJECT NO. 19103.02
100% CONSTRUCTION DOCUMENTS
JUNE 06, 2024

All construction, Demo and repairs shall be conducted per Chapter 33, IBC; NFPA 101 Section 4.6.10, NFPA 241; and MCFSC §22-94. (Note portable fire extinguishers shall be provided during construction).

MONTGOMERY COLLEGE SUSTAINABILITY STATEMENT

IN DECEMBER 2017, MONTGOMERY COUNTY COUNCIL DECLARED A CLIMATE EMERGENCY. IN RESPONSE, THE MONTGOMERY COUNTY EXECUTIVE PUBLISHED A CLIMATE ACTION PLAN (CAP), JUNE 2021, WITH THE GOAL OD REDUCING GREENHOUSE GAS BY 80% BY 2027 AND 100% BY 2035. THE EXECUTIVE ALSO PUBLISHED BUILDING ENERGY PERFORMANCE STANDARDS (BEPS), WHICH WAS INTRODUCED TO THE COUNTY COUNCIL AS BILL 16-21, ON MAY 4, 2021. BEPS REQUIRES ALL BUILDINGS, 25,000 GROSS SQUARE FOOT (GSF) AND LARGER, TO BENCHMARK AND ESTABLISH A PLAN TO REDUCE GHG BY THE PROPOSED CAP DATES.

FUTURE FACILITIES MASTER PLANS AND UTILITIES MASTER PLANS SHOULD ADDRESS BOTH THE CAP AND BEPS, SPECIFICALLY IN THE FOLLOWING AREA:

- BUILDINGS: INCREASE ENERGY CONSERVATION AND EFFICIENCY, DECREASE FOSSIL FUEL USE IN BUILDINGS, AND SUPPORT CARBON NEUTRAL BUILDING DESIGN.
- CARBON SEQUESTRATION: RETAIN, INCREASE, AND RESTORE TERRESTRIAL ECOSYSTEMS, INCLUDING FOREST, MEADOWS, WETLANDS, GREEN SPACES, AND URBAN TREES.
- CLIMATE ADAPTATION ACTIONS: PROVIDE SUITABLE INFRASTRUCTURE AND TOOLS TO REDUCE THE RISKS AND IMPACTS OF MORE EXTREME CLIMATE HAZARDS, I.E., RESILIENCE, ENHANCED STORM WATER MANAGEMENT, AND GREEN INFRASTRUCTURE.
- CLIMATE GOVERNANCE ACTIONS: ALIGN AND ORIENT STAFFING, TECHNICAL CAPACITY, PROCESS, AND DECISION-MAKING TO ADDRESS CLIMATE CHANGE.
- CLEAN ENERGY ACTIONS: ENSURE CARBON-FREE ELECTRICITY, EXPAND RENEWABLE ELECTRICITY GENERATION AND USE OF DISTRIBUTED ENERGY RESOURCES.
- HOW CAN I ACT ON CLIMATE CHANGE: PUBLIC AWARENESS FOR TRANSPORTATION, HOME ENERGY, BUSINESS, CONSUMPTION, AND RESILIENCE.
- PUBLIC ENGAGEMENT, PARTNERSHIPS, AND EDUCATION ACTIONS: FACILITATE INCLUSIVE, COMMUNITY-DRIVEN LEADERSHIP, BUILD STRATEGIC PARTNERSHIPS, EMPOWER YOUTH TO ACT AT HOME AND IN THEIR COMMUNITY, BUILD COMMUNITY TRUST AND PARTNERSHIPS.
- TRANSPORTATION ACTIONS: TRANSITION TO 100% ZERO EMISSIONS TRANSPORTATION AND EXPAND SUPPORTING INFRASTRUCTURE, PUBLIC TRANSIT, REDUCE USE OF PERSONA AUTOMOBILES, AND INTRODUCE NEW TECHNOLOGIES SUET, AS EV CHARGING STATIONS. THE PLACEMENT OF EV CHARGING STATIONS IN PARKING LOTS WHICH ARE REMOTE FROM THE BUILDINGS WILL BECOME A UTILITY PLANNING ISSUE. DECISIONS WILL NEED TO BE MADE ON THE LOCATION, COSTS, ACCESS AND WHO IS RESPONSIBLE FOR PAYING FOR THE USE OF THE ELECTRICITY.

DRAWING INDEX

In fully-sprinklered buildings, stories used exclusively for mechanical equipment shall be permitted to have a single means of egress where the travel distance to an exit on that story is not in excess of 100 feet. NFPA 101, 7.13.2

bkm
Burdette, Koehler, Murphy & Associates, Inc.
Mechanical / Electrical Engineers
6300 Blair Hill Lane Suite 400 | Baltimore, Maryland 21209
P: 410.323.0600 | www.bkma.com

PROJECT NAME:

MONTGOMERY COLLEGE
Central Administration
Office of Facilities
9221 Corporate Boulevard
Rockville, MD 20850
Telephone: 240-567-7363

TAKOMA PARK / SILVER SPRING CAMPUS
WG ICE MODULE REPLACEMENT

Consultants

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Civil Engineers
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P 202.628.1600 x200
www.AF-Engineers.com

SEAL:

STATE OF MARYLAND — 17117 — REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 17117
EXPIRATION DATE: 10/25/24

ISSUED FOR:

DATE:	DESCRIPTION:
08/09/2023	100% CONSTRUCTION DOCUMENTS
06/06/2024	PERMIT SUBMISSION

PROJECT NO: BKM # 19103.02

SCALE: AS NOTED

DRAWN BY: IPS

CHECKED BY: JMW

DATE: 06/06/2024

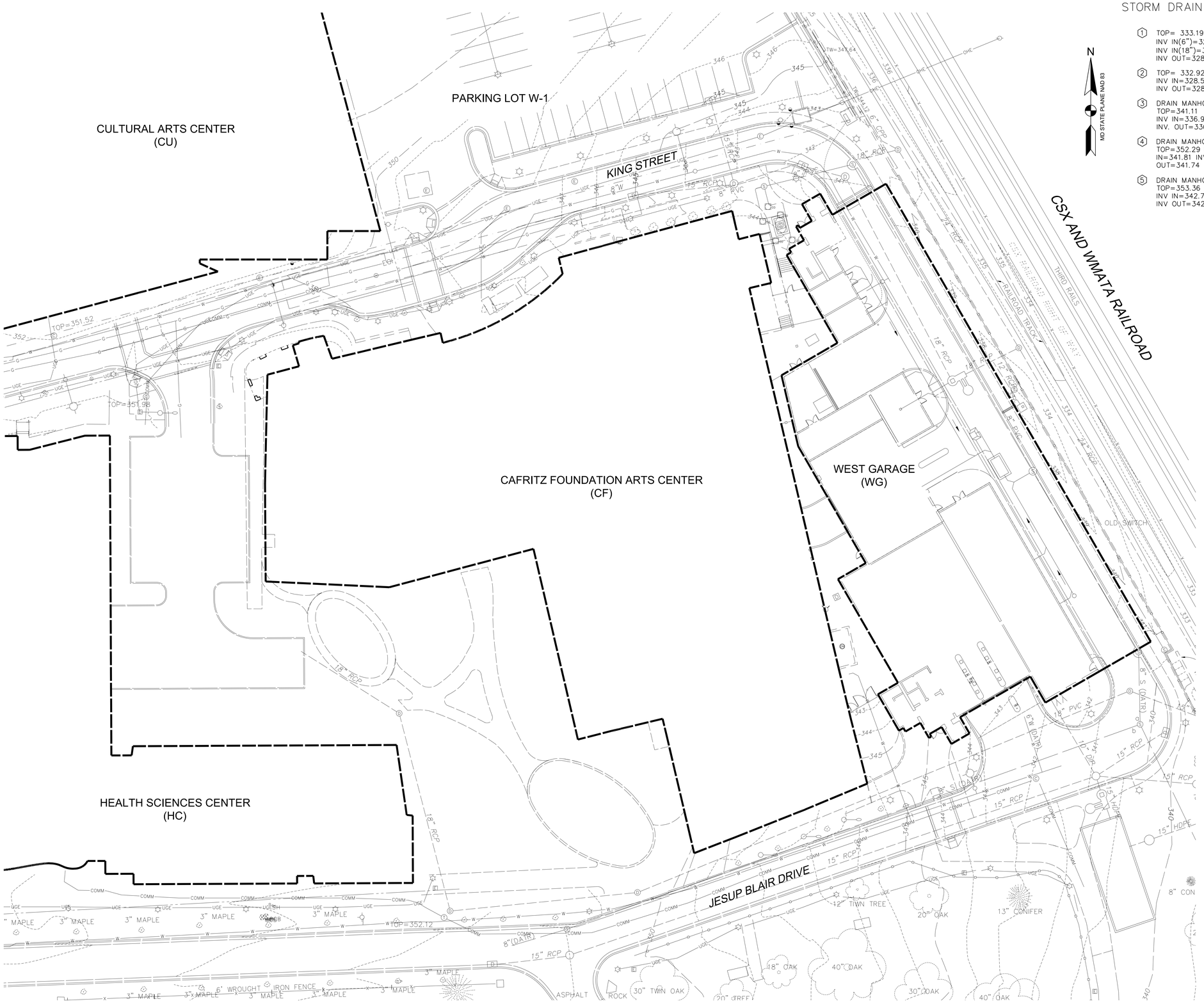
SHEET TITLE:

COVER SHEET

DRAWING NO:

CS

BKM# 19103.02



STORM DRAIN DATA

1. TOP= 333.19
   INV IN(6")=329.69
   INV IN(18")=329.34
   INV OUT=328.59
2. TOP= 332.92
   INV IN=328.52
   INV OUT=328.07
3. DRAIN MANHOLE
   TOP=341.11
   INV IN=336.99
   INV. OUT=336.88
4. DRAIN MANHOLE
   TOP=352.29 INV
   IN=341.81 INV
   OUT=341.74
5. DRAIN MANHOLE
   TOP=353.36
   INV IN=342.71
   INV OUT=342.50

SANITARY SEWER DATA

A. TOP= 343.03
   a INV IN=330.81
   b INV IN=330.81
   INV OUT=330.75
B. TOP= 341.45
   INV IN=330.55
   INV OUT=330.40
C. TOP= 334.95
   FULL OF WATER
D. SEWER MANHOLE
   TOP= 340.70
   INV. IN=327.82
   INV. OUT=327.70
E. SEWER MANHOLE
   TOP=340.52
   FULL OF WATER
   INV=327.93(DATR)
F. SEWER MANHOLE
   TOP=340.45
   a INV IN=327.56(DATR)
   b INV IN=330.56(DATR)
   b INV IN=327.70(DATR)
   INV OUT=327.56(DATR)
G. SEWER MANHOLE
   TOP=350.99
   ABANDONED
   INV IN=340.69
   INV OUT=340.54
H. SEWER MANHOLE
   TOP= 335.92
   INV. IN=325.42
   INV. OUT=325.12
J. TOP= 351.16
   INV IN=341.76
   INV OUT=341.65
K. TOP= 353.17
   INV=343.28(DATR)

PHONE
POLE
CLEAN OUT
ELEC. METER
YARD LIGHT
TRASH CAN
STORM MANHOLE
DRAIN
SIGN
VENT
TELEPHONE MANHOLE
COMMUNICATIONS MH
POWER POLE
LIGHT POLE
LAMP POST
ELECTRIC MANHOLE
ELEC. JUNC. BOX
SAN. SEW. MH
WATER VALVE
WATER MANHOLE
SPRINKLER HEAD
SPRINKLER CONTROL BOX
SIAMESE CONNECTION
MONITORING WELL
IRRIGATION VALVE
FIRE HYDRANT
GAS VALVE
HC SYMBOL
BOLLARD
TRAVERSE
TELE. LINE PAINT MAR
COMM. LINE PAINT MAR
ELECTRIC PAINT MARK
WATERLINE PAINT MARK
GAS LINE PAINT MARK
GUARDRAIL
FENCE
BENCHMARK

NOTE: THIS IS NOT A BOUNDARY SURVEY, PROPERTY INFORMATION SHOWN HEREON IS FROM AVAILABLE RECORDS AND INFORMATION PROVIDED BY OTHERS.

SURVEY CONTROL:

POINT	NORTHING	EASTING	ELEV
600	480658.626	1304916.337	–
924	480333.090	1305252.790	347.62
1	480932.850	1304704.495	349.58
920	480987.047	1305038.963	–
100	480775.237	1305450.964	380.17
101	480996.772	1305137.326	364.06
102	480278.836	1304797.406	354.98
105	480413.596	1304845.162	353.98
935	480483.065	1305440.106	339.47

BENCH MARK TABULATION:

NO.	ELEV.	DESCRIPTION
1	349.84	SQUARE CUT IN CSX RETAINING WALL
2	349.99	SQUARE CUT ON LIGHT POLE BASE IN JESUP BLAIR PARK

SCALE: 1"=20'

bkm
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SEAL:

STATE OF MARYLAND · MICHAEL CHARLES WYCHULIS · 32561 · PROFESSIONAL ENGINEER
06/06/2024

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32561, EXPIRATION DATE: 01/06/26.

ISSUED FOR:

DATE:	DESCRIPTION:
08/09/2023	100% CONSTRUCTION DOCUMENTS
06/06/2024	PERMIT SUBMISSION

PROJECT NO: AMT # 23-0018.001

SCALE: 1" = 10'

DRAWN BY: NS

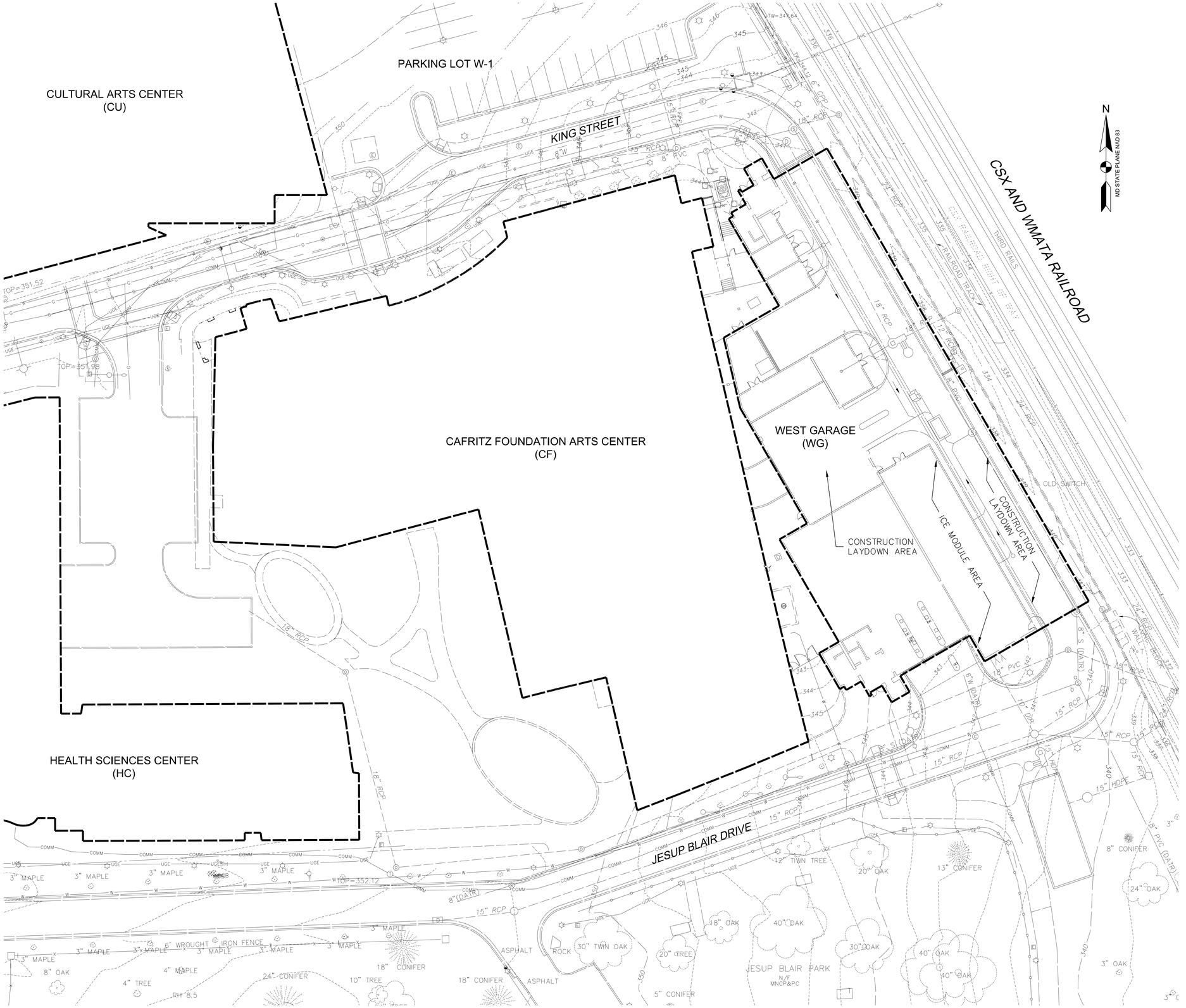
CHECKED BY: MCW

DATE: 06/06/2024

SHEET TITLE:
EXISTING CONDITIONS PLAN

DRAWING NO:
VF-101

BKM# 19103.02



EXISTING CONDITIONS LEGEND:

	PHONE
	POLE
	CLEAN OUT
	ELEC. METER
	YARD LIGHT
	TRASH CAN
	STORM MANHOLE
	DRAIN
	SIGN
	VENT
	TELEPHONE MANHOLE
	COMMUNICATIONS MH
	POWER POLE
	LIGHT POLE
	LAMP POST
	ELECTRIC MANHOLE
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	SPRINKLER CONTROL BOX
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	MONITORING WELL
	IRRIGATION VALVE
	FIRE HYDRANT
	GAS VALVE
	HC SYMBOL
	BOLLARD
	TRAVERSE
UGT	TELE. LINE PAINT MAR
COMM	COMM. LINE PAINT MAR
UGE	ELECTRIC PAINT MARK
W	WATERLINE PAINT MARK
G	GAS LINE PAINT MARK
	GUARDRAIL
X	FENCE
	BENCHMARK

MISS UTILITY
48 HOURS BEFORE YOU DIG
CALL "MISS UTILITY" AT 811
OR LOG ON TO www.missutility.net

Know what's below. Call before you dig.

