NOTICE TO BIDDERS

SMALL BUSINESS RESERVE PROCUREMENT

This is a Small Business Reserve Procurement for which award will be limited to Certified Small Business vendors. Only businesses that meet the statutory requirements set forth in State Finance and Procurement Article, §§ 14-501 - 14-505, Annotated Code of Maryland, and who are registered with the Department of General Services Small Business Reserve Program are eligible for award of a contract.

For the purposes of a Small Business Reserve Procurement, a small business is a business, other than a broker, that meets the following criteria:

- The business is independently owned and operated;
- The business is not a subsidiary of another business;
- The business is not dominant in its field of operation;
- The wholesale operations of the business did not employ more than 50 persons, and the gross sales of the business did not exceed an average of $4,000,000 in its most recently completed 3 fiscal years;*
- The retail operations of the business did not employ more than 25 persons, and the gross sales of the business did not exceed an average of $3,000,000 in its most recently completed 3 fiscal years;*
- The manufacturing operations of the business did not employ more than 100 persons, and the gross sales of the business did not exceed an average of $2,000,000 in its most recently completed 3 fiscal years;*
- The service operations of the business did not employ more than 100 persons, and the gross sales of the business did not exceed an average of $10,000,000 in its most recently completed 3 fiscal years;* and
- The construction operations of the business did not employ more than 50 persons, and the gross sales of the business did not exceed an average of $7,000,000 in its most recently completed 3 fiscal years.*
- The architectural and engineering services of the business did not employ more than 100 persons and the gross sales of the business did not exceed an average of $4,500,000 in its most recently completed 3 fiscal years.

* If a business has not existed for three years, the gross sales average shall be the average for each year or part of a year during which the business has been in existence.

Further information on the certification/registration process is available at e-Maryland Marketplace.
INVITATION FOR BIDS

PRETTYMAN & SCARBOROUGH AC & ELECTRICAL UPGRADES

TU-1940-SBR

PROSPECTIVE BIDDERS/OFFERORS WHO OBTAINED THIS DOCUMENT FROM THE UNIVERSITY'S WEBSITE, E-MARYLAND MARKETPLACE, OR ANY SOURCE OTHER THAN THE PROCUREMENT OFFICER, SHOULD PROVIDE THEIR NAMES AND EMAIL ADDRESSES TO THE ISSUING OFFICE BY CONTACTING (410) 704-2171, TO ENSURE RECEIPT OF ADDENDA AND OTHER COMMUNICATIONS REGARDING THE SOLICITATION.

ISSUING OFFICE
PROCUREMENT DEPARTMENT
8000 YORK ROAD
TOWSON, MD 21252-0001

NOTE:
IF YOU PLAN TO HAND DELIVER YOUR BID/PROPOSAL OR USE AN OVERNIGHT COURIER, DELIVER THE BID TO THE PROCUREMENT OFFICE LOCATION TO ENSURE TIMELY DELIVERY.

PROCUREMENT OFFICE LOCATION
ADMINISTRATION BUILDING
7720 YORK ROAD, 4TH FLOOR
TOWSON, MD 21204

FREE 20-MIN. PARKING METERS ARE AVAILABLE NEAR THE 1ST-FLOOR BUILDING ENTRANCE

DIRECTIONS TO THE UNIVERSITY AND A CAMPUS MAP
http://www.towson.edu/maps/index.html

PARKING INFORMATION
http://www.towson.edu/parking/visitors/index.html

MINORITY BUSINESSES ARE ENCOURAGED TO RESPOND TO THIS SOLICITATION
KEY INFORMATION SUMMARY SHEET

Invitation for Bids (IFB)

TU-1940-SBR – Prettyman & Scarborough AC & Electrical Upgrades

<table>
<thead>
<tr>
<th>IFB Issue Date:</th>
<th>1/28/19</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFB Issuing Office:</td>
<td>Towson University Procurement Department</td>
</tr>
<tr>
<td>Procurement Officer</td>
<td>Michelle Compton</td>
</tr>
<tr>
<td>Representative:</td>
<td>Phone: 410-704-2050</td>
</tr>
<tr>
<td></td>
<td>Fax: 410-704-8233</td>
</tr>
<tr>
<td></td>
<td>e-mail: <a href="mailto:MLCompton@towson.edu">MLCompton@towson.edu</a></td>
</tr>
<tr>
<td>Procurement Office Location:</td>
<td>Towson University</td>
</tr>
<tr>
<td>(preferred—hand deliver/courier)</td>
<td>Procurement Department</td>
</tr>
<tr>
<td></td>
<td>Administration Building, 4th Floor</td>
</tr>
<tr>
<td></td>
<td>7720 York Road</td>
</tr>
<tr>
<td></td>
<td>Towson, MD 21204</td>
</tr>
<tr>
<td>Pre-Bid/Proposal Conference:</td>
<td>1/31/19 – 1:00 PM – 1st site visit immediately following</td>
</tr>
<tr>
<td></td>
<td>Pre-Bid/Proposal Conference</td>
</tr>
<tr>
<td></td>
<td>Administration Building, Room 408</td>
</tr>
<tr>
<td></td>
<td>2nd Site Visit: 2/4/19 @ 10:00 AM</td>
</tr>
<tr>
<td></td>
<td>Meet at 1st Floor Lobby of the Administration Building</td>
</tr>
<tr>
<td>Note: One site visit is mandatory</td>
<td></td>
</tr>
<tr>
<td>Deadline for Questions:</td>
<td>2/12/19 – 4:30 PM</td>
</tr>
<tr>
<td>Bids Due:</td>
<td>2/20/19 – 2:00 PM</td>
</tr>
<tr>
<td>(public bid opening)</td>
<td>Administration Building, Room 408</td>
</tr>
<tr>
<td>Contract Term:</td>
<td>5/28/19 – 8/2/19</td>
</tr>
</tbody>
</table>

The University is committed to ensuring that persons with disabilities have equally effective opportunities to participate in and benefit from the University's programs and services. Persons who may require reasonable ADA accommodations should contact the Issuing Office at 410-704-2171 at least five (5) days prior to any meeting scheduled in connection with this solicitation.
UNIVERSITY SYSTEM OF MARYLAND
TOWSON UNIVERSITY
NOTICE TO BIDDERS/OFFERORS

To help improve the quality of bid and proposal solicitations and to make our procurement process more responsive and "business friendly," we ask that you provide comments and suggestions regarding the enclosed solicitation. Please return your comments with your bid, proposal or "no bid," response, as the case may be. Thank you for your assistance.

Bid/Proposal Number: ___________ Entitled: __________________________________________________________________________

I. If you have responded with a "no bid" please indicate the reasons below:
   (  ) Other commitments preclude our participation at this time.
   (  ) The subject of the solicitation is not something we normally provide.
   (  ) We are inexperienced in the work/commodities required.
   (  ) The specifications are either unclear or too restrictive (Explain below).
   (  ) The scope of work is beyond our current capacity.
   (  ) Doing business with Maryland Government agencies is simply too complicated (Explain below).
   (  ) We cannot be competitive (Explain below).
   (  ) Time allotted for completion of the bid/proposal response is insufficient.
   (  ) Startup time is insufficient.
   (  ) Bonding/Insurance requirements are prohibitive (Explain below).
   (  ) MBE requirements (Explain below).
   (  ) Bid/Proposal requirements (other than specifications or scope) are unreasonable or too risky (Explain below).
   (  ) Prior experience with Towson University contracts was unprofitable or otherwise unsatisfactory (Explain below).
   (  ) Payment schedule too slow.
   (  ) Other: __________________________________________________________________________________________

II. If you have submitted a bid or proposal, but wish to offer suggestions or express concerns, please use the remarks section below.

Remarks: ______________________________________________________________________________________________

____________________________________________________________________________________________

Offeror Name: ______________________________________________________________________________

Contact Person: ______________________________________________________________________________

Signature: ___________________________ Date: __________________________

Address: __________________________________________________________________________________________

E-Mail: __________________________________________________________________________________________

Telephone: ___________________________ Fax: __________________________
# TABLE OF CONTENTS

**SECTION I. PROCUREMENT OBJECTIVE** ................................................................. 1
A. SUMMARY STATEMENT ...................................................................................... 1
B. ISSUING OFFICE AND PROCUREMENT OFFICER .......................................... 1
C. PRE-BID CONFERENCE AND SITE VISIT ....................................................... 1
D. QUESTIONS AND INQUIRIES ........................................................................ 1
E. SITE INVESTIGATION ....................................................................................... 1
F. INSURANCE ....................................................................................................... 2
G. BID SECURITY .................................................................................................... 2
H. LICENSES AND QUALIFICATIONS ................................................................ 2
I. BID DUE DATE ................................................................................................... 2
J. OPENING OF BIDS .......................................................................................... 3
K. DURATION OF BID OFFER .............................................................................. 3
L. PROCUREMENT METHOD .................................................................................. 3
M. AWARD ............................................................................................................ 3
N. MULTIPLE BID OR ALTERNATE BIDS ............................................................ 3
O. MINORITY BUSINESS ENTERPRISE UTILIZATION ........................................ 3
P. LIQUIDATED DAMAGES PROVISION RELATED TO MBE GOAL .................... 3

**SECTION II. GENERAL INFORMATION FOR VENDORS** ................................ 5
A. PURPOSE ......................................................................................................... 5
B. REVISIONS TO IFB .......................................................................................... 5
C. PRE-BID MODIFICATION OR WITHDRAWAL OF OFFERS ............................ 5
D. CANCELLATION OF SOLICITATION/REJECTION OF ALL BIDS .............. 5
E. INCURRED EXPENSES .................................................................................. 5
F. ARREARAGES .................................................................................................. 5
G. VERIFICATION OF REGISTRATION AND TAX PAYMENT ............................ 5
H. ECONOMY OF PREPARATION ....................................................................... 5
I. PUBLIC INFORMATION ACT NOTICE ............................................................ 5
J. EXECUTION OF BIDS ..................................................................................... 6
K. DISCREPANCIES, EXPLANATIONS AND CLARIFICATIONS ....................... 6
L. ORDER OF PRECEDENCE ............................................................................. 6
M. REQUIRED CONTRACT PROVISIONS ........................................................... 7
N. FALSE STATEMENTS ...................................................................................... 7
O. PAYMENT TO THE CONTRACTOR ................................................................. 7
P. VENDOR ELECTRONIC FUNDS TRANSFER REGISTRATION ....................... 7
Q. RECIPROCAL PREFERENCE ................................................................................................. 7
R. NON-VISUAL ACCESS ......................................................................................................... 8
S. PARKING .............................................................................................................................. 8
T. SMOKING ............................................................................................................................ 8

SECTION III. BID SUBMISSION REQUIREMENTS ................................................................. 9
A. ORGANIZATION OF BIDS ................................................................................................. 9
B. SUBMITTAL REQUIREMENTS CHECKLIST ...................................................................... 9
C. EVIDENCE OF BIDDER RESPONSIBILITY ...................................................................... 9

SCOPE OF WORK
SPECIFICATIONS
DRAWINGS
BID PRICE PROPOSAL FORM

Exhibit A-1 – Environmental Health and Safety Requirements
Exhibit A-2 – Required Contract Provisions for Construction and Maintenance
Exhibit B – Bid/Proposal Affidavit
Exhibit C – Contract Affidavit
Exhibit D – Sample Agreement
Exhibit E – Minority Business Enterprise Participation Package
Exhibit F – Company Profile
Exhibit G – Firm Experience
Exhibit H – Bid Bond
Exhibit I – Performance Bond
Exhibit J – Payment Bond
Exhibit K – Addenda Acknowledgment
Exhibit L – Key Personnel Form

TERMS AND CONDITIONS
ATTACHMENT A
SECTION I. PROCUREMENT OBJECTIVE

A. SUMMARY STATEMENT
Towson University is seeking a qualified contractor to provide all labor, equipment and materials to perform air conditioning system and electrical upgrades at the Prettyman & Scarborough Residence Halls.

