ADDENDUM

No. 1

BID NO.: 611-013

PROJECT TITLE: Elevator Modernization: Phase III
Rockville Campus

SUBMISSION DUE DATE AND TIME: By 3:00 PM on June 17, 2011

MONTGOMERY COMMUNITY COLLEGE
Procurement Office
900 Hungerford Drive
Room 110
Rockville, Maryland 20850

ADDENDUM FOR THE PURPOSE OF MAKING CHANGES TO THE BID DOCUMENTS AS FOLLOWS:

Item 1-1: Revise paragraph 1.03.C of specification Section 14240, HYDRAULIC ELEVATOR MODERNIZATION to read as follows:

Electrical Service, Conductors and Devices: By Elevator Contractor.

Item 1-2: Delete Minnesota Elevator Inc. and Canton Elevator from the list of “Approved Providers” at paragraph 1.04.A.1, Section 14240, HYDRAULIC ELEVATOR MODERNIZATION.

Item 1-3: Revise paragraph 1.04.C.1, Section 14240, HYDRAULIC ELEVATOR MODERNIZATION to read as follows:

Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work.

Item 1-4: Add subparagraphs B and C at paragraph 1.07, Section 14240, HYDRAULIC ELEVATOR MODERNIZATION as follows:

B. Emergency Calls:
An emergency is defined as an unforeseen circumstance that calls for immediate action. The Contractor shall make available emergency call back service on a 24-hour, 7-day/week basis at no additional cost.

The Contractor shall be on-site within one hour of receiving an emergency call prepared to repair and put back into service the affected machine unless unavoidable circumstances preclude this option. In the case of personal entrapment or an elevator out of service that provides ADA access, as determined by the College, an immediate response will be expected. The Contractor shall furnish the College the name and phone number of the individual(s) to contact for emergency service. This service requires a live telephone answering service with the capability of immediately contacting operating personnel at all times. Recorded telephone answering service is not acceptable.
C. Elevator Maintenance and Call Back Log:
Each visit of maintenance shall be recorded on the “Elevator Maintenance and Call Back Log”. The Contractor shall maintain an “Elevator Maintenance and Call Back Log” in the machine room with College provided forms. Provide a copy of the work ticket describing the work performed to the Campus Facilities Office contact person after each visit.

Item 1-5: Delete subparagraphs A.1 and A.2 at paragraph 1.08. “CONDITIONS AND SEQUENCE OF WORK”, Section 14240, HYDRAULIC ELEVATOR MODERNIZATION.

Item 1-6: Delete paragraphs 1.10 and 1.11, Section 14240, HYDRAULIC ELEVATOR MODERNIZATION.

Item 1-7 Delete paragraph 14240.2.01.B, Section 14240, HYDRAULIC ELEVATOR MODERNIZATION.

Index of Attachments to Addendum No. 1
None

Items issued for informational purposes:
None

END OF ADDENDUM NO. 1

Please SIGN below to acknowledge receipt of the Addendum and RETURN with the bid response.
NOTE: ADDENDA WILL NOT BE ACCEPTED BY FACSIMILE OR E-MAIL.

DATE: June 7, 2011 PURCHASING SUPERVISOR: Yu (Judy) Zhu

Applicant’s Signature

Company

Title

Date

Dr. Janet Wormack
Director of Procurement

611-013
Addendum No. 1
June 7, 2011
Bid No. 611-013

ELEVATOR

MODERNIZATION:

PHASE III

Rockville Campus

Montgomery College
Maryland

Date: May 31, 2011
Montgomery College
Office of Central Facilities
40 W. Gude Drive -- Suite 200
Rockville, MD 20850
# INTRODUCTORY INFORMATION

- 000001 Cover Page
- 000010 Table of Contents
- 000015 List of Drawings

# BIDDING REQUIREMENTS

- 000101 Request for Bids
- 000200 Instructions for Bidders
- 000210 Supplementary Information
- 000211 Required Submissions
- 000300 Information Available to Bidders
- 000410 Bid Form
- 000431 Bid Bond
- 000440 Verification of Examination of Existing Site Conditions Form
- 000451 Contractor’s Qualification Statement
- 000453 Minority Participation Form
- 000454 Procurement Office Questionnaire

# CONTRACTING REQUIREMENTS

- 000520 Form of Contract – Sample
- 000611 Montgomery College Standard Performance Bond
- 000612 Payment Bond
- 000621 Application and Certificate for Payment
- 000700 Montgomery Community College General Conditions

# TECHNICAL SPECIFICATION SECTIONS

**DIVISION 14 – CONVEYING SYSTEMS**

- 14240 - HYDRAULIC ELEVATOR MODERNIZATION

**DIVISION 15 – MECHANICAL AND PLUMBING**

- 15050 BASIC MECHANICAL MATERIALS AND METHODS
- 15060 HANGERS AND SUPPORTS
- 15071 MECHANICAL VIBRATION CONTROLS
- 15075 MECHANICAL IDENTIFICATION
- 15083 PIPE INSULATION
- 15110 VALVES
- 15140 DOMESTIC WATER PIPING
- 15145 DOMESTIC WATER PIPING SPECIALTIES
## TABLE OF CONTENTS

**DIVISION 15 – PIPING**

- 15150 SANITARY WASTE AND VENT PIPING
- 15155 DRAINING PIPING SPECIALTIES
- 15183 REFRIGERANT PIPING
- 15446 SUMP PUMPS
- 15738 SPLIT SYSTEM AIR CONDITIONING UNITS
- 15940 SEQUENCE OF OPERATIONS

**DIVISION 16 – ELECTRICAL**

- 16050 BASIC ELECTRICAL MATERIALS AND METHODS
- 16060 GROUNDING AND BONDING
- 16072 ELECTRICAL SUPPORTS
- 16075 ELECTRICAL IDENTIFICATION
- 16120 CONDUCTORS AND CABLES
- 16130 RACEWAYS AND BOXES
- 16140 WIRING DEVICES
- 16410 ENCLOSED SWITCHES AND CIRCUIT BREAKERS
- 16442 PANELBOARDS
- 16491 FUSES
- 16511 INTERIOR LIGHTING

**APPENDIX A**

Travel Directions to Pre-Bid Conference Site

**END OF TABLE OF CONTENTS**
Montgomery College

Elevator Modernization: Phase III
Rockville Campus

LIST OF DRAWINGS

<table>
<thead>
<tr>
<th>ARCHITECTURAL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A0.00 COVER SHEET</td>
<td></td>
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<tr>
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<td>A1.02 NOT USED</td>
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<td>A1.03 TA (THEATRE ARTS) – ELEVATOR PLANS, RCP, ELEVATIONS &amp; MISC. DETAILS</td>
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End of List of Drawings 000015
Bids are being solicited for the Elevator Modernization: Phase III project, Rockville Campus. Bids must either be mailed or hand delivered to the Montgomery College Procurement Office (Room 110) at 900 Hungerford Dr., Rockville, Maryland 20850 on or before the date and time defined below. Bids will not be accepted if received after the opening time and date specified or if sent by facsimile or electronic mail. Bids will be opened publicly at the date and time indicated below. Bidders do not need to be present at the bid opening.

BIDS WILL BE ACCEPTED UNTIL THE CLOSING TIME OF 3:00 PM LOCAL TIME ON JUNE 17, 2011.

Bids must remain valid for ninety (90) calendar days to allow administration of College, County and/or State contract award or other regulatory processes. Prices must remain firm for the duration of the term of the contract. All required submissions must accompany each bid response.

An electronic PDF of the bid documents may be obtained by downloading the file from the Procurement website http://www.montgomerycollege.edu/departments/procure/ on or after May 31, 2011 at no charge. Bid Documents will also be available for reference purposes at 40 West Gude Drive, Suite 200, Rockville, Maryland 20850 on or after May 16, 2011.

A Pre-Bid Conference will be held on June 7, 2011 at 2:00 p.m at the Montgomery College Office of Central Facilities, 40 West Gude Drive, Suite 200, Rockville, MD 20850. A site inspection will be conducted immediately following the Pre-Bid Conference. Attendance by all bidders is strongly encouraged.

All procurement questions shall be directed, no later than 5:00 PM on June 10, 2011, to Yu (Judy) Zhu, Purchasing Supervisor, Procurement Office, Montgomery College, Fax: 240-567-6397, E-mail: yu.zhu@montgomerycollege.edu.

All technical questions shall be directed, in writing, no later than 5:00 PM on June 10, 2011, to Cynthia Johnston, Director of Project Management, Office of Central Facilities, Montgomery College, Fax: 240-567-7379, E-mail: cynthia.johnston@montgomerycollege.edu.

Only answers provided via an addendum issued by the College will be binding.

BID AND PERFORMANCE SECURITY REQUIREMENTS: 10% Bid Bond & 100% Performance, Labor and Material Bonds.

MINORITY VENDORS ARE ENCOURAGED TO RESPOND TO THIS SOLICITATION.

NO ALLOWANCES SHALL BE MADE TO THE SUCCESSFUL BIDDER, AT A LATER DATE, FOR ADDITIONAL WORK REQUIRED BECAUSE OF HIS/HER FAILURE TO INSPECT THE PROJECT SITE.
IMPORTANT: YOUR BID WILL BE JEOPARDIZED IF ANY PORTION OF THIS INQUIRY IS NOT COMPLETE. NO BID/PROPOSAL WILL BE ACCEPTED AFTER THE DATE AND TIME STATED ABOVE.

Janet Womack
Director of Procurement
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 original prices and conditions, if the item or items are therefor existing in the classification, in whole or in part, as deemed to be necessary to the work of the College.

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, to the best of its 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 and shall further agree 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 or Montgomery County government.

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 written by a company licensed to do business in the State of Maryland. If bond security is required, bond company must be authorized to do business under laws of the State of Maryland. The following is the signature and address of the bonding company.

7. BID PRICE: 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 60-250.2.

8. 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.

9. 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 changes 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 the purchase order. The addressee is the institution to whom the delivery is to be made.

10. 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 unopened. Bids submitted by mail must be addressed to the Procurement Office, Montgomery College, P.O. Box 5056, 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, Room 110, 900 Hungerford Drive, Rockville, Maryland 20850.

11. 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 from completion of the contract any and all remedies provided by law.

12. 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.

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.

14. HOARDING AND TOXIC SUBSTANCES: Bidders must comply with all federal, state, county and city 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.

15. INSURANCE: If a contract results from this bid, the contractor shall maintain such insurance as will indemnify and hold harmless the College from Worker'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.

16. 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 this requirement will be returned to the contractor at the contractor's expense. The College reserves the right to inspect any bidder's place of business prior to award of contract to determine whether the bidder is a bona fide manufacturer or dealer.

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. All information submitted in any materials, 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 right thereunder without 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 or the relationship between bidder and its persons.

19. NON-COLLUSION: Bidder certifies that it has neither agreed, conspired, connived, or colluded to produce a deceptive show of competition in the solicitation of the bid or offering being submitted hereunder; 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 bid or offer is submitted.

20. NON-DISCRIMINATION: Bidder assures the College that, in accordance with applicable law, it does not discriminate, 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.

21. PATENTS: Bidder guarantees that the name 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, as may be incurred.

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 bid bond or performance bond or other assurance of full performance of the contract will be required. 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 60-250.2.

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 this requirement will be returned to the contractor at the contractor's expense. The College reserves the right to inspect any bidder's place of business prior to award of contract to determine whether the bidder is a bona fide manufacturer or dealer.

24. RECORD RETENTION: 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's identity.

25. TAXES: Montgomery Community College reserves the right to refuse 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 waive the right 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 PUBLIC SCHOOLS BOARD OF EDUCATION: The County agrees when submitting the bids that it will make available to every office and department of 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 signed 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 FOR BIDDERS

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

PART 1 - ANTICIPATED BID AND AWARD SCHEDULE

1.1 BID SCHEDULE

May 31, 2011  Bid Documents Available
June 7, 2011  Pre-Bid Conference
June 10, 2011  Last Requests for Information Due
June 17, 2011  Bids Due

1.2 AWARD SCHEDULE

This contract award may be subject to approval by the College’s Board of Trustees. If such approval is required, it is the College's intention to seek approval of award of this contract at the June 2011 meeting of the College's Board of Trustees.

Contract award is anticipated in June 2011.

Notice to Proceed will be timely provided upon receipt of documentation and information required from successful Bidder 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 College, County and/or State contract award or other regulatory processes. To accommodate this possibility, contract prices must remain firm for ninety (90) days from bid 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 Bidder’s sole responsibility to ensure that the Bid response accommodates this requirement.

PART 2 - PRE-BID CONFERENCE

2.1 A Pre-Bid Conference will be held on June 7, 2011 at 2:00 p.m. at the Montgomery College Office of Central Facilities, 40 West Gude Drive, Suite 200, Rockville, MD 20850.

Attendance by Bidders at the pre-bid conference is strongly encouraged, but is not required.
A site inspection opportunity will be provided immediately following the pre-bid conference. Bidders will be able to satisfy the required Examination of Existing Site Conditions obligation associated with this bid by attending that site inspection.

Directions to the pre-bid conference and site inspection are included in Appendix A.

2.2 Examination of Existing Conditions:

Bidders are REQUIRED to examine and investigate existing site conditions prior to bid. A Verification of Examination of Existing Site Conditions form included in Section 000440 must be signed by an authorized College representative, and submitted together with other required bid documents. To schedule a site visit after the pre-bid conference, please contact:

Alan Yanaway, Project Manager  
Fax: 240-567-7379  
Email: alan.yanaway@montgomerycollege.edu

PART 3 - BID DOCUMENTS

3.1 Bid Documents include the Request for Bid, Instructions to Bidders, Supplementary Information, Preliminary Project Schedule, Required Submissions, Information Available to Bidders, Bid Form and attachments thereto, Form of Contract, Performance and Payment Bonds (if required), General Conditions, Supplementary Conditions, Specifications, Drawings and all Addenda.

3.2 An electronic PDF of the complete Bid Documents may be obtained by downloading the file from the Procurement website http://www.montgomerycollege.edu/departments/procure/ at no charge, on or after May 31, 2011.

3.3 Bid Documents will also be available for reference purposes at the following location, on or after May 31, 2011:

Montgomery College Office of Central Facilities  
40 West Gude Drive, Suite 200  
Rockville, Maryland 20850  
Attn: Kalisa Gross  
Phone No.: 240-567-4267

3.4 Montgomery College is not responsible for content of and/or information obtained from sources not listed in the Request for Bid. Only information obtained through the College’s Procurement Office, on its website or from sources listed in the Request for Bid should be considered reliable. It is highly recommended that Bidders obtain all information pertaining to this Request for Bid from the College’s Procurement website at http://www.montgomerycollege.edu/departments/procure/ and those sources referred to in the RFB document. It is the Bidder’s responsibility to assure that accurate information has been used in preparation of the Bid response.
PART 4 - EXAMINATION OF SITE AND BID DOCUMENTS

4.1 Bid submission shall serve as verification that, at the time of receipt of the bids, the Bidder has inspected the site and has read and is thoroughly familiar with the Bid 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 Bidder to inspect the site or to examine any form, instrument or document shall in no way relieve a Bidder from obligation in respect to the Bid.

4.2 Data in the Bid Documents pertaining to existing conditions is for convenience only and does not supplant obtaining first-hand information at the site. Examination of site conditions is mandatory and the Bidder is required to include a Verification of Examination of Existing Site Conditions form, signed by an authorized representative of the College with the bid submission. Submission of a Bid shall constitute acceptance by the Bidder of existing site conditions as a part of the requirements for this work.

PART 5 - INTERPRETATION OR CORRECTION OF BID DOCUMENTS

5.1 The Bid Documents should be examined carefully. Should any Bidders find discrepancies or omissions in these Bid Documents, or be in doubt as to the meaning of any item(s), they should submit requests for clarification, in writing to:

Cynthia Johnston, Director of Project Management
Fax: 240-567-7379
E-mail: cynthia.johnston@montgomerycollege.edu

5.2 Bidders 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 REQUESTS FOR CLARIFICATIONS BY BIDDERS MUST BE SUBMITTED IN WRITING NO LATER THAN 5:00 PM ON June 10, 2011.

5.4 Bidders shall not communicate directly with the Architect/Engineer or any of the Architect/Engineer's consultants. No interpretation of the meaning of Bid Documents will be made to any Bidder orally as oral instruments do not form a part of the Bid Documents.

5.5 The College will review the written questions and requests for clarification, if any; and any and all interpretations and any supplemental instructions will be issued in the form of written Addenda to the Bid Documents which, if issued, may be obtained by downloading the file from the procurement website http://www.montgomerycollege.edu/departments/procure/ at no charge.

5.6 It is the Bidder’s sole responsibility to ensure receipt of all Addenda. It is highly recommended that the Bidder check the College’s website for all posted Addenda prior to submitting his/her bid. All Addenda shall become part of the Contract documents.
5.7 Failure of any Bidder to receive any such Addenda or interpretation shall not relieve such Bidder from any obligation under his/her bid as submitted.

5.8 If conflicts, discrepancies, ambiguities, or omissions in, or between, the Bid Documents, site conditions, etc., are not brought to the attention of the College prior to bid opening date, the interpretation and intent of the Bid Documents shall be determined by the College in its sole discretion. In such an instance, the decision of the College shall be binding and no claims for extra costs will be allowed.

PART 6 - BID FORMS AND SUBMITTALS

6.1 Each bid must be submitted on the prescribed forms with all attachments as defined in the Bid Documents. One original and the number of copies specified in the Bid Documents must be submitted. The cover sheet of each copy of the bid must be clearly marked “original” or “copy”.

6.2 All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures. The words "No Bid" in any of the spaces constituting a bid price as well as a qualified bid price may cause the entire bid to be rejected.

6.3 Bid shall be signed in longhand below the typed name of the person authorized to bind the Bidder to the Contract.

6.4 When a Bidder is a corporation, the bid must be signed with the legal name of the corporation followed by the name of the State of incorporation and the legal signature of a person authorized to bind the corporation to the Contract.

6.5 Bids must be submitted in a sealed envelope.

Bidders must copy and paste the following bid envelope label on the outside of the envelope for each bid submitted. It is mandatory that the bid envelope label is used or this exact information is duplicated on the envelope of the sealed bid. Failure to do so may cause the bid to be rejected.

**BID ENVELOPE LABEL**

<table>
<thead>
<tr>
<th>Bid Package No.:</th>
<th>611-013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid Opening Date:</td>
<td>June 17, 2011</td>
</tr>
<tr>
<td>Bid Opening Time:</td>
<td>3:00 PM</td>
</tr>
<tr>
<td>Bidder’s Name:</td>
<td>____________________</td>
</tr>
<tr>
<td>Bidder’s Address:</td>
<td>____________________</td>
</tr>
</tbody>
</table>

Project Title: Elevator Modernization: Phase III
Rockville Campus

Bid No.: 611-013
6.6 Any bid received after the time and date specified, or at a different location than specified above, will not be opened or given any consideration.

PART 7 - DELAYED OPENING

7.1 If the College is closed for any reason on the day Bids are due, the Bid shall be submitted on the next business day the College is open, at the same stated submission time, unless other notification is provided.

PART 8 - WITHDRAWAL OF BIDS

5.1 Bidder may not withdraw or modify the bid for ninety (90) calendar days after the bid opening because the College may require additional time to administer College, County and/or State contract award or other regulatory processes.

To accommodate for this possibility, prices must remain firm for ninety (90) days from bid 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 Bidder’s sole responsibility to ensure that the bid response accommodates this requirement.

PART 9 - BID EVALUATION

Bids submitted in response to this solicitation will be evaluated as follows:

9.1 Bidder is responsible – Bidder demonstrates ability to provide products and/or services that can meet or exceed requirements. The following criteria will be used to determine Bidder is responsible:

9.1.1 Bidder has the equipment, ability, and experience to perform the work as stated in the specifications listed in this bid.
9.1.2 Bidder is financially stable.

9.2 Bidder is responsive – Bidder follows bid submission instructions and provides all requested materials. The following criteria will be used to determine Bidder is responsive:

9.2.1 Bidder has favorable references that can confirm their ability to provide the products and/or services as stated in the specifications listed in this bid.
9.2.2 Bidder has provided all documentation and samples requested in the Scope of Work and Specifications.

PART 10 - AWARD OR REJECTION OF BIDS

10.1 The Contract will be awarded in consideration of the Total Base Bid Price and the substantiated ability of the apparent low responsive, responsible Bidder to perform the required construction services described in the Bid Documents.
10.2 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 accept the bid. 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 Bidder and to determine the ability of the Bidder to perform the work. The Bidder shall furnish all such information and data as the College may request. The College reserves the right to reject any bid if the evidence submitted by, or investigation of such Bidder fails to satisfy the College that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated herein.

B. Conditional bids will not be accepted. Any conditions, qualifications and/or exclusions accompanying a bid will be rejected by the College. Bidders who submit conditional bids will be asked to either withdraw their conditions or to withdraw their Bid and potentially forfeit their bid bond.

C. To reject any or all bids 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 Request for Bid.

D. To accept or reject any item of the bid or any alternate prices in the priority order established by the Bid Form.

E. To consider informal, any bid 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 Bid 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 receipt of bids. Anticipated contract award date, notice to proceed date and project scheduling expectations may be adjusted in concert with this provision. It is the Bidder’s sole responsibility to ensure that the bid response accommodates this requirement. Upon Award, price 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 bids without any further action by the College.

PART 11 - BONDS

11.1 Each Bidder shall furnish a Bid Bond and Letter of Intent from Bonding Company as required below.

11.2 Bidder shall submit one original and the specified number of copies 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, for not less than 10% of the amount of the Total Base Bid, or a cashier's check in the amount of not less than 10% of the Total Base Bid amount.

Bid Bond shall be prepared on AIA Document A310-2010, "BID BOND".
11.3 Bidder shall submit one original and the specified number of copies of a letter from the Bidder's bonding company saying that it guarantees it will furnish the required 100% performance and labor and material payment bonds if the Bidder is recommended for contract award. Letter provided shall not be generic, but must be written specifically for this project.

11.4 Prior to the execution of the Contract, the successful Bidder shall deliver to the College a performance bond, properly executed on the Montgomery College Standard Performance Bond a copy of which is enclosed in the 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.

11.5 Should the successful Bidder fail or refuse to execute and deliver the Contract and bonds required within five (5) days, Saturdays, Sundays and legal holidays excluded, after receiving notice of the acceptance of the bid, the Bidder shall forfeit to the College, as liquidated damages for such failure or refusal, the security deposited with the Bid.

11.6 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.

11.7 Upon request, Bid Bonds will be returned to all Bidders after the College and the successful Bidder have executed a Contract, or if no Contract has been executed within ninety (90) calendar days after the bid due date, upon demand of the Bidders at any time thereafter so long as Bidders have not been notified of the acceptance of the bid.

PART 12 - POWER OF ATTORNEY

12.1 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 13 - FORM OF CONTRACT

13.1 The Agreement between the Bidder and the College shall be executed on the Form of Contract by the College, a copy of which is enclosed in these Bid Documents. Any exceptions to the FORM OF CONTRACT must be included with the bid to be considered by the College. An exception to the FORM OF CONTRACT by the Bidder is considered by the College to be a request for information. The College makes no implicit or explicit statement as to any willingness to deviate from the FORM OF CONTRACT included in the Bid Documents. Unless explicitly stated by the Bidder in the Bid Form that an exception to the FORM OF CONTRACT is a condition of the bid, the College does not consider exceptions to the FORM OF CONTRACT provided by a Bidder to be the submission of a conditional bid. The College, at its sole discretion, reserves its right to declare any bid non-responsive.
PART 14 - SUBCONTRACTOR QUALIFICATIONS

14.1 The College's intent, with regard to verification of Subcontractor qualifications and financial stability, is that it is the Bidder's responsibility to evaluate the qualifications, financial viability and solvency of all Subcontractors.

14.2 Within three (3) business days from request by the College, Bidders shall submit to the College for each Principal Subcontractor, herein defined as those Subcontractors whose contract value is anticipated to exceed $100,000:

a) Bidder's Qualification Statement, per section 000451

b) Three (3) project references, including two projects within the Metropolitan Baltimore-Washington region, documenting successful completion of projects of similar size, scope and complexity, within the last five years.