0 10' 20' 40'
SCALE: 1"=20'

bkm
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SEAL:

STATE OF MARYLAND · MICHAEL CHARLES WYCHULIS · 32561 · PROFESSIONAL ENGINEER

06/06/2024

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ISSUED FOR:

DATE:	DESCRIPTION:
08/09/2023	100% CONSTRUCTION DOCUMENTS
06/06/2024	PERMIT SUBMISSION

PROJECT NO: AMT # 23-0018.001

SCALE: 1" = 20'

DRAWN BY: AMT

CHECKED BY: MCW

DATE: 06/06/2024

SHEET TITLE:
SITE UTILITY PLAN

DRAWING NO:
CS-101

BKM# 19103.02

APPROVED
Department of Permitting Services

DPS ELECTRONIC STAMP:

A. **Codes and Standards**

1. Overall Design Codes
   a. Maryland Building Performance Standards 2018 – IBC 2018
   b. ICC IEBC-18 "International Existing Building Code"
   c. ASCE 7-16 "Minimum Design Loads and Associated Criteria for Buildings"
2. Masonry Construction
   a. TMS 402-13 or 402-16 "Building Code Requirements for Masonry Structures"
   b. TMS 602-13 or 602-16 "Specification for Masonry Structures"
3. General Standards
   a. ASTM American Society For Testing And Materials (Current Edition Per Section)
   b. UL Underwriters Laboratories (Current Edition Per Assembly)

B. **Project Scope**

Removal and replacement of a wall to allow removal and replacement of mechanical equipment

C. Design loads

1. Risk category — II

2. Live loads
   - Slab on grade — 40 psf (existing)
   - Typical Floor — 40 psf (existing)
   - Typical Roof — 66 psf (existing)

3. Superimposed dead loads (sdl)
   - Typical floor — 3 psf (existing)

4. Snow loads
   - Ground snow load — pg = 30 psf (existing)
   - Snow importance factor — I = 1.0
   - Snow exposure factor — Ce = 1.0
   - Snow thermal factor — Ct = 1.2
   - Flat roof snow load — pf = 26 psf
   - Snow drift / slope calculation per asce 7 (in excess of flat roof live load)

5. Lateral earth pressures
   - At rest equiv. Fluid pressure — 65 psf/ft (existing)
   - Active equiv. Fluid pressure — 45 psf/ft (existing)

6. Wind loads design data (existing per ASCE 7-05)
   - Nominal design wind speed — 90 mph
   - Wind exposure — B
   - Internal pressure coeff. — +/- 0.18
   - Wind Load Importance Factor — 1.0

7. Earthquake load design data (existing per ASCE 7-05)
   - Seismic import. Factor — 1.0
   - Seismic site class — D
   - Mapped spectral resp. acc. — Ss= 0.187 S1= 0.063
   - Design spectral response coeff. — Sds= 0.1496 Sd1= 0.0714
   - Seismic design category — B
   - Seismic force resist. System — Ordinary reinforced concrete walls
   - Response modification factor — R= 5
   - Seismic response coefficient — Cs= 0.0299
   - Seismic analysis procedure — Equivalent lateral force
   - seismic base shear — 591 kips

8. No part of the building shall be used as a staging area resulting in a load (under the limited loaded area) that exceeds the design live load.

9. Increases to mass and/or profile and reductions in member capacity meet the provisions of IEBC chapter 4, therefore the existing lateral force resisting system remains adequate for the modified building. Verification of the overall wind and/or seismic system is beyond the scope of these documents.

D. **General**

1. All details, sections & notes shown on drawings are intended to be typical and shall apply to similar conditions elsewhere unless otherwise indicated.
2. Do not scale drawings. Where beam / joist spacings are not dimensioned it is permissible to assume equal spacing between dimensioned points. Any assumptions made must be highlighted on shop drawings for review.
3. Structural elements shown at grid lines are intended to be located on those grid lines UON.
4. No change in size, dimensions or position of structural elements shall be made, nor shall any openings or sleeves be permitted through any structural element without the written approval of the Engineer, unless they are detailed and specifically noted as "changes to the contract documents", on the (reviewed and accepted) structural shop drawings of the affected elements.
5. Provide separate shop drawings indicating all penetrations through the structural elements for approval by the structural Engineer prior to or concurrent with the submission of the shop drawings of the affected elements.
6. Refer to Architectural, Civil & MEP drawings for locations and dimensions of chases, inserts, openings, sleeves, drips, reveals, finishes, depressions, partitions, doors, expansion joint filler material, extent of excavation, dewatering and other such project requirements not shown on the structural drawings.
7. The contractor shall field verify all existing conditions and dimensions before starting construction and/or submitting shop drawings for approval. Any discrepancies must be reported to the Architect.
8. The contractor shall take all necessary measures to protect existing and new utilities and shall assume full responsibility for any damage during construction.
9. The contractor is solely and completely responsible for the safety at the job site and shall comply with the department of labor safety and health regulations for construction promulgated under the occupational safety and health act.
10. The contractor shall design, provide and maintain any temporary shoring and bracing necessary to properly and safely construct the building and underground utilities. Temporary shoring and bracing must remain in place until structural members affected are properly cured, aligned, and connected (as applicable).The Contractor is solely and completely responsible for sequencing and site coordination. This also includes timely notification and providing access for any required inspections.
11. The size of existing structural elements has not been confirmed at the time of the design. These structural documents have been prepared based on the assumption that as-built drawings provided by the College represent the actual construction on site. The contractor must verify these assumptions prior to proceeding with the construction of the new work. Any discrepancies must be reported to the Architect.
12. Existing structural elements have not been checked to confirm that they can support the code specified loads, except those that are directly affected and loaded by the addition and renovation scope of work indicated in these structural drawings.

E. **Demolition**

1. The contractor is fully responsible for means and methods of demolition, including the integrity and stability of the existing structure during demolition operations.
2. The contractor is responsible for repairs to any structural elements not intended to be demolished that have been damaged during the demolition process. These repairs shall be at no additional cost to the owner. All repair work shall be designed and inspected by a licensed professional Engineer in the project's jurisdiction. Repair measures must be submitted to the design team for review prior to commencement of repair work.
3. All elements not specifically noted to be demolished shall remain in their current condition.
4. All existing framing is indicated for reference only and shall be verified in field by the contractor. Determine exact nature and extent of demolition on site by comparing existing construction to contract document requirements, and report any discrepancies to the design team.
5. The contractor shall use qualified, experienced personnel for demolition and removal operations. Perform all demolition and removal in a careful and orderly manner.
6. Do not permit uncontrolled fall of debris or portions of the structure scheduled for removal. All waste removal must be handled to avoid impact loading on adjacent or lower structural elements.
7. Prior to the start of work, verify that scope of demolition indicated on contract documents does not damage, cut, or disrupt services or utilities noted to remain in operation. Verify that any services or utilities to be removed have been properly capped / disconnected prior to removal.
8. Where new openings in existing concrete slabs or walls are to be cut, core holes at corners of the new opening and connect holes with saw cuts. Do not perform saw cuts prior to installation of all required new structural framing and/or reinforcing noted on the plan / section. Saw cutting shall be performed in straight lines only, and shall not extend past the boundaries of the new opening.

F. **Foundation**

1. Geotechnical report was prepared by Froehling & Robertson, dated August 15, 2007, however this report was not made available to the design team and therefore has not been reviewed.
2. The building foundation systems and allowable bearing capacities are:
   Spread Footings designed at 3000 psf
   Drilled Piers designed at 50 ksf

G. **Masonry**

1. Hollow concrete masonry units must conform to ASTM C90. Units shall have a minimum net area compressive strength of 2600 psi and be compatible with a prism strength f'm of 2000 psi.
2. All new masonry units light-weight, subject to required fire resistance rating criteria in NCMA TEK 02-06.
3. Mortar for all masonry walls shall be lime-cement mortar formulated in accordance with ASTM C270, and the following types:
   a. Concrete masonry at or below grade: type M.
   b. Exterior, bearing, or shear walls: type S.
4. Grout for grouted and reinforced walls shall be mixed in accordance with ASTM C476, and have 3,500 psi minimum strength and 8" minimum slump.
5. Provide galvanized ladder type masonry wall ladder type joint reinforcing complying with ASTM A82, with minimum diameter and maximum spacing per typical details.
6. All top connections of non-load bearing masonry partitions to structure must be of type that provides a 1" soft joint for independent vertical and horizontal (parallel to wall) movement of the structure above.
7. All masonry vertical reinforcing splices to be 48 bar diameters.
8. All masonry horizontal joint reinforcing splices to be 8" minimum.
9. In walls with vertical reinforcing provide additional reinforcing equivalent to half of the reinforcing interrupted by the opening on each side of all openings.
10. All reinforced masonry walls must be specially inspected.
11. Mortar bedding for running bond masonry shall be as follows:
    a. First course of masonry to be fully bedded in mortar.
    b. Fully bed all face shells and webs at all courses in reinforced walls.
    c. Bed horizontal and vertical face shells at all courses of unreinforced walls.
    d. Mortar all collar joints solid whenever wythes are separated by less than 1".
12. Grouting for hollow concrete masonry shall be as follows:
    a. At masonry anchors, fill voids solid with mortar around all anchors, to 8" above and below anchor.
    b. Fill all reinforced cells over the full height of the wall.
    c. Fill all bond beams over the full width of the wall. Break bottom shell at reinforced cells to allow both reinforcing and grout to pass between wall and bond beam.
    d. Grout one cell for every two fully interrupted blocks on either side of openings in unreinforced walls, over the full height of the wall.
    e. Grouting in lifts higher than 5'-0" is not permitted in walls of 8" cmu or thinner.
13. Owner or Owner's Designated Representative shall hire an independent inspector to carry out all inspections shown on the Schedule of Special Inspections. These inspections shall include at a minimum:
    a. Size and placement of all bearing and exterior CMU
    b. Size, placement, and grouting of all vertical reinforcing.
    c. Size, placement, and mortaring of all horizontal joint reinforcing.
    d. Size, grouting, and reinforcing of all horizontal bond beams.

H. **Post-installed anchors and rebars**

1. Aside from noted products below, substitution requests with detailed supporting literature and ICC-ES reports must be submitted for SER approval prior to procurement. Acceptance of substitution is at SER discretion.
2. All anchors and rebars installed in hardened concrete or masonry construction shall conform to the following:
   a. Epoxy anchoring system in solid grouted CMU or clay masonry shall one of the products below, with embedment of 12 bar diameters UON. Do not anchor to hollow CMU or across unmortared collar joints. Use screen tubes as per manufacturer's recommendations.
      i. Hilti HIT-HY-270.
      ii. DeWalt AC100+ gold
      iii. ITW/RedHead A7+
   b. Screw anchors into concrete or solid grouted cmu shall be one of:
      i. Hilti Kwik-HUS-EZ or Kwik-HUS-EZ-I.
      ii. DeWalt Screw-bolt+.
      iii. ITW/RedHead LDT or Tapcon+.
   c. Other types of anchors shall be the product noted on drawings. Substitution must be approved by SER.
3. For all epoxy anchors, steel element shall be continuously threaded rod, complying with ASTM A36, A307, F1554-36, or Hilti HAS-E. UON.
4. Do not install anchors in concrete less than 21 days old or concrete that has not r reached full design strength without specific approval of SER.
5. All anchors must be installed according to manufacturer recommendations, as included with the anchor packaging.
6. Anchors have been designed for installation in hammer-drilled dry holes UON. Any other installation requires prior approval from SER.
7. All persons involved in anchor installation must be certified for anchor products specified. Submit certification for record. Acceptable certifications are:
   a. ACI certified adhesive anchor installer.
   b. Manufacturer's advanced installation certificate.
8. Anchor holes deeper than 12" and overhead anchors must be installed using piston plugs.
9. Existing reinforcing bars within concrete substrate must be located and not cut unless SER indicates that bars may be cut.
10. Do not violate as detailed anchor spacing or distance to edge of concrete without SER approval.

I. **Hangers and supports**

1. Unless explicitly designed to cantilever and marked as such on relevant shop drawings, all non structural elements shall be braced to structure at no less than two points, spread apart by no less than 2/3 of the length of the element. Bracing to non-structural elements is acceptable if and only if the bracing element is designed by a professional Engineer to resist applicable bracing loads.
2. The web and bottom flanges of steel beams and joists shall not be used for the lateral support of cladding, supported, and suspended systems unless kicker to the diaphragm is provided at the point of bracing. The slope of the kicker shall not be steeper than 2 horizontal to 1 vertical.
3. All hangers for piping, ductwork conduits, equipment, etc. Shall comply with MSS SP-58, mechanical specifications, and the requirements of this section:
   a. Where elements must be hung from structure and structure is not conveniently located, contractor shall design and provide appropriate subframing for direct support of elements.
   b. Anchors must be distributed to produce a uniform load of no greater than 10 pounds per square foot (30 pounds per square foot above mechanical rooms).
   c. Concrete cast in place slabs and precast elements
      i. Anchors for hung elements shall be sized by contractor based on elements supported.
      ii. Where post-tensioning tendons exist, scan for reinforcing prior to placing anchors and do not disturb tendons.
   d. Hanger requirements
      i. All anchors into concrete shall be in compliance with section on post-installed anchors.
      ii. Maintain manufacturer's recommended concrete cover / clearance / spacing on all anchors.
      iii. All equipment and pipes 6" nominal diameter and larger must be supported by anchors that concentrically load structural elements (i.e. no c-clamps to ends of flanges).
      iv. Where c-clamps are used they must attach to the top flange of beams/joists.
4. Structural systems have not been designed to mitigate vibrations due to reciprocating machinery unless specifically noted as such. Any equipment that will generate objectionable vibrations must be isolated from the structure with appropriate isolators.
5. Connections of non-structural elements and/or cladding to building structure are assumed to transfer vertical and horizontal loads only. Where connections are marked as lateral clips, they are assumed to transfer only horizontal loads. Any moments or torsions due to eccentric mounting must be resisted with appropriate supplementary bracing, which must be shown on the shop drawings prior to submission for review.

J. **Testing and inspections**

1. The Owner or Owner's Designated Representative must hire an independent, qualified testing and inspection agency to provide inspections and material testing as required by the applicable code.
2. The Engineer may visit the site to generally observe the construction progress and to provide construction assistance. Such visits are not to be construed as meeting the inspection requirements unless the Engineer states so in writing.
3. See individual material specifications for specific information on testing required.
4. Cast and test cubes of all mortar and grout to confirm the required 28 day minimum strength according to the latest applicable ASTM specifications.
5. All concrete and masonry reinforcing must be inspected in place prior to concrete and grout casting.

K. **Submittals**

1. Shop drawings of all structural elements shown on the contract documents must be submitted by the contractor for the Engineer's review.
2. For all elements that require design by or the supervision of a professional Engineer, the contractor must submit a certification letter signed and sealed by the professional Engineer stating that the design and detailing of the referenced elements meet the requirements of the code, applicable standards and the contract documents.
3. At the time the submittal is submitted the contractor must inform the Engineer in writing of any deviations or omissions from the contract documents.
4. Reproduction of the structural documents for use as shop drawings is not permitted.