B. ISSUING OFFICE AND PROCUREMENT OFFICER
The sole point of contact in the State for purposes of this IFB is the Procurement Officer or his/her representative (hereinafter referred to as Procurement Officer) noted on the Key Information Summary Sheet. Only the information communicated by the Procurement Officer shall be deemed the official position of the University; no other State or University employee, official, or representative has authority to change the requirements of this solicitation. Attempts by Bidder to contact the requester, evaluator, or otherwise circumvent this procedure in any manner may be grounds for disqualification.

C. PRE-BID CONFERENCE AND SITE VISIT
1. Prior to submitting its bid, each contractor is encouraged to attend the scheduled pre-bid conference to examine the facility and familiarize himself with the full nature and extent of the work to be done. They shall obtain for themselves all information that may be necessary for the satisfactory performance of the contract work and the cost thereof. It is the sole responsibility of the contractor to fully familiarize themselves with the areas involved and the extent of the services required by visual inspection. Failure to visit the site and become familiar with the conditions and requirements affecting the work will not relieve the successful contractor from the provisions of the contract and from completing the work for the consideration set forth.

2. Two (2) site visits are scheduled and listed on the Key Information Summary Sheet. Please note: in order to be considered for award one (1) site visit is mandatory.

3. Towson University is committed to ensuring that persons with disabilities are given an equally effective opportunity to participate in and benefit from the university's programs and services. Persons with disabilities who might need reasonable accommodations should contact the Procurement Department at least 72 hours before any meetings held in connection with this solicitation at (410) 704-2171.

D. QUESTIONS AND INQUIRIES
Bidders shall direct all communications regarding this solicitation to the Procurement Officer, in writing (email preferred), not later than the date indicated on the Key Information Summary Sheet. Addenda, if required, will be furnished to all potential Bidders known to have received the IFB.

E. SITE INVESTIGATION
By submitting a bid the vendor acknowledges that he has investigated and satisfied himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, and electric power. Any failure by the contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the cost
of successfully performing the work. The University shall not be responsible for any conclusions or interpretations made by the contractor of the information made available by the University.

F. INSURANCE
Upon award, the successful bidder shall furnish certificates of insurance as required in Exhibit A, Required Contract Provisions, Section 51, naming Towson University as an additional insured. The certificate shall reflect the number and title of the solicitation/contract.

G. BID SECURITY
1. If the total Bid Price is $100,000.00 or more, each Bidder shall furnish with his bid price a "bid bond" (See Exhibit H) issued by a surety company licensed to issue bonds in the State of Maryland. The bond must be in an amount not less than five percent (5%) of the total amount of the base bid price and shall be in the form specified with the bid documents.

2. Certified checks, cash and other security in that amount are acceptable in lieu of a "bid bond", and shall be submitted with the Bid Price and subject to the same conditions as a bond.

3. Should the Bidder to whom the contract is awarded fail or be unable to execute the contract, for any reason, within ten (10) days after notification of award, then an amount equal to the difference between the accepted price, and that of the bidder to whom the award subsequently is made shall be paid to the University as liquidated damages.

4. The Bidder to whom a contract in excess of $100,000.00 is awarded also must furnish Performance and Payment Bonds (See Exhibits I and J), each in the amount of one hundred percent (100%) of the contract price, including executed Change Orders, in the form specified with the bid documents. These must be provided at the time of the signing of the contract and prior to the start of any work.

5. Bid Bonds remain in effect a minimum of ninety (90) days from the bid due date.

H. LICENSES AND QUALIFICATIONS
1. Construction contractors must be licensed as Md. Code Ann., Bus: Reg. § 17-601, and shall submit proof of current licensing with the bid.

2. The University reserves the right to require that a contractor demonstrate that it has the skills, equipment and other resources to satisfactorily perform the nature and magnitude of work necessary to complete the project within the proposed contract schedule.

I. BID DUE DATE
Bids must be received at the Issuing Office by date and time indicated on the Key Information Summary Sheet. Requests for extensions will not be granted. Late bids, late requests for modification, or late requests for withdrawal will not be considered. Unless specifically requested, bids submitted by fax or other electronic devices will be rejected. It is recommended that bids be hand delivered.
J. OPENING OF BIDS
A public opening will be held at the date, time and location noted on the Key Information Summary Sheet.

K. DURATION OF BID OFFER
Bids submitted are irrevocable for 90 days after the bid due date. This period may be extended by mutual written agreement between the bidder and the University.

L. PROCUREMENT METHOD
This solicitation shall be conducted in accordance with the provisions of the University System of Maryland (USM) Procurement Policies and Procedures. The procurement method is Competitive Sealed Bidding.

M. AWARD
The University will recommend for award a responsive bid from the responsible bidder submitting the most favorable evaluated bid price for the requirement(s) herein.

N. MULTIPLE BID OR ALTERNATE BIDS
Unless multiple or alternate bids are specifically requested in the solicitation, they will not be accepted.

O. MINORITY BUSINESS ENTERPRISE UTILIZATION
An MBE subcontract participation goal of 15 percent of the total contract dollar amount has been established for this procurement. By submitting a response to this solicitation, the bidder or offeror agree that this percentage of the total dollar amount of the contract will be performed by certified minority business enterprises.

By submitting a response to this solicitation, the bidder or offeror agrees that these percentages of the total dollar amounts of the contract will be performed by certified minority business enterprises as specified.

♦ A prime contractor — including an MBE prime contractor — must accomplish an amount of work not less than the MBE subcontract goal with certified MBE subcontractors.

♦ A prime contractor comprising a joint venture that includes MBE partner(s) must accomplish the MBE subcontract goal with certified MBE subcontractors.

Note: Per Exhibit E, Attachment 1A, when a certified MBE firm participates as a prime contractor on a Contract, a procurement agency may count the distinct, clearly-defined portion of the work of the Contract that the certified MBE firm performs with its own workforce toward fulfilling up to, but no more than, fifty-percent (50%) of the overall MBE participation goal.

P. LIQUIDATED DAMAGES PROVISION RELATED TO MBE GOAL
This contract requires the Contractor to make good faith efforts to comply with the Minority Business Enterprise (“MBE”) Program and contract provisions. The University and the Contractor acknowledge and agree that the University will incur damages, including but not limited to, loss of goodwill, detrimental impact on economic development and diversion...
of internal staff resources if the Contractor does not make good faith efforts to comply with the requirements of the MBE Program and MBE contract provisions. The parties further acknowledge and agree that the damages the University might reasonably anticipate to accrue as a result of such lack of compliance are difficult to ascertain with precision.

Therefore, upon a determination by the University that the Contractor failed to make good faith efforts to comply with one or more of the specified MBE Program requirements or contract provisions, the Contractor agrees to pay liquidated damages to the University at the rates set forth below. The Contractor expressly agrees that the University may withhold payment on any invoices as a set-off against liquidated damages owed. The Contractor further agrees that for each specified violation, the agreed upon liquidated damages are reasonably proximate to the loss the University is anticipated to incur as a result of such violation.

a. Failure to submit each monthly payment report in full compliance with COMAR 21.11.03.13B (3): $24.93 per day until the monthly report is submitted as required.

b. Failure to include in its agreements with MBE subcontractors a provision requiring submission of payment reports in full compliance with COMAR 21.11.03.13B (4): $87.24 per MBE subcontractor.

c. Failure to comply with COMAR 21.11.03.12 in terminating, canceling, or changing the scope of work/value of a contract with an MBE subcontractor and/or amendment of the MBE participation schedule: the difference between the dollar value of the MBE participation commitment on the MBE participation schedule for that specific MBE firm and the dollar value of the work performed by that MBE firm for the contract.

d. Failure to meet the Contractor’s total MBE participation goal and sub-goal commitments: the difference between the dollar value of the total MBE participation commitment on the MBE participation schedule and the MBE participation actually achieved.

Notwithstanding the use of liquidated damages, the University reserves the right to terminate the contract and exercise all other rights and remedies provided in the contract or by law.

END OF SECTION I.
SECTION II. GENERAL INFORMATION FOR VENDORS

A. PURPOSE
The overall purpose of this solicitation is to provide information to vendors interested in preparing and submitting bids to meet the requirements herein. Bidders shall familiarize themselves with each section and subsection of this document.

B. REVISIONS TO IFB
1. The University reserves the right to amend this solicitation at any time prior to the bid due date. If it becomes necessary to amend any part of this solicitation, the procurement officer will furnish addenda to all prospective bidders known to have received a copy of this IFB.

2. Each bidder shall acknowledge the receipt of all addenda issued by completing Exhibit K, Addendum Acknowledgment Form, and enclosing it with the bid.

C. PRE-BID MODIFICATION OR WITHDRAWAL OF OFFERS
Bids may be modified or withdrawn by written notice received at the Issuing Office before the bid opening date and time.

D. CANCELLATION OF SOLICITATION/REJECTION OF ALL BIDS
The University reserves the right to cancel this IFB, to accept or reject any or all bids, in whole or in part, received in response to this IFB, and to waive or permit cure of minor irregularities as its best interests may require.

E. INCURRED EXPENSES
The University assumes no responsibility for expenses incurred in preparing and submitting bids in response to this solicitation.

F. ARREARAGES
By submitting a response to this solicitation, a bidder represents that it is not in arrears in the payment of any obligation due and owing the State of Maryland, including the payment of taxes and employee benefits, and that it shall not become so in arrears during the term of the contract if selected for contract award.

G. VERIFICATION OF REGISTRATION AND TAX PAYMENT
Each prospective bidder is encouraged to ensure that it is appropriately registered to do business in the State of Maryland, and in good standing with respect to taxes, personal property returns, unemployment insurance, etc., before the bid opening date. Failure to complete registration with the State Department of Assessments and Taxation (SDAT) may disqualify an otherwise successful bidder from recommendation for contract award.

H. ECONOMY OF PREPARATION
Bids should be prepared simply and economically, providing a straight-forward, concise description of the bidder's ability to fulfill the requirements of this solicitation.