14.3 The College reserves the right to reject any Subcontractor.

PART 15 - LIST OF SUBCONTRACTORS

15.1 Within three (3) business days from request by the College, Bidder 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 Bidder for this project, regardless of anticipated contract value.

PART 16 - VENDOR QUALIFICATIONS

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

16.2 Within 3 business days from request by the College, Bidder 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:

1) Name
2) Address
3) Type of Work Performed
4) Years in Business
5) Representative Project List (including three projects of similar size, scope and complexity)
6) References (list three references, including contact name and telephone number)
7) Copy of Maryland registration/license number, if applicable

16.3 The College reserves the right to reject any Vendor.
PART 17 - INSURANCE

17.1 Before starting any work, the Contractor must provide sufficient evidence of insurance showing adequate coverage as defined in the sample FORM OF CONTRACT included in this bid request.

PART 18 - LAWS AND REGULATIONS

18.1 The Bidder'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 19 - MINORITY PARTICIPATION

19.1 Pursuant to Board Resolutions #87-82 and #87-83, adopted on July 20, 1987, it is the policy of Montgomery College to encourage minority businesses to provide goods and services for the performance of College functions. Minority businesses include non-profit entities organized to promote the interests of handicapped persons, and firms that are 51% owned and controlled by a member(s) of socially or economically disadvantaged minority group, which includes: African American, American Indian/Native American, Asian, Hispanic, women, and physically or mentally disabled.

19.2 The Bidder must submit the College’s Minority Participation Form, included in the contract documents, with their Bid.

19.3 The Bidder is encouraged to demonstrate that at a minimum 15% of the subcontractors and/or vendors anticipated to be retained by the Bidder for the College's project are minority firms.

19.4 Within three (3) business days of request by the College, the Bidder shall provide a list indicating minority subcontractor and/or vendor participation anticipated for the project. The Bidder shall provide the College with routine updates should any changes in subcontractor or vendor status occur during the conduct of the project.

End of Instructions for Bidders
SUPPLEMENTARY INFORMATION

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

PART 1 – PRICING INFORMATION

1.1 With regard to General Condition 3.3.1.3, please note that this project is NOT subject to State of Maryland DLLR Prevailing Wage requirements.

PART 2 – PRELIMINARY PROJECT SCHEDULE

2.1 Bidder is advised that work must be coordinated in a manner that accommodates the needs of summer programming in the Rockville Campus’ Theater Arts (R-TA) building.

Anticipated project schedule milestones include:

   Start of Work: June 2011 [submittals; long lead time items].
   Start of Work at the site: First week of August 2011.
   Completion: within 90 days of Start of Work at the site

End of Supplementary Information
REQUIRED SUBMISSIONS

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

TO: PROSPECTIVE BIDDERS

FROM: PROCUREMENT OFFICE
MONTGOMERY COMMUNITY COLLEGE

Bids (one original and three copies, including all Attachments) shall be submitted on the enclosed Bid Form, properly signed with the required Attachments, if any, in sealed envelopes and addressed to:

Director of Procurement
Montgomery Community College
900 Hungerford Drive, Room 110
Rockville, MD  20850

Any size envelope may be used. However, all envelopes must be marked with the bidder's name and address, bid number and description for which the bid is submitted, as well as date and time of receipt of bid in the College's Procurement Office.

PART 1 - ITEMS REQUIRED FOR ALL BID SUBMISSIONS:

A.  Bid Form

B.  Bidder’s Qualification Statement

C.  Copy of Bidder’s Maryland Contractor’s License

D.  Bidder’s Project References

   The Bidder shall provide five (5) project references, for work performed within the last five years describing the Bidder’s experience in providing construction services on projects of similar size, scope and complexity. Project references should include the name and address of the project, brief explanatory description, name of contact person and telephone number, and the contract value. At least two (2) of the referenced projects shall be within the Baltimore and Washington Metropolitan area.

E.  Bidder’s Management/Supervisory Personnel List including Construction Superintendent.

   The Bidder 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.

F.  AIA Document A310-2010, Bid Bond
G. Bonding Company Letter Guaranteeing the Required 100% Performance, Labor and Material Payment Bonds

H. Minority Participation Form for Bidder

I. Any exceptions to the FORM OF CONTRACT

PART 2 – ITEMS REQUIRED, UPON REQUEST BY COLLEGE

A. List of Proposed Subcontractors (regardless of anticipated contract award value).

B. Subcontractor Qualification Data for Principal Subcontractors.

C. Vendor Qualification Data for Principal Vendors.

D. List of Minority Subcontractor and/or Vendor participation anticipated.

End of Required Submissions
INFORMATION AVAILABLE TO BIDDERS

Montgomery College

ELEVATOR MODERNIZATION: PHASE III
Rockville Campus

1.1 GENERAL PROVISIONS

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

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

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

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

E. Bidders 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 Bidders.

1.2 BUILDING DOCUMENTATION

Bidders 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
Fax: 240-567-7379
Email: alan.yanaway@montgomerycollege.edu

1.3 ROCKVILLE UTILITY REFERENCE DATA

As-Built documentation is available as reference documents. Documentation may be examined by submitting a written request to Alan Yanaway as prescribed above in Section 1.2.

END OF INFORMATION AVAILABLE TO BIDDERS
Montgomery College

Elevator Modernization: Phase III
Rockville Campus

To: Montgomery College

Re: Elevator Modernization: Phase III
Rockville Campus

Attn.: Procurement Office
Montgomery Community College
900 Hungerford Drive – Room 110
Rockville, Maryland 20850

From: ________________________________
(Provide Your Company’s Name)

PART 1 - Bidder must submit one original plus three copies of the Bid Form and all Attachments (see PART 8 – Bid Submittal 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 bid non-responsive and be grounds for rejection of the entire bid. Conditional bids will not be accepted.

PART 3 - Bidder acknowledges receipt of the following Addenda:

Number____________________________________ Date_____________________________

Number____________________________________ Date_____________________________

Number____________________________________ Date_____________________________

Number____________________________________ Date_____________________________

PART 4 - The Bidder proposes to provide all of the necessary labor, materials, equipment, and insurance for the Elevator Modernization: Phase III, project at the Montgomery College Rockville Campus, as specified in the Bid Documents. The work to be performed by the Bidder shall include all items accepted by the College as part of the Bidder's submittal. It is understood that Montgomery College (hereinafter referred to as College) will be the sole judge as to the acceptance of the bids and award of the contract. All work shall be done in accordance with the accompanying Specifications and Drawings for the amount
listed below, and accepted Alternates, if any, as applicable in accordance with the terms of the Bid Documents. The Bidder is reasonably expected, given the existing conditions and required construction, to complete the Work within the completion date stated in the Bid Documents.

PART 5 - BASE BID: (State amounts in both words and numbers where indicated)

The proposed total contract amount to complete the Elevator Modernization: Phase III project at the Rockville Campus, including the cost associated with Performance, Labor and Material Payment Bonds, and including the cost associated with any Special Pricing Requirements if requested in Part 6 below, in accordance with the Bid Documents, and having examined both the Place of the Work and all matters referred to in the Bid Documents, is:

Base Bid Detail (In Numbers):

1. General Conditions $________________________

2. Elevator Modernization: Phase III
   a. Equipment & Materials $________________________
   b. Labor $________________________
   c. Total (2a+2b) $________________________

3. Total Base Bid Price (1+2c): $________________________
   (Total Base Bid Price)

4. Total Base Bid Price (Line 3):
   (In Words): _____________________________________________________________ Dollars
   (In Numbers): $__________________________________________________________

PART 6 - SPECIAL PRICING REQUIREMENTS: (State amounts in both words and numbers)

A. DEDUCT ALTERNATES – NOT USED

B. ADD ALTERNATES – NOT USED

C. UNIT PRICES – NOT USED
D. SEPARATELY IDENTIFIED PRICES – NOT USED

PART 7 - 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 Bid Form:

   Bid Bond (AIA Document A310-2010, “Bid Bond”)
   Bonding Company Letter

PART 8 - BID SUBMITTAL ATTACHMENTS

(Submit One Original plus Three (3) Copies of the Bid Form and all Attachments)

A. Minority Participation Form

B. Contractor Qualification Statement per Section 000451

C. AIA Document A310-2010, Bid Bond

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

E. Copy of Maryland Contractor’s License

F. Bidder's Project References (if separate sheets are provided beyond the Bid Form)

G. Contractor’s Management/Supervisory Personnel List including the Construction Superintendent

H. Any exceptions to the FORM OF CONTRACT
PART 9 - BIDDER’S PROJECT REFERENCES

The Bidder shall list at five (5) projects of similar scope, size and complexity. At least two (2) of the project sites are to be within the Metropolitan Baltimore-Washington area. The referenced work shall have been completed within the past five years. Provide a brief description of the scope of work. Please make sure your references and contact persons are current. Use separate sheets if necessary and include with your submission. These will become part of the Contract.

REFERENCE #1:
Name and Address of Project: ____________________________  Name of Contact Person: ______________________  Telephone: ________  Contract Value: ________

REFERENCE #2:
Name and Address of Project: ____________________________  Name of Contact Person: ______________________  Telephone: ________  Contract Value: ________

REFERENCE #3:
Name and Address of Project: ____________________________  Name of Contact Person: ______________________  Telephone: ________  Contract Value: ________

Date & Description:
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
ELEVATOR MODERNIZATION: PHASE III

BID NO. 611-013

<table>
<thead>
<tr>
<th>REFERENCE #4:</th>
<th>Name and Address of Project:</th>
<th>Name of Contact Person:</th>
<th>Telephone:</th>
<th>Contract Value:</th>
</tr>
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<tbody>
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</tbody>
</table>

Date & Description:

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

<table>
<thead>
<tr>
<th>REFERENCE #5:</th>
<th>Name and Address of Project:</th>
<th>Name of Contact Person:</th>
<th>Telephone:</th>
<th>Contract Value:</th>
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</tbody>
</table>

Date & Description:

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

PART 10 – The undersigned agrees, if selected as the Contractor, to execute a Contract in accordance with the terms of this Bid Solicitation and Contract Documents, within five (5) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the College.

PART 12 - The undersigned further certifies under the penalties of perjury that this bid 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 13 - The undersigned acknowledges the right of the College in its sole discretion to accept any Bid or to reject any or all Bids.
PART 14 - SIGNATURES:

_________________________________________________________  ________________________________
(Date)  (Company Name)

_________________________________________________________
(Address)

_________________________________________________________
(Telephone Number)

_________________________________________________________
(Facsimile Number)

By:  _________________________________________________________

_________________________________________________________
Authorized Agent & Title (Print)

_________________________________________________________
Signature

_________________________________________________________
(F.E.I.N.)

_________________________________________________________
(Contractor License Number)

BE SURE TO SIGN YOUR BID
BID BOND

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

Use AIA Document A310-2010, Bid Bond
VERIFYING OF EXAMINATION OF EXISTING SITE CONDITIONS

Montgomery College
Elevator Modernization: Phase III
Rockville Campus

This form must be completed and attached to all bids.

The undersigned hereby certifies the attendance of a site inspection on ____________, 2011, with an authorized College Representative, to examine the existing site conditions.

Date

Company Name

Address

Telephone Number

Facsimile Number

Name & Title (Print)

Signature

Attendance confirmed by College Representative

Date

College Representative Name & Title

Signature
BIDDER’S QUALIFICATION STATEMENT

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

Bid Number 611-013

Submit Montgomery College’s “Bidder Qualification Statement”, unless otherwise indicated. A copy of the form is included with this Section of the Project Manual.
Bidder Qualification Statement

Information provided in this statement is for the express purpose of assisting Montgomery College in its assessment of the Bidder’s suitability for providing services as a General Contractor for the referenced project.

SUBMITTED TO: Director of Procurement
MONTGOMERY COMMUNITY COLLEGE

ADDRESS: 900 Hungerford Drive, Room 110
Rockville, MD 20850

SUBMITTED BY:
TITLE:

COMPANY NAME:
ADDRESS:

NAME OF PROJECT: Elevator Modernization: Phase III
Rockville 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 Please describe the form of your organization (i.e. corporation, partnership, individual, or other) and name the principal(s):
2.0 LICENSING
2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business:

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 major construction projects your organization currently has in progress, giving the name of the project, owner, contract amount, percent complete and scheduled completion date.

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)
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 ____________________, 2011.
    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 ________________, 2011.

    _______________________________________________________

    Notary Public:

    My Commission Expires:
MINORITY PARTICIPATION FORM

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

BIDDERS SHALL COMPLETE THE FOLLOWING:

I HEREBY REPRESENT THAT OUR/MY FIRM IS __________

IS NOT ________

A MINORITY BUSINESS FIRM AS INDICATED BELOW (circle one):

African American (not Hispanic) _____ Hispanic _____ Asian _____
American Indian/Native American _____ Disabled _____ Female _____

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 Total Contract Price

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

MINORITY PARTICIPATION FORM 000453-1
ELEVATOR MODERNIZATION: PHASE III

PROCUREMENT OFFICE QUESTIONNAIRE

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

MONTGOMERY COLLEGE
Procurement Office

RFB Number: 611-013

RFB Title: Elevator Modernization: Phase III, Rockville Campus

Please be advised that our company does not wish to submit a bid in response to the above-captioned Request for Bid 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 Community College
Procurement Office
900 Hungerford Drive, Room 110
Rockville, Maryland 20850-1733
ELEVATOR MODERNIZATION: PHASE III

CONTRACT
BETWEEN
MONTGOMERY COMMUNITY COLLEGE
AND

________________________________________

Board of Trustees
Montgomery Community College
Rockville, Maryland 20850

Project Title: ___________________
Contract No.: _________________
Account No.: _________________

This AGREEMENT made this _____ day of ______________, 201__, by and between the Board of Trustees of MONTGOMERY COMMUNITY 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 ten (10) 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. David J. Capp
Associate Vice President for College Facilities
Montgomery College
Office of Central Facilities
40 West Gude Drive, Suite 200
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
   - Bodily Injury: $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 attorneys 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 20.1 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 20.1 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 WHEREOF, the Contractor and the College have hereunto set their hands and seals the day and year first above written.

Montgomery Community College

By: ________________________________
DeRionne P. Pollard, Ph.D.
President

Date: ________________________________

Contractor

By: ________________________________

Date: ________________________________

Fed Tax I.D. No.: ______________________
This contract is executed by the Montgomery Community 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.

David J. Capp
Associate Vice President for College Facilities

Date

Certify that funds are available for this Contract.

Thomas Sheeran
Chief Business Officer

Date

Contract No.
Account No
Amount:

End of Form of Contract
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
Company: (Corporate Seal) 

SURETY
Company: (Corporate Seal) 

Signature: __________________________________________
Name and Title: ________________________________

Signature: __________________________________________
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 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 herefrom 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
Company: ________________________________ (Corporate Seal)
Signature: ________________________________
Name and Title: __________________________
Address: ________________________________

SURETY
Company: ________________________________ (Corporate Seal)
Signature: ________________________________
Name and Title: __________________________
Address: ________________________________
PAYMENT BOND

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

RFB Number 611-013

Use AIA Document A312-2010, Payment Bond
APPLICATION AND CERTIFICATE FOR PAYMENT

Montgomery College

Elevator Modernization: Phase III
Rockville Campus

RFP Number 611-013

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

1. GENERAL PROVISIONS
   1.1. DEFINITIONS
   1.2. CONTRACT DOCUMENTS
       1.2.1. Correlation and Intent of Contract Documents
       1.2.2. Specifications Format
       1.2.3. Standard Specifications
       1.2.4. Ownership

2. COLLEGE AND COLLEGE’S AGENTS
   2.1. AUTHORITY OF THE COLLEGE’S PROJECT MANAGER
   2.2. RESPONSIBILITY OF THE COLLEGE’S PROJECT MANAGER AND/OR
        CONSTRUCTION MANAGER
   2.3 RESPONSIBILITIES OF THE ARCHITECT/ENGINEER
   2.4 COLLEGE’S RIGHT TO STOP OR SUSPEND WORK
       2.3.1. Stopping of the Work
       2.3.2. Suspension of the Work

3. CONTRACTOR
   3.1. RESPONSIBILITIES OF THE CONTRACTOR
   3.2. CONTRACTOR’S ADMINISTRATION AND SUPERVISION OF THE WORK
       3.2.1. Staff
       3.2.2. Supervision
       3.2.3. Subcontracts
       3.2.4. Behavior of Contractor’s Employees, Agents and Subcontractors
   3.3. MATERIALS, LABOR, EQUIPMENT AND PROCESSES
       3.3.1. Proposals
       3.3.2. Labor, Materials and Equipment
       3.3.3. Or Equal
       3.3.4. Substitutions
       3.3.5. Required List of Materials and Equipment
   3.4 WARRANTY/GUARANTEES
   3.5 TAXES
   3.6 PERMITS, FEES AND NOTICES
   3.7 PROSECUTION AND PROGRESS OF THE WORK
       3.7.1. Notice to Proceed
       3.7.2. Hours of Work
       3.7.3. Construction Schedule
       3.7.4. Progress Meetings
   3.8 REFERENCE DOCUMENTS FOR THE WORK
       3.8.1. Progress Documents
       3.8.2. Record Documents
   3.9 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
3.10 SITE ACCESS, USE AND RESTRICTIONS
3.10.1 Site Information
3.10.2 Campus Coordination Requirements
3.10.3 Coordination where Work is in or adjacent to an Occupied Existing Building
3.10.4 Temporary Facilities
3.10.5 Existing Utilities
3.10.6 Erosion Control
3.10.7 Tree and Plant Protection
3.10.8 Snow and Ice Removal
3.10.9 Trash Removal, Salvage and Recycling
3.10.10 Project Signage
3.11 HAZARDOUS AND TOXIC SUBSTANCES
3.11.1 Hazardous and Toxic Substances
3.11.2 Asbestos-Containing Materials
3.11.3 Environmental Litigation
3.12 CUTTING AND PATCHING
3.13 CLEANING
3.13.1 Progress Cleaning
3.13.2 Final Cleaning
3.14 ROYALTIES AND PATENTS
3.15 INDEMNIFICATION

4. ADMINISTRATION OF THE CONTRACT
4.1 CLARIFYING INSTRUCTIONS
4.2 REQUESTS FOR INFORMATION
4.3 SITE VISITS AND OBSERVATIONS
4.4 CLAIMS AND DISPUTES
4.5 DELAYS AND DAMAGES

5. CONSTRUCTION BY COLLEGE OR BY SEPARATE CONTRACTORS

6. CHANGES IN THE WORK
6.1 CHANGES IN THE WORK
6.1.1 Changes
6.1.2 Disputed Work
6.1.3 Modification of Contract Sum
6.1.4 Minor Changes in the Work

7. PAYMENTS AND COMPLETION
7.1 SCHEDULE OF VALUES
7.2 PROGRESS PAYMENTS
7.3 ACCEPTANCE OF THE WORK AND FINAL PAYMENT
7.4 ASSIGNMENT OF CONTRACT MONIES
7.5 AUDIT

8. PROTECTION OF PERSONS AND PROPERTY
8.1 SAFETY PRECAUTIONS AND PROGRAMS
8.2 SAFETY OF PERSONS AND PROPERTY
8.3 FIRE PROTECTION
8.4 EMERGENCIES
8.5 ACCIDENTS
9. INSURANCE AND BONDS
   9.1. INSURANCE
   9.2. PERFORMANCE, LABOR AND MATERIAL BONDS

10. CORRECTION OF WORK
    10.1 CORRECTION OF WORK
        10.1.1 Correction of Work before Final Payment
        10.2.1 Correction of Work after Final Payment
    10.2 ACCEPTANCE OF NON-CONFORMING WORK

11. MISCELLANEOUS PROVISIONS
    11.1 LEGAL OBLIGATIONS, RELATIONS AND RESPONSIBILITIES
        11.1.1 Laws to be Observed
        11.1.2 Regulations
    11.2 INDEPENDENT CONTRACTOR
    11.3 EQUAL OPPORTUNITY
    11.4 COMPLIANCE WITH THE IMMIGRATION REFORM AND CONTROL ACT OF 1986
    11.5 ASSURANCE OF CONVICTION OF NON-BRIBERY
    11.6 CONFLICT OF INTEREST
    11.7 ASSIGNMENT AND SUBCONTRACTING
    11.8 CONTINGENT FEES
    11.9 MARYLAND PUBLIC INFORMATION ACT
    11.10 TESTING AND INSPECTION
    11.11 NO WAIVER OF RIGHTS – COLLEGE’S REMEDIES CUMULATIVE – COLLEGE’S DAMAGES

12. TERMINATION OF THE CONTRACT
    12.1 TERMINATION FOR DEFAULT
    12.2 TERMINATION FOR CONVENIENCE
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 Proposals, Instructions for Contractors, 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, the 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 Associate Vice President for College Facilities 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.

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) Any modifications to the Contract Documents executed after the date of the Contract, with the Modifications having the latest date having the greatest authority.
   (2) The Contract.
   (3) The General Conditions.
   (4) Drawings and Specifications.

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

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. 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 ARCHITECT/ENGINEER

2.3.1. Architect/Engineer’s Status

   2.3.1.1. The College may maintain staff personnel from the Office of Central Facilities, 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.

   2.3.1.2. 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.
2.3.1.3. 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.

2.3.1.4. 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.

2.3.1.5. 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.

2.4. COLLEGE’S RIGHT TO STOP OR SUSPEND WORK

2.4.1. Stopping of the Work

2.4.1.1. 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.

2.4.2. Suspension of the Work

2.4.2.1. 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.

2.4.2.2. 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 job 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.
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 his 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. Or Equal

3.3.3.1. Where materials are specified by name, or several names, 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.

3.3.3.2. 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. 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.

3.3.4. Substitutions

3.3.4.1. Should the Contractor desire to substitute another material for one or more specified by name, it shall apply in writing to the College’s Project Manager for permission and state the credit or extra, if any, involved with the use of such material.

3.3.4.2. Contractor shall endeavor to submit substitution requests for consideration prior to submitting a price proposal or bid response. Requests shall be accompanied by detail sufficient to facilitate the College’s evaluation.

3.3.4.3. Requests for substitutions of products, materials or processes other than those specified shall be accompanied by evidence that the proposed substitution: (1) is equal in quality and serviceability to the specified 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; and (4) will provide a cost advantage to the College. The Contractor will furnish with his 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. The burden of proof shall be upon the Contractor.

3.3.4.4. Regardless of the evidence submitted or any review or independent investigation by the College, a request for a substitution 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.

3.3.4.5. Any substitutions requested after the award of the Contract 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.

3.3.4.6. 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.

3.3.4.7. The College may reject a proposed substitution without cause.
3.3.5. Required List of Materials and Equipment

3.3.5.1. 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.

3.4. 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 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. 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 change orders are experienced, 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 reviewed by the College's
Project Manager and shall be approved or disapproved by them.

(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, RFI’s, 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 College’s Project Manager.

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. Progress Documents

3.8.1.1 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.

3.8.2. Record Documents

3.8.2.1. 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.

3.8.2.2. 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 drawing 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 drawing 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 drawings, the Contractor shall resubmit the 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 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.

3.10.4. 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, shall be recorded by the Contractor’s surveyor and referenced to a campus
benchmark provided by the College. Locations shall be recorded on project progress documents.

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 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 “Indemnities”) from any claims, loss, costs, damages or other expenses suffered or incurred by the Indemnities, including attorneys 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 Indemnities in any action or suit brought against any of the Indemnities 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 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 Specifications, the College’s, College’s Project Manager’s, and Architect/Engineer’s instructions, 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. 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 authorized in writing 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 his 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 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 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; and
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.