L. **Abbreviations**

AB = ANCHOR BOLT
A/E = ARCHITECT/ENGINEER
BTW = BETWEEN
BF = BOTTOM FACE
BOD = BOTTOM OF DECK
BW = BOTH WAYS
CJ = CONTROL JOINT
CL = CENTER LINE
CLR = CLEARANCE, CLEAR
DB = REINFORCING BAR DIAMETER
DBA = DEFORMED BAR ANCHOR
DL = DEAD LOAD
EA = EACH
EE = EACH END
EF = EACH FACE
EJ = EXPANSION JOINT
EL = ELEVATION
ES = EACH SIDE
EW = EACH WAY
EX = EXISTING
FF = FINISHED FLOOR
FOW = FACE OF WALL
FS = FAR SIDE
GA = GAUGE
HDG = HOT DIP GALVANIZED
HP = HIGH POINT
IF = INSIDE FACE
JT = JOINT
LG = LONG
LP = LOW POINT
LWT = LIGHTWEIGHT
LLH = LONG LEG HORIZONTAL
LLV = LONG LEG VERTICAL
LW = LONG WAY
MC = MOMENT CONNECTION
MEP = MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION
NS = NEAR SIDE
NW = NORMAL WEIGHT
OC = ON CENTER
OF = OUTSIDE FACE
OSL = OUTSTANDING LEG
P/C = PRECAST CONCRETE
PT = POST-TENSIONED
SER = STRUCTURAL ENGINEER OF RECORD
SMP = SOLID MASONRY PEDESTAL/PIER
SP = SPACING
SS = STAINLESS STEEL
SW = SHORT WAY
T/xxx = TOP OF ELEMENT xxx
TYP = TYPICAL
UON = UNLESS OTHERWISE NOTED
VIF = VERIFY IN FIELD
W/ = WITH
W/O = WITHOUT
W.P. = WORKING POINT
WWF = WELDED WIRE FABRIC

Schedule of Special Inspections – MCT TPSS Ice Storage Replacement

Material / Activity	Description of Inspection	Y / N	Firm / Agent	Continuous	Periodic	Referenced Standard	IBC Reference
General							
Pre-Construction Conference	Meeting / Conference to discuss special inspections	Y			X		Ch. 17.
Post-Installed Anchors							
Mechanical anchors installed in hardened concrete	Field Inspection of type, size, location, Installation, etc.	Y			X	ACI 318	1705, Ch. 19.
Adhesive anchors installed in hardened concrete	Field Inspection of type, size, location, installation procedure, etc.	Y		X		ACI 318	1705, Ch. 19.
Masonry							
Materials	Field Inspection of approved material application, including Unit size, weight, strength etc.	Y			X	ACI 530	1705, Ch. 21.
Mortar / Grout	Field Inspection of type, strength, cleanness of grout space and mortar bedding, etc.	Y			X	ACI 530	1705, Ch. 21.
Reinforcing steel	Field Inspection of grade, size, configuration, location, quantity, spacing, cover, finish, etc.	Y			X	ACI 530	1705, Ch. 21.
Embedded Items / bolts	Field Inspection prior and during placement of size, quantity, location, orientation etc.	Y		X		ACI 530	1705, Ch. 21.
Grout / Mortar Strength	Field and Lab testing, inspections, and evaluation of in-place grout and mortar strength	Y		X		ACI 530	1705, Ch. 21.
Lintels / Control joints	Field Inspection of Size, Location, Orientation etc.	Y			X	ACI 530	1705, Ch. 21.
Mortar / Grout placement	Field Inspection of operations and procedures including requirements of hot / cold weather protection, curing, etc.	Y		X		ACI 530	1705, Ch. 21.
Anchorage	Field Inspection of anchorages Size, Location, etc.	Y			X	ACI 530	1705, Ch. 21.
Notes / Definitions:							
1. "Continuous" Inspection - Full-time special inspection while the work is being executed							
2. "Periodic" Inspection – Part-time or Intermittent special inspection where the work has been or being executed. 100% of the work / material must be inspected regardless the frequency of inspections, unless lesser is permitted by the specific material specifications.							
3. "SER" - Structural Engineer of Record							
4. All inspections must be made to verify compliance with Contract Documents and any notes made by the SER on the approved shop drawings							
5. All items listed under "Description of Inspections" above are minimum requirements. Additional items per code and standard practice shall be included.							
6. Refer to project specifications, in addition to code references, for inspection and testing frequency, techniques, etc.							

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PROJECT NAME:

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SEAL:

MCT - Ice Module Repl.
2024-06-06

PROFESSIONAL CERTIFICATION.
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 24086
EXPIRATION DATE: 02-01-2025

ISSUED FOR:

DATE:	DESCRIPTION:
08/09/2023	100% CONSTRUCTION DOCUMENTS
06/06/2024	ISSUED FOR PERMIT

PROJECT NO: A+F # 21026.00

SCALE: AS NOTED

DRAWN BY: FA

CHECKED BY: JM

DATE: 06/06/2024

SHEET TITLE:

General Structural Notes & Sched. of Special Inspections

DRAWING NO:

S0.01

A+F# 21026.00

Plotted By: Svetlana Yuriditskiy | 10/21/2021 1:04 PM   ARL: G:\21034.06\Drawings\Acad\21034.06 TB

APPROVED
Department of Permitting Services
Permit # COMBUILD-1078469
Date 10/30/24

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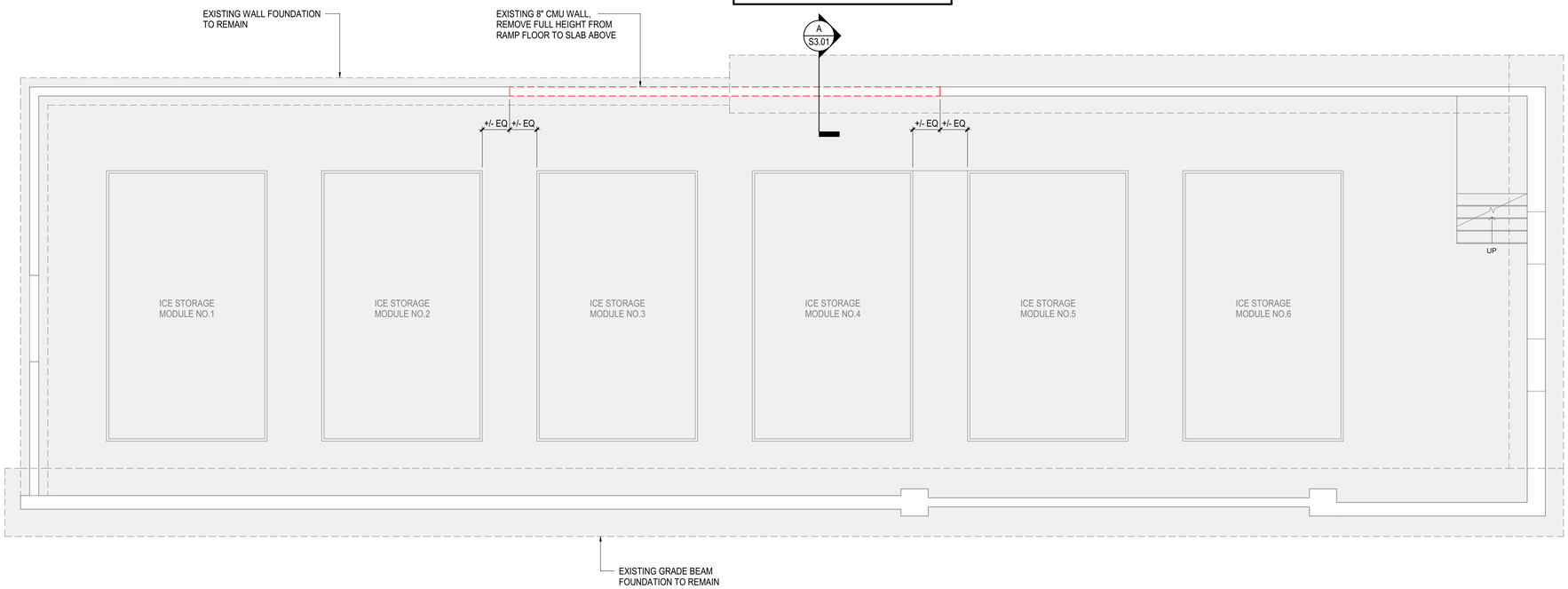
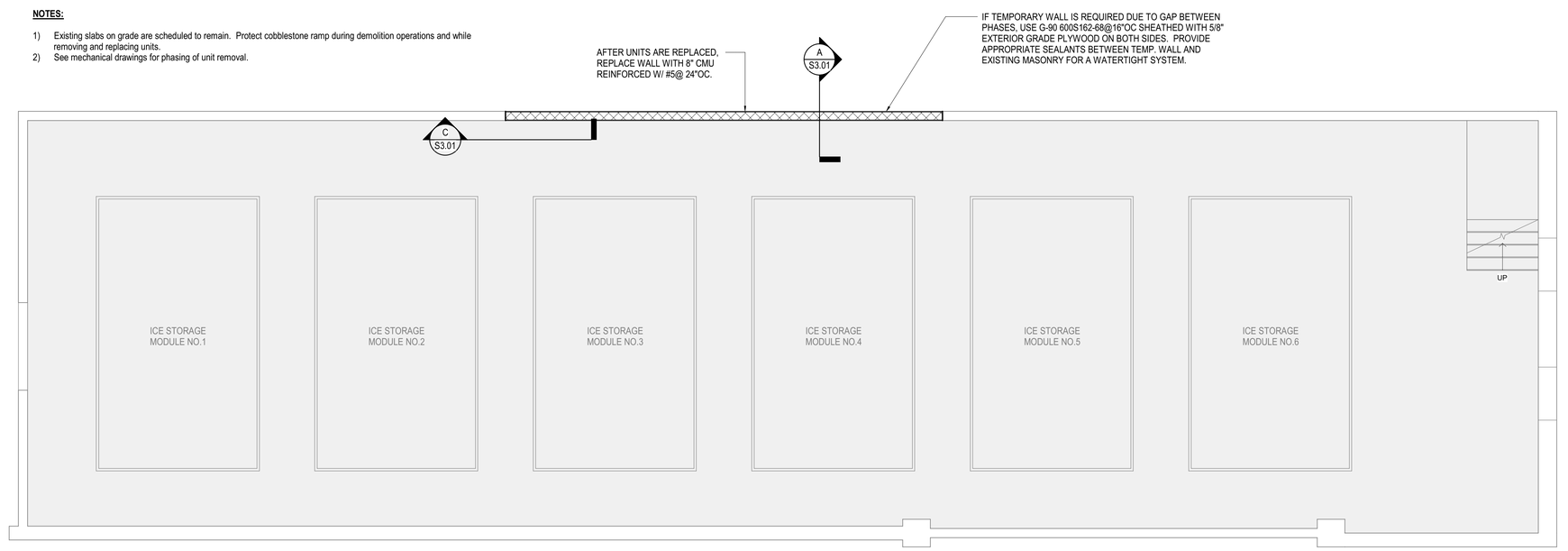


A STORAGE ROOM FLOOR PLAN - DEMOLITION

1/4" = 1'-0"

NOTES:

1) Existing slabs on grade are scheduled to remain. Protect cobblestone ramp during demolition operations and while removing and replacing units.
2) See mechanical drawings for phasing of unit removal.



B STORAGE ROOM FLOOR PLAN - NEW WORK

1/4" = 1'-0"

NOTES:

1) DRAWING REFLECTS THE PLAN FOR REMOVAL AND REPLACEMENT OF ALL ICE STORAGE UNITS. IF ONLY HALF OF THE UNITS ARE SCHEDULED TO BE REPLACED IN A PHASE, ADJUST EXTENTS ACCORDINGLY.
2) FOR PHASING PURPOSES, EDGE OF WALL MUST BE TREATED AS EXISTING PER THE DETAILS REGARDLESS OF WHETHER IT IS ORIGINAL CONSTRUCTION OR A PATCH PLACED IN PREVIOUS PHASE.

bkm
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STATE OF MARYLAND · JAMES E. MURPHY · 24086 · REGISTERED PROFESSIONAL ENGINEER

MCT Ice Module Repl.
2024-06-06

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PROJECT NO: A+F # 21026.00

SCALE: AS NOTED

DRAWN BY: FA

CHECKED BY: JM

DATE: 06/06/2024

SHEET TITLE:

Floor Plans

DRAWING NO:

S1.01

APPROVED
Department of Permitting Services
Permit # COMBUILD-1078469
Date 10/30/24
Stamped By: Rebecca Mason

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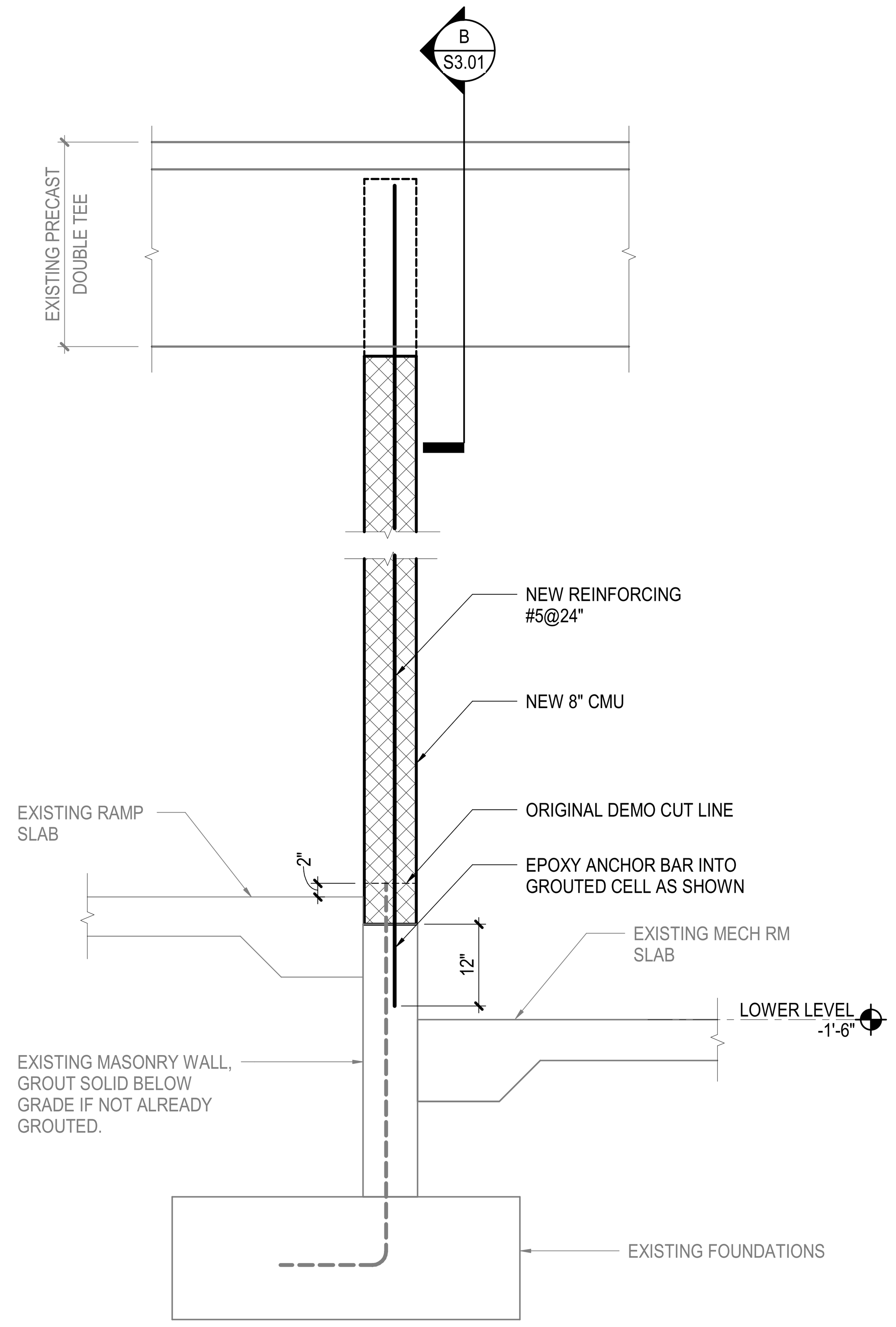
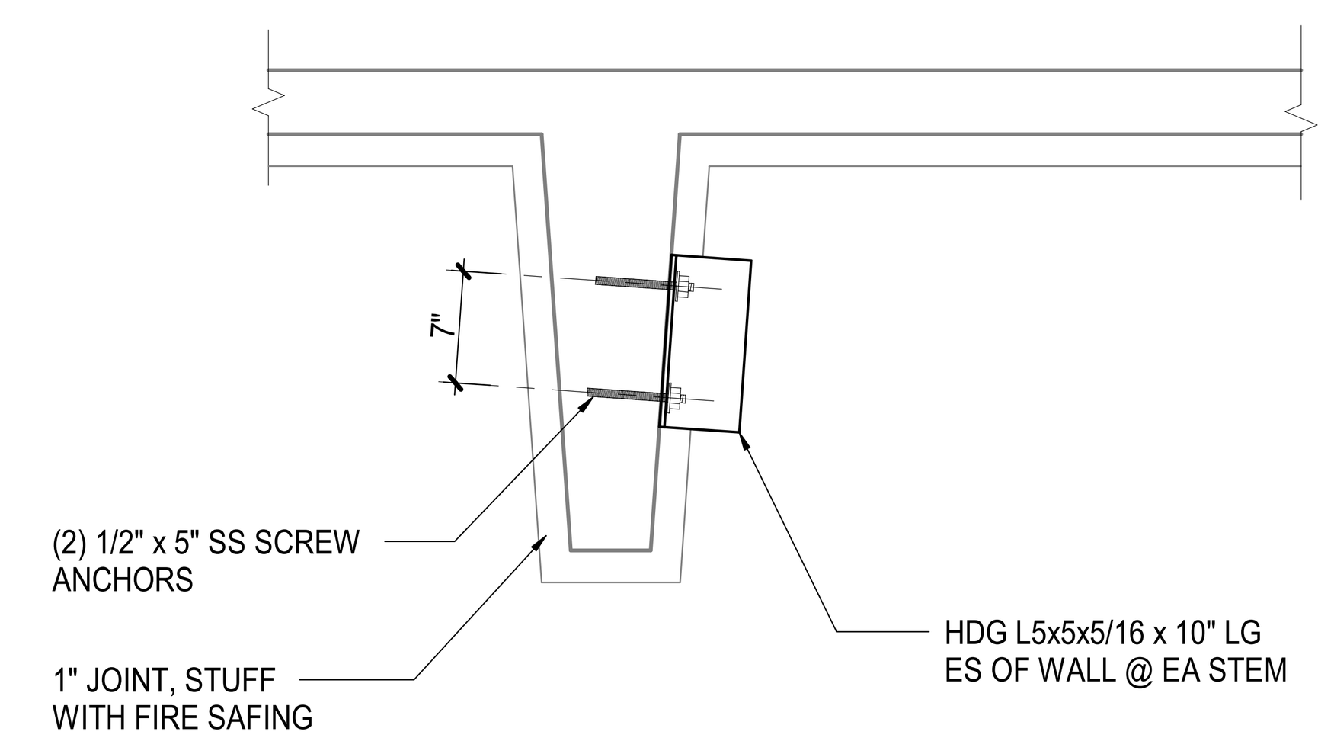


Sequence of Construction:

1) Saw cut sides of wall removal area at the nearest masonry joint.
2) Demolish wall in segments to 2" above the top of the ramp slab.
3) Remove and replace ice storage units per mech. drawings
4) Demolish wall down to first mortar joint below initial cut, maintain all existing vertical reinforcing. Step demo as required.
5) Epoxy anchor new reinforcing into cells of existing CMU
6) Rebuild wall as shown.