I. PUBLIC INFORMATION ACT NOTICE
Bidder shall give specific attention to identification of those portions of its bid considered confidential, or containing proprietary information or trade secrets. Upon request, bidder shall provide justification why such material should not be disclosed by the University.
under the Public Information Act, General Provisions Article, §§ 4-401 et seq., Annotated Code of Maryland.

J. EXECUTION OF BIDS
Bids shall be typewritten or written legibly in ink, and signed in ink as follows, depending on the bidder’s form of business organization:

1. **Sole Proprietorship.** Proprietor shall sign full name, with address.

2. **Partnership and Joint Venture.** Submit the bid/price proposal form in the name of the partnership or joint venture. Clearly state the partnership name and the identity of each general partner, and execute all affidavits and certificates on behalf of the partnership, or on behalf of each general partner. No provision of any agreement among partners will be binding on the University unless it is disclosed in the Bidder’s proposal. Reasonable evidence satisfactory to the University of the authority of one partner to bind other purported partners is required. Include a copy of the partnership agreement, if one exists. If no partnership agreement exists, and if the number of general partners is reasonably small, each general partner should execute all required documents. At the University’s option, all general partners may be required to sign. Failure to present the University with satisfactory information concerning a purported partnership or joint venture may be grounds for bid rejection.

3. **Corporation.** An officer or authorized agent of the corporation shall sign with full name, indicate title, and include the name and address of the corporation. In the case of an authorized agent, enclose a letter from an officer of the corporation authorizing said individual to act on behalf of the corporation.

K. DISCREPANCIES, EXPLANATIONS AND CLARIFICATIONS
Bidders finding discrepancies in the specifications or other provisions included in this solicitation, or in doubt as to the meaning or intent of any section or subsection herein, shall request clarification from the Procurement Officer. Failure to request clarification prior to the due date shall be a waiver of any claim by the Bidder for expenses made necessary by reason of later interpretation of the contract documents, and Bidder shall be bound to the University’s interpretation. Request clarifications in accordance with the instructions above.

L. ORDER OF PRECEDENCE
The contract to be entered into as a result of the IFB (the "Contract") will consist of the following contract documents listed in their order of precedence:

1. The contract executed by the parties and/or Purchase Order issued by the University;

2. The solicitation, including Exhibit A-2 Required Contract Provisions for Construction/Maintenance, and all other Exhibits; and

3. The bid, as submitted by bidder and accepted by the University.

No modifications to this order of precedence will be accepted.
M. REQUIRED CONTRACT PROVISIONS
Bids submitted, and contract(s) executed with the successful bidder, are subject to Exhibit A and Exhibit A-1 (if applicable).

By submitting a bid, the vendor is deemed to have accepted the terms of this IFB, including exhibits; a bid that takes exception to the terms of the IFB may be rejected. Mutually agreeable modifications of the solicitation provisions, if allowed by law, will be documented by express identification in the final contract as superseding the pertinent provisions of the solicitation.

N. FALSE STATEMENTS
Bidders are advised that the Annotated Code of Maryland provides that in connection with a procurement contract, a person may not willfully: Falsify, conceal or suppress a material fact by any scheme or device; make a false or fraudulent statement or representation of a material fact; use a false writing or document that contains a false or fraudulent statement or entry of a material fact; or aid or conspire with another person to commit any of the aforementioned acts. A person who violates these provisions is guilty of a felony, and on conviction is subject to a fine not exceeding $20,000 or imprisonment not exceeding five (5) years, or both.

O. PAYMENT TO THE CONTRACTOR
Payment is governed by Title 15, Subtitle 1, of the State Finance and Procurement Article, Annotated Code of Maryland. The State of Maryland is exempt from Maryland Retail Sales tax and Federal Excise Tax.

If the contract is a maintenance service/service contract, at the end of each calendar month, the Contractor shall render to the Accounts Payable Office, its invoice, in triplicate, for work done during the month. The amount shall not exceed one-twelfth (1/12) of the yearly service contract, unless otherwise specified in the Detailed Specifications.

P. VENDOR ELECTRONIC FUNDS TRANSFER REGISTRATION
Contractors of the State are required to complete a COT/GAD Form X-10, Vendor Electronic Funds Transfer (EFT) Registration Request Form, for each new contract with a value greater than $200,000. Vendors must register for EFT by submitting a completed COT/GAD Form X-10 to the Comptroller’s General Accounting Division (GAD) or request an exemption from GAD. The revised form is on the Comptroller’s Web site at http://compnet.comp.state.md.us/General_Accounting_Division/Vendors/Electronic_Funds_Transfer/default.shtml

Q. RECIPROCAL PREFERENCE
While Maryland law does not authorize state agencies to favor resident bidders, other states grant preferences to their residents over Maryland businesses. Therefore, a resident business preference may be given to a Maryland firm if: A responsible bidder whose headquarters, principal base of operations, or principal site that will provide the services required by this IFB is located in another state submits the most advantageous offer; the other state gives a preference to its residents through law, policy, or practice; and the preference does not conflict with a Federal law or grant affecting the contract. The preference given shall be identical to the preference that the other state gives to its residents.
R. NON-VISUAL ACCESS
The Contractor shall ensure compliance in any applicable contract with State of Maryland IT Non-Visual Access Standards. The standards should be incorporated to the fullest extent possible for information technology contracts. These standards/policies may be revised from time to time and the Contractor shall comply with all such revisions. The Non-visual Access Clause noted in COMAR 21.05.08.05 and referenced in the IFB is the basis for the standards that have been incorporated in the Maryland regulations.

S. PARKING
All vehicles parked on Towson University property must strictly observe University parking regulations. Each vehicle parked on campus between 6 am and 8 pm, Monday through Thursday, and from 6 am to 3 pm on Fridays, must display a valid University permit unless parked at a paid meter. Parking on sidewalks or unpaved areas is prohibited at all times. All fines for parking or other vehicle violations are the responsibility of the Contractor. This applies to vendors, salespersons, company vehicles, and Contractor employees’ personal vehicles. Long- and short-term permits are available, at designated rates, for vendors with contracts that require them to park regularly on the campus; see the parking website at http://www.towson.edu/parking/visitors/index.html for permit rates and information to support preparation of Bid/Price Proposal. Parking Transportation phone: (410) 704-7275. NOTE: INCLUDE PARKING FEES IN BID/PRICE PROPOSAL.

T. SMOKING
Smoking, defined as the burning of tobacco or any other material in any type of smoking equipment, including but not restricted to cigarettes, cigars or pipes, is prohibited on all property owned, leased or operated by the University. This consists of all buildings, including residence halls, leased restaurants and lodging facilities; all grounds, including exterior open spaces, parking lots and garages, on-campus sidewalks, streets, driveways, stadiums, recreational spaces and practice facilities; and in all University-owned or leased vehicles. The policy applies to all individuals on the University campus, including faculty, staff, students, parents, vendors and visitors. Contractor and its employees and subcontractors who violate the policy may be denied access to the University campus.

END OF SECTION II.
SECTION III.  BID SUBMISSION REQUIREMENTS

A.  ORGANIZATION OF BIDS
1.   Bids must be submitted to the campus location of the Issuing Office not later than the date and time indicated on the Key Information Summary Sheet.

2.   Submit one (1) clearly marked original and one (1) copy of each bid, in a sealed envelope. Indicate on the outside of the envelope the solicitation/ project number, bid due date, and bidder’s name and address.

3.   If technical data, product literature, or brochures are needed to supplement the bid, enclose those materials after the last required form.

4.   Bids that are incomplete or that deviate from the format required in this section may be rejected.

B.  SUBMITTAL REQUIREMENTS CHECKLIST
Each bid must include the following:

1.   BID/PRICE PROPOSAL FORM, typewritten or completed in ink and executed in accordance with the requirements in Section II. Each alteration to the Bid Form must be initialed, in ink, by the signatory.

2.   Exhibit B, BID/PROPOSAL AFFIDAVIT, typewritten or completed in ink and executed in accordance with the requirements in Section II.

3.   Attachment 1A, from Exhibit E, MINORITY BUSINESS UTILIZATION PACKAGE.

4.   Exhibit F, COMPANY PROFILE

5.   Exhibit G, FIRM EXPERIENCE. Duplicate as necessary to furnish references for no less than three (3) comparable projects completed within the past five (5) years, or currently underway.

6.   Exhibit H, BID BOND

7.   Exhibit K, ADDENDA ACKNOWLEDGMENT FORM. Should one or more addenda be issued, each bidder must acknowledge receipt using this form, identifying each addendum by number and date, and signing the document.

8.   Exhibit L, KEY PERSONNEL FORM. Provide the names of key personnel to be assigned to this project, if awarded, and a brief resume on each, including educational background, work experience with bidder, previous work experience with other firms, and specific experience similar to the current project.

C.  EVIDENCE OF BIDDER RESPONSIBILITY
The University may require any bidder to furnish additional information regarding past performance, financial capacity, technical expertise, or other qualifications bearing on
performance of the contract, and reserves the right to consider any information otherwise available, or to make such additional investigations as it deems necessary to confirm the responsibility of any bidder.

The Procurement Officer shall make purchases from, and award contracts, only to responsible contractors. In the absence of information clearly indicating that the prospective contractor is responsible, the Procurement Officer shall make a determination of non-responsibility.

END OF SECTION III.
TU-1940
Prettyman & Scarborough Air Conditioning Installation and Electrical Upgrades

Scope of Work

I. General
The contractor shall install an air conditioning system in the Prettyman and Scarborough Residence Halls per the attached drawings and specifications. This project includes window air conditioning units in the residence rooms along with miscellaneous ductless split systems throughout the building. The installation of the air conditioning units requires an electrical upgrade which includes a new 500KVA transformer and new exterior mounted switchboard outside Prettyman Hall and new electrical underground conduit serving Scarborough Hall. The electrical upgrades shall include new panels located on within Prettyman and Scarborough Halls to feed the air conditioning units. Doors and bulkheads shall be added to accommodate the installation of conduit and piping.

II. Schedule
Work on this project shall take place between May 28, 2019 and August 2, 2019.

The Contractor shall provide Towson University a proof of purchase of the air conditioning units prior to 5/1/19.

III. Outages
All outages shall be coordinated in advance with Towson University Project Manager. All outages to occur outside of standard business hours (M-F, 7 AM – 5 PM).

IV. Additional Information
Please note that during the HVAC installation project, the bathrooms in Prettyman and Scarborough are also being renovated. The Contractor working on the HVAC project and the Contractor working on the bathroom project will need to coordinate work in shared locations.