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 Associate Vice President for College Facilities 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 Associate Vice President for College Facilities, in consultation with such other persons as deemed advisable, shall prepare and deliver a written decision to the Contractor. The Associate 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 Associate Vice President for College Facilities 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 Associate Vice President for College Facilities, the Associate Vice President for College Facilities' decision shall be considered to be conclusive and final unless within thirty days from the date of the Associate Vice President for College Facilities' decision the Contractor requests submitting the dispute to non-binding mediation as a 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 Associate Vice President for College Facilities' decision, the Associate Vice President for College Facilities' 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 Associate Vice President for College Facilities 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. Delays beyond the control of the Contractor

4.5.1.1. 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:
   (1) Terminate the Agreement, or
   (2) Allow the President of the College or their designee to extend the time for performance. No monetary compensation will be awarded for the time extension.

4.5.1.2. 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.

4.5.2. No Waiver of Delay

4.5.2.1. 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.

4.5.3. Mitigation of Delays and College Remedies.

4.5.3.1. 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 of 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.
4.5.3.2 If Contractor should at any time cause the Delays described in subparagraph 4.5.3.1, 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 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.

4.5.4. Waiver of Right to a Time Extension

4.5.4.1. Failure of the Contractor to request a time extension within seven (7) calendar days of the time the Contractor should have known about the delay to which it might otherwise be entitled, shall constitute a waiver of the Contractor's right to an extension of the required completion date, except that subsection 4.5.5 shall be separately applied if necessary.

4.5.5. Severe Weather Delays

4.5.5.1. "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.

4.5.6. Liquidated Damages

4.5.6.1. 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 contract completion date, 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.
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 his 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 clean up. 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 clause 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; and provided further that 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.

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 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 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 mark up 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, not to exceed 5% of the Subcontractor's labor, materials and equipment cost.

Sample Calculation:

A. Subcontractor's cost (LME) = A
   (includes direct costs of Subsubcontractors and/or suppliers)
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+B+C
E. Contractor's Bonds and
   Builder's Risk Insurance if required = as a % of A+B+C+D
F. Total 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. 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 Article 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 following schedule:

- Claims less than $4,000 require review and approval by the College’s Associate Vice President for College Facilities.
- Claims between $4,000 and $7,499 require review and approval by the College’s Vice President for Administrative and Fiscal Services
- Claims between $7,500 and $24,999 require review and approval by the College President.
- Claims $25,000 and greater require review and 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 total sum of the Contract. 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 to be supplied or approved by the College’s Project Manager:

(1) Updated schedule information of Contractor’s progress to 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 stating respectively that their subcontractors, vendors and material suppliers have been paid from the proceeds of the last 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. From each Application for Payment the College shall withhold 10% of the amount earned as retainage. Upon request by the Contractor and approval by the College, and, if required, the surety, and if the progress of the Work and quality of the Work is in accordance with the current schedule and is satisfactory as determined by the College at its sole discretion, and if the Contractor's Work is physically 50% complete, no additional retainage shall be withheld for Work completed subsequent to that date. Unless otherwise agreed to by the College in writing, the retainage withheld for the first 50% of the Contractor's Work shall be paid with the Final Payment. The College reserves the right to withhold from subsequent payments for the balance of the Work a sum sufficient to restore the retainage to 10% of the value of the Work for the balance of the Work from the time it may conclude in its sole judgment that the Work may not be completed by the date required by the Contractor or the work is otherwise not in conformance with the requirements of the Contract Documents. Unless otherwise agreed to by the College in writing, until Substantial Completion of the Project is achieved, the retainage withheld shall not be less than 5%. Following Substantial Completion of the Project, the College at 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. 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.

7.3.2.2. 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 unless 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.

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 Agreement. 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 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
- Property Damage: $2,000,000 each occurrence

- Bodily Injury by Disease: $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

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. 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.

9.2.2. 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.

9.2.3. 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, 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 Final Payment

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 Agreement is a contract under seal and its provisions 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 there from.

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 10 of the State Government 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 was 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 therefor, 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 a rising out of this
Contract, the College may collect damages of any kind, including consequential damages, or damages
for purely economic loss.
ARTICLE 12 – TERMINATION OF THE CONTRACT

12.1. TERMINATION FOR DEFAULT

12.1.1. 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.

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 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
SECTION 14240
HYDRAULIC ELEVATOR MODERNIZATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. One (1) hydraulic passenger elevator located in the Theatre Arts (TA) Building on the Rockville Campus of Montgomery College.

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator modernization required by Contract Documents.

C. Applicable conditions of General, Special, and Supplemental Conditions, Division 1, and all sections listed in Contract Documents "Table of Contents."

D. Preventive maintenance as described herein.

E. Cartage and Hoisting: All required staging, hoisting and movement to, on and from the site including new equipment, reused equipment, or dismantling and removal of existing equipment.

F. Unless specifically identified as “Reuse,” “Retain,” or “Refurbish,” provide new equipment.

G. Protective barrier(s) between car(s) in normal operation and adjacent car(s) in the modernization process. Full depth and height of hoistway.

H. Hoistway, pit and machine room barricades as required.

1.02 RELATED WORK PROVIDED BY ELEVATOR CONTRACTOR

A. Hoistway and Pit:
   1. Clear, plumb, substantially flush hoistway with variations not to exceed 1" at any point.
   2. Bevel cants not less than 75° from the horizontal on any rear or side wall ledges and beams that project or recess 4" or more into the hoistway. Not required on hoistway divider beams.
   3. Divider beams between adjacent elevators at each floor, pit, and overhead. Supports at each floor for car guide rail fastening. Intermediate car guide rail support when floor heights exceed 14'-0". Building supports not to deflect in excess of 1/8" under normal conditions.
   4. Continuous vertical car and counterweight guide rail support between floors.
   5. Installation of guide rail bracket supports in concrete. Inserts or embeds, if used, will be furnished under this Section.
   6. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
   7. Cutting and patching walls and floors.
8. Opening in hoistway wall or pit wall for hydraulic piping. Trench and back fill underground piping.
9. Erect front hoistway wall after elevator entrances are installed.
10. Grout floor up to hoistway sills and around hoistway entrances.
11. Pit access ladder for each elevator.
12. Structural support at pit floor for buffer impact loads, guide rail loads, and cylinder loads.
13. Waterproof pit. Indirect waste drain or sump with flush grate and pump.
14. Protect open hoistways and entrances during construction per OSHA Regulations.
15. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
16. Hoistway venting.
17. Seal fireproofing to prevent flaking.

B. Machine Room and Machinery Spaces: By Elevator Contractor
1. Enclosure with access.
2. Self-closing and locking access door.
3. Ventilation and heating. Maintain minimum temperature of 55°F, maximum 90°F. Maintain maximum 80% relative humidity, non-condensing.
4. Paint walls and ceiling.
5. Class “ABC” fire extinguisher in each elevator machine room.
6. Seal fireproofing to prevent flaking.

C. Electrical Service, Conductors and Devices: By GPI.
1. Lighting and GFCI convenience outlets in pit, machine room, and overhead machinery spaces. Provide one additional non-GFCI convenience outlet in pit for oil return pump.
2. Three-phase mainline copper power feeder to terminals of each elevator controller in the machine room with protected, lockable “open,” disconnecting means with auxiliary contacts to allow Elevator Contractor to electronically interlock battery power lowering unit.
3. Single-phase copper power feeder to each elevator controller for car lighting and exhaust blower with individual protected, lockable “open,” disconnecting means located in machine room.
4. Emergency telephone line to designated elevator control panel in elevator machine room.
5. Fire alarm initiating devices in each elevator lobby, for each group of elevators or single elevator and each machine room to initiate firefighters’ return feature. Device at top of hoistway if sprinklered. Provide alarm initiating signal wiring from hoistway or machine room connection point to elevator controller terminals. Device in machine room and at top of hoistway to provide signal for general alarm and discrete signal for Phase II firefighters’ operation.

1.03 DEFINITIONS

A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.

B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.
C. Provisions of this specification are applicable to all elevators unless identified otherwise.

1.04 QUALITY ASSURANCE

A. Approved Providers:

B. Compliance with Regulatory Agencies. Comply with most stringent applicable provisions of following Codes, laws, and/or Authorities, including revisions and changes in effect:
   1. Safety Code for Elevators and Escalators, ASME A17.1
   2. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2
   3. Elevator and Escalator Electrical Equipment, ASME A17.5
   4. National Electrical Code, NFPA 70
   5. Americans with Disabilities Act, ADA
   6. Local Fire Authority
   7. State of Maryland, DLLR, Elevator Division
   8. Requirements of UBC, BOCA, SBC, IBC, OSHPD, DSA, and all other Codes, Ordinances and Laws applicable within the governing jurisdiction
   10. Uniform Federal Accessibility Standard, UFAS

C. Warranty:
   1. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Montgomery College and Heery International, Inc. at no additional cost, unless due to ordinary wear and tear, or improper use or care by Montgomery College. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.
   2. Defective is defined to include, but not limited to; operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibration, and similar unsatisfactory conditions.
   3. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.04, C. 1. & 2. above.
   4. Make modifications, requirements, adjustments and improvements to meet performance requirements.
   5. Provide maintenance for the duration of the warranty per Article 1.07.

1.05 DOCUMENT AND SITE VERIFICATION

A. In order to discover and resolve conflicts or lack of definition which might create problems, Provider must review Contract Documents and site conditions for compatibility with its product prior to submittal of quotation. Review existing structure, electrical and
mechanical provisions for compatibility with Provider's products. Montgomery College will not pay for change to structural, mechanical, electrical, or other systems required to accommodate Provider’s equipment.

1.06 PERMIT, TEST AND INSPECTION

A. Obtain and pay for permit, license, and inspection fee necessary to complete installation.

B. Perform test required by Governing Authority in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative.

1.07 MAINTENANCE

A. Warranty Maintenance: 24 hours a day, 7 days a week. Provide preventive maintenance and 24-hour emergency callback service and response to the site for one year commencing on date of final acceptance by Montgomery College. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Provider of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

1.08 CONDITIONS AND SEQUENCE OF WORK

A. Required scheduling for work shall proceed as follows:

1. 30 Days Receipt of bids
2. 5 Days Award of elevator modernization contract or notice to proceed
3. 30 Days Submission of Drawings
4. 15 Days Complete approval of all elevator equipment
5. 90 Days Manufacturing Time
6. 90 Days Car #1 modernization
7. 15 Days Complete approval elevator equipment

1.09 DEFINITION OF TERMS

A. The term, ARCHITECT, as used herein, refers to Heery International, 1099 14th Street NW, Suite 101, Washington, DC.

B. The term, MONTGOMERY COLLEGE, as used herein, refers to Montgomery College, Rockville, Maryland.

C. The term, MONTGOMERY COLLEGE’S AGENT, as used herein, refers to Montgomery College, Rockville, Maryland, acting on Montgomery College’s behalf.
D. The term, CONTRACT, refers to the contract provided to the Contractor during the bid process, and the term, CONTRACT DOCUMENTS, refers to the contract documents as defined in the aforesaid contract.

E. The term, CONTRACTOR or ELEVATOR CONTRACTOR, as used herein, refers to any persons, partners, firm, or corporation having a contract with Montgomery College to furnish labor and materials for the execution of the work herein described.

F. The term, SUBCONTRACTOR, as used herein, refers to any persons, partners, firm, or corporation having a contract with the Contractor to furnish labor and materials for the execution of the work herein described.

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


1.10 ARCHITECT’S STATUS

The Architect shall advise Montgomery College’s representative on matters pertaining to the elevator work. He shall interpret the specifications and other contract documents; check and approve all submittals of the Contractor including billings, review technical details and construction procedure; inspect and approve the work in progress; and inspect, test, and approve the completed work for compliance with the specifications prior to final acceptance by Montgomery College.

1.11 SPECIFICATIONS

A. It is intended that the contract include all labor and material to accomplish a complete installation in every respect, except those items specifically indicated to be done by other trades. However, bidders are cautioned to familiarize themselves with existing conditions on the premises and to include all incidental work that might occur during the job. After the contract has been signed, there will be no extra charges allowed for any labor or material necessary to complete the work whether exactly described in these specifications herein or not, as long as such work, labor, and material are required to obtain the contracted effect and results.

B. Any discrepancies or ambiguities found in the specifications shall be reported to the Architect prior to bid for resolution.

1.12 CODES AND ORDINANCES

A. All the work covered by these specifications is to be done in full accordance with the State of Maryland codes, ordinances, and elevator safety orders as are in effect at the time of the execution of the contract. All the requirements are to be fulfilled by the Contractor and his subcontractors.

B. The entire elevator plant, including all elevator equipment and work, shall be in accordance with the latest edition and supplements of the American National Standard Safety Code for
Elevators, Dumbwaiters, Escalators, and Moving Walks, ASME A17.1, the National Electrical Code (NFPA 70), ADA Accessibility Guidelines, and any other requirements set forth by the State of Maryland.

1.13 TIME FOR COMPLETION

A. The schedule to be adhered to is identified under conditions and sequence of work.

B. The time for completion assumes Contractor will be working single shifts and includes a time allowance for:
   1. Approval of and procurement of the required materials.
   2. Delays inherent in renovation-type contracts, such as resolution of differing site conditions, etc.
   3. No on-site work will be started until adequate materials are on site or in the Contractor’s possession. Once on-site work is started, it shall continue without interruption until completed. The Contractor’s proposed work schedule shall include scheduling for submittals and the procurement of materials. Schedules shall also include a contingency allowance for delays due to the work renovation of existing facilities. Any work performed before 8:00 a.m. and after 8:00 p.m. shall be accomplished with minimal noise levels and in a manner so as to minimize disruption to the building and the tenants. Without limitation, any work involving loud noises or vibration to the building shall be performed during the hours determined by Montgomery College in its reasonable discretion.

1.14 LABOR LAWS

A. The Contractor performing work under this contract shall comply with applicable provisions of all federal and local labor laws.

1.15 PATENTS

A. The Contractor shall hold and save Montgomery College and its officers, agents, servants, employees, and the Elevator Consultant harmless from liability of any nature or kind on account of any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by Montgomery College, including all cost and expenses for defending any suits unless otherwise specifically stipulated in the contract documents.

B. Licenses that may be required for completion of the contracted work are to be obtained and paid for by the Elevator Contractor.

1.16 ASSIGNMENTS

A. Neither party to the contract shall assign the contract or sublet it as a whole without the written consent of the other, nor shall the Elevator Contractor assign any payment due him or to become due to him hereunder without the previous written consent of Montgomery College.
1.17 ADVERTISING

A. The advertising privileges will be retained by Montgomery College and it shall be the duty of the Elevator Contractor to keep the premises free from posters, signs, decorations, etc.

1.18 PERMITS

A. The Contractor shall obtain and pay for all permits necessary for execution of the elevator work.

1.19 PROTECTION OF WORK AND PROPERTY

A. The Contractor shall continuously maintain adequate protection of all his work from damage and shall protect Montgomery College’s property from injury or loss arising out of this contract. The Contractor shall make good any such damages, injury, or loss, except such as may be directly caused by agents or employees of Montgomery College. The Contractor shall provide all barricades and other safety means and measures required to protect open hoistway or shafts per OSHA regulations.

1.20 ACCIDENT REPORTS

A. In the event of accidents of any kind, the Contractor shall furnish Montgomery College with copies of all accident reports. The reports shall be sent without delay and at the same time they are forwarded to any other parties.

1.21 STORAGE OF MATERIALS

A. Elevator Contractor shall confine storage of materials for this project only on job site to limits approved by Montgomery College and shall not unnecessarily encumber the premises or overload any portion with materials to a greater extent than the structure design load. The Elevator Contractor should limit storage of materials to the elevator machine room and the area directly outside the machine room.

1.22 REMOVAL OF EQUIPMENT AND RUBBISH

A. The Contractor shall remove all rubbish as fast as it accumulates, keeping the building and premises clean during the progress of the work, and shall leave the premises at completion in perfect condition, as far as his work is concerned, to Montgomery College’s complete satisfaction. The disposal of materials, etc., shall be off site and the responsibility of the Elevator Contractor.

1.23 MATERIALS AND WORKMANSHIP

A. All materials and equipment furnished shall be new and the best of their respective kinds. Installation shall be in a neat, accurate, workmanlike manner and shall be subject to the approval of the Architect and/or Montgomery College. All materials and equipment furnished shall conform to the regulations of the bodies having jurisdiction over such installation. The Contractor shall furnish for approval all samples as directed and material shall be in accordance with approved samples.
1.24 PAINTING AND FINISHES

A. All equipment and metal work installed under this contract that does not have baked enamel or a special architectural finish and is exposed in the hoistway shall be cleaned and painted with one (1) field coat of enamel. The shank and base of the T-section of the guide rails shall be thoroughly cleaned and painted with one (1) field coat of black metal enamel.

B. All machine room equipment and flooring shall be painted upon completion of the installation with the manufacturer’s standard machinery enamel and gray floor paint.

1.25 SUBMITTALS

A. Manufacturers’ Data and Tools: Submit to the Architect and Montgomery College copies of the manufacturers’ specifications and installation instructions for each item of component part and for each elevator system. Include manufacturers’ certifications and other data as may be required to show compliance with these specifications.

Provide assurance that the elevator subcontractor will furnish all data and special tools required for equipment maintenance and adjustment in the event the elevator subcontractor is unable to continue maintenance support.

B. Submittals:

1. Prior to the beginning of the work the Contractor shall submit and have approved copies of standard cuts. These items shall include all accessories and fixtures. The Architect shall pass on the submittals with reasonable promptness, and the Contractor shall be responsible to insure that there will be no delay in his work or that of any other trade involved.

2. Samples of wood, metal, plastic, paint, or other architectural finish material shall be submitted for approval to Montgomery College.

3. It shall be distinctly understood that approval of the drawings and cuts shall be for general arrangement only and does not include measurements, which are the Contractor’s responsibility, or approval of variations from the contract documents.

1.26 ELEVATOR CONTRACTOR’S PERSONNEL

A. The Elevator Contractor shall keep a competent mechanic at the job site during the work progress and any necessary assistant, all satisfactory to Montgomery College. A job superintendent shall be assigned to the project and shall represent the Elevator Contractor and all instructions given to him shall be as binding as if given to the Elevator Contractor.

1.27 CERTIFICATE OF INSPECTION

A. Contractor shall arrange and pay for any necessary inspections by governing authorities, certificates of inspection, and permits for operation of the elevators by Montgomery College and shall conduct regularly scheduled inspections during the term of the maintenance agreement.

1.28 ELEVATOR DRAWINGS AND DIAGRAMS

A. Layout Drawings:
1. The Elevator Contractor shall submit four (4) copies of accessory and fixture drawings and details to the Architect for approval. One (1) copy shall be returned to the Elevator Contractor by the Architect marked “NO EXCEPTIONS TAKEN,” “FURNISH AS CORRECTED,” “SUBMIT SPECIFIC ITEM,” or “REVISE AND RESUBMIT.” Drawing marked “FURNISH AS CORRECTED,” “REJECTED,” or “REVISE AND RESUBMIT” shall be resubmitted for approval.

2. At the conclusion of the job, four (4) final sets of “as built” drawings shall be submitted incorporating all changes that have been made.

B. Wiring Diagrams:
   1. Three (3) complete sets of “as installed” straight-line wiring diagrams shall be furnished upon completion showing the electrical equipment in the hoistway as well as the machine room. (One (1) set of diagrams shall be reproducible master.) Contractor will bind one (1) set between clear vinyl covers and mount in machine room.
   2. A legend sheet shall be furnished with each set of drawings containing the following information:
      a. Name and symbol of each relay, switch, or other electrical apparatus.
      b. Location on drawings, drawing sheet number, and area of switches and relays, etc., and location of all contacts.
      c. Location of apparatus whether on controller, selector, motor generator, starter, hoistway, or elevator car.

1.29 PRINTED INSTRUCTIONS
   A. The following printed information shall be furnished upon completion:
      1. Three (3) sets of neatly bound instructions explaining all operating features, including all apparatus in the car and lobby control panels.
      2. Three (3) lubrication charts indicating all lubricating points and type of lubricant and schedule recommended for all equipment.
      3. Three (3) complete parts catalogs for all replaceable parts.

1.30 KEYS
   A. Four (4) sets of keys to operate all keyed switches and locks shall be furnished upon completion. Keys shall be properly tagged. All keying shall be arranged with Montgomery College.

1.31 REMOVAL OF EXISTING EQUIPMENT
   A. All existing elevator equipment that will not to be used in the new installation shall be removed by the Contractor prior to the new equipment installation. Hazardous materials shall be removed and disposed of properly. All equipment that is not to be retained by Montgomery College shall become the property of the Contractor and shall be removed by him from the premises.

1.32 HOISTING
   A. All required hoisting and movement of new equipment, reused equipment, or removal of existing equipment shall be the responsibility of the Elevator Contractor.
1.33 REUSED EQUIPMENT

A. All equipment that is reused, shall be placed in a first-class condition as a part of this contract. All new, existing, and modernized equipment shall be included in the one-year full warranty contract and no prorations on the five-year maintenance agreement will be allowed. All hazardous materials shall be stored properly and a Material Safety Data Sheet (MSDS) provided.

1.34 CONDITIONS OF GUARANTEE

A. The Elevator Contractor shall make any changes or additions to the equipment necessary to meet the performance guarantees. Montgomery College may retain the final 10% of job payment until the performance guarantees are satisfactorily demonstrated.

1.35 CARTAGE, HOISTING, AND EQUIPMENT INSTALLATION

A. All elevator equipment installed under this contract shall be delivered to the job site and hoisted into place by the Elevator Contractor.