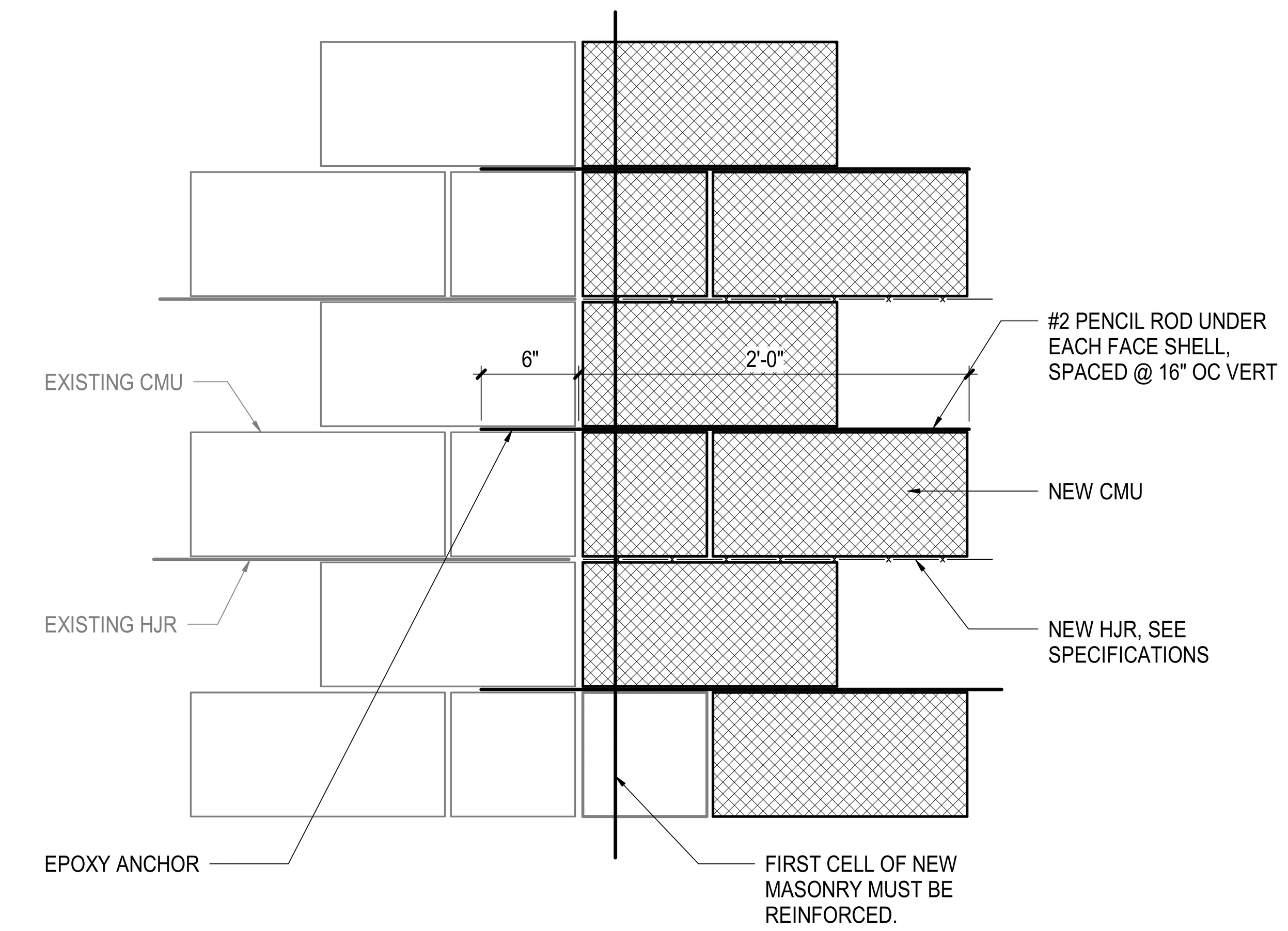
A WALL REPLACEMENT SECTION
3/4" = 1'-0"



NOTES:

1. CONTRACTOR OPTION: RETAIN AND RE-USE EXISTING T/WALL BRACING IN LIEU OF BRACING SHOWN.
2. SCAN FOR EXISTING REINFORCING IN TEE STEMS PRIOR TO DRILLING ANCHORS AND LOCATE ALL ANCHORAGE POINTS TO MISS EXISTING PT TENDONS.
3. DO NOT PLACE ANCHORS WITHIN THE BOTTOM 6" OF THE TEE STEM.

B TOP OF WALL BRACING DETAIL
1" = 1'-0"



C SIDE OF REBUILT WALL DETAIL
1 1/2" = 1'-0"

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SCALE: AS NOTED

DRAWN BY: FA

CHECKED BY: JM

DATE: 06/06/2024

SHEET TITLE:

Typical Details

DRAWING NO:

S3.01

Plotted By: Svetlana Yuridtskiy | 10/21/2021 1:04 PM ARL: G:\21034.06\Drawings\Acad\21034.06 TB

MECHANICAL GENERAL NOTES

1. THE MECHANICAL CONTRACT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO INDICATE SCOPE AND THE GENERAL ARRANGEMENT OF THE SYSTEMS. WHERE APPLICABLE THE FOLLOWING NOTES SHALL APPLY TO ALL MECHANICAL (HVAC) SYSTEMS.
2. THOUGH SOME PIPING OFFSETS AND TRANSITIONS ARE INDICATED, IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL OFFSETS AND TRANSITIONS REQUIRED. THE CONTRACTOR SHALL FULLY COORDINATE THE MECHANICAL WORK WITHIN ITSELF AND WITH THE WORK OF ALL OTHER TRADES TO PROVIDE COMPLETE AND OPERABLE SYSTEMS WITHOUT INTERFERENCES.
3. DEMOLISH ALL SYSTEMS AND EQUIPMENT INDICATED TO BE REMOVED BY DRAWINGS OR NOTES. WHERE EXISTING SYSTEMS ARE TO REMAIN IN USE, REMOVE ALL UNUSED PORTIONS OF THE SYSTEMS TO A POINT AS CLOSE TO THE REMAINING SYSTEMS AS POSSIBLE AND CAP WITH MATERIALS AND CONSTRUCTION MATCHING THE REMAINING SYSTEMS' CUT END.
4. REFER TO MECHANICAL DETAILS FOR TYPICAL EQUIPMENT CONNECTIONS.
5. PIPING CONNECTIONS TO COOLING COILS SHALL BE MADE TO PROVIDE COUNTER FLOW BETWEEN WATER AND AIR.
6. PATCH AND SEAL ALL REMAINING OPENINGS (NEW AND EXISTING) THROUGH FLOORS, CEILINGS, WALLS, AND ROOF RESULTING FROM DEMOLITION OR NEW WORK WITH MATERIALS AND FINISHES TO MATCH EXISTING CONSTRUCTION AND FIRE RATING.
7. AS AN INTEGRAL PART OF THESE DOCUMENTS, THE CONTRACTOR SHALL REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
8. CONTRACTOR SHALL VISIT THE SITE AND VERIFY EXISTING CONDITIONS PRIOR TO THE BEGINNING OF ANY WORK. FAILURE TO VISIT THE SITE SHALL IN NO WAY RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY.
9. CONTRACTOR SHALL USE CARE WHEN PERFORMING SELECTIVE DEMOLITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO BUILDING FINISHES, EQUIPMENT, FURNITURE, STRUCTURE, AND MECHANICAL/ELECTRICAL SYSTEMS AND EQUIPMENT. SHOULD ANY DAMAGE OCCUR THE CONTRACTOR SHALL RESTORE DAMAGED AREA/ITEMS TO ORIGINAL CONDITION TO MEET THE OWNER'S SATISFACTION.
10. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE OWNER ANY UTILITY OUTAGES. OWNER SHALL BE GIVEN A MINIMUM OF 72 HOURS NOTICE (THREE WORKING DAYS) FOR ANY OUTAGES.
11. HVAC SHALL BE MAINTAINED TO ALL AREAS OUTSIDE OF THE CURRENT PHASE OF THE RENOVATED AREA AT ALL TIMES. PROVIDE TEMPORARY CONNECTIONS AS REQUIRED TO COORDINATE OUTAGES WITH THE OWNER A MINIMUM OF 72 HOURS (THREE WORKING DAYS) IN ADVANCE.
12. DEMOLITION AND NEW WORK THAT WILL RESULT IN DOWN TIME OF SERVICES (HVAC, PLUMBING, ETC.) SHALL BE PERFORMED AT PREMIUM TIME AS REQUIRED TO MINIMIZE DOWN TIME TO ADJACENT SPACES. COORDINATE ALL OUTAGES WITH OWNER.
13. SCHEDULE ALL WORK IN OCCUPIED SPACES WITH OWNER AT LEAST TWO (2) WEEKS PRIOR TO CONSTRUCTION.
14. RETURN TO OWNER, AT THEIR DISCRETION, ALL UNUSED MECHANICAL EQUIPMENT (I.E. THERMOSTATS AND CONTROLS).
15. CONTRACTOR SHALL PRE-TEST EXISTING ICE MODULES TO DOCUMENT EXISTING WATER FLOW (CFM) AND TOTAL WATER PRESSURE DROP PRIOR TO START OF WORK. PROVIDE DOCUMENTATION OF TEST TO THE ENGINEER AND OWNER .
16. CONTRACTOR SHALL TEST/BALANCE ALL HYDRONIC EQUIPMENT AND DEVICES INDICATED ON THE DOCUMENTS. AIR SYSTEM EQUIPMENT AND DEVICES SHALL INCLUDE, BUT NOT BE LIMITED TO: HYDRONIC EQUIPMENT AND DEVICES SHALL INCLUDE, BUT NOT BE LIMITED TO: CHILLERS, COOLING TOWERS, CONDENSERS, HEAT EXCHANGERS, PUMPS, COILS, BALANCING VALVES, ETC. BALANCE ALL EQUIPMENT AND DEVICES TO THE WATER FLOWS (GPM) INDICATED ON THE DOCUMENTS (WHERE FLOWS ARE NOT CLEARLY INDICATED, CONTACT THE A/E FOR CLARIFICATION).
17. WHERE PIPING PENETRATES CONCRETE WALL, PROVIDE GROUND PENETRATING RADAR (GPR) SCAN TO IDENTIFY THE LOCATION OF REBAR. SUBMIT RESULTS TO OWNER AND ENGINEER FOR REVIEW.
18. WHERE PENETRATIONS OF STRUCTURAL WALLS, ETC. ARE ANTICIPATED, PROVIDE GROUND PENETRATING RADAR (GPR), OR OTHER APPROVED METHODS, TO DETERMINE THE LOCATION OF STRUCTURAL REINFORCEMENT. COORDINATE ALL PENETRATIONS WITH STRUCTURAL REINFORCEMENT AS REQUIRED TO AVOID DAMAGE TO THE REINFORCEMENT AS WELL AS TO MAINTAIN THE STRUCTURAL INTEGRITY OF ALL WALLS, ETC. SUBMIT TO STRUCTURAL ENGINEER FOR REVIEW.
19. WHERE MOTOR STARTERS AND/OR VARIABLE FREQUENCY DRIVES (VFD'S) ARE INDICATED FOR MECHANICAL EQUIPMENT, THEY SHALL COMPLY WITH ALL REQUIREMENTS OUTLINED WITH THE ELECTRICAL SPECIFICATIONS FOR MOTOR STARTERS AND VFD'S. WHERE MOTOR STARTERS AND/OR VFD'S ARE PROVIDED BY THE MECHANICAL CONTRACTOR, OR AS A PORTION OF A PACKAGED MECHANICAL UNIT, THE ELECTRICAL SPECIFICATIONS SHALL ALSO APPLY. ALL VFD'S FOR THE PROJECT, WHETHER PROVIDED BY THE MECHANICAL OR ELECTRICAL CONTRACTOR, SHALL BE PROVIDED BY A SINGLE MANUFACTURER, AND SHALL INCLUDE THE SAME FEATURES AND OPTIONS.
20. CONTRACTOR SHALL REMOVE, REINSTALL AND/OR RELOCATE ANY EXISTING CONDUIT, PIPING SYSTEMS, DUCTWORK, TELECOMMUNICATIONS WIRING, HANGERS/SUPPORTS, ETC. AS REQUIRED TO ACCOMPLISH THE MECHANICAL WORK INDICATED.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECOVERY, STORAGE AND RE-USE OF THE PROPYLENE GLYCOL WATER MIXTURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLY OF THE 70/30 WATER/PROPYLENE GLYCOL MAKE-UP. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR DRAINING AND DISPOSING OF ICE BATH WATER IN THE MODULES THAT HAS BEEN CONTAMINATED WITH GLYCOL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION, REMOVAL AND DISPOSAL OF THE OLD MODULES.

GENERAL PHASING NOTES

1. CONTRACTOR SHALL DEVELOP PHASING PLAN FOR APPROVAL BY THE COLLEGE AND ENGINEER PRIOR COMMENCING WORK.
2. THREE ICE MODULES SHALL BE KEPT IN OPERATION AT ALL TIMES.
3. OUTAGES WHICH REQUIRE ICE PLANT TO BE OFFLINE SHALL BE PERFORMED DURING OFF HOURS AND COORDINATED WITHE COLLEGE.
4. SUGGESTED PHASING PLAN INCLUDES REMOVAL AND INSTALLATION OF EXISTING MODULES 1, 2, AND 3 AND NEW MODULES 1, 2, AND 3. EXISTING MODULES 4, 5, AND 6 SHALL REMAIN IN OPERATION. ONLY AFTER NEW MODULES 1, 2, AND 3 HAVE BEEN INSTALLED AND SYSTEM COMMISSIONED COMPLETELY, ICE MODUES 4, 5, AND 6 SHALL BE REMOVED AND NEW MODULES 4, 5, AND 6 INSTALLED.