During this period, the water will be turned off to both Prettyman and Scarborough residence halls to allow the bathroom renovation work to occur. The HVAC Contractor should plan accordingly and provide temporary restrooms for it’s’ workers which are to be located outside the Prettyman and Scarborough residence halls.
DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS
Section 000110  Table of Contents

DIVISION 01 – GENERAL REQUIREMENTS
Section 013300  Submittal Procedures
Section 014000  Quality Requirements
Section 014200  References
Section 015000  Temporary Facilities and Controls
Section 017000  Execution
Section 017329  Cutting & Patching
Section 017419  Construction Waste Management
Section 017700  Closeout Procedures
Section 017810  Project Record Documents
Section 017823  Operation & Maintenance Documentation
Section 017839  Project Record Documents

DIVISION 26 – ELECTRICAL
Section 260050  Common Work Results for Electrical
Section 260519  Low-Voltage Electrical Power Conductors and Cables
Section 260526  Grounding and Bonding for Electrical Systems
Section 260529  Hangers and Supports for Electrical Systems
Section 260533  Raceways and Boxes for Electrical Systems
Section 260553  Identification for Electrical Systems
Section 260573.13  Short Circuit Studies
Section 260573.16  Coordination Studies
Section 260573.19  Arc Flash Studies
Section 261219  Pad Mounted Liquid Filled Medium Voltage Transformers
Section 262413  Switchboards
Section 262416  Panelboards
Section 262726  Wiring Devices
Section 262813  Fuses
Section 262816  Enclosed Switches and Circuit Breakers
Section 262913.03  Manual and Magnetic Motor Controllers
SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

1. Contractor's construction schedule.
2. Submittal schedule.
3. Shop Drawings.
4. Product Data.
5. Samples.

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits.
2. Applications for payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of Subcontractors.

C. The Schedule of Values submittal is included in Section “Payment Procedures.”

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
3. The Architect reserves the right to withhold action on a submittal requiring coordination with other
submittals until related submittals are received.

B. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time
required to process submittals, including time for resubmittals.

1. Allow two (2) weeks for initial review. Allow additional time if processing must be delayed to
permit coordination with subsequent submittals. The Architect will promptly advise the Contractor
when a submittal being processed must be delayed for coordination.

2. If an intermediate submittal is necessary, process the same as the initial submittal.

3. Allow two (2) weeks for reprocessing each submittal.

4. No extension of Contract Time will be authorized because of failure to transmit submittals to the
Architect sufficiently in advance of the Work to permit processing.

C. Submittal Preparation: Place a permanent label or title block on each submittal for identification.
Indicate the name of the entity that prepared each submittal on the label or title block.

D. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to
record the Contractor's review and approval markings and the action taken.

E. Include the following information on the label for processing and recording action taken:

1. Project name.

2. Date.

3. Name and address of Architect.

4. Name and address of Contractor.

5. Name and address of subcontractor.

6. Name and address of supplier.

7. Name of manufacturer.

8. Number and title of appropriate Specification Section.

9. Drawing number and detail references, as appropriate.

F. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit
each submittal from Contractor to Architect using a transmittal form. Submittals received from sources
other than the Contractor will be returned without action.

1. On the transmittal, record relevant information and requests for data. On the form, or separate
sheet, record deviations from Contract Document requirements, including minor variations and
limitations. Include Contractor's certification that information complies with Contract Document
requirements.

G. Transmittal Form: Use AIA Document G 810 or Contractor's standard form.
1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".

1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".

2. Within each time bar indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.

3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.

4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.

5. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.

6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.

B. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.

C. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.

D. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

E. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.5 SUBMITTAL SCHEDULE

A. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.

B. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
C. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:

1. Scheduled date for the first submittal.
2. Related Section number.
3. Submittal category.
4. Name of subcontractor.
5. Description of the part of the Work covered.
6. Scheduled date for resubmittal.
7. Scheduled date the Architect's final release or approval.

D. Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

E. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

F. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.6 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. Dimensions.
2. Identification of products and materials included.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.

C. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48". Quantities and distribution to be determined at the pre-construction meeting.
1. One of the prints returned shall be marked-up and maintained as a "Record Document".

2. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.7 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

1. Manufacturer's printed recommendations.
2. Compliance with recognized trade association standards.
3. Compliance with recognized testing agency standards.
4. Application of testing agency labels and seals.
5. Notation of dimensions verified by field measurement.
6. Notation of coordination requirements.

C. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

D. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.

E. Submittals: Submit 3 copies of each required submittal; submit 5 copies where required for maintenance manuals. The Architect will retain one, and will return the other marked with action taken and corrections or modifications required.

F. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

G. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

1. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.8 SAMPLES
A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with
the material or product proposed. Samples include partial sections of manufactured or fabricated
components, cuts or containers of materials, color range sets, and swatches showing color, texture
and pattern.

B. Mount, display or package Samples in the manner specified to facilitate review of qualities indicated.
Prepare Samples to match the Architect's Sample. Include the following:

1. Generic description of the Sample.
2. Sample source.
3. Product name or name of manufacturer.
4. Compliance with recognized standards.
5. Availability and delivery time.

C. Submit Samples for review of kind, color, pattern, and texture, for a final check of these
characteristics with other elements, and for a comparison of these characteristics between the final
submittal and the actual component as delivered and installed.

1. Where variation in color, pattern, texture or other characteristics are inherent in the material or
product represented, submit multiple units (not less than 3), that show approximate limits of the
variations.
2. Refer to other Specification Sections for requirements for Samples that illustrate workmanship,
fabrication techniques, details of assembly, connections, operation and similar construction
characteristics.
3. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work.
Such Samples must be undamaged at time of use. On the transmittal, indicate special requests
regarding disposition of Sample submittals.

D. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar
characteristics from a range of standard choices, submit a full set of choices for the material or
product.

E. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and
other action.

F. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques,
connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the
action taken.

G. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the
course of construction.

1. Unless noncompliance with Contract Document provisions is observed, the submittal may serve
as the final submittal.
2. Sample sets may be used to obtain final acceptance of the construction associated with each set.
H. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

I. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

1. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.9 ARCHITECT'S ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "No Exceptions Taken," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. Final-But-Restricted Release: When submittals are marked "Make Corrections Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Returned for Resubmittal: When submittal is marked "Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.

4. Do not permit submittals marked "Revise and Resubmit" or "Rejected" to be used at the Project site, or elsewhere where Work is in progress.

5. Other Action: Where a submittal is marked "See Attached Comments" or "Submit Specified Items," address specific issue or item and resubmit if required.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION
SECTION 014000

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

1.2 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.

1.3 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.

2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.

3. Divisions 2 through 16 Sections for specific test and inspection requirements.

1.4 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

E. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

F. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.5 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority. Also submit proof of qualifications for "Quality Control" Agencies.

B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.8 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.

3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

   a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."
D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

   1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
   1. Access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   4. Facilities for storage and field curing of test samples.
   5. Delivery of samples to testing agencies.
   6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.

2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.

3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.

4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.

5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.

6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.

2. Description of the Work tested or inspected.

3. Date test or inspection results were transmitted to Architect.

4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION
SECTION 014200

REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Indicated: The term "indicated" refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled" and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.

C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Architect," "requested by the Architect," and similar phrases.

D. Approve: The term "approved," where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

E. Regulation: The term "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

G. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

I. Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced," when used with the term "Installer," means having a minimum of five previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.

J. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as
"carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

K. Assignment of Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

a. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

L. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

M. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 33-Division format and MASTERFORMAT numbering system.

B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated shall be interpolated as the sense required. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

3. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
B. Publication Dates: Comply with the standard in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels. Refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.

D. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

E. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

   1. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

1.5 GOVERNING REGULATIONS/AUTHORITIES

A. The Architect has contacted authorities having jurisdiction where necessary to obtain information necessary for preparation of Contract Documents. Contact authorities having jurisdiction directly for information and decisions having a bearing on the Work.

B. Copies of Regulations: Obtain copies of the following regulations and retain at the Project Site, available for reference by parties who have a reasonable need for such reference.

1.6 SUBMITTALS

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION
SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

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 specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.

B. Temporary construction and support facilities required include but are not limited to:
   1. Field offices and storage sheds within contract limits.
   2. Temporary enclosures.
   3. Temporary elevator use.
   4. Temporary Project identification signs and bulletin boards.
   5. Waste disposal services.
   6. Rodent and pest control.
   7. Construction aids and miscellaneous services and facilities.

C. Security and protection facilities required include but are not limited to:
   1. Temporary fire protection.
   2. Barricades, warning signs, lights.
   3. Environmental protection.

1.3 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
   1. Building Code requirements.
   2. Health and safety regulations.
3. Utility company regulations.
4. Police, Fire Department and Rescue Squad rules.
5. Environmental protection regulations.
6. Department of Transportation regulations.
7. Local, state and municipal regulations


C. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

D. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

E. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

A. Temporary Utilities: The contractor may utilize existing utilities on the project floor; electric and heat. Phones, however, must be installed by contractor.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.

2. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.

3. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.

4. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.

B. Gypsum Wallboard: Provide gypsum wallboard complying with requirements of ASTM C 36 on temporary interior walls.
C. **Paint:** Comply with requirements of Division-9 Section "Finish Painting."
   
   1. For job-built temporary offices, shops, sheds, fences and other exposed lumber and plywood, provide exterior grade acrylic-latex emulsion over exterior primer.
   
   2. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.
   
   3. For interior walls of temporary offices, provide two coats interior latex flat wall paint.

D. **Tarpaulins:** Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

E. **Water:** Utilize existing potable water system approved by the owner.

2.2 **EQUIPMENT**

A. **General:** Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. **Electrical Outlets:** Where existing is not available, provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

C. **Electrical Power Cords:** Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

D. **Lamps and Light Fixtures:** Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

E. **Heating Units:** Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed, if required.

F. **Temporary Offices:** Utilize a space within the construction limits.

G. **Temporary Toilet Units:** The use of the toilets in the Building is prohibited. Provide portable toilet facilities as required. Maintain in sanitary condition.

H. **First Aid Supplies:** Comply with governing regulations.

I. **Fire Extinguishers:** Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION


B. Temporary Lighting: If required to supplement existing, install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.

C. Sewers and Drainage: Existing sewers are available to remove effluent that can be discharged lawfully.
   1. Filter out excessive amounts of construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.
   2. Maintain sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Provide incombustible construction for offices, shops and sheds located within the construction area. Comply with requirements of NFPA 241.

B. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

C. Heating Facilities: Use of the permanent system is authorized.

D. Drinking Water Fixtures: Utilize existing drinking water fountain.

E. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, other construction operations and similar activities.
1. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

2. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.

G. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

H. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days. Lunch garbage to be removed daily. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

I. Stairs: Permanent stairs are available. Cover finished permanent stairs with a protective covering where needed to maintain original condition.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.


1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

C. Store combustible materials in containers in fire-safe locations.

D. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

E. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

F. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

G. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.

H. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
I. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

J. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.

C. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

D. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

   1. Materials and facilities that constitute temporary facilities are property of the Contractor.

E. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:

   1. Replace air filters and clean inside of ductwork and housings.

   2. Replace significantly worn parts and parts that have been subject to unusual operating conditions.

   3. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION
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 general procedural requirements governing execution of the Work including, but not limited to, the following:

2. General installation of products.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.
6. Correction of the Work.

B. Related Sections include the following:

1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 1 Section "Submittal Procedures" for submitting surveys.
3. Division 1 Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
4. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
PART 3 - EXECUTION

1.3 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

1.4 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.