B. Contractor is responsible for receiving and securing all materials.

C. Contractor to coordinate the receiving, hoisting, and storage of materials with Montgomery College.

PART 2 PRODUCTS

2.01 SUMMARY

A. Unless specifically identified as “retain existing,” provide new equipment.

B. Science and Applied Studies (SA) Building on the Germantown Campus

<table>
<thead>
<tr>
<th>NUMBER:</th>
<th>EXISTING EQUIPMENT</th>
<th>DISPOSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER:</td>
<td>CAR 1</td>
<td>RETAIN EXISTING</td>
</tr>
<tr>
<td>CAPACITY:</td>
<td>2,500 LBS.</td>
<td>RETAIN EXISTING</td>
</tr>
<tr>
<td>CONTRACT SPEED:</td>
<td>100 F.P.M.</td>
<td>RETAIN EXISTING</td>
</tr>
<tr>
<td>MACHINE:</td>
<td>HYDRAULIC PUMP –</td>
<td>PROVIDE NEW</td>
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<td></td>
<td>SUBMERSIBLE</td>
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<tr>
<td>MACHINE LOCATION:</td>
<td>BOTTOM LANDING</td>
<td>RETAIN AT BOTTOM LANDING</td>
</tr>
<tr>
<td>OPERATIONAL CONTROL:</td>
<td>SELECTIVE COLLECTIVE</td>
<td>SELECTIVE COLLECTIVE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MICROPROCESSOR BASED</td>
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<tr>
<td></td>
<td></td>
<td>SYSTEM</td>
</tr>
</tbody>
</table>
**EXISTING EQUIPMENT** | **DISPOSITION**
---|---
**MOTOR CONTROL:** | SINGLE SPEED AC
| SINGLE SPEED AC WITH ELECTRONIC SOFT START
**POWER CHARACTERISTICS:** | 480 VOLTS, 3 PHASE, 60 HERTZ FIELD VERIFY
| RETAIN EXISTING
**STOPS:** | 2 FRONT
| RETAIN EXISTING
**OPENINGS:** | 2 FRONT
| RETAIN EXISTING
**FLOORS SERVED:** | 2
| RETAIN EXISTING
**MINIMUM CLEAR INSIDE CAR:** | 6’-8” WIDE X 4’ 1” DEEP
| RETAIN EXISTING
**ENTRANCE SIZE:** | 42” WIDE X 84” HIGH
| RETAIN EXISTING
**ENTRANCE TYPE:** | SINGLE SPEED, CENTER OPENING
| RETAIN EXISTING
**DOOR OPERATION:** | MEDIUM SPEED, HEAVY-DUTY DOOR OPERATOR, MINIMUM OPENING SPEED 1-1/2 F.P.S.
| HIGH SPEED, HEAVY-DUTY, DOOR OPERATOR, MINIMUM OPENING SPEED 2-1/2 F.P.S.
**DOOR PROTECTION:** | INFRARED, FULL SCREEN DEVICE
| INFRARED, FULL SCREEN DEVICE, WITH DIFFERENTIAL TIMING NUDGING AND INTERRUPTED BEAM TIME
**HYDRAULIC TYPE:** | DIRECT PLUNGER
| DIRECT PLUNGER – RETAIN EXISTING
**GUIDE RAILS:** | PLANED STEEL TEES
| RETAIN EXISTING
**BUFFERS:** | SPRING
| SPRING
| RETAIN EXISTING
**CAR ENCLOSURE:** | AS SPECIFIED
| PAD BUTTONS AND VINYL COVERED PADS
| BATTERY POWERED EMERGENCY CAR LIGHTING. PROVIDE SEPARATE CONSTANT PRESSURE TEST BUTTON IN CAR SERVICE COMPARTMENT.
**SIGNAL FIXTURES:** | LED ILLUMINATION PROVIDER’S STANDARD
<table>
<thead>
<tr>
<th>EXISTING EQUIPMENT</th>
<th>DISPOSITION</th>
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</thead>
<tbody>
<tr>
<td>HALL AND CAR PUSHBUTTON STATIONS:</td>
<td>SINGLE HALL PUSHBUTTON RISER</td>
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<tr>
<td></td>
<td>SINGLE CAR OPERATING PANEL</td>
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<tr>
<td>CAR POSITION INDICATORS:</td>
<td>SINGLE DIGITAL WITH CAR DIRECTION ARROWS</td>
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<td></td>
<td>FIREFIGHTERS' CONTROL PANEL</td>
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<td>IN CAR LANTERS:</td>
<td>ALL CAR ENTRANCE COLUMNS WITH VOLUME ADJUSTABLE</td>
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<td></td>
<td>ELECTRONIC CHIME OR TONE. SOUND TWICE FOR DOWN</td>
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<tr>
<td></td>
<td>DIRECTION</td>
</tr>
<tr>
<td></td>
<td>DIGITAL WITH CAR DIRECTION ARROWS AT FIRST FLOOR</td>
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<tr>
<td>COMMUNICATION SYSTEM:</td>
<td>SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL,</td>
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<td></td>
<td>TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING</td>
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<td></td>
<td>AND VOICELESS COMMUNICATION</td>
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<tr>
<td>FIXTURE SUBMITTAL:</td>
<td>SUBMIT BROCHURE DEPICTING PROVIDER’S PROPOSED</td>
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<td>DESIGNS WITH BID</td>
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<tr>
<td>ADDITIONAL FEATURES –</td>
<td>CAR ROLLER GUIDES</td>
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<tr>
<td></td>
<td>CAR TOP INSPECTION STATION</td>
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<td></td>
<td>FIREFIGHTERS’ SERVICE, PHASE I AND II, INCLUDING</td>
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<td>ALTERNATE FLOOR RETURN</td>
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<td>BATTERY PACK STANDBY POWER PROVISION</td>
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<td>STATIONARY CAR RETURN PANEL(S) ARRANGED FOR</td>
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<td></td>
<td>SURFACE APPLIED CAR OPERATING PANEL(S)</td>
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<td></td>
<td>HOISTWAY DOOR UNLOCKING DEVICE - ALL FLOORS</td>
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### C. Theatre Arts (TA) Building on the Rockville Campus

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<td>NUMBER: CAR 1</td>
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<td><strong>POWER CHARACTERISTICS:</strong></td>
<td>480 VOLTS, 3 PHASE, 60 HERTZ</td>
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<td><strong>STOPS:</strong></td>
<td>2 FRONT – 1 REAR</td>
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**RETAIN EXISTING**

**PROVIDE NEW**

**FIELD VERIFY**
### EXISTING EQUIPMENT

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### SIGNAL FIXTURES:

### HALL AND CAR PUSHBUTTON STATIONS:

- SINGLE HALL PUSHBUTTON RISER
- SINGLE CAR OPERATING PANEL

### CAR POSITION INDICATORS:

- SINGLE DIGITAL WITH CAR DIRECTION ARROWS
- FIREFIGHTERS’ CONTROL PANEL

### IN CAR LANTERNS:

- ALL CAR ENTRANCE COLUMNS WITH VOLUME ADJUSTABLE ELECTRONIC CHIME OR TONE. SOUND TWICE FOR DOWN DIRECTION

### HALL AND CAR POSITION INDICATOR:

- DIGITAL WITH CAR DIRECTION ARROWS AT FIRST FLOOR

### COMMUNICATION SYSTEM:

- SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL, TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING AND VOICELESS COMMUNICATION

### FIXTURE SUBMITTAL:

- SUBMIT BROCHURE DEPICTING PROVIDER’S PROPOSED DESIGNS WITH BID

### ADDITIONAL FEATURES –

- CAR ROLLER GUIDES
- CAR TOP INSPECTION STATION
- FIREFIGHTERS’ SERVICE, PHASE I AND II, INCLUDING ALTERNATE FLOOR RETURN
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<td>INDEPENDENT SERVICE FEATURE</td>
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<td>CARD READER PROVISIONS</td>
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<td>FIREFIGHTERS’ CONTROL PANEL AND REMOTE WIRING</td>
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<tr>
<td>HYDRAULIC PUMP UNIT, AND CONTROLLER SOUND ISOLATION</td>
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<tr>
<td>TAMPER RESISTANT FASTENERS FOR ALL FASTENINGS EXPOSED TO THE PUBLIC</td>
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<tr>
<td>ONE YEAR WARRANTY MAINTENANCE WITH 24-HOUR CALL-BACK SERVICE</td>
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<tr>
<td>FIREFIGHTERS’ TELEPHONE</td>
<td></td>
</tr>
<tr>
<td>SIGNAGE ENGRAVING FILLED WITH BLACK PAINT OR APPROVED ETCHING PROCESS</td>
<td></td>
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<tr>
<td>NO VISIBLE COMPANY NAME OR LOGO</td>
<td></td>
</tr>
<tr>
<td>WIRING DIAGRAMS, OPERATING INSTRUCTIONS, AND PARTS ORDERING INFORMATION</td>
<td></td>
</tr>
<tr>
<td>MONITORING SYSTEM PROVISIONS</td>
<td></td>
</tr>
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EXISTING EQUIPMENT | DISPOSITION
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 | SYSTEM DIAGNOSTIC MEANS AND INSTRUCTIONS

2.02 MATERIALS

A. Site condition inspection:
   1. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify that no irregularities exist which affect execution of work specified.
   2. Do not proceed with installation until work in place conforms to project requirements.

B. Product Delivery, Storage, and Handling:
   1. Deliver material in Provider’s original, unopened protective packaging.
   2. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.
   3. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.
   4. Allocate available site storage areas and coordinate their use with Montgomery College and other Providers.
   5. Provide suitable temporary weather-tight storage facilities as may be required for materials that will be stored in the open.

C. Installation Requirements:
   1. Install all equipment in accordance with Provider’s instructions, referenced Codes, specification and approved submittals.
   2. Install machine room equipment with clearances in accordance with referenced Codes and specification.
   3. Install all equipment so it may be easily removed for maintenance and repair.
   4. Install all equipment for ease of maintenance.
   5. Install all equipment to afford maximum accessibility, safety, and continuity of operation.
   6. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
   7. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   9. Neatly touch up damaged factory-painted surfaces with original paint color. Protect machine-finish surfaces against corrosion.

D. Manufacturer’s Nameplates:
   1. Manufacturer’s name plates and other identifying markings shall not be affixed on surfaces exposed to public view. This requirement does not apply to Underwriter’s Laboratories and code required labels.
2. Each major component of mechanical and electrical equipment shall have identification plate with the Manufacturer’s name, address, model number rating and any other information required by Governing Codes.

E. Colors of Factory-Finished Equipment:
1. All colors will be selected from the Manufacturer’s standard range unless custom colors are specified herein.
2. Submit samples of all standard colors available and/or specified custom colors for review and approval.

F. Materials And Finishes:
1. Steel:
   c. Structural Steel Shapes and Plates: ASTM A36.
   d. Stainless Steel: Type 302 or 304 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength and durability. Apply mechanical finish on fabricated work in the locations shown or specified, (Federal Standard and NAAMM nomenclature), with texture and reflectivity required to match Montgomery College’s sample. Protect with adhesive paper covering.
2. Satin: Directional polish finishes (US 32D). Graining directions as shown or, if not shown, in longest dimension.
4. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
5. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.
6. Plastic Laminate: ASTM E84 Class A and NEMA LD3.1, Fire-Rated Grade (GP-50), Type 7, 0.050" ± .005" thick, color and texture as follows;
7. Exposed Surfaces: Color and texture selected by Montgomery College.
8. Concealed Surfaces: Provider’s standard color and finish.
9. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class “I” rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.
10. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.
11. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.
12. Baked Enamel Finish: Prime finish per above. Unless specified “prime finish” only, apply and bake three (3) additional coats of enamel in the selected solid color.
13. Entrance Field Paint: Clean all surfaces of dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply
filler to insure smooth surface, sand and apply one coat of electrostatic enamel in the selected solid color.

14. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove and or check for corrosive activity. Replace components that exhibit severe deterioration. Tighten all fastenings. Repaint exposed surfaces with two coats of rust preventive primer.

2.03 CAR AND GROUP PERFORMANCE

A. Car Speed: ± 10% of contract speed under any loading condition.

B. Car Capacity: Safely lower, stop and hold 125% of rated load.

C. Car Stopping Zone: ±1/4" under any loading condition.

D. Door Opening Time: Seconds from start of opening to fully open; 2 seconds

E. Door Closing Time: Seconds from start of closing to fully closed; 3 seconds

F. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open (1/2 open for side opening doors) and car level and stopped at next successive floor under any loading condition or travel direction; 14 seconds

G. Pressure: Fluid system components shall be designed and factory tested for 500 p.s.i. Maximum operating pressure shall be 400 p.s.i.

H. Car Ride Quality:
   1. Horizontal acceleration within car during all riding and door operating conditions. Not more than 20 mg peak to peak (adjacent peaks) in the 1 - 10 Hz range.
   2. Acceleration and Deceleration: Smooth constant and not more than 3 feet/second² with an initial ramp between 0.5 and 0.75 second.
   3. Sustained Jerk: Not more than 8 feet/second³.
   4. Acceleration and deceleration rates not to exceed .09g.

I. Noise and Vibration Control:
   1. Airborne Noise: Measured noise level of elevator equipment during operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
   2. Vibration Control: All elevator equipment provided under this contract, including power unit, controller, oil supply lines and their support shall be mechanically isolated from the building structure and electrically isolated from the building power supply and to each other to minimize the possibility of objectionable noise and vibrations being transmitted to occupied areas of the building.
   3. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
   4. All dBA readings to be taken three (3) feet off the floor and three (3) feet from the equipment using the “A” weighted scale.
2.04 OPERATION

A. Selective Collective Microprocessor Based: Operate car without attendant from pushbuttons in car and located at each floor. When car is available, automatically start car and dispatch it to floor corresponding to registered car or hall call. Once car starts, respond to registered calls in direction of travel and in the order the floors are reached.

B. Does not reverse car direction until all car calls have been answered, or until all hall calls ahead of car and corresponding to the direction of car travel have been answered.

C. Slow car and stop automatically at floors corresponding to registered calls, in the order in which they are approached in either direction of travel. As slowdown is initiated for a hall call, automatically cancel hall call. Cancel car calls in the same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.

D. Answer calls corresponding to direction in which car is traveling unless call in the opposite direction is highest (or lowest) call registered.

E. Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.

F. Other Items:
   1. Low Oil Control: In the event oil level is insufficient for travel to the top floor, provide controls to return elevator to the main level and park until oil is added.
   2. Independent Service: Provide controls for operation of each car from its pushbuttons only. Close doors by constant pressure on desired destination floor button or door close button. Open doors automatically upon arrival at selected floor.

G. Firefighters’ Service: Provide equipment and operation in accordance with Code requirements.

H. Automatic Car Stopping Zone: Stop car within 1/4” above or below the landing sill. Maintain stopping zone regardless of load in car, direction of travel, and distance between landings.

I. Remote Monitoring and Diagnostics: Equip each controller with standard ports, interface boards, and drivers to accept maintenance, data logging, fault finding diagnostic and monitoring computers, keyboards, modems, and programming tools. The system shall be capable of driving remote color CRT monitor(s) that continually scan and display the status of each car and call.

J. Motion Control: AC type with unit valve suitable for operation specified and capable of providing smooth, comfortable car acceleration and retardation. Limit the difference in car speed between full load and no load to not more than ±10% of the contract speed in either direction of travel.

K. Door Operation: Automatically open doors when car arrives at main floor. At expiration of normal dwell time, close doors. Reopen doors when car is designated for loading.

L. Standby Lighting and Alarm: Car mounted battery unit with solid-state charger to operate alarm bell and car emergency lighting. Battery to be rechargeable with minimum 5-year
life expectancy. Include required transformer. Provide constant pressure test button in service compartment of car operating panel.

M. Battery Standby Power Transfer: Upon loss of normal power, provide controls to automatically run the car(s) at inspection speed to the nearest landing, up or down, depending upon load in the car. Upon arrival at the nearest landing, the elevator doors shall open automatically and remain open until regular door time has expired. The elevator shall then become deactivated. The standby power source shall be provided via 12-volt D.C. battery units installed in machine room, including solid-state charger and testing means mounted in a common metal container. Battery to be rechargeable lead acid or nickel cadmium with a 10-year life expectancy. Upon restoration of normal power, the elevator shall automatically resume normal operation.

2.05 MACHINE ROOM EQUIPMENT

A. Arrange equipment in existing machine room spaces.

B. Pump Unit: Provide new assembled unit consisting of submersible positive displacement pump and induction motor. Include master-type control valves combining safety features, holding, direction, bypass, stopping, manual lowering functions, shut off valve, oil reservoir with protected vent opening, oil level gauge, outlet strainer, drip pan, muffler, all mounted on isolating pads. Provide oil temperature thermostat to maintain oil at operating temperature. Enclose entire unit with removable sheet steel panels lined with sound-absorbing material. Provide SCR soft start with closed transition. Design unit for 80 upstarts/hour.

C. Landing Systems: Solid-state, magnetic or optical type.

D. Controller: UL/CSA labeled.
   1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
   2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor-Related Hardware:
      a. Provide built-in noise suppression devices which provide a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits shall not be affected by accidental grounding of any part of the system.
      f. System shall automatically restart when power is restored.
      g. System memory shall be retained in the event of power failure or disturbance.
      h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.

5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.

6. Provide controller or pump unit mounted auxiliary, lockable “open,” disconnect if mainline disconnect is not in sight of controller and/or pump unit.

E. Piping and Oil: Provide new.

F. Shutoff Valve: Provide new.

G. Pressure Switch: Provide oil pressure sensitive switch in line to automatically close and prevent loss of oil in cylinder upon loss of pressure in oil supply line.

H. Noise/Vibration Isolation: All elevator equipment including their supports and fastenings to building, shall be mechanically and electrically isolated from the building structure and main line power feeders to minimize objectionable noise and vibration transmission to car, building structure, or adjacent occupied areas of building.

I. Sound Isolation:
   1. Noise level relating to elevator equipment operation in machine room shall not exceed 80 dBA.
   2. All dBA readings shall be taken three (3) feet off the floor and three (3) feet from equipment using the "A" weighted scale.

2.06 HOISTWAY EQUIPMENT

A. Guide Rails: Retain main guide rails in place.
   1. Clean rails and brackets. Remove rust.
   2. Check all rail and bracket fastenings and tighten.
   3. Realign rails as required to provide smooth car ride.
   4. Provide supplemental rail brackets and/or backing as required by Code or to enhance car ride quality.

B. Buffers, Car: Retain existing.
   1. Rebuild as required and paint.

C. Hydraulic Jack Assembly: Retain existing.
   1. Cylinder(s): Retain existing. Provide means to collect oil at cylinder head and return automatically to oil reservoir.
   2. Plunger(s): Retain existing. Isolate plunger from car frame(s).

D. Jack Support: Retain existing steel pit channels to support jack assembly and transmit loads to building structure.

E. Terminal Stopping: Provide normal and final devices.

F. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections: Copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction
boxes. Provide 10% spare conductors throughout. Run spare wires from car connection points to individual elevator controllers in the machine room. Provide four (4) pairs of spare shielded communication wires in addition to those required to connect specified items. Tag spares in machine room.

2. Conduit: Painted or galvanized steel conduit, EMT or duct. Conduit size, 3/4" minimum. Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.

3. Traveling Cables: Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway. Provide five (5) pair of shielded wires and two (2) RG-6/U type coaxial cables for card reader. Provide two (2) RG-6/U coaxial CCTV cables within traveling cable from car controller to car top, plus 3'-0" excess loop at both ends.

4. Auxiliary Wiring: Connect fire alarm initiating devices, emergency two-way communication system, and firefighters’ phone in each car controller in machine room.

G. Entrance Equipment: Provide new.
   1. Door Hangers: Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.
   2. Door Tracks: Bar or formed, cold-drawn removable steel tracks with smooth roller contact surface.
   3. Door Interlocks: Operable without retiring cam. Paint interlock box flat black.
   4. Door Closers: Spring, spirator or jamb/strut mounted counterweight type. Design and adjust to insure smooth, quiet mechanical close of doors.

H. Hoistway Door Unlocking Device: Provide unlocking device with escutcheon in door panel at all floors, with finish to match adjacent surface.

2.07 HOISTWAY ENTRANCE AT FLOOR “E” IN THE THEATRE ARTS BUILDING ONLY

A. Frames: Remove existing and provide new.

B. Door Panels: Remove existing and provide new. Provide new door gibs with fire tabs at all floors. Minimum two gibs per panel, one at leading edge, and one at trailing edge of each panel.

C. Sight Guards: Remove existing and provide new to match new door panels.

D. Sills: Remove existing and provide new with non-slip surface; finish selected by the Architect.

E. Sill Supports: Retain existing or replace at the contractor’s option.

F. Fascia, Toe Guards and Hanger Covers: Remove existing and provide new at the rear of the hoistway. Paint with one coat of rust-inhibiting enamel.

G. Struts and Headers: Remove existing and provide new.

2.08 HOISTWAY ENTRANCES - TYPICAL

A. Frames: Retain existing.
B. Door Panels: Retain existing. Provide new door gibs with fire tabs at all floors. Minimum two gibs per panel, one at leading edge, and one at trailing edge of each panel

C. Sight Guards: Retain existing. Replace damaged sight guards.

D. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.

E. Sill Supports: Retain existing. Check and tighten all fastenings.

F. Fascia, Toe Guards and Hanger Covers: Retain existing. Provide as required where damaged or missing. Check and tighten all fastenings.

G. Struts and Headers: Retain existing. Check and tighten all fastenings.

2.09 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings.

B. Platform: Retain existing. Check and tighten all fastenings.

C. Guide Shoes: Provide new. Roller type with three or more spring dampered, sound-deadening rollers per shoe.

D. Finish Floor Covering: Provide a finished floor as scheduled.

E. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.

F. Door Hangers: Provide new. Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.

G. Door Track: Retain existing. Clean and sand for smooth, quiet operation. Check and tighten all fastenings.

H. Door Header: Retain existing. Check and tighten all fastenings.

I. Door Electrical Contact: Prohibit car operation unless car door is closed.

J. Door Clutch: Heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation. Design clutch so car doors can be closed, while hoistway doors remain open.

K. Restricted Opening Device: Restrict opening of car door(s) outside unlocking zone.

L. Door Operator: High speed, heavy-duty door operator capable of opening doors at no less than 2-1/2 f.p.s. Accomplish reversal in no more than 2-1/2" of door movement. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current. Maintain consistent, smooth and quiet door operation at all floors, regardless of door weight or varying air pressure. Manufacturer: GAL MOVFR door operators.

M. Door Control Device:
1. Infrared Reopening Device: Black, fully enclosed device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor. Device shall prevent doors from closing and reverse doors at normal opening speed if beams are obstructed while doors are closing, except during nudging operation. In event of device failure, provide for automatic shutdown of car at floor level with doors open
   a. Acceptable Infrared Reopening Device:
      1) Cegard/MAX-154 by CEDES
      2) Gatekeeper by Adams
      3) Lambda II by Otis
      4) Magic Edge by Tri-Tronics
      5) Microlite by ThyssenKrupp
      6) Microscan E by T.L. Jones
      7) Pana40 Plus by Janus
2. Nudging Operation: After beams of door control device are obstructed for a predetermined time interval (minimum 20.0 - 25.0 seconds), warning signal shall sound and doors shall attempt to close with a maximum of 2.5 foot pounds kinetic energy. Activation of the door open button shall override nudging operation and reopen doors.
3. Interrupted Beam Time: When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0 - 1.5 seconds after beams are reestablished.
4. Differential Door Time: Provide separately adjustable timers to vary time that doors remain open after stopping in response to calls.
   a. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   b. Hall Call: Hold open time adjustable between 5.0 and 8.0 seconds. Use hall call time when car responds to coincidental calls.

N. Car Operating Panel:
1. Car operating panel(s) as shown and noted on the architect’s drawings.
2. Suitably identify floor buttons, alarm button, door open button, door close button and emergency push-to-call button with SCS, Visionmark or Entrada cast tactile symbols surface mounted. Configure plates per local building code accessibility standards including Braille. Locate operating controls no higher than 48” above the car floor; no lower than 35” for emergency push-to-call button and alarm button.
3. Provide minimum 3/4” diameter raised floor pushbuttons which illuminate to indicate call registration.
4. Provide alarm button to ring bell located on car. Illuminate button when actuated.
5. Provide keyed stop switch at bottom of car operating panel in locked car service compartment. Mark device to indicate "run" and "stop" positions.
6. Provide “door open” button to stop and reopen doors or hold doors in open position.
7. Provide “door close” button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car or hall call has expired, except firefighters’ operation.
8. Provide firefighters’ Phase II key switch with engraved instructions filled red. Include light jewel, buzzer, and call cancel button.
9. Install firefighters’ telephone with approved mounting matching adjacent controls.
10. Provide lockable service compartment with recessed flush door. Door material and finish shall match car return panel or car operating panel faceplate.
11. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
   a. Inspection switch.
   b. Light switch.
   c. Four-position exhaust blower switch.
   d. Independent service switch.
   e. Constant pressure test button for battery pack emergency lighting.
   f. 120-volt, AC, GFCI protected electrical convenience outlet.
   g. Card reader override switch.
   h. Stop switch.

12. Provide black paint filled (except as noted), engraved or approved etched signage as follows with approved size and font:
   a. Phase II firefighters’ operating instructions per code.
   b. Car number on main car operating panel.
   c. “No Smoking” on main car operating panel.
   d. Car capacity in pounds on service compartment door.

O. Car Top Control Station: Mount to provide safe access and utilization while standing in an upright position on car top.

P. Work Light and Duplex Plug Receptacle: GFCI protected outlet at top and bottom of car. Include on/off switch and lamp guard.

Q. Communication System:
   1. “Push to Call,” two-way communication instrument in car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic rollover capability with minimum two numbers.
      a. “Push to Call” button or adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase "PUSH TO CALL," "HELP ON THE WAY" engraved signage adjacent to button.
      b. Provide “Push to Call” button tactile symbol, engraved signage, and Braille adjacent to button mounted integral with car front return panel.
   2. Firefighters’ telephone in car panel, with four shielded wires to machine room junction box. Jack bezel shall match adjacent controls.
   3. Provide two-way communication between car and machine room if required.

2.10 CAR ENCLOSURE

A. Provide as detailed on architectural drawings.

2.11 HALL CONTROL STATIONS

A. Pushbuttons: Provide one (1) riser with flush mounted faceplates. Include pushbuttons for each direction of travel which illuminate to indicate call registration. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation as part of faceplate. Pushbutton design shall match car operating panel pushbuttons. Provide enlarged faceplate to cover existing wall blockout and facilitate handicapped access requirements. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation as part of faceplate. Provide any cutting and patching required.
2.12 SIGNALS

A. Car Direction Lantern: Provide flush-mounted car lantern in all car entrance columns. Illuminate up or down LED lights and sound electronic tone once for up and twice for down direction travel as doors open. Sound tone once for up direction and twice for down direction. Sound level shall be adjustable from 0 - 80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time. Car direction lenses shall be arrow shaped with faceplates. Lenses shall be minimum 2-1/2" in their smallest dimension. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility.