MECHANICAL ABBREVIATIONS

ABOVE FINISHED FLOOR	AFF	GLYCOL WATER RETURN	GWR
ARCHITECTURAL	ARCH	HEIGHT	H
AUTOMATIC TEMPERATURE CONTROLS	ATC	HORSEPOWER	HP
BUILDING AUTOMATION SYSTEM	BAS	KILOWATT	KW
BACK-FLOW PREVENTER	BFP	LENGTH	L
BRAKE HORSEPOWER	BHP	POUNDS	LBS
BRITISH THERMAL UNIT	BTU	LOCKED ROTOR AMPS	LRA
BRITISH THERMAL UNITS PER HOUR	BTUH	LEAVING WATER TEMPERATURE	LWT
CAPACITY	CAP	MAXIMUM	MAX
CONDENSER WATER SUPPLY	CS	THOUSAND BRITISH THERMAL UNITS PER HOUR	MBH
CONDENSER WATER RETURN	CR	MINIMUM CIRCUIT AMPACITY	MCA
COOLING TOWER	CT	MECHANICAL EQUIPMENT ROOM	MER
COLD WATER (DOMESTIC)	CW	MAXIMUM FUSE SIZE	MFS
CHILLED WATER SUPPLY	CWS	MINIMUM	MIN
CHILLED WATER RETURN	CWR	MAXIMUM OVERCURRENT PROTECTION	MOP
CONNECT TO EXISTING	CX	NORMALLY CLOSED	NC
DRY BULB	DB	NOT IN CONTRACT	NIC
DIFFERENTIAL BYPASS VALVE	DBV	NORMALLY OPEN / NUMBER	NO
DESIGNATION	DESIG	POUNDS PER SQUARE INCH	PSI
DIAMETER	DIA	PRESSURE	PRESS
DOWN	DN	QUANTITY	QTY
DIFFERENTIAL PRESSURE SENSOR	DPS	RELATIVE HUMIDITY	RH
DRAWING(S)	DWG	REDUCED PRESSURE BACK-FLOW PREVENTER	RPBFP
ENERGY EFFICIENCY RATIO	EER	REVOLUTIONS PER MINUTE	RPM
ENERGY MANAGEMENT CONTROL SYSTEM	EMCS	REMOVE EXISTING	RX
EXISTING TO REMAIN	ETR	TESTING AND BALANCING	TAB
ENTERING WATER TEMPERATURE	EWT	TYPICAL	TYP
FULL LOAD AMPS	FLA	UNLESS OTHERWISE NOTED	UON
FINS PER INCH	FPI	VOLTS	V
FEET PER MINUTE	FPM	VARIABLE FREQUENCY DRIVE	VFD
FEET	FT	WIDTH	W
FLOW METER	FM	WET BULB	WB
GALLON(S)	GAL	WATER COLUMN	WC
GALLONS PER MINUTE	GPM	WATER GAUGE	WG
GLYCOL WATER SUPPLY	GWS	WATER PRESSURE DROP	WPD

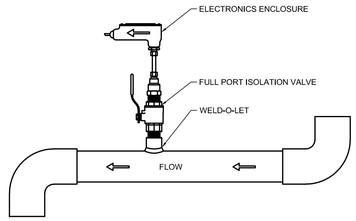
MECHANICAL LEGEND

COLD WATER (CW)	TEE
CHILLED WATER SUPPLY (CWS)	THERMOMETER
CHILLED WATER RETURN (CWR)	UNION
CONDENSER WATER SUPPLY (CS)	PIPING CAP
CONDENSER WATER RETURN (CR)	CONCENTRIC REDUCER
GLYCOL WATER SUPPLY (GWS)	ECCENTRIC REDUCER
GLYCOL WATER RETURN (GWR)	MANUAL AIR VENT
COOLING TOWER SUPPLY (CTS)	AUTOMATIC AIR VENT
COOLING TOWER RETURN (CTR)	PIPE GUIDE OR SLEEVE
CONDENSATE DRAIN LINE (CD)	PIPE ANCHOR
CHECK VALVE	PIPING ELBOW DOWN
BALL VALVE	PIPING ELBOW UP
GATE VALVE	PIPE CONNECTION BOTTOM
BUTTERFLY VALVE	PIPE CONNECTION TOP
GLOBE VALVE	FLOOR CLEANOUT (CO)
BALANCING VALVE W/ FLOW METER FITTING (VENTURI TYPE)	WALL CLEANOUT (CO)
MULTI-PURPOSE VALVE	HOSE-END VALVE
3-PORT MODULATING CONTROL VALVE	VALVE IN VERTICAL POSITION
2-PORT MODULATING CONTROL VALVE	HEAT TRACED AND INSULATED PIPE
RELIEF VALVE	FLOOR DRAIN (FD)
BACKFLOW PREVENTER	FLEXIBLE CONNECTION
BUCKET STRAINER	LIMIT OF DEMOLITION
Y-STRAINER W/HOSE-END VALVE	CONNECT TO EXISTING
FLANGED CONNECTION	FLOW METER (FM)
GAUGE AND VALVE	
TEMPERATURE/PRESSURE TEST PORT	

ICE STORAGE MODULE SCHEDULE

DESIG	TYPE	THERMAL STORAGE CAPACITY (TON/HR)	COOLANT	COOLANT FLOW (GPM)	COOLANT ENTERING TEMPERAUTRE (ICE BUILD)	COOLANT LEAVING TEMPERATURE (ICE MELT)	MANUFACTURER	MODEL	DIMENSIONS	REMARKS
ICE STORAGE MODULE 1	ICE ON COIL, INTERNAL MELT	761	30% PROPYLENE GLYCOL	250	22.0	37.0	BALTIMORE AIR COIL	TSU-761M	19.85' L x 11.81' W x 8.00' H	
ICE STORAGE MODULE 2	ICE ON COIL, INTERNAL MELT	761	30% PROPYLENE GLYCOL	250	22.0	37.0	BALTIMORE AIR COIL	TSU-761M	19.85' L x 11.81' W x 8.00' H	
ICE STORAGE MODULE 3	ICE ON COIL, INTERNAL MELT	761	30% PROPYLENE GLYCOL	250	22.0	37.0	BALTIMORE AIR COIL	TSU-761M	19.85' L x 11.81' W x 8.00' H	
ICE STORAGE MODULE 4	ICE ON COIL, INTERNAL MELT	761	30% PROPYLENE GLYCOL	250	22.0	37.0	BALTIMORE AIR COIL	TSU-761M	19.85' L x 11.81' W x 8.00' H	
ICE STORAGE MODULE 5	ICE ON COIL, INTERNAL MELT	761	30% PROPYLENE GLYCOL	250	22.0	37.0	BALTIMORE AIR COIL	TSU-761M	19.85' L x 11.81' W x 8.00' H	
ICE STORAGE MODULE 6	ICE ON COIL, INTERNAL MELT	761	30% PROPYLENE GLYCOL	250	22.0	37.0	BALTIMORE AIR COIL	TSU-761M	19.85' L x 11.81' W x 8.00' H	

NOTES:
1. PROVIDE INLINE PROCESS REFRACTOMETER CAPABLE OF MONITORING AND REPORTING GLYCOL SOLUTION CONCENTRATION TO BUILDIMG MANGEMENT SYSTEM.



HYDRONIC FLOW METER INSTALLATION

NOT TO SCALE

1. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR UPSTREAM AND DOWNSTREAM DISTANCES REQUIRED. INSTALL STRAIGHTENING VANES TO ACHIEVE REQUIRED DISTANCES IF NECESSARY.
2. INSERT METER PER MANUFACTURER'S GUIDELINES. METER MUST ALWAYS BE PERPENDICULAR TO THE PIPE. INSTALLATION IN VERTICAL RUN PIPES IS ALSO ACCEPTABLE.
3. PROVIDE SUFFICIENT CLEARANCE FOR METER REMOVAL AND MAINTENANCE.

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SEAL:

STATE OF MARYLAND — JIMMY WEAVER — 17117 — REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 17117, EXPIRATION DATE: 10/25/24.

ISSUED FOR:

DATE:	DESCRIPTION:
08/09/2023	100% CONSTRUCTION DOCUMENTS
06/06/2024	PERMIT SUBMISSION

PROJECT NO: BKM # 19103.02

SCALE: AS NOTED

DRAWN BY: SY

CHECKED BY: IPS

DATE: 06/06/2024

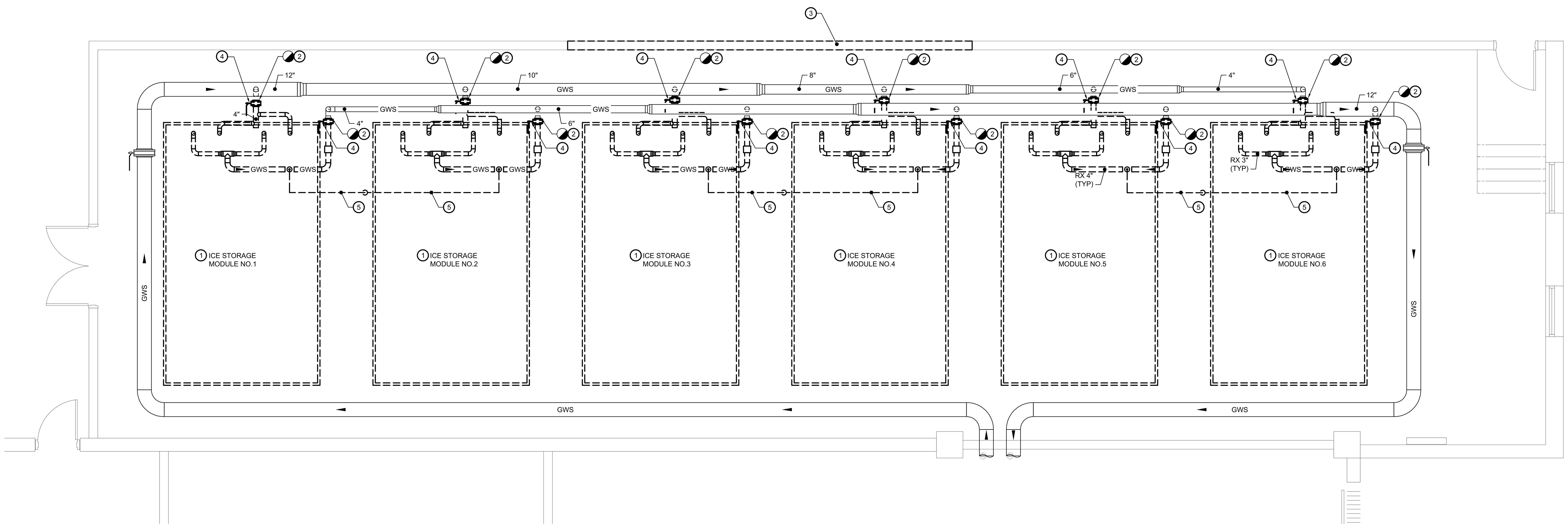
SHEET TITLE:

MECHANICAL LEGEND ABBREVIATIONS AND GENERAL NOTES

DRAWING NO:

M0.01

BKM# 19103.02



ICE MODULE AREA - MECHANICAL - DEMOLITION

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

GENERAL NOTES:

1. REFER TO M0.01 FOR MECHANICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO GENERAL PHASING NOTES ON M0.01.
3. ESTIMATED 790 GALLONS OF GLYCOL WATER PER ICE MODULE (TOTAL 4,740 GALLONS) TO BE DRAINED AND REUSED. CONTRACTOR SHALL CONFIRM PRIOR TO DRAINING.
4. ESTIMATED TOTAL OF 935 GALLONS OF GLYCOL WATER FROM PIPING TO BE DRAINED AND REUSED. CONTRACTOR SHALL CONFIRM PRIOR TO DRAINING.
5. ESTIMATED 9,150 GALLONS OF ICE BATH WATER PER ICE MODULE (TOTAL 54,900 GALLONS) TO BE DRAINED. CONTRACTOR SHALL CONFIRM PRIOR TO DRAINING.

DRAWING NOTES:

1. REMOVE EXISTING ICE STORAGE MODULE AND ALL ASSOCIATED APPURTENANCES.
2. REMOVE EXISTING GLYCOL WATER PIPE AND EXISTING SHUTOFF VALVE.
3. TEMPORARILY REMOVE SECTION OF WALL AS REQUIRED TO REMOVE ICE STORAGE MODULES ONE AT A TIME. TEMPORARILY SUPPORT STRUCTURE AS REQUIRED. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION. REMOVED SECTION OF WALL TO REMAIN FOR NEW WORK.
4. REMOVE EXISTING VALVE DURING OFF HOURS AND INSTALL NEW VALVE IN SIMILAR LOCATION. REFER TO NEW WORK AND GENERAL PHASING NOTES FOR ADDITIONAL REQUIREMENTS.
5. REMOVE EXISTING PRESSURE RELIEF VALVE PIPING AND CAPTURE TANK.

0 2' 4' 8' 12'
SCALE: 1/4" = 1'-0"

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DATE:	DESCRIPTION:
08/09/2023	100% CONSTRUCTION DOCUMENTS
06/06/2024	PERMIT SUBMISSION

PROJECT NO: BKM # 19103.02

SCALE: AS NOTED

DRAWN BY: SY

CHECKED BY: IPS

DATE: 06/06/2024

SHEET TITLE:

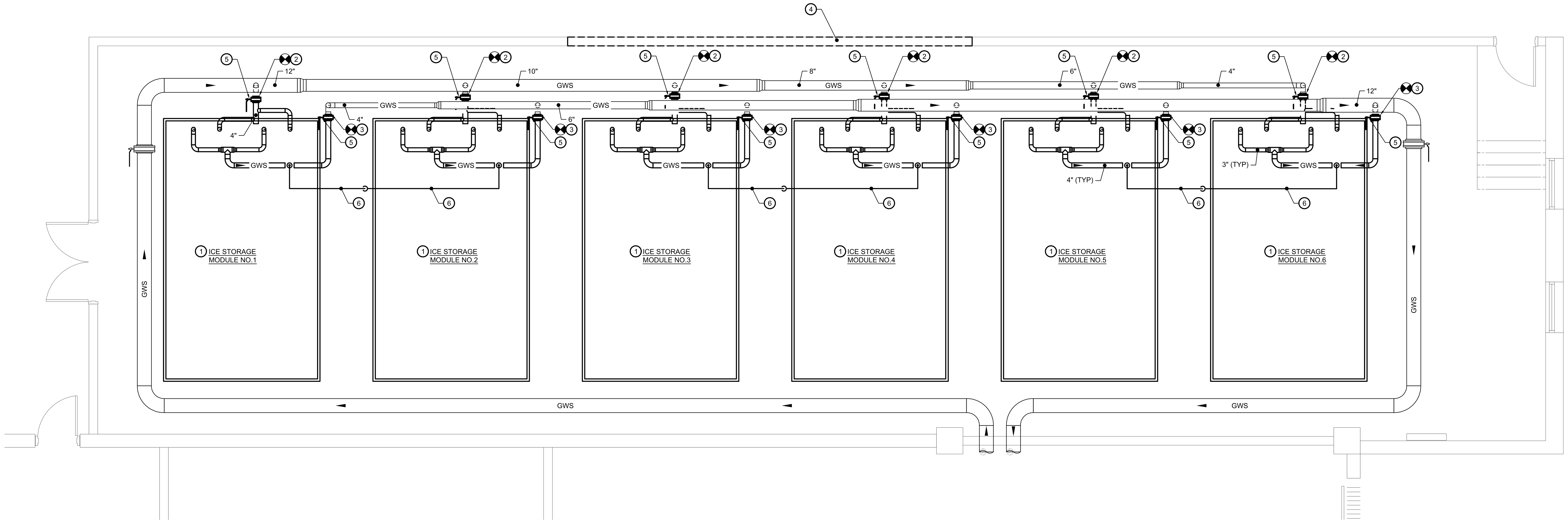
ICE MODULE AREA MECHANICAL DEMOLITION

DRAWING NO:

M1.01

BKM# 19103.02

APPROVED
Department of Permitting Services
Permit # COMBUILD-1078469
Date 10/30/24
Stamped By: Rebecca Mason



1 ICE MODULE AREA - MECHANICAL - NEW WORK

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

GENERAL NOTES:

1. REFER TO M0.01 FOR MECHANICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO GENERAL PHASING NOTES ON M0.01.

DRAWING NOTES:

1. PROVIDE ICE STORAGE MODULE AND ALL ASSOCIATED APPURTENANCES. REFER TO MECHANICAL DETAILS, SCHEMATICS, SCHEDULES, AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. PROVIDE GLYCOL WATER PIPE AND CONNECT TO EXISTING SHUTOFF VALVE. PROVIDE WITH TEMPERATURE SENSOR.
3. PROVIDE GLYCOL WATER PIPE AND CONNECT TO EXISTING SHUTOFF VALVE. PROVIDE WITH TEMPERATURE SENSOR AND FLOW METER.
4. BRING ICE STORAGE MODULES IN ONE AT A TIME UTILIZING REMOVED SECTION OF WALL. TEMPORARILY SUPPORT STRUCTURE AS REQUIRED. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION. AFTER ALL ICE STORAGE MODULES ARE INSTALLED PATCH WALL TO MATCH EXISTING.
5. PROVIDE NEW SHUTOFF VALVE DURING OFF HOURS. REFER TO GENERAL PHASING NOTES FOR ADDITIONAL REQUIREMENTS.
6. PROVIDE NEW PRESSURE RELIEF VALVE PIPING AND CAPTURE TANK TO MATCH PIPING AND TANK REMOVED M101.