1.5 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

1.6 FIELD ENGINEERING

A. Identification: Owner will provide existing survey, if available.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points...
promptly. Report the need to relocate permanent benchmarks or control points to
Architect before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base
replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site,
referenced to data established by survey control points. Comply with authorities having
jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record
Documents.

2. Where the actual location or elevation of layout points cannot be marked, provide
temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed. Restore marked
construction to its original condition.

1.7 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and
elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance
and ease of removal for replacement.

3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.

B. Comply with manufacturer’s written instructions and recommendations for installing products in
applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results.
Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or
loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.

2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

1.8 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.


2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

1.9 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

1.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

1.11 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."

   1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION
PART 1 - GENERAL

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

1.2 SUMMARY
A. This Section specifies administrative and procedural requirements for cutting and patching.
B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 SUBMITTALS
A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform Work.
4. Indicate dates when cutting and patching is to be performed.
5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

B. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

C. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.4 QUALITY ASSURANCE
A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
B. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

1. Bearing and retaining walls.
2. Structural concrete.
4. Lintels.
5. Structural decking.
6. Stair systems.
7. Miscellaneous structural metals.
8. Exterior curtain wall construction.
9. Equipment supports.
10. Piping, ductwork, vessels and equipment.

C. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

1. Shoring, bracing, and sheeting.
2. Primary operational systems and equipment.
3. Air or smoke barriers.
4. Water, moisture, or vapor barriers.
5. Membranes and flashings.
6. Fire protection systems.
7. Noise and vibration control elements and systems.
8. Control systems.
9. Communication systems.
10. Conveying systems.
11. Electrical wiring systems.

D. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2. MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3. INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.
1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.2 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

4. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

4. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.

5. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.3 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION
SECTION 017419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

B. Related Sections:

1. Division 02 Section "Structure Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements.
2. Division 02 Section "Selective Structure Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 7 days of date established for commencement of the Work.
1.4 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons.
4. Quantity of waste salvaged, both estimated and actual in tons.
5. Quantity of waste recycled, both estimated and actual in tons.
6. Total quantity of waste recovered (salvaged plus recycled) in tons.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

1.5 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to ASTM E 1609 and requirements of this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until installation.

4. Protect items from damage during transport and storage.

5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area as designated by Owner.

5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION WASTE, GENERAL

A. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   
a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Grind asphalt to maximum 4-inch size.
B. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
   1. Pulverize concrete to maximum 4-inch size.
D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
   1. Pulverize masonry to maximum 4-inch size.
   2. Clean and stack undamaged, whole masonry units on wood pallets.
E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
F. Metals: Separate metals by type.
   1. Structural Steel: Stack members according to size, type of member, and length.
   2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

017419 - 4
1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

L. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

M. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION
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 administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
3. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.


10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

11. Advise Owner of changeover in heat and other utilities.

12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

13. Complete final cleaning requirements, including touchup painting.

14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."

2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3. Include the following information at the top of each page:
   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Page number.

1.6 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title “WARRANTIES,” Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
   a. Remove tools, construction equipment, machinery, and surplus material from Project site.
   b. Clean exposed hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   c. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   d. Sweep concrete floors broom clean in unoccupied spaces.
   e. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
   f. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
   g. Remove labels that are not permanent.
   h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
   i. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint droppings, and other foreign substances.
   j. Replace parts subject to unusual operating conditions.
   k. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
   l. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
   m. Clean ducts, blowers, and coils if units were operated without filters during construction.
   n. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and
defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

 o. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION
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 administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Emergency manuals.
   3. Operation manuals for systems, subsystems, and equipment.
   4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems, and equipment.
B. Related Sections include the following:
   1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
   2. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.
   3. Division 1 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
   4. Divisions 2 through 16 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS
A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS
A. Initial Submittal: Submit 2 draft copies of each manual at least 7 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return both copies of draft and mark whether general scope and content of manual are acceptable.
   1. Correct or modify each manual to comply with Architect's comments.
B. Final Submittal: Submit two hard copies of each manual, and a CD containing all O&M materials. Architect will review and turn copies over to the Owner upon acceptance.

1.5 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.

3. Name and address of Owner.

4. Date of submittal.

5. Name, address, and telephone number of Contractor.

6. Name and address of Architect.

7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

   a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

   b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.


5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.

   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.
2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
   1. Type of emergency.
   2. Emergency instructions.
   3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
   1. Fire.
   2. Flood.
   5. Power failure.
   7. System, subsystem, or equipment failure.
   8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
   1. Instructions on stopping.
   2. Shutdown instructions for each type of emergency.
   3. Operating instructions for conditions outside normal operating limits.
   4. Required sequences for electric or electronic systems.
   5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   1. System, subsystem, and equipment descriptions.
   2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.
2.6  SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard printed maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   5. Aligning, adjusting, and checking instructions.
   6. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
   1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
   1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
   1. Do not use original Project Record Documents as part of operation and maintenance manuals.
   2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

G. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.
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 administrative and procedural requirements for Project Record Documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.

B. Related Sections include the following:
   1. Division 1 Section "Closeout Procedures" for general closeout procedures.
   2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
   3. Divisions 2 through 16 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit copies of Record Drawings as follows:
      a. Initial Submittal: Submit one set of marked-up Record Prints. Architect will initial and date and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return prints if not acceptable.
      b. Final Submittal: Submit one set of marked-up Record Prints. Print each Drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one copy of each Product Data submittal.
   1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.
PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an understandable drawing technique.
   c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:
   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Locations of utilities.
   d. Revisions to routing of piping and conduits.
   e. Revisions to electrical circuitry.
   f. Actual equipment locations.
   g. Duct size and routing.
   h. Locations of concealed internal utilities.
   i. Changes made by Change Order or Construction Change Directive.
   j. Changes made following Architect's written orders.
   k. Details not on the original Contract Drawings.
   l. Field records for variable and concealed conditions.
   m. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.

3. Note related Change Orders and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

3. Note related Change Orders and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION
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. Section Includes:

1. Electrical equipment coordination and installation.
2. Common electrical installation requirements.

1.3 DESCRIPTION OF WORK

A. Requirements of this Section are applicable to work in Division 26.

B. Contract Documents

1. Unless otherwise modified, drawings and general provisions of the Contract, including provisions of General Conditions, Supplementary Conditions, Division 00, and Division 01 govern work under Division 26.
2. Contract drawings for electrical work are diagrammatic, intended to convey scope and general arrangement.
3. Refer questions involving document interpretation or discrepancies to Engineer for review and direction.
4. Correct faulty work due to resolving discrepancies without proper approval.
6. Follow drawings and specifications in laying out work. Consult other applicable contract drawings and specifications, become familiar with conditions affecting work.

C. Scope

1. The work in Division 26 includes furnishing and installing the electrical work complete and ready for satisfactory service.
2. Requirements specified govern work in all sections of Divisions 26.

D. Definitions: The following are definitions of terms and expressions used in Divisions 26.

1. “Approve” - To permit use of material, equipment or methods conditional upon compliance with contract document requirements.
2. “Concealed” - Hidden from normal sight; includes work in crawl spaces, above ceilings, and in building shafts.
3. “Directed” - directed by Engineer.
4. “Equal, equivalent” - possessing the same performance qualities and characteristics and fulfilling the same utilitarian function.
5. “Exposed” - not concealed.
6. “Furnish” - Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar operations.
8. “Install” - Operations at project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimensions, finishing, curing, protecting, cleaning and similar operations.
9. “Provide” - furnish and install, complete and ready for the intended use.
10. “Removable” - detachable from the structure or system without physical alteration of materials or equipment and without disturbance to other construction.
11. “Review” - limited observation or checking to ascertain general conformance with design concept of the work and with information given in contract documents. Such action does not constitute a waiver or alteration of the contract requirements.

1.4 QUALITY ASSURANCE

A. Regulations: Comply with regulations of NFPA, state, county, and municipal building ordinances, and other applicable codes and regulations.

B. Provide UL label on electric powered equipment or certification that equipment has been tested by a testing agency approved by the local authority as equivalent in safety to UL labeled equipment.

C. Material and Equipment Requirements

1. Use products of one manufacturer where two or more items of same kind of equipment are required.
2. For certain items of equipment the specification and the project design are based upon the specified manufacturer's product. Other manufacturers' names are listed. Contractor may purchase, conditional upon meeting project requirements, equipment from the listed manufacturers.
3. Only the manufacturer's equipment upon which, the specification and the project design has been based, has been checked for this project. Check allocated space and structure for suitability of equipment of other listed manufacturers, including parts replacement and servicing.

D. Workmanship

1. Remove and replace, at no extra cost, work not in conformance with contract requirements.
2. Coordination with Other Trades
   a. Coordinate work and cooperate with other trades to facilitate execution of work.
   b. Contractor shall give full cooperation and coordination with other trades and shall furnish any information necessary to permit the work of all trades to be installed satisfactorily with the least possible interference or delay.
   c. The Contractor shall furnish to other trades, as required, all necessary templates, patterns, setting plans and shop details for the proper installation of the work and for the purpose of coordination adjacent work.
3. Access: The Contractor shall specifically consider all materials and equipment installations and shall coordinate with the work of all trades to insure easy and unobstructed accessibility of all systems for operations, maintenance, repairs, and replacement. Installation of all specified materials and equipment including but not limited to, equipment, supports, electrical conduit shall be in a manner which will allow complete unobstructed access to all panels, transformers, and all other items requiring access for operations or maintenance. Any installation of new equipment or materials which causes problems related to access of new or existing equipment shall be disapproved by the Engineer and reaccomplished by the Contractor.
1.5 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 sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."

1.6 INDEPENDENT TESTING AND INSPECTION

A. The contactor shall coordinate and cooperate with an independent high voltage (600V and above) electrical testing and inspection agency under contract by the contractor for testing and inspection of all electrical high voltage components of the system prior to being energized.

B. The general contractor shall file for an independent inspection agency, and pay all fees associated with such filing, at the start of construction so that adequate rough-in inspections can be made during the course of work. An electrical inspection report from an independent (non-governmental) electrical inspection agency approved by the State of Maryland Fire Marshal must be submitted to the University prior to or with the final payment invoice. The inspection certificate shall be submitted in lieu of a municipal permit for electrical work performed on property belonging to the State of Maryland.

1.7 SHOP DRAWINGS AND SUBMITTALS

A. Refer to Division 01 for complete requirements.

B. Submit all products for a single specification section as a complete submittal. All products specified within a division shall be included, otherwise submittal will be returned as incomplete.

C. Submittals shall be clearly marked indicating actual products intended to be utilized. Marks may include highlighting, circling, boxing, checking, etc. Do not provide submittal data which lists multiple product’s data without clearly indicating which data applies to the products intended to be used on project.

D. Coordinate drawings and data before submitting and certify that provisions of the contract documents have been met.

E. Call attention, in writing, to deviations from contract requirements.

F. Do not fabricate, deliver to site, or install items requiring shop drawing review, until the review has been completed by the Engineer and the shop drawing has been marked to indicate "No Exception Taken" or "Make Corrections Noted."