B. Car Position Indicator: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2" high to indicate floor served and direction of car travel. Locate fixture in each car operating panel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate direction of travel.

C. Hall Position Indicator: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2" high to indicate floor served and direction of car travel. Mount integral with hall lanterns at 1st floor.

D. Faceplate Material and Finish: Stainless steel
   1. Hall Lantern: No. 4 stainless steel
   2. Car Direction Lantern: No. 4 stainless steel
   3. Car Position Indicator: No. 4 stainless steel
   4. Hall Position Indicator: No. 4 stainless steel

E. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

PART 3 EXECUTION

3.01 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify that no irregularities exist which affect execution of work specified.

B. Do not proceed with installation until work in place conforms to project requirements.

3.02 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver material in Provider’s original, unopened protective packaging.

B. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.

C. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.
3.03 INSTALLATION

A. Install all equipment in accordance with Provider’s instructions, referenced Codes, specification and approved submittals.

B. Install machine room equipment with clearances in accordance with referenced Codes and specification.

C. Install all equipment so it may be easily removed for maintenance and repair.

D. Install all equipment for ease of maintenance.

E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.

F. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
   1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   3. Neatly touch up damaged factory-painted surfaces with original paint color. Protect machine-finish surfaces against corrosion.

3.04 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Have Code Authority acceptance inspection performed and complete corrective work.

3.05 ADJUSTMENTS

A. Install hydraulic jack assembly and guide rails plumb and align vertically with tolerance of 1/16" in 100'-0". Secure guide rail joints without gaps and file any irregularities to a smooth surface.

B. Static balance car to equalize pressure of guide shoes on guide rails.

C. Lubricate all equipment in accordance with Provider’s instructions.

D. Adjust motors, valves, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.06 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.
D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

3.07 ACCEPTANCE REVIEW AND TESTS

A. Review procedure shall apply for individual elevators, portions of groups of elevators and completed groups of elevators accepted on an interim basis or elevators and groups of elevators completed, accepted, placed in operation.

B. Provider shall perform review and evaluation of all aspects of its work prior to requesting final review. Work shall be considered ready for final contract compliance review when copies of Provider’s test and review sheets are available for review and all elements of work or a designated portion thereof are in place and elevator or group of elevators are deemed ready for service as intended.

C. Furnish labor, materials, and equipment necessary for Architect’s, review. Notify Heery Inc., five (5) working days in advance when ready for final review of elevator or group of elevators.

D. Architect’s written punch list of observed deficiencies of materials, equipment and operating systems will be submitted to Provider for corrective action.
1. Workmanship and equipment compliance with Contract Documents.
3. Performance of following is satisfactory:
   a. Starting, accelerating, running
   b. Decelerating, stopping accuracy
   c. Door operation and closing force
   d. Equipment noise levels
   e. Signal fixture utility
   f. Overall ride quality
   g. Performance of door control devices
   h. Operations of emergency two-way communication device
   i. Operations of firefighters’ service
   j. Operations of special security features and floor lock-off provisions
   k. Operations of remote monitoring devices
   l. Operations of elevator car air conditioner/heater
4. Test Results:
   a. In all test conditions, obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Montgomery College and the Architect. Tests shall be conducted under both no load and full load condition.
   b. Temperature rise in motor windings limited to 50° Celsius above ambient. A full-capacity, one (1) hour running test, stopping at each floor for ten (10) seconds in up and down directions, may be required.

E. Performance Guarantee: Should the Architect’s review identify defects, poor workmanship, variance or noncompliance with requirements of specified Codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Provider shall complete corrective work in an expedient manner to satisfaction of Montgomery College and the Architect at no cost as follows;
1. Replace equipment that does not meet Code or Contract Document requirements.
2. Perform work and furnish labor, materials and equipment necessary to meet specified operation and performance.


F. A follow-up final contract compliance review (back check) shall be performed by the Architect after notification by Provider that all deficiencies have been corrected. Provide Lerch Bates Inc., with copies of the initial deficiency report marked to indicate items which Provider considers complete. If additional reviews are required due to Provider’s gross non-compliance with initial and follow-up deficiency reports, the Architect shall bill Provider at normal billing rates plus expenses, and Provider acknowledges it will pay for additional compliance reviews.

3.08 MONTGOMERY COLLEGE’S INFORMATION

A. Provide three sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Montgomery College and reviewed by the Architect. Include the following as minimums:

1. Straight-line wiring diagrams of “as-installed” elevator circuits, with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Montgomery College’s property.

2. Lubrication instructions, including recommended grade of lubricants.

3. Parts catalogs for all replaceable parts including ordering forms and instructions.

4. Four sets of keys for all switches and control features properly tagged and marked.

5. Neatly bound instructions explaining all operating features including all apparatus in the car and lobby control panels.

6. Neatly bound maintenance and adjustment instructions explaining areas to be addressed, methods and procedures to be used and specified tolerances to be maintained for all equipment.

7. Diagnostic equipment complete with access codes, adjusters manuals and set-up manuals for adjustment, diagnosis and troubleshooting of elevator system and performance of routine safety tests.

B. Non-Proprietary Equipment Design: Provide three sets of neatly bound written information necessary for proper maintenance and adjustment for equipment of within 30 days following final acceptance. Final retention will be withheld until data is received by Montgomery College and reviewed by the Architect. Include the following as minimums:

1. Straight-line wiring diagrams of “as-installed” elevator circuits, with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Montgomery College’s property. A legend sheet shall be furnished with each set of drawings to provide the following information;

   a. Name and symbol of each relay, switch, or other apparatus.

   b. Location on drawings, drawing sheet number and area, and location of all contacts.
c. Location of apparatus, whether on controller or on car.

2. Printed instructions explaining all operating features.

3. Complete software documentation for all installed equipment.

4. Lubrication instructions, including recommended grade of lubricants.

5. Parts catalogs listing all replaceable parts including Provider’s identifying numbers and ordering instructions.

6. Four sets of keys for all switches and control features properly tagged and marked.

7. Diagnostic test devices together with all supporting information necessary for interpretation of test data and troubleshooting of elevator system, and performance of routine safety tests.

8. The elevator installation shall be a design that can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Provider.
   a. Provide on site capability to diagnose faults to the level of individual circuit boards and individual discreet components for the solid state elevator controller.
   b. Provide a separate, detachable device, as required to the Montgomery College as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Montgomery College.
   c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Montgomery College.

9. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Montgomery College and Provider.

C. Acceptance of such records by Montgomery College/ Heery Inc. shall not be a waiver of any Provider deviation from Contract Documents or shop drawings or in any way relieve Provider from his responsibility to perform work in accordance with Contract Documents.

END OF SECTION
SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Piping materials and installation instructions common to most piping systems.
2. Transition fittings.
3. Dielectric fittings.
4. Mechanical sleeve seals.
5. Sleeves.
7. Grout.
8. Mechanical demolition.
9. Equipment installation requirements common to equipment sections.
10. Painting and finishing.
11. Supports and anchorages.

1.3 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. The following are industry abbreviations for plastic materials:
2. CPVC: Chlorinated polyvinyl chloride plastic.
3. PE: Polyethylene plastic.
4. PVC: Polyvinyl chloride plastic.

G. The following are industry abbreviations for rubber materials:

1. EPDM: Ethylene-propylene-diene terpolymer rubber.
2. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Transition fittings.
2. Dielectric fittings.
3. Mechanical sleeve seals.
4. Escutcheons.

B. Welding certificates.

1.5 QUALITY ASSURANCE

A. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.7 COORDINATION

A. Arrange for pipe spaces, and openings in building structure during progress of construction, to allow for mechanical installations.

B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 15 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fitting.

2.3 JOINING MATERIALS

A. Refer to individual Division 15 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

   1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
      a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
      b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

   2. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.
G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

H. Solvent Cements for Joining Plastic Piping:

1. ABS Piping: ASTM D 2235.
2. CPVC Piping: ASTM F 493.
3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
4. PVC to ABS Piping Transition: ASTM D 3138.

I. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.

2.4 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

2.5 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.

D. One-Piece, Floor-Plate Type: Cast-iron floor plate.

E. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

2.6 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

   2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION
3.1 MECHANICAL DEMOLITION

A. Refer to Division 1 Sections "Cutting and Patching" and "Selective Demolition" for general demolition requirements and procedures.

B. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.
   1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
   4. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
   5. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   7. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 15 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.
H. Install piping free of sags and bends.
I. Install fittings for changes in direction and branch connections.
J. Install piping to allow application of insulation.
K. Select system components with pressure rating equal to or greater than system operating pressure.
L. Install escutcheons for penetrations of walls, ceilings, and floors.
M. Sleeves are not required for core-drilled holes.
N. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.
O. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
   2. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
P. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 7 Section "Through-Penetration Firestop Systems" for materials.
Q. Verify final equipment locations for roughing-in.
R. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.3 PIPING JOINT CONSTRUCTION
A. Join pipe and fittings according to the following requirements and Division 15 Sections specifying piping systems.
B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
   1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
   2. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.6 PAINTING

A. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.
3.7 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 5 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.8 GROUTING

A. Mix and install grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

END OF SECTION 15050
SECTION 15060
HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes hangers and supports for mechanical system piping and equipment:

1. Steel pipe hangers and supports.
2. Metal framing systems.
3. Thermal-hanger shield inserts.
4. Fastener systems.
5. Equipment supports.

B. Related Sections include the following:
1. Division 5 Section "Metal Fabrications" for materials for attaching hangers and supports to building structure.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.

B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

A. Design channel support systems for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 SUBMITTALS
A. Product Data: For each type of pipe hanger, channel support system component, and thermal-hanger shield insert indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Pipe Hangers:
   a. AAA Technology and Specialties Co., Inc.
   b. B-Line Systems, Inc.
   c. Carpenter & Patterson, Inc.
   d. Empire Tool & Manufacturing Co., Inc.
   e. Globe Pipe Hanger Products, Inc.
   f. Grinnell Corp.
   g. GS Metals Corp.
   h. Michigan Hanger Co., Inc.
   i. National Pipe Hanger Corp.
   j. PHD Manufacturing, Inc.
   k. PHS Industries, Inc.
   l. Piping Technology & Products, Inc.

2. Channel Support Systems:
   a. B-Line Systems, Inc.
   b. Grinnell Corp.; Power-Strut Unit.
   c. GS Metals Corp.
   e. National Pipe Hanger Corp.
   f. Thomas & Betts Corp.
   g. Unistrut Corp.
   h. Wesanco, Inc.

3. Thermal Hanger Shield Inserts:
   a. Carpenter & Paterson, Inc.
   b. ERICO/Michigan Hanger Co.
   c. PHS Industries, Inc.
   d. Pipe Shields, Inc.
   e. Rilco Manufacturing Company, Inc.
   f. Value Engineered Products, Inc.
2.2 STEEL PIPE HANGERS AND SUPPORTS

A. Pipe Hangers, Supports, and Components: MSS SP-58, factory-fabricated components. Refer to "Hanger and Support Applications" Article in Part 3 for where to use specific hanger and support types.

1. Galvanized, Metallic Coatings: For piping and equipment that will not have field-applied finish.
2. Nonmetallic Coatings: On attachments for electrolytic protection where attachments are in direct contact with copper tubing.

2.3 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Available Manufacturers:
   a. Hilti, Inc.
   b. ITW Ramset/Red Head.
   c. Masterset Fastening Systems, Inc.
   d. MKT Fastening, LLC.
   e. Powers Fasteners.

B. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Available Manufacturers:
   b. Empire Industries, Inc.
   c. Hilti, Inc.
   d. ITW Ramset/Red Head.
   e. MKT Fastening, LLC.
   f. Powers Fasteners.

2.4 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.
2.5 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
   2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger requirements are specified in Sections specifying equipment and systems.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Specification Sections.

C. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
   1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN15 to DN750).
   2. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4 (DN15 to DN100), to allow off-center closure for hanger installation before pipe erection. NPS 1/2 to NPS 8 (DN15 to DN200), o DN80).
   3. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
   4. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36 (DN65 to DN900), if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange. Expansion and contraction might occur and vertical adjustment is not necessary. barrier and encased in 360-degree sheet metal shield.

D. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500).
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500), if longer ends are required for riser clamps.

3.2 HANGER AND SUPPORT INSTALLATION
A. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

B. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

D. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

E. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

F. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping," is not exceeded.

G. Insulated Piping: Comply with the following:
   1. Attach clamps and spacers to piping.
      a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.

H. Do not exceed pipe stress limits according to ASME B31.9. loads equally on attachments and to achieve indicated slope of pipe.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches (40 mm).

3.5 PAINTING

A. Touch Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 9 painting Sections.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 15060
SECTION 15071
MECHANICAL VIBRATION CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Elastomeric hangers.
   2. Spring hangers.

1.3 SUBMITTALS

A. Product Data: Include load deflection curves for each vibration isolation device.

B. QUALITY ASSURANCE

1.4 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

1.5 VIBRATION ISOLATORS

A. Available Manufacturers:

   1. Amber/Booth Company, Inc.
   2. Mason Industries, Inc.

B. Elastomeric Hangers: Double-deflection type, with molded, oil-resistant rubber or neoprene isolator elements bonded to steel housings with threaded connections for hanger rods. Color-code or otherwise identify to indicate capacity range.

C. Spring Hangers: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression.
1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

3. Minimum Additional Travel: 50 percent of the required deflection at rated load.

4. Lateral Stiffness: More than 80 percent of the rated vertical stiffness.

5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Examine areas and equipment to receive vibration isolation devices for compliance with requirements, installation tolerances, and other conditions affecting performance.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

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

2.2 INSTALLATION

A. Install steel angles or channel, sized to prevent buckling, clamped with ductile-iron clamps to hanger rods for trapeze and individual pipe hangers. At trapeze anchor locations, shackle piping to trapeze. Requirements apply equally to hanging equipment. Do not weld angles to rods.

B. Install resilient bolt isolation washers on equipment anchor bolts.

2.3 ADJUSTING

A. Adjust isolators with equipment at operating weight; adjust active height of spring isolators.

B. Torque anchor bolts according to equipment manufacturer's written recommendations.

2.4 CLEANING

A. After completing equipment installation, inspect vibration isolation devices. Remove paint splatters and other spots, dirt, and debris.

END OF SECTION 15071
SECTION 15075
MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following mechanical identification materials and their installation:

1. Equipment nameplates.
2. Equipment markers.
3. Equipment signs.
4. Pipe markers.
5. Valve tags.

1.3 SUBMITTALS

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

B. Samples: For color, letter style, and graphic representation required for each identification material and device.

1.4 QUALITY ASSURANCE


1.5 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

PART 2 - PRODUCTS
2.1 EQUIPMENT IDENTIFICATION DEVICES

A. Equipment Nameplates: Metal, with data engraved or stamped, for permanent attachment on equipment.

1. Data:
   a. Manufacturer, product name, model number, and serial number.
   b. Capacity, operating and power characteristics, and essential data.
   c. Labels of tested compliances.

2. Location: Accessible and visible.

3. Fasteners: As required to mount on equipment.

B. Equipment Markers: Engraved, color-coded laminated plastic. Include contact-type, permanent adhesive.

1. Terminology: Match schedules as closely as possible.

2. Data:
   a. Name and plan number.
   b. Equipment service.
   c. Design capacity.

C. Equipment Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore, unless otherwise indicated. Fabricate in sizes required for message. Provide holes for mechanical fastening.

1. Data: Instructions for operation of equipment and for safety procedures.

2. Engraving: Manufacturer's standard letter style, of sizes and with terms to match equipment identification.

3. Thickness: 1/8 inch (3.2 mm), unless otherwise indicated.

4. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

2.2 PIPING IDENTIFICATION DEVICES

A. Manufactured Pipe Markers, General: Preprinted, color-coded, with lettering indicating service, and showing direction of flow.

1. Colors: Comply with ASME A13.1, unless otherwise indicated.

2. Lettering: Use piping system terms indicated and abbreviate only as necessary for each application length.

3. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): Full-band pipe markers extending 360 degrees around pipe at each location.

4. Pipes with OD, Including Insulation, 6 Inches (150 mm) and Larger: Either full-band or strip-type pipe markers at least three times letter height and of length required for label.
Arrows: Integral with piping system service lettering to accommodate both directions; or as separate unit on each pipe marker to indicate direction of flow.

B. Pretensioned Pipe Markers: Precoiled semi rigid plastic formed to cover full circumference of pipe and to attach to pipe without adhesive.

C. Shaped Pipe Markers: Preformed semi rigid plastic formed to partially cover circumference of pipe and to attach to pipe with mechanical fasteners that do not penetrate insulation vapor barrier.


E. Plastic Tape: Continuously printed, vinyl tape at least 3 mils (0.08 mm) thick with pressure-sensitive, permanent-type, self-adhesive back.

1. Width for Markers on Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): 3/4 inch (19 mm) minimum.

2.3 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch (6.4-mm) letters for piping system abbreviation and 1/2-inch (13-mm) numbers, with numbering scheme approved by Architect. Provide 5/32-inch (4-mm) hole for fastener.

PART 3 - EXECUTION

3.1 APPLICATIONS, GENERAL

A. Products specified are for applications referenced in other Division 15 Sections. If more than single-type material, device, or label is specified for listed applications, selection is Installer's option.

3.2 EQUIPMENT IDENTIFICATION

A. Install and permanently fasten equipment nameplates on each major item of mechanical equipment that does not have nameplate or has nameplate that is damaged or located where not easily visible. Locate nameplates where accessible and visible. Include nameplates for the following general categories of equipment:

1. condensing units, air handlers, fan coil units
2. Fans.

B. Install equipment markers with permanent adhesive on or near each major item of mechanical equipment. Data required for markers may be included on signs, and markers may be omitted if both are indicated.
1. Letter Size: Minimum 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

2. Data: Distinguish among multiple units, indicate operational requirements, indicate safety and emergency precautions, warn of hazards and improper operations, and identify units.

3. Locate markers where accessible and visible.

C. Install equipment signs with screws or permanent adhesive on or near each major item of mechanical equipment. Locate signs where accessible and visible.

1. Letter Size: Minimum 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

2. Data: Distinguish among multiple units, indicate operational requirements, indicate safety and emergency precautions, warn of hazards and improper operations, and identify units.

A. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm):

   1. Locate pipe markers and color bands where piping is exposed in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior nonconcealed locations as follows:

   2. Near penetrations through walls, floors, ceilings, and nonaccessible enclosures.

3.3 PIPING IDENTIFICATION

A. Install manufactured pipe markers indicating service on each piping system. Install with flow indication arrows showing direction of flow.

   1. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm):

      Pretensioned pipe markers. Use size to ensure a tight fit.

   2. Near penetrations through walls, floors, ceilings, and nonaccessible enclosures.

B. Locate pipe markers and color bands where piping is exposed in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior nonconcealed locations as follows:

   1. Near penetrations through walls, floors, ceilings, and nonaccessible enclosures.
3.4 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; plumbing fixture supply stops; shutoff valves; faucets; convenience and lawn-watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

3.5 ADJUSTING

A. Relocate mechanical identification materials and devices that have become visually blocked by other work.

3.6 CLEANING

A. Clean faces of mechanical identification devices.

END OF SECTION 15075
SECTION 15083
PIPE INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes preformed, rigid and flexible pipe insulation; insulating cements; field-applied
      jackets; accessories and attachments; and sealing compounds.
   B. Related Sections include the following:
      1. Division 7 Section "Firestopping" for firestopping materials and requirements for
         penetrations through fire and smoke barriers.
      2. Division 15 Section "Hangers and Supports" for pipe insulation shields and protection
         saddles.

1.3 SUBMITTALS
   A. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field
      applied, if any), for each type of product indicated.
   B. Installer Certificates: Signed by the Contractor certifying that installers comply with
      requirements.

1.4 QUALITY ASSURANCE
   A. Fire-Test-Response Characteristics: As determined by testing materials identical to those
      specified in this Section according to ASTM E 84, by a testing and inspecting agency
      acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and
      sealer and cement material containers with appropriate markings of applicable testing and
      inspecting agency.
      1. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed
         rating of 50 or less.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Packaging: Ship insulation materials in containers marked by manufacturer with appropriate ASTM specification designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 15 Section "Hangers and Supports."

B. Coordinate clearance requirements with piping Installer for insulation application.

1.7 SCHEDULING

A. Schedule insulation application after testing piping systems. Insulation application may begin on segments of piping that have satisfactory test results.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Mineral-Fiber Insulation:
   a. CertainTeed Manson.
   b. Knauf FiberGlass GmbH.
   c. Owens-Corning Fiberglas Corp.

2. Flexible Elastomeric Thermal Insulation:
   a. Armstrong World Industries, Inc.
   b. Rubatex Corp.

2.2 INSULATION MATERIALS

A. Mineral-Fiber Insulation: Glass fibers bonded with a thermosetting resin complying with the following:

1. Preformed Pipe Insulation: Comply with ASTM C 547, Type 1, with factory-applied, all-purpose, vapor-retarder jacket.

2. Fire-Resistant Adhesive: Comply with MIL-A-3316C in the following classes and grades:
   a. Class 1, Grade A for bonding glass cloth and tape to unfaced glass-fiber insulation, for sealing edges of glass-fiber insulation, and for bonding lagging cloth to unfaced glass-fiber insulation.
b. Class 2, Grade A for bonding glass-fiber insulation to metal surfaces.

3. Vapor-Retarder Mastics: Fire- and water-resistant, vapor-retarder mastic for indoor applications. Comply with MIL-C-19565C, Type II.

B. Flexible Elastomeric Thermal Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.

1. Adhesive: As recommended by insulation material manufacturer.
2. Ultraviolet-Protective Coating: As recommended by insulation manufacturer.

2.3 FIELD-APPLIED JACKETS

A. General: ASTM C 921, Type 1, unless otherwise indicated.


C. PVC Fitting Covers: Factory-fabricated fitting covers manufactured from 20-mil- (0.5-mm-) thick, high-impact, ultraviolet-resistant PVC.

1. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories for the disabled.
2. Adhesive: As recommended by insulation material manufacturer.

2.4 ACCESSORIES AND ATTACHMENTS

A. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, presized a minimum of 8 oz./sq. yd. (270 g/sq. m).

1. Tape Width: 4 inches (100 mm).

B. Bands: 3/4 inch (19 mm) wide, in one of the following materials compatible with jacket:

1. Stainless Steel: ASTM A 666, Type 304; 0.020 inch (0.5 mm) thick.
2. Galvanized Steel: 0.005 inch (0.13 mm) thick.
3. Aluminum: 0.007 inch (0.18 mm) thick.
4. Brass: 0.010 inch (0.25 mm) thick.
5. Nickel-Copper Alloy: 0.005 inch (0.13 mm) thick.

C. Wire: 0.080-inch (2.0-mm), nickel-copper alloy; 0.062-inch (1.6-mm), soft-annealed, stainless steel; or 0.062-inch (1.6-mm), soft-annealed, galvanized steel.

2.5 VAPOR RETARDERS

A. Mastics: Materials recommended by insulation material manufacturer that are compatible with insulation materials, jackets, and substrates.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry pipe and fitting surfaces. Remove materials that will adversely affect insulation application.

3.3 GENERAL APPLICATION REQUIREMENTS

A. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.

B. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each piping system.

C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Apply insulation with longitudinal seams at top and bottom of horizontal pipe runs.

E. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

F. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.

G. Keep insulation materials dry during application and finishing, discard, remove and dispose of wetted insulation and replace with new.

H. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.

I. Apply insulation with the least number of joints practical.

J. Apply insulation over fittings, valves, and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated. Refer to special instructions for applying insulation over fittings, valves, and specialties.

K. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic.
1. Apply insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor retarders are indicated, extend insulation on anchor legs at least 12 inches (300 mm) from point of attachment to pipe and taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
3. Install insert materials and apply insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by the insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect the jacket from tear or puncture by the hanger, support, and shield.