0 2' 4' 8' 12'
SCALE: 1/4" = 1'-0"

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PROFESSIONAL ENGINEER
17117
REGISTERED

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PROJECT NO: BKM # 19103.02

SCALE: AS NOTED

DRAWN BY: SY

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DATE: 06/06/2024

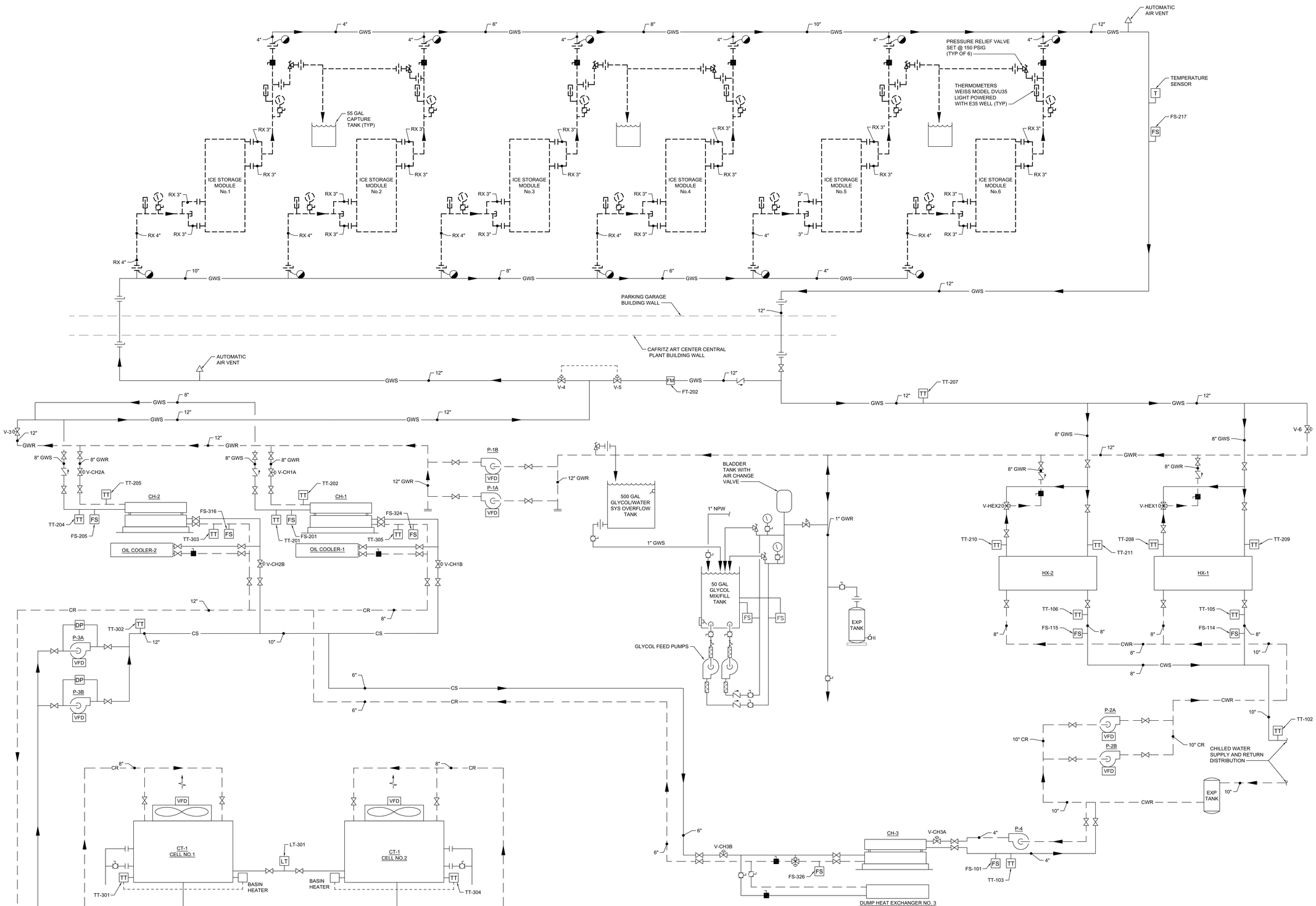
SHEET TITLE:

ICE MODULE AREA MECHANICAL NEW WORK

DRAWING NO:

M2.01

BKM# 19103.02



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PROJECT NO: BKM # 19103.02

SCALE: AS NOTED

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DATE: 06/06/2024

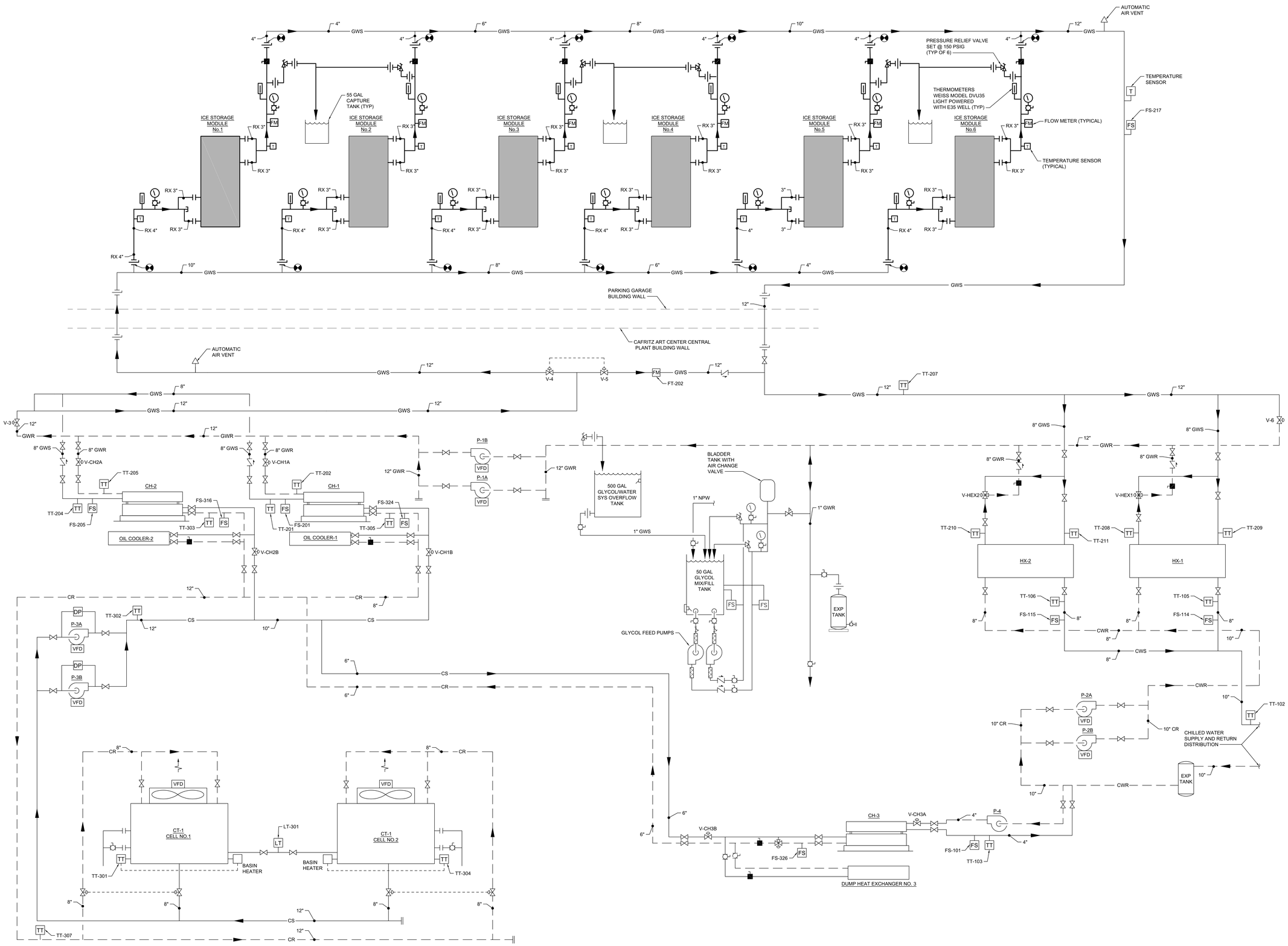
SHEET TITLE:

ICE MODULE AREA MECHANICAL - NEW WORK SCHEMATICS

DRAWING NO:

M3.01

BKM# 19103.02



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DATE: 06/06/2024

SHEET TITLE:

ICE MODULE AREA MECHANICAL - NEW WORK SCHEMATICS

DRAWING NO:

M3.02

BKM# 19103.02

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CHILLER PLANT SEQUENCE OF OPERATION

GENERAL COMMISSIONING NOTES:

A. THE FOLLOWING SEQUENCE IS PROVIDED FOR REFERENCE ONLY.

B. THE COMMISSIONING AGENT SHALL VERIFY THE EXISTING SEQUENCE OF OPERATION AFTER COMPLETION OF ICE MODULE REPLACEMENT.

CHILLED WATER SYSTEM CONTROL:

A. GENERAL: THE BUILDING AUTOMATION SYSTEM (BAS) CONTRACTOR SHALL ENSURE FULL COMMUNICATIONS INTERFACE WITH THE NATURAL GAS ENGINE-DRIVEN CHILLER'S OPEN PROTOCOL CONTROL PANEL.

B. THE UNIT MOUNTED CONTROLS ON THE ENGINE-DRIVEN CHILLER SHALL MODULATE THE CHILLER CAPACITY TO MAINTAIN 41 DEG. F (ADJ.) CHILLED WATER SUPPLY TEMPERATURE. THE ENGINE-DRIVEN CHILLER SHALL OPERATE UNDER ITS OWN CAPACITY CONTROLS, SAFETIES, AND INTERLOCKS.

C. THE BAS SYSTEM SHALL ENABLE/DISABLE THE CHILLED WATER SYSTEM BASED UPON THE OUTSIDE AIR TEMPERATURE (55 DEG. F, ADJ.), USER DEFINED SCHEDULE, OR MANUAL OVERRIDE COMMAND FROM THE OPERATOR'S WORKSTATION.

D. WHEN THE CHILLED WATER SYSTEM IS “ENABLED,” THE BAS SHALL SEND A “START” SIGNAL TO THE CHILLED WATER SUPPLY PUMP P-2A OR P-2B (PRIMARY AND SECONDARY; OPERATOR SELECTABLE). THE BAS SHALL THEN MODULATE THE VARIABLE FREQUENCY DRIVE OF THE CAMPUS CHILLED WATER CHILLED WATER SUPPLY PUMP BASED ON THE CAMPUS BUILDING HAVING ITS LOWEST DIFFERENTIAL PRESSURE BETWEEN THE BUILDING SUPPLY AND RETURN HEADERS. THE BAS SHALL MODULATE THE PUMP TO MAINTAIN A 5 PSIG DIFFERENTIAL PRESSURE AS THE INDICATED MINIMUM.

E. THE BAS SHALL MONITOR THE CAMPUS CHILLED WATER SUPPLY PUMP STATUS. SHOULD EITHER PUMP P-2A OR P-2B FAIL, AN ALARM SIGNAL SHALL BE SENT TO THE OPERATOR'S WORKSTATION AND THE PLANT ANNUNCIATOR PANEL SHALL BE ENERGIZED.

F. THE BAS SHALL ALLOW THE PLANT OPERATORS THE CAPABILITY AND FLEXIBILITY TO DETERMINE WHICH COOLING MECHANISM TO USE. THE AVAILABLE CAMPUS COOLING OPTIONS SHALL BE (AT A MINIMUM):

1. “ICE MELT”
2. “GAS CHILLER”
3. “ICE MELT + GAS CHILLER”
4. “PEAK COOLING - ICE AND CHILLERS”
5. “AUTOMATIC - TIME OF DAY SCHEDULE OPERATION”

G. UPON SELECTION OF THE “ICE MELT” MODE, THE BAS SHALL “DISABLE THE NATURAL GAS ENGINE-DRIVEN CHILLER; IT SHALL “ENABLE” THE GLYCOL SYSTEM, SET THE GLYCOL SYSTEM MODE TO “ICE MELT” AND SHALL FOLLOW THE GLYCOL SYSTEM SEQUENCE OF OPERATIONS.

H. UPON SELECTION OF THE “GAS CHILLER” MODE, THE BAS SHALL “ENABLE” THE ENGINE-DRIVEN CHILLER, CH-3 AND FOLLOW THE SEQUENCE LISTED BELOW:

1. THE BAS SHALL FIRST SEND SIGNALS TO OPEN CHILLER NO. 3 ISOLATION VALVES (V-CH3A & V-CH3B). THE BAS SHALL CONFIRM THE VALVES ARE “OPEN” VIA POSITION SWITCHES ON EACH VALVE.
2. THE BAS SHALL “DISABLE” THE GLYCOL SYSTEM AND VERIFY THAT THE CONDENSER WATER SYSTEM IS “ENABLED” AND OPERATING.
3. THE BAS SHALL THEN SEND A “START” SIGNAL TO THE CHILLED WATER SUPPLY PUMP P-4 AND ENERGIZE THE PUMP, PROVIDED THE H-O-A SWITCH IS IN THE AUTOMATIC POSITION. NEXT, THE BAS SHALL EITHER INDEX THE CONDENSER WATER PUMPS TO THE APPROPRIATE FLOWRATE OR SEND A “START” SIGNAL TO THE CONDENSER WATER SUPPLY PUMP P-3A OR P-3B (PRIMARY OR STAND-BY; OPERATOR SELECTABLE).
4. UPON “PROOF OF FLOW” THROUGH THE EVAPORATOR AND CONDENSER VIA FLOW SWITCHES (FS-101 & FS-326), THE BAS SHALL SEND A “START” SIGNAL TO THE ENGINE-DRIVEN CHILLER, CH-3.

I. UPON SELECTION OF THE 'ICE MELT + GAS CHILLER” MODE, THE BAS SHALL “ENABLE” THE GLYCOL SYSTEM, SET THE GLYCOL SYSTEM MODE TO “ICE MELT” AND FOLLOW THE “ICE MELT” SEQUENCE. THE BAS SHALL ALSO “ENABLE” THE ENGINE-DRIVEN CHILLER CH-3, AND FOLLOW THE SEQUENCE LISTED IN SECTION “H” ABOVE.

J. UPON SELECTION OF THE “CHILLERS ONLY” MODE, THE BAS SHALL “ENABLE” THE ENGINE-DRIVEN CHILLER AND IT SHALL FOLLOW THE SEQUENCE LISTED IN SECTION “H” ABOVE.

K. UPON SELECTION OF THE “PEAK COOLING” MODE, THE BAS SHALL “ENABLE” THE GLYCOL SYSTEM, SET THE GLYCOL SYSTEM MODE TO “ICE AND CHILLERS.” THE BAS SHALL ALSO “ENABLE” THE ENGINE-DRIVEN CHILLER AND IT SHALL FOLLOW THE SEQUENCE LISTED IN SECTION “H” ABOVE.

GLYCOL SYSTEM CONTROL:

A. GENERAL: THE BUILDING AUTOMATION SYSTEM (BAS) CONTRACTOR SHALL ENSURE FULL COMMUNICATIONS INTERFACE WITH THE AMMONIA (R-717) GLYCOL CHILLER'S OPEN PROTOCOL CONTROL PANELS. THE CHILLER MANUFACTURER'S OPEN PROTOCOL CONTROL PANELS SHALL ENABLE THE BAS TO MONITOR, ALARM, AND ADJUST THE CHILLER CONTROLS. THE BAS CONTRACTOR SHALL COORDINATE THE OPEN PROTOCOL COMMUNICATION WITH THE CHILLER MANUFACTURER.

B. THE BAS SHALL “ENABLE/DISABLE” THE GLYCOL SYSTEM BASED UPON THE FIVE (5) OPERATING MODES DESCRIBED BELOW, USER DEFINED SCHEDULE, OR MANUAL OVERRIDE COMMAND FROM THE OPERATOR'S WORKSTATION. THE INDIVIDUAL UNIT MOUNTED CHILLER CONTROLS SHALL MODULATE THE CHILLER'S CAPACITY TO MAINTAIN THE PRE-DETERMINED GLYCOL SUPPLY TEMPERATURES BASED ON THE SELECTED OPERATING MODE. THE CHILLERS SHALL OPERATE UNDER THEIR OWN CAPACITY CONTROLS, SAFETIES, AND INTERLOCKS.

C. WHEN THE GLYCOL SYSTEM MODE IS SET TO “ICE BUILD,” THE BAS SHALL PERFORM THE FOLLOWING SEQUENCE:

1. DRIVE THE CHILLER ISOLATION VALVES V-CH1A AND V-CH2A OPEN AND VERIFY “OPEN” STATUS VIA POSITION SWITCHES. (VALVES MUST BE CONFIRMED OPEN TO “START” GLYCOL PUMPS AND CHILLERS.)
2. “ENABLE” BOTH GLYCOL CHILLERS (CH-1 AND CH-2).
3. SET THE CHILLER “CAPACITY CONTROL” SETPOINTS TO 22 DEG F. FOR BOTH UNITS.
4. MONITOR ALL ICE STORAGE TANK SAFETY LIMITS AND CONFIRM “SATISFIED” IN ORDER TO “ENABLE” TANKS (I.E., “CHARGING” ENABLED).
5. VALVE V-4 IS “NORMALLY OPEN” AND VALVE V-5 (ICE BANKS BY-PASS VALVE) IS “NORMALLY CLOSED.”
6. CONFIRM CHILLER BYPASS VALVE V-3 “CLOSED.”
7. DRIVE THE HEAT EXCHANGER BYPASS VALVE V-6 TO FULL OPEN AND CONFIRM “OPEN” VIA POSITION SWITCH.
8. “ENABLE” THE GLYCOL SYSTEM PUMP P-1A OR P-1B (PRIMARY AND STAND-BY; OPERATOR SELECTABLE).
9. “START” THE GLYCOL SYSTEM PUMP P-1A OR P-1B AND MODULATE TO 1,050 GPM FLOW.
10. VERIFY GLYCOL FLOW THROUGH THE CHILLER CH-1 VIA FLOW SWITCH FS-201. (MUST CONFIRM FLOW TO “START” CHILLER CH-1.)
11. VERIFY GLYCOL FLOW THROUGH THE CHILLER CH-2 VIA FLOW SWITCH FS-205. (MUST CONFIRM FLOW TO “START” CHILLER CH-2.)
12. VERIFY GLYCOL FLOW THROUGH THE ICE TANKS VIA FLOW SWITCH FS-217.
13. MODULATE THE GLYCOL SYSTEM PUMP P-1A OR P-1B UP TO 1,500 GPM FLOW.
14. “START” CHILLERS CH-1 AND CH-2.
15. THE GLYCOL CHILLERS CH-1 AND CH-2 SHALL MAINTAIN CAPACITY BASED ON THEIR ASSOCIATED “LEAVING GLYCOL TEMPERATURE” TRANSMITTERS (TT-201 AND TT-204).
16. UPON A BREAK ON ANY OF THE ICE STORAGE TANKS' OPERATING CONTROLS (I.E., “CHARGING DISABLED”), THE BAS SYSTEM SHALL BEGIN AN ORDERLY GLYCOL SYSTEM SHUTDOWN.