G. Use only final or corrected drawings and data for construction. This includes all Addendums, Architectural Supplemental Information (ASIs), and Change Bulletins.
H. The Engineer’s review of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work.

PART 2 - PRODUCTS (NOT USED)

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 piping systems installed at a required slope.

F. Conditions of Occupancy

1. This building will be occupied during the life of this contract. Execute work in a manner to impose minimal interference with the normal functioning of the building and its occupants. When interference is unavoidable, schedule work 14 days in advance with the Owner.
2. Make temporary connections where necessary to maintain uninterrupted electrical service.
3. Provide adequate protection for the building, its contents, and occupants.
4. Perform work as quietly as possible to avoid unnecessary disturbance. Unusual precaution may be necessary in the conduct or work in some areas to achieve satisfactory compliance.
5. Coordinate with Owner to Perform work producing high noise levels, dust, or hazards to occupants in occupied during non-business hours of the facility.
6. Comply with regulations of Owner pertaining to circulation, sanitation, and behavior of Contractor’s personnel.

3.2 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section “Through-Penetration Firestop Systems.”

END OF SECTION 260050
SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Metal-clad cable, Type MC, rated 600 V or less.
3. Connectors, splices, and terminations rated 600 V and less.

B. Related Requirements:

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

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

1. American Bare Conductor.
2. Cerro Wire LLC.
3. General Cable Technologies Corporation.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.
2.2 METAL-CLAD CABLE, TYPE MC

A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Alpha Wire Company.
   2. American Bare Conductor.
   3. General Cable Technologies Corporation.

C. Standards:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
   2. Comply with UL 1569.
   3. RoHS compliant.
   4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Circuits:

E. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

F. Ground Conductor: Insulated, copper.

G. Conductor Insulation:
   1. Type TFN/THHN/THWN-2: Comply with UL 83.
   2. Type XHHW-2: Comply with UL 44.

H. Armor: Aluminum, interlocked.

I. Jacket: PVC applied over armor.

2.3 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. 3M Electrical Products.
   2. AFC Cable Systems; a part of Atkore International.
   4. O-Z/Gedney; a brand of Emerson Industrial Automation.
   5. Thomas & Betts Corporation; A Member of the ABB Group.
   6. Tyco Electronics Corp.
C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with compression fittings, designed to connect conductors specified in this Section.

D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
   1. Material: Copper.
   2. Type: Two hole with standard barrels.
   3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.

B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

E. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings within Rooms, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway, and Metal-clad cable, Type MC.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. 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.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

### 3.4 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-486B.

B. Make splices, terminations, and taps that are compatible with conductor material.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

### 3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

### 3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

END OF SECTION 260519
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment, plus the following special applications:

1. Underground distribution grounding.
2. Ground bonding common with lightning protection system.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency and testing agency's field supervisor.
B. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1. Plans showing as-built, dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
   a. Ground rods.
   b. Grounding arrangements and connections for separately derived systems.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

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

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

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

1. Burndy; Part of Hubbell Electrical Systems.
2. ERICO International Corporation.
3. Galvan Industries, Inc.; Electrical Products Division, LLC.
4. Harger Lightning & Grounding.
5. ILSCO.
6. O-Z/Gedney; a brand of Emerson Industrial Automation.
7. Thomas & Betts Corporation; A Member of the ABB Group.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
   3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
   4. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

C. Conduit Hubs: Mechanical type, terminal with threaded hub.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.
B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

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.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

C. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in 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.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:
   1. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
   2. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
   3. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
   5. Manhole Grounds: 10 ohms.

F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel slotted support systems.
2. Conduit and cable support devices.
3. Support for conductors in vertical conduit.
4. Structural steel for fabricated supports and restraints.
5. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.

2. Slotted support systems.
3. Equipment supports.
4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, and coordinated with each other, using input from installers of the items involved.

B. Welding certificates.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M.
2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch- diameter holes at a maximum of 8 inches o.c. in at least one surface.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Allied Tube & Conduit; a part of Atkore International.
b. ERICO International Corporation.
c. Cooper B-Line, Inc.
d. GS Metals Corporation.
e. National Pipe Hanger Corporation
f. Michigan Hanger Co
g. Thomas & Betts Corporation; A Member of the ABB Group.
h. Unistrut; Part of Atkore International.
i. Wesanco, Inc.

2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
4. Channel Width: Selected for applicable load criteria.
5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.

B. 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.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored 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 made of malleable iron.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

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

      1) B-line, an Eaton business.
      2) Empire Tool and Manufacturing Co., Inc.
      3) Hilti, Inc.
      4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      5) MKT Fastening, LLC.

2. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
5. Toggle Bolts: All or Stainless-steel springhead type.
PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:

1. NECA 1.
2. NECA 101

B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

E. 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 these supports with two-bolt conduit clamps or single-bolt conduit clamps.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. 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.

C. 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. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
6. To Light Steel: Sheet metal screws.
7. 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.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.
END OF SECTION 260529
SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.

B. Related Requirements:
1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

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

   a. Allied Tube & Conduit; a part of Atkore International.
   b. Anamet Electrical, Inc.
   c. Calconduit.
   d. FSR Inc.
   e. NEC, Inc.
   f. O-Z/Gedney; a brand of Emerson Industrial Automation.
   g. Republic Conduit.
   h. Southwire Company.
   i. Thomas & Betts Corporation; A Member of the ABB Group.
   j. Western Tube and Conduit Corporation.
2. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. GRC: Comply with ANSI C80.1 and UL 6.
4. IMC: Comply with ANSI C80.6 and UL 1242.
5. EMT: Comply with ANSI C80.3 and UL 797.
6. FMC: Comply with UL 1; zinc-coated steel.
7. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings: Comply with NEMA FB 1 and UL 514B.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit; a part of Atkore International.
      b. Cooper Crouse-Hinds.
      c. Appleton
      d. FSR Inc.
      e. Hubbell
      f. O-Z/Gedney; a brand of Emerson Industrial Automation.
      g. Republic Conduit.
      h. Southwire Company.
      i. Thomas & Betts Corporation; A Member of the ABB Group.
      j. Western Tube and Conduit Corporation.
   2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   3. Fittings, General: Listed and labeled for type of conduit, location, and use.
   5. Fittings for EMT:
      a. Material: Steel or die cast.
      b. Type: Compression. Threaded, throated compression in mechanical rooms, kitchens and damp areas
   6. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

C. Joint Compound for IMC or GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. AFC Cable Systems; a part of Atkore International.
      b. Anamet Electrical, Inc.
      c. RACO; Hubbell.
      d. Thomas & Betts Corporation; A Member of the ABB Group.
B. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

C. Nonmetallic Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. AFC Cable Systems; a part of Atkore International.
   b. Anamet Electrical, Inc.
   c. Arnco Corporation.
   d. RACO; Hubbell.
   e. Thomas & Betts Corporation; A Member of the ABB Group.

2. Fittings, General: Listed and labeled for type of conduit, location, and use.
3. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
4. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

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

1. B-line, an Eaton business.
2. Hoffman; a brand of Pentair Equipment Protection.
3. Square D.

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R, or Type 4 as indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, 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.

2.4 SURFACE RACEWAYS

A. Listing and Labeling: Surface raceways shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NEMA Rating: NEMA 1

C. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Hubbell Incorporated; Wiring Device-Kellems.
   b. Panduit Corp.
   c. Wiremold / Legrand – Series 4000
2.5 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Raco.
   3. Hoffman; a brand of Pentair Equipment Protection.
   5. O-Z/Gedney; a brand of Emerson Industrial Automation.
   6. Thomas & Betts Corporation; A Member of the ABB Group.
   7. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

G. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

H. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

I. Gangable boxes are allowed.

J. Cabinets:
   1. NEMA 250, Type 1 or Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
   2. Hinged door in front cover with flush latch and concealed hinge.
   3. Key latch to match panelboards.
   4. Metal barriers to separate wiring of different systems and voltage.
   5. Accessory feet where required for freestanding equipment.
   6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed Conduit: GRC. Not permissible on exterior walls. RNC, Type EPC-40-PVC for use on roofs, painted for UV protection.
   2. Concealed Conduit, Aboveground: GRC.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated.

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Severe Physical Damage: GRC.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: GRC.
6. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. EMT: Use compression, steel or cast-metal fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install surface raceways only where indicated on Drawings.

F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.

D. Do not fasten conduits onto the bottom side of a metal deck roof.

E. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

F. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

G. Arrange stub-ups so curved portions of bends are not visible above finished slab.
H. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.

I. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

J. Support conduit within 12 inches of enclosures to which attached.

K. Raceways Embedded in Slabs:
   1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
   2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
   3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
   4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
   5. Change from PVC to GRC before rising above floor.

L. Stub-ups into Above Recessed Ceilings:
   1. Use EMT, IMC, or RMC for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

M. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

N. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

O. Conduit Joints Indoor, Exposed to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

Q. Surface Raceways:
   1. Install surface raceway with a minimum 2-inch radius control at bend points.
   2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

R. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with 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.
S. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Conduit extending from interior to exterior of building.
4. Conduit extending into pressurized duct and equipment.
5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6. Where otherwise required by NFPA 70.

T. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
   c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F of temperature change for PVC conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

U. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires (Type MC cable may also be used to connect to luminaires), equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

V. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

W. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.

X. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

Y. Locate boxes so that cover or plate will not span different building finishes.
Z. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

AA. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

BB. Set metal floor boxes level and flush with finished floor surface.

CC. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.4 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal conduits and fittings, including GRC and PVC-coated steel conduit.
   2. Rigid nonmetallic duct.
   3. Duct accessories.
   4. Polymer concrete handholes and boxes with polymer concrete cover.
   5. High density plastic boxes.

1.2 DEFINITIONS

A. Direct Buried: Duct or a duct bank that is buried in the ground, without any additional casing materials such as concrete.

B. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.

C. Duct Bank:
   1. Two or more ducts installed in parallel, with or without additional casing materials.
   2. Multiple duct banks.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
   1. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:
      a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
      b. Include duct entry provisions, including locations and duct sizes.
      c. Include cover design.
      d. Include grounding details.
      e. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer and testing agency responsible for testing nonconcrete handholes and boxes.

B. Source quality-control reports.

C. Field quality-control reports.
1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND FITTINGS

A. GRC: Comply with ANSI C80.1 and UL 6.

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

1. Allied Tube & Conduit; a part of Atkore International.
2. Anamet Electrical, Inc.
3. NEC, Inc.
4. O-Z/Gedney; a brand of Emerson Industrial Automation.
5. Southwire Company.
6. Thomas & Betts Corporation; A Member of the ABB Group.
7. Western Tube and Conduit Corporation.

C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

2.2 RIGID NONMETALLIC DUCT

A. Underground Plastic Utilities Duct: Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.

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

1. ARNCO Corp.
2. Condux International, Inc.
3. Electri-Flex Company.
4. Endot Industries Inc.
7. Spiraduct/AFC Cable Systems, Inc.