L. Insulation Terminations: For insulation application where vapor retarders are indicated, taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.

M. Apply adhesives and mastics at the manufacturer's recommended coverage rate.

N. Apply insulation with integral jackets as follows:

1. Pull jacket tight and smooth.
2. Circumferential Joints: Cover with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip and spaced 4 inches (100 mm) o.c.
3. Longitudinal Seams: Overlap jacket seams at least 1-1/2 inches (40 mm). Apply insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches (100 mm) o.c.
   a. Exception: Do not staple longitudinal laps on insulation having a vapor retarder.
4. Vapor-Retarder Mastics: Where vapor retarders are indicated, apply mastic on seams and joints and at ends adjacent to flanges, unions, valves, and fittings.

O. At penetrations in jackets for thermometers and pressure gages, fill and seal voids with vapor-retarder mastic.

P. Fire-Rated Wall Penetrations: Apply insulation continuously through penetrations of fire-rated walls and partitions.

1. Firestopping and fire-resistive joint sealers are specified in Division 7 Section "Firestopping."

3.4 MINERAL-FIBER INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:

1. Secure each layer of preformed pipe insulation to pipe with wire, tape, or bands without deforming insulation materials.
2. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic. Apply vapor retarder to ends of insulation at intervals of 15 to 20 feet (4.5 to 6 m) to form a vapor retarder between pipe insulation segments.

3. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches (150 mm) o.c.

4. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.

B. Apply insulation to fittings and elbows as follows:

1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.

2. When premolded insulation elbows and fittings are not available, apply mitered sections of pipe insulation, or glass-fiber blanket insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire, tape, or bands.

3. Cover fittings with standard PVC fitting covers.

3.5 FLEXIBLE ELASTOMERIC THERMAL INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:

1. Follow manufacturer's written instructions for applying insulation.

2. Seal longitudinal seams and end joints with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface. flange.

3. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the

B. Apply insulation to flanges as follows:

1. Apply pipe insulation to outer diameter of pipe

C. Apply insulation to fittings and elbows as follows:

1. Apply mitered sections of pipe insulation.

D. Secure insulation materials and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

3.6 PIPING SYSTEM APPLICATIONS

A. Insulation materials and thicknesses are specified in schedules at the end of this Section.

B. Items Not Insulated: Unless otherwise indicated, do not apply insulation to the following systems, materials, and equipment:

1. Flexible connectors.
2. Vibration-control devices.
C. Insulation applications will be considered defective if sample inspection reveals noncompliance with requirements. Remove defective Work and replace with new materials according to these Specifications.

D. Reinstall insulation and covers on fittings and valves uncovered for inspection according to these Specifications.

3.7 INSULATION APPLICATION SCHEDULE, GENERAL

A. Refer to insulation application schedules for required insulation materials, vapor retarders, and field-applied jackets.
1. Application schedules identify piping system and indicate pipe size ranges and material, thickness, and jacket requirements.

B. Service: Refrigerant suction and hot-gas piping.
2. Insulation Material: (Flexible elastomeric).
3. Insulation Thickness: (Copper) Pipe, ½” insulation thickness.
5. Vapor Retarder Required: Yes, on liquid line only.
6. Finish none.

END OF SECTION 15083
SECTION 15110

VALVES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following general-duty valves:

1. Copper-alloy ball valves.
2. Bronze check valves.
3. Spring-loaded, lift-disc check valves.
4. Bronze gate valves.

B. Related Sections include the following:

1. Division 2 piping Sections for general-duty and specialty valves for site construction piping.
2. Division 15 Section "Mechanical Identification" for valve tags and charts.
3. Division 15 Section "HVAC Instrumentation and Controls" for control valves and actuators.
4. Division 15 piping Sections for specialty valves applicable to those Sections only.

1.3 DEFINITIONS

A. The following are standard abbreviations for valves:

1. CWP: Cold working pressure.
2. EPDM: Ethylene-propylene-diene terpolymer rubber.
3. NBR: Acrylonitrile-butadiene rubber.
4. PTFE: Polytetrafluoroethylene plastic.
5. SWP: Steam working pressure.
6. TFE: Tetrafluoroethylene plastic.

1.4 SUBMITTALS

A. Product Data: For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimen-
visions; and required clearances. Include list indicating valve and its application. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

1.5 QUALITY ASSURANCE

A. ASME Compliance: ASME B31.1 for power piping valves and ASME B31.9 for building services piping valves.

1.6 DELIVERY, STORAGE, AND HANDLING

B. Prepare valves for shipping as follows:
   1. Protect internal parts against rust and corrosion.
   2. Protect threads.
   3. Set gate valves closed to prevent rattling.
   4. Set ball valves open to minimize exposure of functional surfaces.
   5. Block check valves in either closed or open position.

C. Use the following precautions during storage:
   1. Maintain valve end protection.
   2. Store valves indoors and maintain at higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

D. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
   2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 VALVES, GENERAL

A. Refer to Part 3 "Valve Applications" Article for applications of valves.

B. Bronze Valves: NPS 2 (DN 50) and smaller with threaded ends, unless otherwise indicated.

C. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
D. Valve Sizes: Same as upstream pipe, unless otherwise indicated.

E. Valve Actuators:
   1. Handwheel: For valves other than quarter-turn types.
   2. Lever Handle: For quarter-turn valves NPS 6 (DN 150) and smaller.

F. Extended Valve Stems: On insulated valves.

G. Valve Flanges: ASME B16.24 for bronze valves.

H. Valve Bypass and Drain Connections: MSS SP-45.

2.3 COPPER-ALLOY BALL VALVES

A. Manufacturers:
   1. Three-Piece, Copper-Alloy Ball Valves:
      b. Grinnell Corporation.
      c. Hammond Valve.
      d. NIBCO INC.
      e. Red-White Valve Corp.

B. Copper-Alloy Ball Valves, General: MSS SP-110.

C. Three-Piece, Copper-Alloy Ball Valves: Bronze body with full-port, chrome-plated bronze ball; TFE seats; and 600-psig (4140-kPa) minimum CWP rating and blowout-proof stem.

2.4 BRONZE CHECK VALVES

A. Manufacturers:
   1. Type 3, Bronze, Swing Check Valves with Metal Disc:
      a. Grinnell Corporation.
      b. Hammond Valve.
      c. Milwaukee Valve Company.
      d. NIBCO INC.
      e. Red-White Valve Corp.

B. Bronze Check Valves, General: MSS SP-80.

C. Type 3, Class 125, Bronze, Swing Check Valves: Bronze body with bronze disc and seat.
2.5 SPRING-LOADED, LIFT-DISC CHECK VALVES

A. Manufacturers:

1. Type IV, Threaded Lift-Disc Check Valves:
   a. Grinnell Corporation.
   b. Milwaukee Valve Company.
   c. Mueller Steam Specialty.
   d. NIBCO INC.
   e. Watts Industries, Inc.; Water Products Div.

B. Lift-Disc Check Valves, General: FCI 74-1, with spring-loaded bronze or alloy disc and bronze or alloy seat.

C. Type IV, Class 125, Threaded Lift-Disc Check Valves: Threaded style with bronze shell and threaded ends.

2.6 BRONZE GATE VALVES

A. Available Manufacturers:

B. Manufacturers:

1. Type 1, Bronze, Nonrising-Stem Gate Valves:
   a. Grinnell Corporation.
   b. Hammond Valve.
   c. Milwaukee Valve Company.
   d. NIBCO INC.
   e. Red-White Valve Corp.

C. Bronze Gate Valves, General: MSS SP-80, with ferrous-alloy handwheel.

D. Type 1, Class 125, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge and union-ring bonnet.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.
B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

C. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

D. Examine threads on valve and mating pipe for form and cleanliness.

E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

F. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE APPLICATIONS

A. Refer to piping Sections for specific valve applications. If valve applications are not indicated, use the following:
   1. Shutoff Service: Ball or gate valves.
   2. Pump Discharge: Spring-loaded, lift-disc check valves.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.

C. Domestic Water Piping: Use the following types of valves:
   1. Ball Valves, NPS 2 (DN 50) and Smaller: Three-piece, 600-psig (4140-kPa) CWP rating, copper alloy.

D. Sanitary Waste Piping: Use the following types of valves:
   1. Ball Valves, NPS 2 (DN 50) and Smaller: Three-piece, 600-psig (4140-kPa) CWP rating, copper alloy.
   2. Swing Check Valves, NPS 2 (DN 50) and Smaller: Type 3, Class 125, bronze.
   3. Gate Valves, NPS 2 (DN 50) and Smaller: Type 1, Class 125, bronze.

E. Select valves, except wafer and flangeless types, with the following end connections:
   1. For Steel Piping, NPS 2 (DN 50) and Smaller: Threaded ends.
   2. For Copper Tubing, NPS 2 (DN 50) and Smaller: Solder-joint or threaded ends.

3.3 VALVE INSTALLATION

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

C. Locate valves for easy access and provide separate support where necessary.

D. Install valves in horizontal piping with stem at or above center of pipe.

E. Install valves in position to allow full stem movement.

F. Install check valves for proper direction of flow and as follows:
   1. Swing Check Valves: In horizontal position with hinge pin level.
   2. Dual-Plate Check Valves: In horizontal or vertical position, between flanges.
   3. Lift Check Valves: With stem upright and plumb.

3.4 JOINT CONSTRUCTION

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.5 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

END OF SECTION 15110
SECTION 15140 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes domestic water piping inside the building.
   B. Related Sections include the following:
      1. Division 15 Section "Plumbing Specialties" for water distribution piping specialties.

1.3 DEFINITIONS
   A. CPVC: Chlorinated polyvinyl chloride plastic.
   B. PEX: Crosslinked polyethylene plastic.
   C. PVC: Polyvinyl chloride plastic.

1.4 PERFORMANCE REQUIREMENTS
   A. Provide components and installation capable of producing domestic water piping systems with 125 psig (860 kPa), unless otherwise indicated.

1.5 SUBMITTALS
   A. Product Data: For pipe, tube, fittings, and couplings.
   C. Field quality-control test reports.

1.6 QUALITY ASSURANCE
   A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
   B. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9," for potable domestic water piping and components.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

A. Refer to Part 3 "Pipe and Fitting Applications" Article for applications of pipe, tube, fitting, and joining materials.

B. Transition Couplings for Aboveground Pressure Piping: Coupling or other manufactured fitting the same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

2.3 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Types L (ASTM B 88M, Types B), water tube, drawn temper.

2. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

2.4 VALVES

A. Bronze and cast-iron, general-duty valves are specified in Division 15 Section "Valves."

B. Balancing and drain valves are specified in Division 15 Section "Plumbing Specialties."

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."
3.2 PIPE AND FITTING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.

B. Aboveground Domestic Water Piping: Use the following piping materials for each size range:
   1. NPS 1 (DN 25) and Smaller: Hard copper tube, Type L (Type B) copper pressure fittings; and soldered joints.

3.3 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
   1. Shutoff Duty: Use bronze ball or gate valves for piping NPS 2 (DN 50) and smaller.
   2. Drain Duty: Hose-end drain valves.

B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 (DN 50) and smaller.

C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping.

3.4 PIPING INSTALLATION

A. Basic piping installation requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."

B. Drain valves and strainers are specified in Division 15 Section "Plumbing Specialties."

C. Install domestic water piping level without pitch and plumb.

3.5 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."

B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.6 HANGER AND SUPPORT INSTALLATION

A. Pipe hanger and support devices are specified in Division 15 Section "Hangers and Supports." Install the following:
   1. Vertical Piping: MSS Type 8 or Type 42, clamps.
2. Individual, Straight, Horizontal Piping Runs: According to the following:
   a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.

3. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Install supports according to Division 15 Section "Hangers and Supports."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8 inch (10 mm).

E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 3/4 (DN 20) and Smaller: 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
   2. NPS 1 and NPS 1-1/4 (DN 25 and DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm)

F. Install supports for vertical copper tubing every 10 feet (3 m).

G. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment and machines to allow service and maintenance.

C. Connect domestic water piping to existing water-service piping. Use transition fitting to join dissimilar piping materials.

D. Connect domestic water piping to water-service piping with shutoff valve, and extend and connect to the following:
   1. Sump Pumps: Cold-water discharge piping.
   2. Equipment: Cold-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection.

3.8 FIELD QUALITY CONTROL

A. Inspect domestic water piping as follows:
   1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
   2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test domestic water piping as follows:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.

2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.

4. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.

6. Prepare reports for tests and required corrective action.

3.9 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.

2. Open shutoff valves to fully open position.

3. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.


5. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.10 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing domestic water piping that have been altered, extended, or repaired before using.

2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction or, if methods are not prescribed, procedures described in either AWWA C651 or AWWA C652 or as described below:
a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
b. Fill and isolate system according to either of the following:
   1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.
   2) Fill system or part thereof with water/chlorine solution with at least 200 ppm (200 mg/L) of chlorine. Isolate and allow to stand for three hours.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

B. Prepare and submit reports of purging and disinfecting activities.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

END OF SECTION 15140
SECTION 15145 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   
   A. This Section includes the following domestic water piping specialties:
      
      1. Strainers.
      2. Drain valves.
      3. Trap-seal primer valves.
   
   B. Related Sections include the following:
      
      1. Division 15 Section "Domestic Water Piping" for water meters.

1.3 PERFORMANCE REQUIREMENTS
   
   A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig (860 kPa), unless otherwise indicated.

1.4 SUBMITTALS
   
   A. Product Data: For each type of product indicated.
   
   B. Field quality-control test reports.
   
   C. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE
   
   A. NSF Compliance:
      
      
      2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."
PART 2 - PRODUCTS

2.1 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:
   1. Pressure Rating: 125 psig (860 kPa) minimum, unless otherwise indicated.
   2. Body: Bronze for NPS 2 (DN 50) and smaller.
   3. End Connections: Threaded for NPS 2 (DN 50) and smaller.
   4. Screen: Stainless steel with round perforations, unless otherwise indicated.
   5. Perforation Size:
      a. Strainers NPS 2 (DN 50) and Smaller: 0.033 inch (0.84 mm).

2.2 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:
   2. Pressure Rating: 400-psig (2760-kPa) minimum CWP.
   4. Body: Copper alloy.
   5. Ball: Chrome-plated brass.
   8. Inlet: Threaded or solder joint.

2.3 TRAP-SEAL PRIMER VALVES

A. Supply-Type, Trap-Seal Primer Valves:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. MIFAB, Inc.
      b. PPP Inc.
      c. Sioux Chief Manufacturing Company, Inc.
      e. Watts Industries, Inc.; Water Products Div.
   3. Pressure Rating: 125 psig (860 kPa) minimum.
   5. Inlet and Outlet Connections: NPS 1/2 (DN 15) threaded, union, or solder joint.
6. Gravity Drain Outlet Connection: NPS 1/2 (DN 15) threaded or solder joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, and basic installation requirements.

B. Install water control valves with inlet and outlet shutoff valves.

C. Install Y-pattern strainers for water on supply side of each control valve.

D. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to trap, or inlet fitting. Adjust valve for proper flow.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping and specialties.

3.3 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
   1. Supply-type, trap-seal primer valves.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 15 Section "Mechanical Identification."

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and prepare test reports:

   1. Test each trap primer valve according to authorities having jurisdiction and the device's reference standard.

B. Remove and replace malfunctioning domestic water piping specialties and retest.

END OF SECTION 15145
SECTION 15150 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following for soil, waste, and vent piping inside the building:
   1. Pipe, tube, and fittings.
   2. Special pipe fittings.

B. Related Sections include the following:
   1. Division 15 Section "Drainage Piping Specialties" for Air-Gap fittings.

1.3 DEFINITIONS


B. EPDM: Ethylene-propylene-diene terpolymer rubber.

C. LLDPE: Linear, low-density polyethylene plastic.

D. NBR: Acrylonitrile-butadiene rubber.

E. PE: Polyethylene plastic.

F. PVC: Polyvinyl chloride plastic.

G. TPE: Thermoplastic elastomer.

1.4 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
   2. Sanitary Sewer, Force-Main Piping: 100 psig (690 kPa).
1.5 SUBMITTALS

A. Product Data: For pipe, tube, fittings, and couplings.

B. Field quality-control inspection and test reports.

1.6 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.3 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

B. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.

1. Standard, Shielded, Stainless-Steel Couplings: CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve.

   a. Available Manufacturers:

      1) ANACO.
      2) Fernco, Inc.
3) Ideal Div.; Stant Corp.
4) Mission Rubber Co.
5) Tyler Pipe; Soil Pipe Div.

C. Rigid, Unshielded Couplings: ASTM C 1461, sleeve-type, reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Available Manufacturers:
   a. ANACO.

2.4 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Standard Weight or Schedule 40, galvanized. Include ends matching joining method.

B. Drainage Fittings: ASME B16.12, galvanized, threaded, cast-iron drainage pattern.

C. Pressure Fittings:

2.5 PVC PIPE AND FITTINGS

A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
   1. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.

B. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.
   1. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.

2.6 SPECIAL PIPE FITTINGS

A. Flexible, Nonpressure Pipe Couplings: Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition pattern. Include shear ring, ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Available Manufacturers:
   b. Fernco, Inc.
   c. Logan Clay Products Company (The).
   d. Mission Rubber Co.
e. NDS, Inc.
f. Plastic Oddities, Inc.

2. Sleeve Materials:
   b. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
   c. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

B. Shielded Nonpressure Pipe Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

   1. Available Manufacturers:
      b. Mission Rubber Co.

C. Rigid, Unshielded, Nonpressure Pipe Couplings: ASTM C 1461, sleeve-type reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.

   1. Available Manufacturers:
      a. ANACO.

D. Wall-Penetration Fittings: Compound, ductile-iron coupling fitting with sleeve and flexing sections for up to 20-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

   1. Available Manufacturers:
      a. SIGMA Corp.

PART 3 - EXECUTION

3.1 EXCAVATION
   A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS
   A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
   B. Aboveground, soil and waste piping NPS 4 (DN 100) and smaller shall be any of the following:
      1. Hubless cast-iron soil pipe and fittings standard, shielded, stainless-steel couplings; and hubless-coupling joints.
2. Steel pipe, drainage fittings, and threaded joints.
4. Dissimilar Pipe-Material Couplings: Rigid, unshielded, nonpressure pipe couplings for joining dissimilar pipe materials with small difference in OD.

C. Aboveground, vent piping NPS 4 (DN 100) and smaller shall be any of the following:
   1. Hubless cast-iron soil pipe and fittings; rigid, unshielded couplings; and hubless-coupling joints.
   2. Steel pipe, drainage fittings, and threaded joints.
   4. Dissimilar Pipe-Material Couplings: Rigid, unshielded, nonpressure pipe couplings for joining dissimilar pipe materials with small difference in OD.

D. Underground, soil, waste, and vent piping NPS 4 (DN 100) and smaller shall be any of the following:
   1. Hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.
   2. Cellular-core and Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
   3. Dissimilar Pipe-Material Couplings: Flexible, nonpressure pipe couplings for joining dissimilar pipe materials with small difference in OD.

E. Aboveground sanitary-sewage force mains NPS 1-1/2 and NPS 2 (DN 40 and DN 50) shall be the following:
   1. Steel pipe, pressure fittings, and threaded joints.

3.3 PIPING INSTALLATION

A. Sanitary sewer piping outside the building is specified in Division 2 Section "Sanitary Sewerage."

B. Basic piping installation requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."

C. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.

D. Install cleanout fitting with closure plug inside the building in sanitary force-main piping.

E. Install aboveground, steel, force-main piping.

F. Install wall-penetration fitting at each service pipe penetration through foundation wall. Make installation watertight.


H. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side.
with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

I. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

J. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
1. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

K. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.

L. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.

M. Install underground PVC soil and waste drainage piping according to ASTM D 2321.

N. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.4 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."

B. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

C. PVC Nonpressure Piping Joints: Join piping according to ASTM D 2665.

3.5 VALVE INSTALLATION

A. General valve installation requirements are specified in Division 15 Section "Valves."

B. Shutoff Valves: Install shutoff valve on each sump pump discharge.
   1. Install gate or full-port ball valve for piping NPS 2 (DN 50) and smaller.

C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sump pump discharge.
3.6 HANGER AND SUPPORT INSTALLATION

A. Pipe hangers and supports are specified in Division 15 Section "Hangers and Supports." Install the following:

1. Vertical Piping: MSS Type 8 or Type 42, clamps.
2. Install individual, straight, horizontal piping runs according to the following:
   a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
3. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Install supports according to Division 15 Section "Hangers and Supports."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.

E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 60 inches (1500 mm) with 3/8-inch (10-mm) rod.

F. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).

G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/4 (DN 32): 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
   2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
   3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.

H. Install supports for vertical steel piping every 15 feet (4.5 m).

I. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 48 inches (1200 mm) with 3/8-inch (10-mm) rod.

J. Install supports for vertical PVC piping every 48 inches (1200 mm).

K. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.
B. Connect soil and waste piping to existing sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

C. Connect drainage and vent piping to the following:

1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
2. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
3. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 (DN 65) and larger.

D. Connect force-main piping to the following:

1. Sanitary Sewer: To air-gap fitting.
2. Sump Pumps: To sump pump discharge.

3.8 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water (30 kPa). From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into
piping system equal to pressure of 1-inch wg (250 Pa). Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

6. Prepare reports for tests and required corrective action.

E. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.

2. Cap and subject piping to static-water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

4. Prepare reports for tests and required corrective action.

3.9 CLEANING

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.10 PROTECTION

A. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

END OF SECTION 15150
SECTION 15155
DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes the following drainage piping specialties:
      1. Air-Gap Fittings.

1.3 SUBMITTALS
   A. Field quality-control test reports.
   B. Operation and Maintenance Data: For drainage piping specialties to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE
   A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

1.5 COORDINATION
   A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

PART 2 - PRODUCTS

2.1 AIR-GAP FITTINGS
   A. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
1. Body: Bronze or cast iron.
2. Inlet: Opening in top of body.
3. Outlet: Larger than inlet.
4. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, and basic installation requirements.

B. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

C. Install wood-blocking reinforcement for wall-mounting-type specialties.

D. Install deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

3.3 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
   2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 15155
SECTION 15183

REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes refrigerant piping used for air-conditioning applications.

B. Related Sections include the following:

1. Division 7 Section "Joint Sealants" for materials and methods for sealing pipe penetrations through exterior walls.
2. Division 15 Section "Hangers and Supports" for pipe supports and installation requirements.
3. Delete first subparagraph below if requirements in Division 15 Section "Basic Mechanical Materials and Methods" are sufficient.
4. Division 15 Section "Electrical Controls" for thermostats, controllers, automatic-control valves, and sensors.

C. SUBMITTALS

D. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall, and equipment connection details. Show interface and spatial relationship between piping and equipment.

1. Size refrigerant piping and design the actual piping layout, including oil traps, double risers, specialties, and pipe and tube sizes, to ensure proper operation and compliance with warranties of connected equipment.

E. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

F. Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals specified in Division 1.

1.3 QUALITY ASSURANCE

B. ASME Standard: Comply with ASME B31.5, "Refrigeration Piping."

C. UL Standard: Provide products complying with UL 207, "Refrigerant-Containing Components and Accessories, Nonelectrical"; or UL 429, "Electrically Operated Valves."

1.4 COORDINATION

A. Coordinate layout and installation of refrigerant piping and suspension system components with other construction, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

B. Coordinate pipe sleeve installations for foundation wall penetrations.

C. Coordinate pipe fitting pressure classes with products specified in related Sections.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Refrigerants:
   a. Allied Signal, Inc./Fluorine Products; Genetron Refrigerants.
   b. DuPont Company; Fluorochemicals Div.