D. WHEN THE GLYCOL SYSTEM MODE IS SET TO “ICE MELT,” THE BAS SHALL PERFORM THE FOLLOWING GLYCOL SEQUENCE:

1. “DISABLE” GLYCOL CHILLERS CH-1 AND CH-2.
2. CLOSE CHILLER ISOLATION VALVES V-CH1A AND V-CH2A.
3. MONITOR ALL ICE STORAGE TANKS' SAFETY LIMITS AND VERIFY “SATISFIED” IN ORDER TO “ENABLE” TANKS (I.E., MELT “ENABLED”).
4. DRIVE CHILLER BYPASS VALVE V-3 OPEN AND VERIFY “OPEN” VIA POSITION SWITCH.
5. VALVE V-4 IS “NORMALLY OPEN.”
6. VERIFY HEAT EXCHANGER BYPASS VALVE V-6 “CLOSED.”
7. “ENABLE” GLYCOL SYSTEM PUMP P-1A OR P-1B (PRIMARY AND STAND-BY; OPERATOR SELECTABLE).
8. “START” GLYCOL SYSTEM PUMP AND MODULATE TO 1,500 GPM.
9. VERIFY FLOW THROUGH ICE TANKS VIA FLOW SWITCH.
10. RELEASE GLYCOL SYSTEM PUMP TO TRACK WITH CAMPUS CHILLED WATER LOAD (I.E., FURTHEST BUILDING DPT SIGNAL).
11. MODULATE VALVE V-4 AND ICE TANKS' BYPASS VALVE V-5 TO MAINTAIN “MIXED GLYCOL TEMPERATURE” TT-207 AT 37 DEG F.
12. VERIFY CHILLED WATER FLOW THROUGH PLATE AND FRAME HEAT EXCHANGERS HEX-1 AND HEX-2 VIA FLOW SWITCHES (FS-114 AND FS-115).
13. FOLLOWING CONFIRMATION OF CHILLED WATER FLOW, MODULATE TEMPERATURE CONTROL VALVES V-HEX1 AND V-HEX2 TO MAINTAIN 41 DEG F LEAVING WATER TEMPERATURE TO CAMPUS LOOP (TT-102).
14. UPON A DROP OF V-3 OPEN SIGNAL, A BREAK IN THE ICE TANKS' OPERATING CONTROLS, OR A “CHANGE IN MODE” CONDITION, THE BAS SHALL BEGIN AN ORDERLY GLYCOL SYSTEM SHUTDOWN.

E. WHEN THE GLYCOL SYSTEM IS SET TO “CHILLERS ONLY,” THE BAS SHALL PERFORM THE FOLLOWING GLYCOL SEQUENCE:

1. DRIVE THE CHILLER ISOLATION VALVE V-CH1 AND/OR V-CH2 OPEN. VERIFY “OPEN” VIA POSITION SWITCHES. (PRIMARY AND SECONDARY CHILLER - OPERATOR SELECTABLE.)
2. “ENABLE” PRIMARY GLYCOL CHILLER (CH-1 AND/OR CH-2; OPERATOR SELECTABLE).
3. SET “CAPACITY CONTROL” SETPOINT TO 38 DEG. F FOR BOTH UNITS.
4. VERIFY CHILLER BYPASS VALVE V-3 “CLOSED.”
5. DRIVE ICE TANKS VALVE V-4 FULLY CLOSED AND V-5 (ICE TANKS BYPASS VALVE) FULLY OPEN.
6. VERIFY HEAT EXCHANGER BYPASS VALVE V-6 “CLOSED.”
7. “ENABLE” GLYCOL SYSTEM PUMP P-1A OR P-1B (PRIMARY AND STAND-BY; OPERATOR SELECTABLE).
8. “START” GLYCOL SYSTEM PUMP AND MODULATE TO 525 GPM.
9. VERIFY FLOW THROUGH CHILLER(S) CH-1 AND/OR CH-2 (MUST CONFIRM TO START CHILLER).
10. “START” CHILLER(S) CH-1 AND/OR CH-2.
11. RELEASE GLYCOL SYSTEM PUMP TO TRACK WITH CAMPUS CHILLED WATER LOAD.
12. MODULATE TEMPERATURE CONTROL VALVES V-HEX1 AND V-HEX2 TO MAINTAIN 41 DEG F LEAVING WATER TEMPERATURE TO CAMPUS LOOP (TT-102).
13. ON A CONTINUED RISE IN GLYCOL TEMPERATURE, THE BAS CHILLER SEQUENCING SOFTWARE SHALL SEQUENCE “ON” SECONDARY CHILLER. THE BAS SHALL SEQUENCE CHILLER “OFF” ON A GLYCOL TEMPERATURE DROP BELOW SETPOINT.
14. UPON A DROP OF V-CH1 OR V-CH2 “OPEN” SIGNAL, A “NO FLOW” CONDITION THROUGH THE CHILLERS, OR A “CHANGE OF MODE” CONDITION, THE BAS SHALL BEGIN AN ORDERLY GLYCOL SYSTEM SHUTDOWN.

F. WHEN THE GLYCOL SYSTEM MODE IS SET TO “ICE & CHILLERS,” THE BAS SHALL PERFORM THE FOLLOWING GLYCOL SEQUENCE:

1. DRIVE CHILLER ISOLATION VALVE V-CH1 AND/OR V-CH2 OPEN AND VERIFY “OPEN” VIA POSITION SWITCH (PRIMARY AND SECONDARY CHILLER - OPERATOR SELECTABLE).
2. “ENABLE” PRIMARY GLYCOL CHILLER CH-1 OR CH-2.
3. SET CHILLER “CAPACITY CONTROL” SETPOINT TO 45 DEG. F FOR BOTH UNITS.
4. VERIFY CHILLER BYPASS VALVE V-3 “CLOSED.”
5. MONITOR ALL ICE TANKS SAFETY LIMITS AND VERIFY “SATISFIED” IN ORDER TO “ENABLE” TANKS (I.E. MELT “ENABLED”).
6. VALVE V-4 IS “NORMALLY OPEN.”
7. VERIFY HEAT EXCHANGER BYPASS VALVE V-6 “CLOSED.”
8. “ENABLE” GLYCOL SYSTEM PUMP P-1A OR P-1B (PRIMARY AND STAND-BY; OPERATOR SELECTABLE).
9. “START” GLYCOL SYSTEM PUMP AND MODULATE TO 525 GPM FLOW.
10. VERIFY FLOW THROUGH CHILLER CH-1 AND/OR CH-2 (MUST CONFIRM TO “START” CHILLER).
11. VERIFY FLOW THROUGH ICE TANKS VIA FLOW SWITCH FS-217.
12. “START” PRIMARY GLYCOL CHILLER.
13. MODULATE CHILLER BYPASS VALVE V-3 TO MAINTAIN 525 GPM FLOW THROUGH THE SELECTED CHILLER.
14. ON A CALL FOR A SECOND CHILLER, MODULATE THE GLYCOL SYSTEM PUMP TO 1,050 GPM FLOW.
15. MODULATE VALVE V-4 AND ICE TANKS “BY-PASS VALVE” V-5 TO MAINTAIN 36 DEG F “MIXED GLYCOL TEMP” TT-207.
16. VERIFY CHILLED WATER FLOW THROUGH PLATE AND FRAME HEAT EXCHANGERS HEX-1 AND HEX-2 (FS-114 AND FS-115).
17. FOLLOWING CONFIRMATION OF CHILLED WATER FLOW, MODULATE TEMPERATURE CONTROL VALVES V-HEX1 AND V-HEX2 TO MAINTAIN 41 DEG. F LEAVING WATER TEMPERATURE TO CAMPUS LOOP (TT-102).
18. UPON A DROP OF V-3 SIGNAL, A BREAK IN THE ICE TANK(S) OPERATING CONTROLS, OR A “CHANGE OF MODE” CONDITION, THE BAS SHALL BEGIN AN ORDERLY GLYCOL SYSTEM SHUTDOWN.

G. WHEN THE GLYCOL SYSTEM MODE IS SET TO “ICE + COOLING,” THE BAS SHALL PERFORM THE FOLLOWING GLYCOL SEQUENCE:

1. SYSTEM SHALL OPERATE IDENTICALLY TO SECTION “C - ICE BUILD” WITH THE FOLLOWING ADDITIONS:
   a. VERIFY CHILLED WATER FLOW THROUGH THE PLATE AND FRAME HEAT EXCHANGERS HEX-1 AND HEX-2.
   b. DRIVE HEAT EXCHANGER BY-PASS VALVE V-6 PARTIALLY CLOSED (70%).
   c. FOLLOWING CONFIRMATION OF CHILLED WATER FLOW, MODULATE TEMPERATURE CONTROL VALVES V-HEX1 AND V-HEX2 TO MAINTAIN 41 DEG. F LEAVING WATER TEMPERATURE TO THE CAMPUS LOOP (TT-102).
2. UPON A LOSS OF CHILLED WATER FLOW CONFIRMATION, VALVE V-6 SHALL BE DRIVEN FULL OPEN AND VALVES V-HEX1 AND V-HEX2 DRIVEN TO THEIR “NORMALLY OPEN” POSITION.
3. THE GLYCOL SYSTEM SEQUENCE OFF SHALL BE BASED ON SECTION “C.16.”

CONDENSER WATER SYSTEM CONTROL

A. GENERAL: THE CONDENSER WATER SYSTEM SHALL BE CONTROLLED BY THE BUILDING AUTOMATION SYSTEM (BAS). THE BAS CONTRACTOR CHALL ENSURE FULL COMMUNICATIONS INTERFACE WITH THE COOLING TOWER(S) “OPEN” PROTOCOL CONTROL PANEL(S) AND THE VARIABLE SPEED DRIVES OF THE CONDENSER WATER PUMP(S). THE COOLING TOWER MANUFACTURER'S OPEN PROTOCOL PANEL(S) SHALL ENABLE THE BAS TO MONITOR, ALARM, AND ADJUST COOLING TOWER CONTROLS.

B. THE BAS SYSTEM SHALL “ENABLE/DISABLE” THE CONDENSER WATER SYSTEM WHENEVER THE GLYCOL AND/OR CHILLED WATER SYSTEMS ARE ACTIVATED/DEACTIVATED. BOTH SYSTEMS (GLYCOL/CHILLED WATER) MUST BE “DEACTIVATED” IN ORDER TO “DISABLE” THE CONDENSER WATER SYSTEM.

C. THE BAS SOFTWARE SHALL ALLOW THE PLANT OPERATORS TO ASSIGN A “START” SEQUENCING ORDER FOR THE COOLING TOWER UNITS. IT SHALL ALSO MONITOR, RECORD, AND DISPLAY THE NUMBER OF INDIVIDUAL TOWER “STARTS” AND CUMULATIVE RUN TIME FOR EACH TOWER UNIT. AN AUTOMATIC SEQUENCING FEATURE BASED ON CUMULATIVE RUN TIME SHALL ALSO BE AVAILABLE.

D. AT FIRST INDICATION OF ANY CHILLER(S) “ENABLED,” THE BAS SHALL DETERMINE WHICH CHILLERS HAVE BEEN SELECTED FOR OPERATION. THE BAS SHALL INDEX THE CONDENSER WATER FLOW RATE SETPOINT AS INDICATED BELOW BASED ON THE NUMBER AN SIZE OF THE CHILLERS SELECTED.

CHILLER NO. 1 “ENABLED”	FLOWRATE = 1,100 GPM
CHILLER NO. 2 “ENABLED”	FLOWRATE = 1,100 GPM
CHILLER NO. 3 “ENABLED”	FLOWRATE = 500 GPM
CHILLER NOS. 1 & 2 “ENABLED” (ICE BUILD)	FLOWRATE = 2,200 GPM
CHILLER NOS. 1 & 3 “ENABLED”	FLOWRATE = 1,600 GPM
CHILLER NOS. 2 & 3 “ENABLED”	FLOWRATE = 1,600 GPM
ALL CHILLERS “ENABLED” (PEAK COOLING)	FLOWRATE = 2,700 GPM

E. FOLLOWING THE CONDENSER WATER FLOWRATE SETPOINT ADJUSTMENT, THE BAS SHALL DRIVE THE SELECTED CHILLER(S) CONDENSER WATER ISOLATION VALVE(S) V-CH1B, V-CH2B, AND/OR V-CH3B OPEN AND VERIFY VALVE(S) OPEN VIA THEIR POSITION SWITCHES.

F. SIMULTANEOUSLY, THE BAS SHALL DRIVE OPEN THE INDIVIDUAL COOLING TOWER ISOLATION VALVES BASED ON THE DEFINED SEQUENCING ORDER AND THE NUMBER OF TOWERS “ENABLED” SHALL BE BASED ON THE DEFINED CONDENSER WATER FLOWRATE AS FOLLOWS:

UP TO 500 GPM =	1 TOWER “ON-LINE”
UP TO 1,500 GPM =	2 TOWERS “ON-LINE”
UP TO 2,000 GPM =	3 TOWERS “ON-LINE”
UP TO 3,500 GPM =	4 TOWERS “ON-LINE”

G. FOLLOWING ALL VALVES OPENED, THE BAS SHALL ENERGIZE THE CONDENSER WATER PUMP P-3A OR P-3B (PRIMARY AND STAND-BY; OPERATOR SELECTABLE) AND MODULATE THE PUMP VARIABLE FREQUENCY DRIVE (VFD) TO MAINTAIN THE SELECTED FLOWRATE SETPOINT.

H. THE BAS SHALL MONITOR THE SELECTED PRIMARY CONDENSER WATER PUMP “STATUS” VIA AN INSTALLED DIFFERENTIAL PRESSURE SWITCH. SHOULD EITHER PUMP FAIL, AN ALARM SHALL BE SENT TO THE OPERATOR WORKSTATION AND PLANT ALARM ANNUNCIATOR.

I. THE BAS SHALL THEN MONITOR THE CONDENSER WATER FLOW SWITCHES FOR EACH SELECTED CHILLER TO CONFIRM CONDENSER WATER FLOW PRIOR TO BAS SENDING THE “START” COMMAND TO EACH CHILLER.

J. THE BAS SHALL MONITOR CONDENSER WATER TEMPERATURE VIA TT-302. ON A RISE IN CONDENSER WATER TEMPERATURE ABOVE 75 DEG. F (ADJ), THE BAS SHALL START THE SELECTED COOLING TOWER FAN(S) AT MINIMUM SPEED. UPON A CONTINUED RISE IN CONDENSER WATER TEMPERATURE, THE BAS SHALL CONTROL THE COOLING TOWER FAN MOTOR SPEEDS VIA THEIR VFDS TO MAINTAIN SETPOINT. THE MAXIMUM CONDENSER WATER SUPPLY TEMPERATURE SHALL BE 85 DEG. F (ADJ).

THE BAS CONTROL SOFTWARE SHALL HAVE AVAILABLE TWO (2) FAN CONTROL SCHEMES WHICH SHALL BE OPERATOR SELECTABLE. SCHEME ONE (1) SHALL MODULATE ALL OF THE SELECTED TOWER VFDS IN UNISON TO MAINTAIN THE CONDENSER WATER TEMPERATURE. SCHEME TWO (2) SHALL MODULATE THE PRIMARY COOLING TOWER'S VFD TO 80% OF FULL LOAD SPEED PRIOR TO BEGINNING THE MODULATING PROCESS FOR THE NEXT COOLING TOWER IN SEQUENCE.

UPON A FALL IN THE CONDENSER WATER TEMPERATURE, THE BAS SHALL FOLLOW THE SEQUENCE IN SECTION J ON REVERSE.

K. DURING THE COURSE OF OPERATION, SHOULD ANY CHILLER BE SEQUENCED TO “DISABLED,” THE BAS SHALL RE-EVALUATE THE REQUIRED CONDENSER WATER FLOWRATE AND ADJUST THE SETPOINT ACCORDINGLY. THE BAS SHALL CORRESPONDINGLY DRIVE THE “DISABLED” CHILLER'S CONDENSER WATER ISOLATION VALVE CLOSED, AND BASED ON THE INDEXED CONDENSER WATER FLOWRATE, ISOLATE ONE OR MOR COOLING TOWERS FROM THE SYSTEM (SEE ITEM F).

L. A HIGH VIBRATION LEVEL SWITCH (VSH-301 & VSH-302) SHALL BE INTERLOCKED WITH EACH COOLING TOWER VARIABLE FREQUENCY DRIVE TO DE-ENERGIZE THE COOLING TOWER FAN MOTOR SHOULD EXCESSIVE VIBRATION BE DETECTED. THE BAS SHALL SEND “INDICATE” AN ALARM AT THE OPERATOR'S WORKSTATION AND SEND AN ALARM TO THE PLANT ANNUNCIATOR.

M. THE BAS SHALL CONTROL THE BASIN WATER LEVEL IN EACH OF THE TOWERS VIA A SINGLE CONDUCTIVITY TYPE TRANSMITTER INSTALLED IN THE BASIN EQUALIZING LINE. THE TRANSMITTER SHALL OPEN AND CLOSE A COMMON MAKE-UP WATER VALVE TO MAINTAIN THE LEVEL IN ALL OF THE BASINS. THE LEVEL TRANSMITTER SHALL SEND AN ALARM SIGNAL TO THE OPERATOR WORKSTATION AND PLANT ANNUNCIATOR ON HIGH AND LOW LEVEL CONDITIONS.