C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

D. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 DUCT ACCESSORIES

A. Duct Spacers: Factory-fabricated, rigid, PVC interlocking spacers; sized for type and size of duct with which used, and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.

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

   a. Allied Tube & Conduit; a part of Atkore International.
b. CANTEX INC.
c. Carlon; a brand of Thomas & Betts Corporation.
d. IPEX USA LLC.
e. PenCell Plastics.
f. Underground Devices, Inc.

B. Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

2.4 POLYMER CONCRETE HANDHOLES AND BOXES WITH POLYMER CONCRETE COVER

A. Description: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.

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

1. Armorcast Products Company.
2. NewBasis.
3. Oldcastle Enclosure Solutions.


D. Color: Gray.

E. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.

F. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.

G. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

H. Cover Legend: Molded lettering, "ELECTRIC."

I. Direct-Buried Wiring Entrance Provisions: Knockouts equipped with insulated bushings or end-bell fittings, selected to suit box material, sized for wiring indicated, and arranged for secure, fixed installation in enclosure wall.

J. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering duct for secure, fixed installation in enclosure wall.

K. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.

2.5 SOURCE QUALITY CONTROL

A. Test and inspect precast concrete utility structures according to ASTM C 1037.

B. Nonconcrete Handhole and Pull-Box Prototype Test: Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
1. Strength tests of complete boxes and covers shall be by an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.

2. Testing machine pressure gages shall have current calibration certification, complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate elevations of duct and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes and handholes, and as approved by Architect.

3.2 UNDERGROUND DUCT APPLICATION

A. Duct for Electrical Feeders 600 V and Less: RNC Type EPC-40-PVC, concrete-encased unless otherwise indicated.

B. Duct for Electrical Branch Circuits: RNC Type EPC-40-PVC, direct-buried unless otherwise indicated.

C. Underground Ducts Crossing Paved Paths and Roadways: RNC Type EPC-40 PVC, encased in reinforced concrete.

D. Stub-ups: Concrete-encased GRC.

3.3 UNDERGROUND ENCLOSURE APPLICATION

A. Handholes and Boxes for 600 V and Less:

1. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer concrete, SCTE 77, Tier 15 structural load rating.

2. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Polymer concrete units, SCTE 77, Tier 8 structural load rating.

3. Units Subject to Light-Duty Pedestrian Traffic Only: High-density plastic, structurally tested according to SCTE 77 with 3000-lbf vertical loading.

4. Cover design load shall not exceed the design load of the handhole or box.

3.4 EARTHWORK

A. Excavation and Backfill: do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching.
D. Cut and patch existing pavement in the path of underground duct, duct bank, and underground structures according to "Cutting and Patching" Article in Section 017300 "Execution."

3.5 DUCT AND DUCT-BANK INSTALLATION

A. Where indicated on Drawings, install duct, spacers, and accessories into the duct-bank configuration shown. Duct installation requirements in this Section also apply to duct bank.

B. Install duct according to NEMA TCB 2.

C. Slope: Pitch duct a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope duct from a high point between two manholes, to drain in both directions.

D. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.

E. Joints: Use solvent-cemented joints in duct and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent duct do not lie in same plane.

F. End Bell Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch duct, and vary proportionately for other duct sizes.

G. Terminator Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inches o.c. for 4-inch duct, and vary proportionately for other duct sizes.

H. Building Wall Penetrations: Make a transition from underground duct to GRC at least 10 feet outside the building wall, without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for RNC-to-GRC transition. Install GRC penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

I. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.


K. Concrete-Encased Ducts and Duct Bank:

1. Excavate trench bottom to provide firm and uniform support for duct. Prepare trench bottoms for pipes less than 6 inches in nominal diameter.
2. Width: Excavate trench 12 inches wider than duct on each side.
3. Depth: Install so top of duct envelope is at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
4. Support duct on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
5. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 feet of duct. Place spacers within 24 inches
of duct ends. Stagger spacers approximately 6 inches between tiers. Secure spacers to earth and to duct to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.


7. Reinforcement: Reinforce concrete-encased duct where crossing disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.

8. Concrete Cover: Install a minimum of 3 inches of concrete cover between edge of duct to exterior envelope wall, 2 inches between duct of like services, and 4 inches between power and communications ducts.

9. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.

10. Pouring Concrete: Place concrete carefully during pours to prevent voids under and between duct and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Allow concrete to flow around duct and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-installation application.

L. Direct-Buried Duct and Duct Bank:

1. Excavate trench bottom to provide firm and uniform support for duct. Prepare of trench bottoms for pipes less than 6 inches in nominal diameter.

2. Width: Excavate trench 3 inches wider than duct on each side.

3. Depth: Install top of duct at least 36 inches below finished grade unless otherwise indicated.

4. Set elevation of bottom of duct bank below frost line.

5. Support ducts on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.

6. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 feet of duct. Place spacers within 24 inches of duct ends. Stagger spacers approximately 6 inches between tiers. Secure spacers to earth and to ducts to prevent floating. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.

7. Install duct with a minimum of 3 inches between ducts for like services and 6 inches between power and communications duct.

8. Elbows: Install manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct direction unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.

9. Install manufactured GRC elbows for stub-ups, at building entrances, and at changes of direction in duct.

10. After installing first tier of duct, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches over duct and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction.

a. Place minimum 3 inches of sand as a bed for duct. Place sand to a minimum of 6 inches above top level of duct.
M. Underground-Line Warning Tape: Bury conducting underground line specified in Section 260553 "Identification for Electrical Systems" no less than 12 inches above all concrete-encased duct and duct banks and approximately 12 inches below grade. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

3.6 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Elevations:
   1. Install handholes with bottom below frost line.
   2. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
   3. Where indicated, cast handhole cover frame integrally with handhole structure.

B. Field-Installed Bolting Anchors in Concrete Handholes: Do not drill deeper than 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

3.7 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of duct, and seal joint between box and extension as recommended by manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch above finished grade.

D. Install handholes and boxes with bottom below frost line.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.

F. Field cut openings for duct according to enclosure manufacturer’s written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.8 GROUNDING

A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.9 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 12-inch-long mandrel equal to duct size minus 1/4 inch. If obstructions are indicated, remove obstructions and retest.

B. Correct deficiencies and retest as specified above to demonstrate compliance.

C. Prepare test and inspection reports.

3.10 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

END OF SECTION 260543
SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
   2. Sleeve-seal fittings.
   4. Silicone sealants.

B. Related Requirements:

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:
   2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. Sleeves for Rectangular Openings:
   2. Minimum Metal Thickness:
      a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
      b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
a. HOLDRITE.

2.3 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.


C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.4 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

   a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.
   b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.

4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Color and legend requirements for raceways, conductors, and warning labels and signs.
   2. Labels.
   4. Tapes and stencils.
   5. Tags.
   7. Cable ties.
   9. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Delegated-Design Submittal: For arc-flash hazard study.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS


B. Comply with NFPA 70.


D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E and Section 260573.19 “Arc-Flash Hazard Analysis” requirements for arc-flash warning labels.

F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

   1. Temperature Change: 120 degrees F, ambient; 180 degrees F, material surfaces.
2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:
   1. Black letters on an orange field.
   2. Legend: Indicate voltage and system or service type.

B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service and feeder conductors.
   1. Color shall be factory applied.
   2. Colors for 208/120-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
   3. Colors for 480/277-V Circuits:
      b. Phase B: Orange.
      c. Phase C: Yellow.
   6. Colors for Isolated Grounds: Green with white stripe.

C. Warning Label Colors:
   1. Identify system voltage with black letters on an orange background.

D. Warning labels and signs 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."

E. Equipment Identification Labels:
   1. Black letters on a white field. Letters shall be ½" high, minimum.
   2. Emergency Equipment: Red letters on a white field. Letters shall be ½" high, minimum.

F. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Brady Corporation.
      b. Champion America.
      c. emedco.
      d. Grafolast Wire Markers.
      e. HellermannTyton.
f. LEM Products Inc.
g. Marking Services, Inc.
h. Panduit Corp.
i. Seton Identification Products.

G. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameter and that stay in place by gripping action.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
   b. HellermannTyton.
   c. Marking Services, Inc.
   d. Panduit Corp.
   e. Seton Identification Products.

H. Self-Adhesive Wraparound Labels: Write-on, 3-mil- thick, polyester flexible label with acrylic pressure-sensitive adhesive.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. A’n D Cable Products.
   b. Brady Corporation.
   c. Brother International Corporation.
   d. emedco.
   e. Grafoplast Wire Markers.
   f. Ideal Industries, Inc.
   g. LEM Products Inc.
   h. Marking Services, Inc.
   i. Panduit Corp.
   j. Seton Identification Products.

2. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.

3. Marker for Labels: Permanent, waterproof, black ink marker recommended by tag manufacturer.

I. Self-Adhesive Labels: Polyester or Vinyl, thermal, transfer-printed, 3-mil- thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. A’n D Cable Products.
   b. Brady Corporation.
   c. Brother International Corporation.
   d. emedco.
   e. Grafoplast Wire Markers.
   f. HellermannTyton.
   g. Ideal Industries, Inc.
   h. LEM Products Inc.
i. Marking Services, Inc.
j. Panduit Corp.
k. Seton Identification Products.

2. Minimum Nominal Size:
   a. 1-1/2 by 6 inches for raceway and conductors
   b. 3-1/2 by 5 inches for equipment.
   c. As required by authorities having jurisdiction.

2.3 BANDS AND TUBES

A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameter and that stay in place by gripping action.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
   b. HellermannTyton.
   c. Marking Services, Inc.
   d. Panduit Corp.

B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameters of and shrunk to fit firmly around item being identified. Full shrink recovery occurs at a maximum of 200 deg F. Comply with UL 224.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
   b. Panduit Corp.

2.4 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Carlton Industries, LP.
   b. Champion America.
   c. HellermannTyton.
   d. Ideal Industries, Inc.
   e. Marking Services, Inc.
   f. Panduit Corp.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
b. Carlton Industries, LP.
c. emedco.
d. Marking Services, Inc.

C. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and is 12 inches wide. Stop stripes at legends.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. HellermannTyton.
   b. LEM Products Inc.
   c. Marking Services, Inc.
   d. Seton Identification Products.

D. Floor Marking Tape: 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Carlton Industries, LP.
   b. Seton Identification Products.

E. MetallicUnderground-Line Warning Tape:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
   b. Ideal Industries, Inc.
   c. LEM Products Inc.
   d. Marking Services, Inc.
   e. Reef Industries, Inc.
   f. Seton Identification Products.

2. Tape:
   a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical utility lines.
   b. Printing on tape shall be permanent and shall not be damaged by burial operations.
   c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

3. Color and Printing:
   b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".

F. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.
2.5 TAGS

A. Write-on Tags:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Carlton Industries, LP.
   b. LEM Products Inc.
   c. Seton Identification Products.

2. Polyester Tags: 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment.

3. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.6 SIGNS

A. Baked-Enamel Signs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Carlton Industries, LP.
   b. Champion America.
   c. emedco.
   d. Marking Services, Inc.

2. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.