2.2 COPPER TUBE AND FITTINGS

A. Drawn-Temper Copper Tube: ASTM B 88, Type L.

B. Annealed-Temper Copper Tube: ASTM B 88, Type L.

C. Wrought-Copper Fittings: ASME B16.22.

D. Wrought-Copper Unions: ASME B16.22.

2.3 REFRIGERANTS

A. ASHRAE 34, R-134a: Tetrafluoroethane.

B. ASHRAE 34, R-22: Monochlorodifluoromethane.

PART 3 - EXECUTION
3.1 PIPING APPLICATIONS

A. Aboveground, within Building: Type L (Type B) drawn-copper tubing.

B. When brazing, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion valve bulb.

C. Hanger, support, and anchor products are specified in Division 15 Section "Hangers and Supports."

3.2 FIELD QUALITY CONTROL

A. Test and inspect refrigerant piping according to ASME B31.5, Chapter VI.

1. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure.

2. Test high- and low-pressure side piping of each system at not less than the lower of the design pressure or the setting of pressure relief device protecting high and low side of system.

   a. System shall maintain test pressure at the manifold gage throughout duration of test.
   b. Test joints and fittings by brushing a small amount of soap and glycerine solution over joint.
   c. Fill system with nitrogen to raise a test pressure of 150 psig (1035 kPa) or higher as required by authorities having jurisdiction.
   d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

3.3 ADJUSTING

A. Adjust thermostatic expansion valve to obtain proper evaporator superheat requirements.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of the conditioned air or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:

1. Open shutoff valves in condenser water circuit.
2. Check compressor oil level above center of sight glass.
3. Open compressor suction and discharge valves.
4. Open refrigerant valves, except bypass valves that are used for other purposes.
5. Check compressor-motor alignment, and lubricate motors and bearings.
3.4 CLEANING

A. Before installing copper tubing other than Type ACR, clean tubing and fittings with trichloroethylene.

B. Replace core of filter-dryer after system has been adjusted and design flow rates and pressures are established.

3.5 SYSTEM CHARGING

A. Charge system using the following procedures:

1. Install core in filter-dryer after leak test but before evacuation.
2. Evacuate entire refrigerant system with a vacuum pump to a vacuum of 500 micrometers (67 Pa). If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig (14 kPa).
5. Fill system with full-operating charge of refrigerant.

END OF SECTION 15183
SECTION 15446

SUMP PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following sump pump and accessories, inside the building, for building storm drainage systems:

1. Submersible sump pump.
2. Sump pump pit.

1.3 SUBMITTALS

A. Product Data: For type and size of sump pump specified. Include certified performance curves with operating points plotted on curves, and rated capacities of selected models, furnished specialties, and accessories.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Operation and Maintenance Data: For each sump pump to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of sump pump and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Retain shipping flange protective covers and protective coatings during storage.

B. Protect bearings and couplings against damage.
C. Comply with pump manufacturer's written rigging instructions for handling.

1.6 COORDINATION

A. Coordinate size and location of concrete pits. Concrete, reinforcement, and formwork requirements are specified in Division 3.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SUBMERSIBLE SUMP PUMP

A. Manufacturers:

1. Stancor, Inc.

B. Description: Factory-assembled and -tested, simplex, single-stage, centrifugal, end-suction, submersible, direct-connected sump pumps complying with UL 778 and HI 1.1-1.2 and HI 1.3 for submersible sump pump.

C. Casing: Cast iron; with cast-iron inlet strainer, legs that elevate pump to permit flow into impeller, and vertical discharge with companion flange for piping connection.

D. Impeller: Stainless steel; statically and dynamically balanced, semiopen nonclog design, overhung, single suction, keyed and secured to shaft.

E. Pump and Motor Shaft: Steel, with factory-sealed, grease-lubricated ball bearings.

F. Motor: Hermetically sealed, capacitor-start type, with built-in overload protection; three-conductor waterproof power cable of length required, and with grounding plug and cable-sealing assembly for connection at pump. Comply with requirements in Division 15 Section "Motors."

1. Moisture-Sensing Probe: Internal moisture sensor with moisture alarm.

G. Pump Discharge Piping: Factory or field fabricated, ASTM A 53/A 53M, Schedule 40, galvanized-steel pipe.
H. Pit Cover: Cast iron or steel with bituminous coating and strong enough to support controls. See Part 2 "Sump Pump Pit" Article for other requirements.

I. Controls: NEMA 250, Type 6, 120-V ac, float switch, mounted on discharge piping.

   1. High-Water Alarm: Rod-mounted, NEMA 250, Type 6 enclosure with mechanical- or mercury-float switch alarm matching control and electric bell; 120-V ac, with transformer and contacts for remote alarm bell.

J. Capacity and Characteristics:

   1. Pump:

      b. Total Dynamic Head: 37 feet.
      c. Speed: 3600 rpm.
      d. Discharge Pipe Size: 2 NPS.
      e. Motor Horsepower: 0.5
      f. Electrical Characteristics:

         1) Volts: 115.
         2) Phases: Single.
         3) Hertz: 60.

      g. Unit Electrical Characteristics:

         1) Full-Load Amperes: 5.
         2) Minimum Circuit Ampacity: 6.3

2.3 SUMP PUMP PIT

A. Description: Concrete pit with sump, pipe connections, curb frame, and separate cover.

B. Sump: Construct of watertight, cast-in-place, reinforced concrete with sidewall openings for pipe connections. Cast-in-place concrete, formwork, and reinforcement are specified in Division 3 Section "Cast-in-Place Concrete (Limited Applications)."

   1. Pipe Connections: Sleeved openings large enough for mechanical sleeve seals for drainage piping. Sleeves and mechanical sleeve seals are specified in Division 15 Section "Basic Mechanical Materials and Methods," and drainage piping is specified in Division 15 Section "Storm Drainage Piping."

C. Curb Frame and Cover:

   1. Curb Frame Material: Galvanized steel or steel with bituminous coating.

      a. Pattern: Angle-cross-section shape with flat top surface.

   2. Cover: Open grating fabricate with openings for discharge piping and power cables.
a. Material: Cast iron or steel with bituminous coating.
b. Discharge Pipe Size: 2 NPS.
c. Dimensions: 24 by 24 inches.

D. Capacity and Characteristics:
1. Capacity: 60 gal.
2. Inside Dimensions: 24 by 24 inches.
3. Depth: 24 inches.

2.4 BUILDING AUTOMATION SYSTEM INTERFACE
A. Provide auxiliary contacts in pump controllers for interface to building automation system. Include the following:
1. On-off status of pump.
2. Alarm status.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine roughing-in of plumbing piping to verify actual locations of waste drainage piping connections before sump pump installation.

3.2 SUMP PUMP INSTALLATION
A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."
B. Install sump pump according to applicable requirements in HI 1.4.
C. Install pump and arrange to provide access for maintenance including removal of motors, impellers, couplings, and accessories.
D. Set submersible sump pump on pit floor. Make direct connections to waste drainage piping.
E. Construct sump pump pit and connect to drainage piping. Set pit curb frame recessed in and anchored to concrete. Fasten pit cover to pit curb flange. Install cover so top surface is flush with finished floor.
F. Support piping so weight of piping is not supported by pumps.

3.3 CONNECTIONS
A. Piping installation requirements are specified in Division 15 Section "Storm Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
B. Install piping adjacent to sump pump to allow service and maintenance.

C. Connect waste drainage piping to pump. Install discharge piping equal to or greater than size of pump discharge piping. Refer to Division 15 Section "Sanitary Waste and Vent Piping."
   1. Install flexible connectors adjacent to pump in discharge piping.
   2. Install check and shutoff valve on discharge piping from pump. Install unions on pump having threaded pipe connections. Install valves same size as connected piping. Refer to Division 15 Section "Valves" for general-duty valves for drainage piping.

D. Ground equipment according to Division 16 Section "Grounding and Bonding."

E. Connect wiring according to Division 16 Section "Conductors and Cables."

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Verify bearing lubrication.
   3. Disconnect couplings and check motors for proper direction of rotation.
   4. Verify that pump is free to rotate by hand. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
   5. Verify that pump controls are correct for required application.

B. Start pump without exceeding safe motor power:
   1. Start motors.
   2. Open discharge valve slowly.
   3. Check general mechanical operation of pump and motors.

C. Test and adjust controls and safeties.

D. Remove and replace damaged and malfunctioning components.
   1. Pump Controls: Set pump controls for automatic start, stop, and alarm operation as required for system application.
   2. Set field-adjustable switches and circuit-breaker trip ranges as indicated, or if not indicated, for normal operation.

E. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project outside normal occupancy hours for this purpose.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain controls and pump. Refer to Division 1 Section "Closeout Procedures."
SECTION 15738

SPLIT-SYSTEM AIR-CONDITIONING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes split-system air-conditioning and heat pump units consisting of separate evaporator-fan and compressor-condenser components. Units are designed for exposed or concealed mounting, and may be connected to ducts.

1.3 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

F. Warranty: Special warranty specified in this Section.

G. LEED Submittals:
   1. Credit EA 4: Manufacturers' product data for refrigerants, including printed statement that refrigerants are free of HCFCs.

1.4 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of split-system units and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.


D. Coefficient of Performance: Equal to or greater than prescribed by ASHRAE 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings."

E. Units shall be designed to operate with HCFC-free refrigerants.

1.5 COORDINATION

A. Coordinate size, location, and connection details with roof curbs, equipment supports, and roof penetrations.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: One set of filters for each unit.
2. Fan Belts: One set of belts for each unit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products of the following:

1. Mitsubishi Electronics America, Inc.; HVAC Division.
2.2 WALL-MOUNTING, EVAPORATOR-FAN COMPONENTS

A. Cabinet: Enameled steel with removable panels on front and ends in color selected by Architect, and discharge drain pans with drain connection.

B. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with thermal-expansion valve.

C. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements with refractory ceramic support bushings; automatic-reset thermal cutout; built-in magnetic contactors; manual-reset thermal cutout; airflow proving device; and one-time fuses in terminal box for over current protection.

D. Fan: Direct drive, centrifugal fan.

E. Fan Motors: Comply with requirements in Division 15 Section "Motors."
   1. Special Motor Features: Multitapped, multispeed with internal thermal protection and permanent lubrication.

F. Filters: Permanent, cleanable.

G. Condensate drain: Piping and fittings shall be hard copper type L. Minimum pitch of 1 inch in 8 feet. Piping shall be supported at a minimum of 3 feet on center without “sagging”.

2.3 AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS

A. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.

B. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
   1. Compressor Type: Reciprocating, Scroll
   2. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.

C. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with liquid subcooler.

D. Heat Pump Components: Reversing valve and low-temperature air cut-off thermostat.

E. Fan: Aluminum-propeller type, directly connected to motor.

F. Motor: Permanently lubricated, with integral thermal-overload protection.

G. Low Ambient Kit: Permits operation down to 45 deg F
H. Mounting Base: Polyethylene.

2.4 ACCESSORIES

A. Control equipment and sequence of operation are specified in Division 15 Sections "HVAC Instrumentation and Controls" and "Sequence of Operation."

B. Thermostat: Low voltage with subbase to control compressor and evaporator fan.

C. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:
   1. Compressor time delay.
   2. 24-hour time control of system stop and start.
   3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
   4. Fan-speed selection, including auto setting.

D. Automatic-reset timer to prevent rapid cycling of compressor.

E. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

F. Additional Monitoring:
   1. Monitor cooling load.

PART 3 - EXECUTION

PART 4 - INSTALLATION

A. Install units level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install ground-mounting, compressor-condenser components on polyethylene mounting base.

D. Install roof-mounting compressor-condenser components on equipment supports. Anchor units to supports with removable, cadmium-plated fasteners.

E. Install seismic restraints.

F. Install compressor-condenser components on restrained, spring isolators with a minimum static deflection of 1 inch. Refer to Division 15 Section "Mechanical Vibration Controls and Seismic Restraints."

G. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.
4.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to unit to allow service and maintenance.

C. Ground equipment according to Division 16 Section "Grounding and Bonding."

D. Electrical Connections: Comply with requirements in Division 16 Sections for power wiring, switches, and motor controls.

4.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

4.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

4.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units. Refer to Division 1 Section

END OF SECTION 15738
SECTION 15940

SEQUENCE OF OPERATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

B. Related Sections include the following:

1. Division 15 Section "HVAC Instrumentation and Controls" for control equipment and devices and submittal requirements.

2. Division 15 Section “Electric Control Systems.”

1.3 SEQUENCE OF OPERATION

a. Sequence of operation, air-cooled, split system heat pump, is shown and described on drawings.

PART 2 - EXECUTION (Not Applicable)

END OF SECTION 15940
SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

   A. This Section includes the following:

      1. Electrical equipment coordination and installation.
      2. Sleeves for raceways and cables.
      3. Sleeve seals.
      4. Common electrical installation requirements.

1.3 DEFINITIONS

   B. EPDM: Ethylene-propylene-diene terpolymer rubber.
   C. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

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

1.5 QUALITY ASSURANCE

   A. Test Equipment Suitability and Calibration: Comply with NETA ATS, "Suitability of Test Equipment" and "Test Instrument Calibration."

1.6 COORDINATION

   A. Coordinate arrangement, mounting, and support of electrical equipment:

      1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 8 Section "Access Doors and Frames."

D. Coordinate electrical testing of electrical, mechanical, and architectural items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052- or 0.138-inch (1.3- or 3.5-mm) thickness as indicated and of length to suit application.

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."
2.3 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Available Manufacturers:
   a. Advance Products & Systems, Inc.
   b. Calpico, Inc.
   c. Metraflex Co.
   d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM or NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.

3. Pressure Plates: Stainless steel. Include two for each sealing element.

4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."

C. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
D. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

E. Rectangular Sleeve Minimum Metal Thickness:

1. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side greater than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).

2. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches (1270 mm) and 1 or more sides equal to, or greater than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

F. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

G. Cut sleeves to length for mounting flush with both surfaces of walls.

H. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

I. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.

J. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.

K. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Refer to Division 7 Section "Joint Sealants" for materials and installation.

L. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with Division 7 Section "Through-Penetration Firestop Systems."

M. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

N. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

O. Underground, Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal underground, exterior wall penetrations.
B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Through-Penetration Firestop Systems."

3.5 FIELD QUALITY CONTROL

A. Inspect installed sleeve and sleeve-seal installations and associated firestopping for damage and faulty work.

END OF SECTION
SECTION 16060
GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.3 SUBMITTALS
   A. Product Data: For each type of product indicated.
   B. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
   C. Field Test Reports: Submit written test reports to include the following:
      1. Test procedures used.
      2. Test results that comply with requirements.
      3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.4 QUALITY ASSURANCE
   A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.
      1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association to supervise on-site testing specified in Part 3.
   B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
      1. Comply with UL 467.
C. Comply with NFPA 70; for overhead-line construction and medium-voltage underground construction, comply with IEEE C2.

D. Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Grounding Conductors, Cables, Connectors, and Rods:
   a. Apache Grounding/Erico Inc.
   b. Chance/Hubbell.
   c. Copperweld Corp.
   e. Framatome Connectors/Burndy Electrical.
   f. Harger Lightning Protection, Inc.
   g. Heary Brothers Lightning Protection Co.
   h. Ideal Industries, Inc.
   i. ILSCO.
   k. Lightning Master Corp.
   l. Lyncole XIT Grounding.
   m. O-Z/Gedney Co.; a business of the EGS Electrical Group.
   n. Raco, Inc.; Division of Hubbell.
   o. Thomas & Betts, Electrical.

2.2 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."

B. Material: Copper.

C. Equipment Grounding Conductors: Insulated with green-colored insulation.

D. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.

E. Grounding Electrode Conductors: Stranded cable.

F. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

G. Bare Copper Conductors: Comply with the following:

H. Copper Bonding Conductors: As follows:

1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch (6.4 mm) in diameter.
2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.
4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.

I. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

2.3 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.

C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

PART 3 - EXECUTION

3.1 APPLICATION

A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.

B. In raceways, use insulated equipment grounding conductors.

C. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.

D. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

3.2 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

B. Install equipment grounding conductors in all feeders and circuits.
C. Install insulated equipment grounding conductor with circuit conductors for the following items, in addition to those required by NEC:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.

D. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.

E. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

C. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

D. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.

3.4 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

E. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

G. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.5 FIELD QUALITY CONTROL

A. Testing: Engage a qualified testing agency to perform the following field quality-control testing:

B. Testing: Perform the following field quality-control testing:

1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural
drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.

3. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

   a. Equipment Rated 500 kVA and Less: 10 ohms.
   b. Equipment Rated 500 to 1000 kVA: 5 ohms.
   c. Equipment Rated More Than 1000 kVA: 3 ohms.
   e. Manhole Grounds: 10 ohms.

4. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION
SECTION 16072

ELECTRICAL SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.
C. IMC: Intermediate metal conduit.
E. OSHPD: Office of Statewide Health Planning and Development.
F. RMC: Rigid metal conduit.

1.4 SUBMITTALS

A. Product Data: Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of electrical support component used.

B. Shop Drawings: Indicate materials and dimensions and identify hardware, including attachment and anchorage devices, signed and sealed by a qualified professional engineer. Professional engineer qualification requirements are specified in Division 1 Section "Quality Requirements." Include the following:
1. Fabricated Supports: Representations of field-fabricated supports not detailed on Drawings.

C. Welding certificates.

D. Qualification Data: For professional engineer and testing agency.

E. Field quality-control test reports.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed under this Project, with a minimum structural safety factor of five times the applied force.

B. Steel Slotted Support Systems: Comply with MFMA-3, factory-fabricated components for field assembly.

1. Available Manufacturers:

   a. Cooper B-Line; a division of Cooper Industries.
   b. ERICO International Corporation.
   c. Allied Support Systems; Power-Strut Unit.
   d. GS Metals Corp.
   e. Michigan Hanger Co., Inc.; O-Strut Div.
   f. National Pipe Hanger Corp.
   g. Thomas & Betts Corporation.
h. Unistrut; Tyco International, Ltd.

2. Finishes:
   a. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-3.
   b. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-3.
   c. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-3.

3. Channel Dimensions: Selected for structural loading.

C. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inch- (14-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c., in at least 1 surface.

1. Available Manufacturers:
   a. Allied Support Systems; Aickinstrut Unit.
   b. Cooper B-Line; a division of Cooper Industries.
   c. Fabco Plastics Wholesale Limited.

2. Fittings and Accessories: Products of channel and angle manufacturer and designed for use with those items.

3. Fitting and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.

4. Rated Strength: Selected to suit structural loading.

D. Raceway and Cable Supports: As described in NECA 1.

E. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

F. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

G. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

H. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

   a. Available Manufacturers:
1) Hilti, Inc.
2) ITW Construction Products.
3) MKT Fastening, LLC.
4) Simpson Strong-Tie Co. Inc.

2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
   a. Available Manufacturers:
      1) Cooper B-Line; a division of Cooper Industries.
      2) Empire Tool and Manufacturing Co., Inc
      3) Hilti, Inc.
      4) ITW Construction Products.
      5) MKT Fastening, LLC.
      6) Powers Fasteners.

3. Concrete Inserts: Steel or malleable-iron slotted-support-system units similar to MSS Type 18; complying with MFMA-3 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES
A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
B. Materials: Comply with requirements in Division 5 Section "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION
A. Comply with NECA 1 for application of hangers and supports for electrical equipment and systems, except if requirements in this Section are stricter.
B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
2. Secure raceways and cables to these supports with two-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 for installation requirements, except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Install seismic-restraint components using methods approved by the evaluation service providing required submittals for component.

D. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

E. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

F. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.
3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 5 Section "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and seismic criteria at Project.

B. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so expansion anchors will be a minimum of 10 bolt diameters from edge of the base.

1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around full perimeter of the base.
2. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
3. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to supported equipment.
5. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
6. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 3 Section "Cast-in-Place Concrete."

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.


1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.
6. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

C. Record test results.

END OF SECTION
SECTION 16075

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Identification for raceway and metal-clad cable.
2. Identification for conductors and communication and control cable.
4. Warning labels and signs.
5. Instruction signs.
7. Miscellaneous identification products.

1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

C. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

1.4 QUALITY ASSURANCE


B. Comply with NFPA 70.

1.5 COORDINATION


B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 RACEWAY AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Color for Printed Legend:
   1. Power Circuits: Black letters on an orange field.
   2. Legend: Indicate system or service and voltage, if applicable.

C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

D. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

F. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

2.2 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Aluminum Wraparound Marker Labels: Cut from 0.014-inch- (0.35-mm-) thick aluminum sheet, with stamped, embossed, or scribed legend, and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.

D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking nylon tie fastener.

E. Write-On Tags: Polyester tag, 0.015 inch (0.38 mm) thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable.

   1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.3 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.

   1. Not less than 6 inches (150 mm) wide by 4 mils (0.102 mm) thick.
   2. Compounded for permanent direct-burial service.
   3. Embedded continuous metallic strip or core.
   4. Printed legend shall indicate type of underground line.

2.4 WARNING LABELS AND SIGNS


B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

C. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting. Nominal size, 7 by 10 inches (180 by 250 mm).

D. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting. Nominal size, 10 by 14 inches (250 by 360 mm).

E. Warning label and sign shall include, but are not limited to, the following legends:

   1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.5 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. in. (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
   1. Engraved legend with black letters on white face.
   2. Punched or drilled for mechanical fasteners.
   3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.6 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm).

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm). Overlay shall provide a weatherproof and ultraviolet-resistant seal for label.

C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

E. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch (25 mm).

2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
   1. Minimum Width: 3/16 inch (5 mm).
   2. Tensile Strength: 50 lb (22.6 kg), minimum.
   3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).

B. Paint: Paint materials and application requirements are specified in Division 9 painting Sections.

C. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.
PART 3 - EXECUTION

3.1 APPLICATION

A. Raceways and Duct Banks More Than 600 V Concealed within Buildings: 4-inch- (100-mm-) wide black stripes on 10-inch (250-mm) centers over orange background that extends full length of raceway or duct and is 12 inches (300 mm) wide. Stencil legend "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- (75-mm-) high black letters on 20-inch (500-mm) centers. Stop stripes at legends. Apply to the following finished surfaces:

1. Floor surface directly above conduits running beneath and within 12 inches (300 mm) of a floor that is in contact with earth or is framed above unexcavated space.
2. Wall surfaces directly external to raceways concealed within wall.
3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.

B. Accessible Raceways and Metal-Clad Cables More Than 600 V: Identify with "DANGER-HIGH VOLTAGE" in black letters at least 2 inches (50 mm) high, with snap-around labels. Repeat legend at 10-foot (3-m) maximum intervals.

C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A: Identify with orange snap-around label.

D. Accessible Raceways and Cables of Auxiliary Systems: Identify the following systems with color-coded, snap-around, color-coding bands:

1. Fire Alarm System: Red.
5. Mechanical and Electrical Supervisory System: Green and blue.
7. Control Wiring: Green and red.

E. Power-Circuit Conductor Identification: For primary and secondary conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

F. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.

G. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.


I. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable. Install underground-line warning tape for both direct-buried cables and cables in raceway.

J. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
   a. Controls with external control power connections.

2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.

K. Instruction Signs:

1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:
   a. Indoor Equipment: Adhesive film label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where 2 lines of text are required, use labels 2 inches (50 mm) high.
   b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
   c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

2. Equipment to Be Labeled:
   a. Panelboards, electrical cabinets, and enclosures.
   b. Access doors and panels for concealed electrical items.
c. Emergency system boxes and enclosures.
d. Disconnect switches.
e. Enclosed circuit breakers.
f. Motor starters.
g. Push-button stations.
h. Contactors.
i. Remote-controlled switches, dimmer modules, and control devices.
j. Voice and data cable terminal equipment.
k. Fire-alarm control panel and annunciators.

3.2 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

G. Color-Coding for Phase Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.

1. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.
   b. Phase B: Red. Orange.
   c. Phase C: Blue. Yellow.

3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.

J. Painted Identification: Prepare surface and apply paint according to Division 9 painting Sections.

END OF SECTION
SECTION 16120
CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes building wires and cables and associated connectors, splices, and
      terminations for wiring systems rated 600 V and less.
   B. Related Sections include the following:
      1. Division 16 Section "Medium-Voltage Cables" for single-conductor and multiconductor
         cables, cable splices, and terminations for electrical distribution systems with 2001 to
         35,000 V.

1.3 SUBMITTALS
   A. Product Data: For each type of product indicated.
   B. Qualification Data: For testing agency.
   C. Field Quality-Control Test Reports: From a qualified testing and inspecting agency engaged by
      Contractor.