N. THE COOLING TOWER BASIN TEMPERATURE IN EACH TOWER SHALL BE CONTROLLED BY A FACTORY MOUNTED BASIN HEATER, TEMPERATURE CONTROLLER TT-301 & TT-304, AND THE LOW LEVEL HEATER CUT-OUT FROM THE COMMON LEVEL TRANSMITTER.

O. THE BAS SHALL ALSO MONITOR THE FOLLOWING CONDENSER WATER SYSTEM POINTS:

1. CONDENSER WATER SUPPLY TEMPERATURE TT-302.
2. CONDENSER WATER RETURN TEMPERATURE TT-307.
3. FILTRATION SYSTEM LOADING.
4. SYSTEM MAKE-UP RATE.

P. THE BAS SHALL “ENERGIZE/DE-ENERGIZE” THE BASIN SWEEPER FILTRATION SYSTEM BASED ON A USER DEFINED SCHEDULE OF MANUAL OVERRIDE COMMAND FROM THE OPERATOR WORKSTATION.

Q. THE BAS SHALL MONITOR THE BASIN SWEEPER SYSTEM FOR LOADING AND ON A “HIGH DP ALARM” FROM THE UNIT. THE BAS SHALL INDICATE A VISUAL ALARM AT THE OPERATOR WORKSTATION.

R. WHEN THE BAS SENDS A “START” SIGNAL TO THE BASIN SWEEPER, THE SYSTEM SHALL BE ENERGIZED AND RUN CONTINUOUSLY UNTIL A “STOP” SIGNAL IS RECEIVED.

bkm
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PROJECT NAME:

MONTGOMERY COLLEGE
Central Administration
Office of Facilities
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TAKOMA PARK / SILVER SPRING CAMPUS WG ICE MODULE REPLACEMENT

Consultants

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www.AF-Engineers.cor

SEAL:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 17117, EXPIRATION DATE: 10/25/24.

ISSUED FOR:

DATE:	DESCRIPTION:
08/09/2023	100% CONSTRUCTION DOCUMENTS
06/06/2024	PERMIT SUBMISSION

PROJECT NO: BKM # 19103.02

SCALE: AS NOTED

DRAWN BY: KF

CHECKED BY: IPS

DATE: 06/06/2024

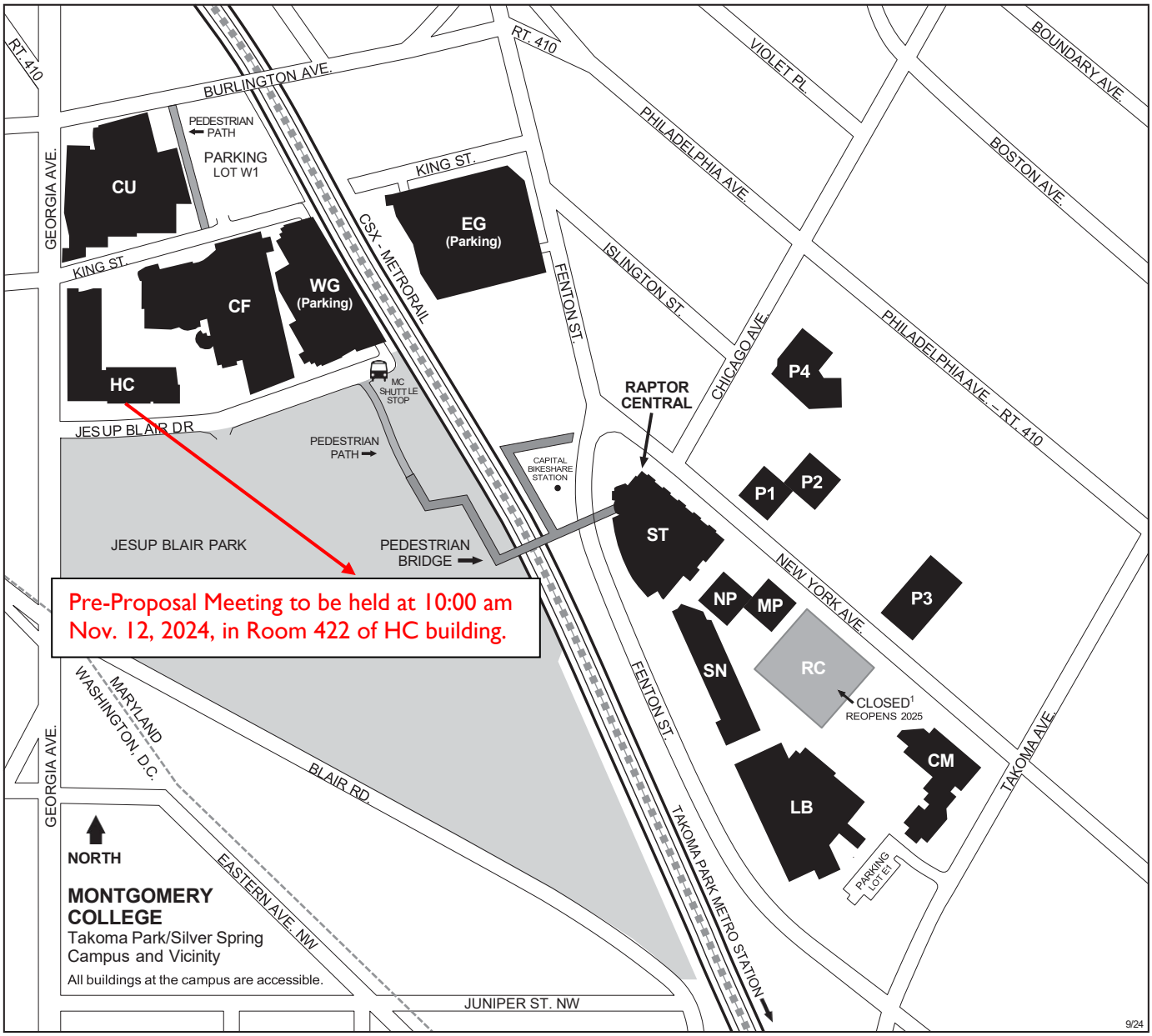
SHEET TITLE: MECHANICAL CONTROLS

DRAWING NO: M4.01

BKM# 19103.02

MONTGOMERY COLLEGE

Takoma Park/Silver Spring Campus and Vicinity



MONTGOMERY COLLEGE

Takoma Park/Silver Spring Campus
7600 Takoma Avenue
Takoma Park, MD 20912
240-567-1300; TTY 301-587-7207

Public Safety: 240-567-3333 (24/7)
montgomerycollege.edu/safety

montgomerycollege.edu/maps

Legend of Campus Buildings

(as of September 2024)

- CF The Morris and Gwendolyn Cafritz Foundation Arts Center
  - *Refugee Training Center*
  - *Workforce Development and Continuing Education (WDCE)*
- CM Catherine F. Scott Commons
- CU Cultural Arts Center
- EG East Garage (parking)
- HC Health Sciences Center
- LB Catherine and Isiah Leggett Math and Science Building
  - *Greenhouse*
  - *Planetarium*
- MP Mathematics Pavilion
- NP North Pavilion
- P1 Pavilion One
- P2 Pavilion Two
- P3 Pavilion Three
- P4 Pavilion Four
- RC Resource Center[1] *(closed for renovation)*
  - *Library (closed)*
- SN Science North Building
- ST Charlene R. Nunley Student Services Center
  - *Bookstore*
  - *Cafeteria*
  - *Counseling and Advising*
  - *Financial Aid Office*
  - *Public Safety Office*
  - *Raptor Central (Admissions, Enrollment, Visitor Services)*
  - *Records and Registration Office*
  - *Student Life Office*
- WG West Garage (parking)

[1] Resource Center reopens winter 2025.

STATE OF MARYLAND

DEPARTMENT OF LABOR
DIVISION OF LABOR AND INDUSTRY
PREVAILING WAGE SECTION
1100 N. Eutaw Street, Room 607
Baltimore, MD 21201
(410) 767-2342

The wage rates to be paid laborers and mechanics for the locality described below is announced by order of Commissioner of Labor and Industry.

It is mandatory upon the successful bidder and any subcontractor under him, to pay not less than the specific rates to all workers employed by them in executing contracts in this locality. Reference: Annotated Code of Maryland State Finance and Procurement, Section 17-201 thru 17-226.

These wage rates were taken from the locality survey of 2023 for Montgomery County, issued pursuant to the Commissioner's authority under State Finance and Procurement Article Section 17-209, Annotated Code of Maryland or subsequent modification.

**Note: If additional Prevailing Wage Rates are needed for this project beyond those listed below, contact the Prevailing Wage Unit. Phone: (410) 767-2342, email: prevailingwage@dllr.state.md.us.

Name and Title of Requesting Officer: Yu Zhu - Procurement Officer

Department, Agency or Bureau: Montgomery College
9221 Corporate Blvd. Rockville, MD 20850

Project Number
RFP No. 625-005

Location and Description of work:

Montgomery County: Replace six existing ice storage modules in kind at the West Garage to support the Takoma Park/Silver Spring campus chilled water system

Determination Number
59611

Date of Issue: Nov 05, 2024

BUILDING CONSTRUCTION

CLASSIFICATION	MODIFICATION REASON	BASIC HOURLY RATE	BORROWED FROM	FRINGE BENEFIT PAYMENT
BALANCING TECHNICIAN	AD	$45.37		$23.48
BOILERMAKER	AD	$43.37	033	$25.67
BRICKLAYER	AD	$36.50		$13.77
CARPENTER	AD	$33.21		$14.03
CARPENTER - SHORING SCAFFOLD BUILDER	AD	$33.21		$14.03
CARPET LAYER	AD	$33.34		$14.40
CEMENT MASON	AD	$29.65	033	$11.88
COMMUNICATION INSTALLER TECHNICIAN	AD	$28.55		$11.28
DRYWALL - SPACKLING, TAPING, & FINISHING	AD	$33.21		$14.03
ELECTRICIAN	AD	$53.00		$21.35

ELEVATOR MECHANIC	AD	$52.49		$42.53
FIRESTOPPER	AD	$29.41		$9.48
GLAZIER	AD	$28.02		$5.23
INSULATION WORKER	AD	$39.27		$19.42
IRONWORKER - ORNAMENTAL	AD	$34.85		$25.17
IRONWORKER - REINFORCING	AD	$36.10	033	$25.52
IRONWORKER - STRUCTURAL	AD	$34.85		$25.17
MECHANICAL SYSTEMS SERVICE TECH- HVAC SYSTEMS	AD	$50.27		$23.99
MECHANICAL SYSTEMS SERVICE TECH- PLUMBING SYSTEMS	AD	$44.66	021	$23.80
MECHANICAL SYSTEMS SERVICE TECH- REFRIGERATION SYSTEMS	AD	$44.66	021	$23.80
MILLWRIGHT	AD	$37.65		$14.86
PAINTER	AD	$27.46		$11.71
PAINTER-INDUSTRIAL	AD	$34.96	033	$14.44
PILEDRIVER	AD	$35.62		$14.10
PLUMBER	AD	$48.00		$21.17
POWER EQUIPMENT OPERATOR - BACKHOE	AD	$30.50		$5.42
POWER EQUIPMENT OPERATOR - BULLDOZER	AD	$29.69		$3.86
POWER EQUIPMENT OPERATOR - CONCRETE PUMP	AD	$29.91		$11.60
POWER EQUIPMENT OPERATOR - CRANE	AD	$44.94		$12.60
POWER EQUIPMENT OPERATOR - DRILL - RIG	AD	$38.93		$11.60
POWER EQUIPMENT OPERATOR - EXCAVATOR	AD	$33.77		$11.60
POWER EQUIPMENT OPERATOR - FORKLIFT	AD	$41.47		$11.60
POWER EQUIPMENT OPERATOR - GRADER	AD	$33.38	021	$13.92
POWER EQUIPMENT OPERATOR - LOADER	AD	$24.00		$3.41
POWER EQUIPMENT OPERATOR - MECHANIC	AD	$35.44	021	$13.92
POWER EQUIPMENT OPERATOR - MILLING MACHINE	AD	$27.00		$1.83
POWER EQUIPMENT OPERATOR - PAVER	AD	$29.13		$2.07
POWER EQUIPMENT OPERATOR - ROLLER - ASPHALT	AD	$50.27	033	$23.99
POWER EQUIPMENT OPERATOR - ROLLER - EARTH	AD	$27.80	021	$13.92
POWER EQUIPMENT OPERATOR - SCREED	AD	$26.00		$1.86
POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)	AD	$30.14		$11.60
POWER EQUIPMENT OPERATOR-VACUUM TRUCK	AD	$36.30	021	$14.05
RESILIENT FLOOR	AD	$33.34		$14.40
ROOFER/WATERPROOFER	AD	$43.78		$4.53
SHEETMETAL WORKER (INCLUDING METAL ROOFING)	AD	$45.37		$23.48
STEAMFITTER/PIPEFITTER	AD	$50.27		$23.99
STONE MASON	AD	$43.16		$20.48
TILE & TERRAZZO FINISHER	AD	$27.68		$11.83
TILE & TERRAZZO MECHANIC	AD	$33.41		$12.87
TRUCK DRIVER - DUMP	AD	$24.00		$2.11
TRUCK DRIVER - DUMP - ARTICULATING	AD	$27.86		$3.84
TRUCK DRIVER - LOWBOY	AD	$27.86		$3.42
TRUCK DRIVER - TACK/TAR TRUCK	AD	$27.00		$4.42

TRUCK DRIVER - TRACTOR TRAILER	AD	$28.14	$12.60
TRUCK DRIVER - WATER	AD	$24.00	$1.71
LABORER GROUP II			
LABORER - ASPHALT RAKER	AD	$28.02	$8.82
LABORER - COMMON	AD	$28.02	$8.82
LABORER - CONCRETE PUDDLER	AD	$28.02	$8.82
LABORER - CONCRETE TENDER	AD	$28.02	$8.82
LABORER - CONCRETE VIBRATOR	AD	$28.02	$8.82
LABORER - DENSITY GAUGE	AD	$28.02	$8.82
LABORER - FIREPROOFER - MIXER	AD	$28.02	$8.82
LABORER - FLAGGER	AD	$28.02	$8.82
LABORER - GRADE CHECKER	AD	$28.02	$8.82
LABORER - HAND ROLLER	AD	$28.02	$8.82
LABORER - JACKHAMMER	AD	$28.02	$8.82
LABORER - LANDSCAPING	AD	$28.02	$8.82
LABORER - LAYOUT	AD	$28.02	$8.82
LABORER - LUTEMAN	AD	$28.02	$8.82
LABORER - MORTAR MIXER	AD	$28.02	$8.82
LABORER - PLASTERER - HANDLER	AD	$28.02	$8.82
LABORER - TAMPER	AD	$28.02	$8.82
LABORERS GROUP I			
LABORER - AIR TOOL OPERATOR	AD	$24.46	$9.34
LABORER - ASPHALT PAVER	AD	$24.46	$9.34
LABORER - BLASTER - DYNAMITE	AD	$24.46	$9.34
LABORER - BURNER	AD	$24.46	$9.34
LABORER - CONCRETE SURFACER	AD	$24.46	$9.34
LABORER - HAZARDOUS MATERIAL HANDLER	AD	$24.46	$9.34
LABORER - MASON TENDER	AD	$24.46	$9.34
LABORER - PIPELAYER	AD	$24.46	$9.34
LABORER - SCAFFOLD BUILDER	AD	$24.46	$9.34

Incidental Craft Data: Caulker, Man Lift Operator, Rigger, Scaffold Builder, and Welder receive the wage and fringe rates prescribed for the craft performing the operation to which welding, scaffold building, rigging, operating a Man Lift, or caulking is incidental.

These **Informational Prevailing Wage Rates** may not be substituted for the requirements of pre-advertisement or onsite job posting for a public work contract that exceeds $250,000 in value and either of the following criteria are met: (1) the contracting body is a unit of State government or an instrumentality of the State and there is any State funding for the project; or (2) the contracting body is a political subdivision, agency, person or entity (such as a county) and the State funds 25% or more of the project.

Modification Codes:

(AD) 17-209 Annual Determination from Survey Wage Data Received
(CH) 17-211 Commissioners' Hearing
(CR) 17-208 Commissioners' Review
(SR) 17-208 Survey Review by Staff

Each "Borrowed From" county is identified with the FIPS 3-digit county code
unique for the specific jurisdiction in Maryland.

For additional information on the FIPS (Federal Information Processing Standard) code,
see http://www.census.gov/datamap/fipslist/AllSt.txt

The Prevailing Wage rates appearing on this form were originally derived from Maryland's annual Wage Survey. The Commissioner of Labor & Industry encourages all contractors and interested groups to participate in the voluntary Wage Survey, detailing wage rates paid to workers on various types of construction throughout Maryland.

A mail list of both street and email addresses is maintained by the Prevailing Wage Unit to enable up-to-date prevailing wage information, including Wage Survey notices to be sent to contractors and other interested parties. If you would like to be included in the mailing list, please forward (1) your Name, (2) the name of your company (if applicable), (3) your complete postal mailing address, (4) your email address and (5) your telephone number to PWMAILINGLIST@dllr.state.md.us. Requests for inclusion can also be mailed to: Prevailing Wage, 1100 N. Eutaw Street - Room 607, Baltimore MD 21201-2201.