1.4 QUALITY ASSURANCE
   A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a
      member company of the InterNational Electrical Testing Association and that is acceptable to
      authorities having jurisdiction.
      1. Testing Agency's Field Supervisor: Person currently certified by the InterNational
         Electrical Testing Association or the National Institute for Certification in Engineering
         Technologies to supervise on-site testing specified in Part 3.
   B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70,
      Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for
      intended use.
C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 CONDUCTORS AND CABLES

A. Available Manufacturers:

1. Alcan Aluminum Corporation; Alcan Cable Div.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.

B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.

C. Conductor Material: Copper complying with NEMA WC 7; solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.

D. Conductor Insulation Types: Type THW, THHN-THWN, XHHW, UF, USE, and, SO complying with NEMA WC 5 or 7.

E. Multiconductor Cable: Metal-clad cable, Type MC and Type USE with ground wire.

2.3 CONNECTORS AND SPLICES

A. Available Manufacturers:

1. AFC Cable Systems, Inc.
2. AMP Incorporated/Tyco International.
3. Hubbell/Anderson.
4. O-Z/Gedney; EGS Electrical Group LLC.
5. 3M Company; Electrical Products Division.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
PART 3 - EXECUTION

3.1 CONDUCTOR AND INSULATION APPLICATIONS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspace: Type THHN-THWN, single conductors in raceway.

E. Exposed Branch Circuits, including in Crawlspace: Type THHN-THWN, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway or Metal-clad cable, Type MC.

G. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.

H. Underground Feeders and Branch Circuits: Type UF multiconductor cable.

I. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.

J. Fire Alarm Circuits: Type THHN-THWN, in raceway or Power-limited, fire-protective, signaling circuit cable.

K. Class 1 Control Circuits: Type THHN-THWN, in raceway.

L. Class 2 Control Circuits: Type THHN-THWN, in raceway or Power-limited cable, concealed in building finishes.

3.2 INSTALLATION

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
E. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."

F. Seal around cables penetrating fire-rated elements according to Division 7 Section "Through-Penetration Firestop Systems."

G. Identify and color-code conductors and cables according to Division 16 Section "Electrical Identification."

3.3 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.4 FIELD QUALITY CONTROL

A. Testing: Engage a qualified testing agency to perform the following field quality-control testing:

B. Testing: Perform the following field quality-control testing:

   1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
   2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

C. Test Reports: Prepare a written report to record the following:

   1. Test procedures used.
   2. Test results that comply with requirements.
   3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION
SECTION 16130

RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
   B. Related Sections include the following:
      1. Division 2 Section "Underground Ducts and Utility Structures" for exterior ductbanks, manholes, and underground utility construction.
      2. Division 7 Section "Through-Penetration Firestop Systems" for firestopping materials and installation at penetrations through walls, ceilings, and other fire-rated elements.
      3. Division 16 Section "Electrical Supports " for raceways, boxes, enclosures, and cabinets.
      4. Division 16 Section "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

1.3 DEFINITIONS
   A. EMT: Electrical metallic tubing.
   B. ENT: Electrical nonmetallic tubing.
   C. FMC: Flexible metal conduit.
   D. IMC: Intermediate metal conduit.
   E. LFMC: Liquidtight flexible metal conduit.
   F. LFNC: Liquidtight flexible nonmetallic conduit.
   G. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS
   A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
B. Shop Drawings: Show fabrication and installation details of components for raceways, fittings, boxes, enclosures, and cabinets.

C. Shop Drawings:

1. Detail assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

D. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:

1. Ceiling suspension assembly members.
2. Method of attaching hangers to building structure.
3. Size and location of initial access modules for acoustical tile.
4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 METAL CONDUIT AND TUBING

A. Available Manufacturers:
1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. Electri-Flex Co.
5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Cole-Flex.
8. O-Z Gedney; Unit of General Signal.
9. Wheatland Tube Co.

B. Rigid Steel Conduit: ANSI C80.1.

C. IMC: ANSI C80.6.

D. EMT and Fittings: ANSI C80.3.
   1. Fittings: Set-screw or compression type.

E. FMC: Aluminum.

F. LFMC: Flexible steel conduit with PVC jacket.

G. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.3 NONMETALLIC CONDUIT AND TUBING

A. Available Manufacturers:
   2. Anamet Electrical, Inc.; Anaconda Metal Hose.
   3. Arnco Corp.
   4. Cantex Inc.
   7. ElecSYS, Inc.
   8. Electri-Flex Co.
   9. Lamson & Sessions; Carlon Electrical Products.
   10. Manhattan/CDT/Cole-Flex.
   11. RACO; Division of Hubbell, Inc.
   12. Spiralduct, Inc./AFC Cable Systems, Inc.

B. ENT: NEMA TC 13.

C. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

D. ENT and RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.

E. LFNC: UL 1660.
2.4 METAL WIREWAYS

A. Available Manufacturers:
   1. Hoffman.
   2. Square D.

B. Material and Construction: Sheet metal sized and shaped as indicated, NEMA 1 or 3R.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

E. Wireway Covers: Hinged type, Screw-cover type, Flanged-and-gasketed type, As indicated.

F. Finish: Manufacturer's standard enamel finish.

2.5 NONMETALLIC WIREWAYS

A. Available Manufacturers:
   1. Hoffman.
   2. Lamson & Sessions; Carlon Electrical Products.

B. Description: Fiberglass polyester, extruded and fabricated to size and shape indicated, with no holes or knockouts. Cover is gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections are flanged, with stainless-steel screws and oil-resistant gaskets.

C. Description: PVC plastic, extruded and fabricated to size and shape indicated, with snap-on cover and mechanically coupled connections with plastic fasteners.

D. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

E. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

2.6 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.

   1. Available Manufacturers:
a. Airey-Thompson Sentinel Lighting; Wiremold Company (The).
b. Thomas & Betts Corporation.
d. Wiremold Company (The); Electrical Sales Division.

2.7 BOXES, ENCLOSURES, AND CABINETS

A. Available Manufacturers:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
6. O-Z/Gedney; Unit of General Signal.
7. RACO; Division of Hubbell, Inc.
10. Spring City Electrical Manufacturing Co.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.

E. Floor Boxes: Cast metal, fully adjustable, rectangular.

F. Floor Boxes: Nonmetallic, nonadjustable, round.

G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

H. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

I. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

J. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.
2.8 FACTORY FINISHES

A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard primecoat finish ready for field painting.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors:

1. Exposed: Rigid steel or IMC.
2. Concealed: Rigid steel or IMC.
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Boxes and Enclosures: NEMA 250, Type 3R.

B. Indoors:

1. Exposed: EMT.
2. Concealed: EMT.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
4. Damp or Wet Locations: Rigid steel conduit.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
   a. Damp or Wet Locations: NEMA 250, Type 4, nonmetallic.

C. Minimum Raceway Size: 3/4-inch trade size (DN 21).

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.

E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

F. Do not install aluminum conduits embedded in or in contact with concrete.
3.2 INSTALLATION

A. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

B. Complete raceway installation before starting conductor installation.

C. Support raceways as specified in Division 16 Section "Electrical Supports."

D. Install temporary closures to prevent foreign matter from entering raceways.

E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.

F. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.

G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
   1. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

H. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches (50 mm) of concrete cover.
   1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
   2. Space raceways laterally to prevent voids in concrete.
   3. Run conduit larger than 1-inch trade size (DN 27) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
   4. Change from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above the floor.

I. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
   1. Run parallel or banked raceways together on common supports.
   2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

J. Join raceways with fittings designed and approved for that purpose and make joints tight.
   1. Use insulating bushings to protect conductors.

K. Tighten set screws of threadless fittings with suitable tools.

L. Terminations:
1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.

2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

N. Telephone and Signal System Raceways, 2-Inch Trade Size (DN 53) and Smaller: In addition to above requirements, install raceways in maximum lengths of 150 feet (45 m) and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

O. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

P. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

Q. Flexible Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.

R. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.

S. Set floor boxes level and flush with finished floor surface.

T. Set floor boxes level. Trim after installation to fit flush with finished floor surface.

U. Install hinged-cover enclosures and cabinets plumb. Support at each corner.
3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.4 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

END OF SECTION
SECTION 16140

WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Single and duplex receptacles, ground-fault circuit interrupters, integral surge suppression units, and isolated-ground receptacles.
   3. Device wall plates.
   4. Pin and sleeve connectors and receptacles.
   5. Floor service outlets, poke-through assemblies, service poles, and multioutlet assemblies.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. PVC: Polyvinyl chloride.

D. RFI: Radio-frequency interference.

E. TVSS: Transient voltage surge suppressor.

F. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

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

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

C. Field quality-control test reports.
1.5 QUALITY ASSURANCE
   A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer.
   B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
   C. Comply with NFPA 70.

1.6 COORDINATION
   A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
      1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      1. Wiring Devices:
         b. Eagle Electric Manufacturing Co., Inc.
         c. Hubbell Incorporated; Wiring Device-Kellems.
         d. Leviton Mfg. Company Inc.
         e. Pass & Seymour/Legrand; Wiring Devices Div.
      2. Multioutlet Assemblies:
         a. Hubbell Incorporated; Wiring Device-Kellems.
         b. Wiremold Company (The).
         c. Thomas & Betts Corporation.
         d. Wiremold Company (The).

2.2 RECEPTACLES
   A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498.
   B. Straight-Blade and Locking Receptacles: Heavy Duty grade.
C. GFCI Receptacles: Straight blade, feed-through type, Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter.

2.3 CORD AND PLUG SETS

A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.

1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.

2.4 SWITCHES


B. Snap Switches: Heavy-Duty grade, quiet type.

C. Combination Switch and Receptacle: Both devices in a single gang unit with plaster ears and removable tab connector that permit separate or common feed connection.

2. Receptacle: NEMA WD 6, Configuration 5-15R.

2.5 WALL PLATES

A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: satin-finished stainless steel, 0.04-inch- (1-mm-) thick.
4. Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

2.6 MULTIOUTLET ASSEMBLIES

A. Components of Assemblies: Products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.

B. Raceway Material: Metal, with manufacturer's standard finish.

C. Wire: No. 12 AWG.
2.7 FINISHES

A. Color:

1. Wiring Devices Connected to Normal Power System: White or as selected by Architect, unless otherwise indicated or required by NFPA 70.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install devices and assemblies level, plumb, and square with building lines.

B. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

C. Remove wall plates and protect devices and assemblies during painting.

D. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

A. Comply with Division 16 Section "Electrical Identification."

1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 CONNECTIONS

A. Ground equipment according to Division 16 Section "Grounding and Bonding."

B. Connect wiring according to Division 16 Section "Conductors and Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

B. Remove malfunctioning units, replace with new units, and retest as specified above.

END OF SECTION
SECTION 16410

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following individually mounted, enclosed switches and circuit breakers:

1. Fusible switches.
2. Nonfusible switches.
5. Enclosures.

1.3 DEFINITIONS

A. GD: General duty.
B. GFCI: Ground-fault circuit interrupter.
C. HD: Heavy duty.
D. RMS: Root mean square.
E. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
4. UL listing for series rating of installed devices.
5. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Qualification Data: For testing agency.

D. Field quality-control test reports including the following:
   1. Test procedures used.
   2. Test results that comply with requirements.
   3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

E. Manufacturer's field service report.

F. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:
   1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
   2. Time-current curves, including selectable ranges for each type of circuit breaker.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
   1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

D. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
1.6 PROJECT CONDITIONS
   A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:
      1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).

1.7 COORDINATION
   A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.8 EXTRA MATERIALS
   A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      1. Spares: For the following:
         b. Control-Power Fuses: Six.
         c. Fuses and Fusible Devices for Fused Circuit Breakers: Six.
         d. Fuses for Fusible Switches: Six.
         e. Fuses for Fused Power Circuit Devices: Six.
      2. Spare Indicating Lights: Six of each type installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
      1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 FUSIBLE AND NONFUSIBLE SWITCHES
   A. Available Manufacturers:
      1. Eaton Corporation; Cutler-Hammer Products.
2. General Electric Co.; Electrical Distribution & Control Division.
4. Square D/Group Schneider.

B. Fusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Nonfusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

D. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors.
   3. Auxiliary Contact Kit: Auxiliary set of contacts arranged to open before switch blades open.

2.3 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

A. Available Manufacturers:
   1. Eaton Corporation; Cutler-Hammer Products.
   2. General Electric Co.; Electrical Distribution & Control Division.
   5. Square D/Group Schneider.

B. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
   3. Electronic Trip-Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:
      a. Instantaneous trip.
      b. Long- and short-time pickup levels.
      c. Long- and short-time time adjustments.
      d. Ground-fault pickup level, time delay, and $I^t$ response.
   4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller and let-through ratings less than NEMA FU 1, RK-5.
5. **Integrally Fused Circuit Breakers:** Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.

6. **GFCI Circuit Breakers:** Single- and two-pole configurations with 5-mA trip sensitivity.

C. **Molded-Case Circuit-Breaker Features and Accessories:**

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical style suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
5. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
6. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
7. Auxiliary Switch: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
8. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.

D. **Molded-Case Switches:** Molded-case circuit breaker with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.

E. **Molded-Case Switch Accessories:**

1. Lugs: Mechanical style suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage. Provide "dummy" trip unit where required for proper operation.
4. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay. Provide "dummy" trip unit where required for proper operation.
5. Auxiliary Switch: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
6. Key Interlock Kit: Externally mounted to prohibit operation; key shall be removable only when switch is in off position.

2.4 **ENCLOSURES**

A. **NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.**

1. **Outdoor Locations:** NEMA 250, Type 3R.
3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
4. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.
   B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CONCRETE BASES
   A. Coordinate size and location of concrete bases. Verify structural requirements with structural engineer.
   B. Concrete base is specified in Division 16 Section "Electrical Supports and Seismic Restraints," and concrete materials and installation requirements are specified in Division 3.

3.3 INSTALLATION
   A. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.
   B. Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated. Anchor floor-mounting switches to concrete base.
   C. Comply with mounting and anchoring requirements specified in Division 16 Section "Electrical Supports and Seismic Restraints."
   D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

3.4 IDENTIFICATION
   A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."
   B. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate as specified in Division 16 Section "Electrical Identification."
3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Prepare for acceptance testing as follows:
   1. Inspect mechanical and electrical connections.
   2. Verify switch and relay type and labeling verification.
   3. Verify rating of installed fuses.
   4. Inspect proper installation of type, size, quantity, and arrangement of mounting or anchorage devices complying with manufacturer's certification.

C. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

D. Perform the following field tests and inspections and prepare test reports:
   1. Test mounting and anchorage devices according to requirements in Division 16 Section "Electrical Supports and Seismic Restraints."
   2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
   3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
   4. Infrared Scanning:
      a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Open or remove doors or panels so connections are accessible to portable scanner.
      b. Follow-Up Infrared Scanning: Perform an additional follow-up infrared scan of each unit 11 months after date of Substantial Completion.
      c. Instruments, Equipment and Reports:
         1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
         2) Prepare a certified report that identifies enclosed switches and circuit breakers included and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.
3.7 CLEANING

A. On completion of installation, vacuum dirt and debris from interiors; do not use compressed air to assist in cleaning.

B. Inspect exposed surfaces and repair damaged finishes.

END OF SECTION
SECTION 16442

PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Distribution panelboards.
   2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.
B. GFCI: Ground-fault circuit interrupter.
C. RFI: Radio-frequency interference.
D. RMS: Root mean square.
E. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.
   1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
      a. Enclosure types and details for types other than NEMA 250, Type 1.
      b. Bus configuration, current, and voltage ratings.
      c. Short-circuit current rating of panelboards and overcurrent protective devices.
d. UL listing for series rating of installed devices.

e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Power, signal, and control wiring.

C. Qualification Data: For testing agency.

D. Field quality-control test reports including the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

E. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

F. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.

C. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories through one source from a single manufacturer.

D. Product Options: Drawings indicate size, profiles, and dimensional requirements of panelboards and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

F. Comply with NEMA PB 1.

G. Comply with NFPA 70.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:
   1. Ambient Temperature: Not exceeding 104 deg F (40 deg C).

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:
   1. Ambient temperatures within limits specified.
   2. Altitude not exceeding 6600 feet (2000 m).

1.7 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Keys: Six spares for each type of panelboard cabinet lock.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
2.2 MANUFACTURED UNITS

A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Division 16 Section "Electrical Supports and Seismic Restraints."

B. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1.

1. Rated for environmental conditions at installed location.
   a. Outdoor Locations: NEMA 250, Type 3R.
   c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
4. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
5. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
6. Column-Type Panelboards: Narrow gutter extension, with cover, to overhead junction box equipped with ground and neutral terminal buses.
7. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

C. Phase and Ground Buses:

2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.
3. Isolated Equipment Ground Bus: Adequate for branch-circuit equipment ground conductors; insulated from box.
4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads.
5. Split Bus: Vertical buses divided into individual vertical sections.

D. Conductor Connectors: Suitable for use with conductor material.

1. Main and Neutral Lugs: Mechanical type.
2. Ground Lugs and Bus Configured Terminators: Mechanical type.
3. Feed-Through Lugs: Compression type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
4. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

E. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

F. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

2.3 PANELBOARD SHORT-CIRCUIT RATING

A. UL label indicating series-connected rating with integral or remote upstream overcurrent protective devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.

2.4 DISTRIBUTION PANELBOARDS

A. Doors: Secured with vault-type latch with tumbler lock; keyed alike. Omit for fused-switch panelboards.

B. Main Overcurrent Protective Devices: Circuit breaker.

C. Branch Overcurrent Protective Devices:
   1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
   2. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

2.5 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.6 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: UL 489, with series-connected rating to meet available fault currents.
3. Electronic trip-unit circuit breakers shall have RMS sensing; field-replaceable rating plug; and with the following field-adjustable settings:
   a. Instantaneous trip.
   b. Long- and short-time pickup levels.
   c. Long- and short-time time adjustments.
   d. Ground-fault pickup level, time delay, and $I^2t$ response.
4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
5. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker; trip activation on fuse opening or on opening of fuse compartment door.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
1. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
4. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
5. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
6. Auxiliary Contacts: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
7. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
8. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
9. Multipole units enclosed in a single housing or factory-assembled to operate as a single unit.

C. Fused Switch: NEMA KS 1, Type HD; clips to accommodate specified fuses; lockable handle.

D. Fuses are specified in Division 16 Section "Fuses."

2.7 ACCESSORY COMPONENTS AND FEATURES

A. Furnish accessory set including tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

B. Furnish portable test set to test functions of solid-state trip devices without removal from panelboard.
C. Fungus Proofing: Permanent fungicidal treatment for panelboard interior, including overcurrent protective devices and other components.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Comply with mounting and anchoring requirements specified in Division 16 Section "Electrical Supports."

C. Mount top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.

D. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

E. Install overcurrent protective devices and controllers.

   1. Set field-adjustable switches and circuit-breaker trip ranges.

F. Install filler plates in unused spaces.

G. Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.

H. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

3.3 CONNECTIONS

A. Ground equipment according to Division 16 Section "Grounding and Bonding."

B. Connect wiring according to Division 16 Section "Conductors and Cables."
3.4 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

C. Perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

1. Measure as directed during period of normal system loading.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

E. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scanning of each panelboard. Remove panel fronts so joints and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies panelboards checked and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.
END OF SECTION
SECTION 16491

FUZZES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Cartridge fuses rated 600 V and less for use in switches, and controllers.
2. Spare-fuse cabinets.

1.3 SUBMITTALS

A. Product Data: Include the following for each fuse type indicated:

1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
2. Let-through current curves for fuses with current-limiting characteristics.
3. Time-current curves, coordination charts and tables, and related data.
4. Fuse size for elevator feeders and elevator disconnect switches.

B. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.

1. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
2. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.

C. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:

a. Let-through current curves for fuses with current-limiting characteristics.
b. Time-current curves, coordination charts and tables, and related data.
c. Ambient temperature adjustment information.
1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain fuses from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NEMA FU 1.

D. Comply with NFPA 70.

1.5 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (5 deg C) or more than 100 deg F (38 deg C), apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.6 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: Quantity equal to 25 percent of each fuse type and size, but no fewer than six of each type and size.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper Bussman, Inc.
3. Ferraz Shawmut, Inc.
2.2 CARTRIDGE FUSES
A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.

2.3 SPARE-FUSE CABINET
A. Cabinet: Wall-mounted, 0.05-inch- (1.27-mm-) thick steel unit with full-length, recessed piano-hinged door and key-coded cam lock and pull.
   1. Size: Adequate for storage of spare fuses specified with 15 percent spare capacity minimum.
   2. Finish: Gray, baked enamel.
   3. Identification: "SPARE FUSES" in 1-1/2-inch- (38-mm-) high letters on exterior of door.
   4. Fuse Pullers: For each size of fuse.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
B. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS
A. Motor Branch Circuits: Class RK5, time delay.
B. Other Branch Circuits: Class RK5, time delay.

3.3 INSTALLATION
A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.
B. Install spare-fuse cabinet(s).
3.4 IDENTIFICATION

A. Install labels indicating fuse replacement information on inside door of each fused switch.

END OF SECTION
SECTION 16511 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Interior lighting fixtures, lamps, and ballasts.

1.2 SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In Interior Lighting Fixture Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2. Basis-of-Design Product: The design for each lighting fixture is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

A. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.

B. Metal Parts: Free of burrs and sharp corners and edges.
C. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

E. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.
4. Laminated Silver Metallized Film: 90 percent.

F. Plastic Diffusers, Covers, and Globes:

1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
   a. Lens Thickness: At least 0.125 inch minimum unless different thickness is indicated.
   b. UV stabilized.
2. Glass: Annealed crystal glass, unless otherwise indicated.

2.3 BALLASTS

A. Electronic Ballasts for Linear Fluorescent Lamps: Comply with ANSI C82.11; programmed-start type, unless otherwise indicated, and designed for type and quantity of lamps served. Ballasts shall be designed for full light output unless dimmer or bi-level control is indicated.

1. Sound Rating: A.
2. Total Harmonic Distortion Rating: Less than 20 percent.
3. Transient Voltage Protection: IEEE C62.41, Category A or better.
4. Operating Frequency: 20 kHz or higher.
5. Lamp Current Crest Factor: 1.7 or less.
6. BF: 0.85 or higher.
7. Power Factor: 0.95 or higher.

B. Ballasts for Temperatures Minus 20 Deg F and Higher for Linear Fluorescent Lamps: Electromagnetic type designed for use with indicated lamp types.

2.4 LAMPS

A. Low-Mercury Fluorescent Lamps: Comply with EPA's toxicity characteristic leaching procedure test; shall yield less than 0.2 mg of mercury per liter when tested according to NEMA LL 1.
B. T8 Rapid-Start low-mercury Fluorescent Lamps: Rated 32 W maximum, nominal length 48 inches, 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life 20,000 hours, unless otherwise indicated.

2.5 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Division 16 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.

B. Comply with NFPA 70 for minimum fixture supports.

C. Connect wiring according to Division 16 Section "Conductors and Cables."

END OF SECTION 16511

* * * END OF SPECIFICATIONS * * *
APPENDIX A

GUDE OFFICE PARK SITE LOCATION

Montgomery College Central Facilities Office
Suite 200
40 West Gude Drive
Rockville, Maryland 20850-1166

DETAIL SITE MAP AND PARKING LOCATION

DRIVING DIRECTIONS
PLEASE CAR POOL WHENEVER POSSIBLE.
FROM WASHINGTON, DC:
EXIT BELTWAY TO 270 NORTH
FOLLOW RT. 270 TO SHADY GROVE ROAD. EXIT #8
TAKE IMMEDIATE RIGHT ON EXIT RAMP, REDLAND BLVD.
FOLLOW REDLAND BLVD. TO RT. 355 INTERSECTION, MAKE RIGHT TURN.
FOLLOW RT. 355 SOUTH (FREDERICK ROAD - HUNGERFORD DRIVE)
PASS GUDE INTERSECTION AND TAKE RIGHT INTO PARKING LOT.