3. 1/4-inch grommets in corners for mounting.


B. Metal-Backed Butyrate Signs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
   b. Champion America.
   c. emedco.
   d. Marking Services, Inc.

2. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.

3. 1/4-inch grommets in corners for mounting.

4. Nominal Size: 10 by 14 inches.

C. Laminated Acrylic or Melamine Plastic Signs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
b. Carlton Industries, LP.
c. emedco.
d. Marking Services, Inc.

2. Engraved legend.
3. Thickness:
   a. For signs up to 20 sq. in., minimum 1/16 inch thick.
   b. For signs larger than 20 sq. in., 1/8 inch thick.
   c. Engraved legend with black letters on white face.
   d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.
   e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 CABLE TIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. HellermannTyton.
   2. Ideal Industries, Inc.
   3. Marking Services, Inc.
   4. Panduit Corp.

B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.

C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.

D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 7000 psi.
   3. UL 94 Flame Rating: 94V-0.
   4. Temperature Range: Minus 50 to plus 284 deg F
   5. Color: Black.

2.8 MISCELLENEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
B. 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 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

H. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

   1. Secure tight to surface of conductor, cable, or raceway.

I. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.

   1. Secure tight to surface of conductor, cable, or raceway.


K. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.

L. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

M. Accessible Fittings for Raceways: Identify the covers of each junction and pull box of the following systems with the wiring system legend and system voltage. System legends shall be as follows:

   1. "POWER:"

N. Vinyl Wraparound Labels:
1. Secure tight to surface at a location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.

O. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.

P. Self-Adhesive Wraparound Labels: Secure tight to surface of raceway or cable at a location with high visibility and accessibility.

Q. Self-Adhesive Labels:

1. On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.

R. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.

S. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.

T. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.

U. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

V. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.

W. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.

X. Underground Line Warning Tape:

1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
2. Install underground-line warning tape for direct-buried cables and cables in raceways.

Y. Write-on Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

Z. Baked-Enamel Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

AA. Metal-Backed Butyrate Signs:
   1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
   2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

BB. Laminated Acrylic or Melamine Plastic Signs:
   1. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
   2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

CC. Cable Ties: General purpose, for attaching tags, except as listed below:
   1. Outdoors: UV-stabilized nylon.
   2. In Spaces Handling Environmental Air: Plenum rated.

3.2 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive labels containing the wiring system legend and system voltage. System legends shall be as follows:
   1. "POWER."

D. Wiring Devices: Identify with indelible marker on back of coverplate of receptacles and wiring devices. Indicate circuit number and panel name

E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use vinyl wraparound labels, self-adhesive wraparound labels, snap-around labels, snap-around color-coding band, or self-adhesive vinyl tape to identify the phase.
   1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

F. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use write-on tags or self-adhesive wraparound labels with the conductor or cable designation, origin, and destination.

G. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.
H. Auxiliary Electrical Systems Conductor Identification: Marker tape or Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

I. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.

J. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

K. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive equipment labels or Baked-enamel warning signs.

1. Apply to exterior of door, cover, or other access.
2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
   a. Power-transfer switches.


N. Operating Instruction Signs: Self-adhesive labels or Baked-enamel warning signs.

O. Emergency Operating Instruction Signs: Self-adhesive labels or Baked-enamel warning signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.
P. Equipment Identification Labels:

1. Indoor Equipment: White phenolic nameplate with black letters and black trim.
2. Outdoor Equipment: White phenolic nameplate with black letters and black trim.

END OF SECTION 260553
SECTION 260573.13 - SHORT-CIRCUIT STUDIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes a computer-based, fault-current study to determine the minimum interrupting capacity of circuit protective devices.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For computer software program to be used for studies.
2. Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.

   a. Short-circuit study input data, including completed computer program input data sheets.
   b. Short-circuit study and equipment evaluation report; signed, dated, and sealed by a qualified professional engineer.

1) Submit study report for action prior to receiving final approval of distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that selection of devices and associated characteristics is satisfactory.

2) Revised one-line diagram, reflecting field investigation results and results of short-circuit study.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data:

1. For Power Systems Analysis Software Developer.
2. For Power System Analysis Specialist.
3. For Field Adjusting Agency.

B. Product Certificates: For short-circuit study software, certifying compliance with IEEE 399.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Study shall be performed using commercially developed and distributed software designed specifically for power system analysis.

B. Software algorithms shall comply with requirements of standards and guides specified in this Section.

C. Manual calculations are unacceptable.
1. Power System Analysis Software Qualifications: Computer program shall be designed to perform short-circuit studies or have a function, component, or add-on module designed to perform short-circuit studies.

2. Computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society’s Certified Software Development Professional certification.

D. Power Systems Analysis Specialist Qualifications: Professional engineer licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

E. Short-Circuit Study Certification: Short-Circuit Study Report shall be signed and sealed by Power Systems Analysis Specialist.

1. Employer of a NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification responsible for all field adjusting of the Work.

2. A member company of NETA.

3. Acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 POWER SYSTEM ANALYSIS SOFTWARE DEVELOPERS

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

1. ESA Inc.
2. SKM Systems Analysis, Inc.

B. Comply with IEEE 399 and IEEE 551.

1. Analytical features of power systems analysis software program shall have capability to calculate “mandatory” features as listed in IEEE 399.

C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output.

2.2 SHORT-CIRCUIT STUDY REPORT CONTENTS

A. Executive summary of study findings.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of results.

C. One-line diagram of modeled power system, showing the following:

1. Protective device designations and ampere ratings.
2. Conductor types, sizes, and lengths.
3. Transformer kilovolt ampere (kVA) and voltage ratings.
4. Motor and generator designations and kVA ratings.
5. No VFDs shall be in-line
6. Switchgear, switchboard, motor-control center, and panelboard designations and ratings.
7. Derating factors and environmental conditions.
8. Any revisions to electrical equipment required by the study.
D. Comments and recommendations for system improvements or revisions in a written document, separate from one-line diagram.

E. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to available short-circuit currents. Verify that equipment withstand ratings exceed available short-circuit current at equipment installation locations.
2. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short-circuit duties.
3. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
4. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in standards to 1/2-cycle symmetrical fault current.

F. Short-Circuit Study Input Data:

1. One-line diagram of system being studied.
2. Power sources available.
3. Manufacturer, model, and interrupting rating of protective devices.
4. Conductors.
5. Transformer data.

G. Short-Circuit Study Output Reports:

1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. Equivalent impedance.

2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. Calculated asymmetrical fault currents:
      1) Based on fault-point X/R ratio.
      2) Based on calculated symmetrical value multiplied by 1.6.
      3) Based on calculated symmetrical value multiplied by 2.7.

3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. No AC Decrement (NACD) ratio.
   e. Equivalent impedance.
   f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

PART 3 - EXECUTION

3.1 POWER SYSTEM DATA

A. Obtain all data necessary for conduct of the study.

B. Gather and tabulate the required input data to support the short-circuit study. Comply with requirements in Section 017839 "Project Record Documents" for recording circuit protective device characteristics. Record data on a Record Document copy of one-line diagram. Comply with recommendations in IEEE 551 as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification.

3.2 SHORT-CIRCUIT STUDY

A. Perform study following the general study procedures contained in IEEE 399.

B. Calculate short-circuit currents according to IEEE 551.

C. Base study on device characteristics supplied by device manufacturer.

D. Begin short-circuit current analysis at the service, extending down to system overcurrent protective devices as follows:
   1. To all line voltage panelboards.

E. Distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

F. Include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and apply to low- and medium-voltage, three-phase ac systems. Also account for the fault-current dc decrement to address asymmetrical requirements of interrupting equipment.

G. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and a single line-to-ground fault at each equipment indicated on one-line diagram.
   1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

H. Include in the report identification of any protective device applied outside its capacity.
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes computer-based, overcurrent protective device coordination studies to determine overcurrent protective devices and to determine overcurrent protective device settings for selective tripping.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For computer software program to be used for studies.
2. Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.
   a. Coordination-study input data, including completed computer program input data sheets.
   b. Study and equipment evaluation reports.
3. Overcurrent protective device coordination study report; signed, dated, and sealed by a qualified professional engineer.
   a. Submit study report for action prior to receiving final approval of distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that selection of devices and associated characteristics is satisfactory.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data:

1. For Power System Analysis Software Developer.
2. For Power Systems Analysis Specialist.
3. For Field Adjusting Agency.

B. Product Certificates: For overcurrent protective device coordination study software, certifying compliance with IEEE 399.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Studies shall be performed using commercially developed and distributed software designed specifically for power system analysis.

B. Software algorithms shall comply with requirements of standards and guides specified in this Section.
C. Manual calculations are unacceptable.

D. Power System Analysis Software Qualifications:
   1. Computer program shall be designed to perform coordination studies or have a function, component, or add-on module designed to perform coordination studies.
   2. Computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society’s Certified Software Development Professional certification.

E. Power Systems Analysis Specialist Qualifications: Professional engineer licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

F. Field Adjusting Agency Qualifications:
   1. Employer of a NETA ETT-Certified Technician Level III responsible for all field adjusting of the Work.
   2. A member company of NETA.
   3. Acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 POWER SYSTEM ANALYSIS SOFTWARE DEVELOPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. ESA Inc.
   2. SKM Systems Analysis, Inc.

B. Comply with IEEE 242 and IEEE 399.

C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory" features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.

2.2 COORDINATION STUDY REPORT CONTENTS

A. Executive summary of study findings.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of results.

C. One-line diagram of modeled power system, showing the following:
   1. Protective device designations and ampere ratings.
   2. Conductor types, sizes, and lengths.
   3. Transformer kilovolt ampere (kVA) and voltage ratings.
   4. Motor and generator designations and kVA ratings.
5. Switchgear, switchboard, motor-control center, and panelboard designations.
6. Any revisions to electrical equipment required by the study.
7. Study Input Data: As described in "Power System Data" Article.

D. Protective Device Coordination Study:

1. Report recommended settings of protective devices, ready to be applied in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective devices when available. Run study with variable frequency drives in bypass.
   a. Phase and Ground Relays:
      1) Device tag.
      2) Relay current transformer ratio and tap, time dial, and instantaneous pickup value.
      3) Recommendations on improved relaying systems, if applicable.
   b. Circuit Breakers:
      1) Adjustable pickups and time delays (long time, short time, and ground).
      2) Adjustable time-current characteristic.
      3) Adjustable instantaneous pickup.
      4) Recommendations on improved trip systems, if applicable.
   c. Fuses: Show current rating, voltage, and class.

E. Time-Current Coordination Curves: Determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

1. Device tag and title, one-line diagram with legend identifying the portion of the system covered.
2. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.
3. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
4. Plot the following listed characteristic curves, as applicable:
   a. Power utility's overcurrent protective device.
   b. Low-voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
   c. Low-voltage equipment circuit-breaker trip devices, including manufacturer's tolerance bands.
   d. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves.
   e. Ground-fault protective devices.
   f. The largest feeder circuit breaker in each motor-control center and panelboard.

5. Maintain selectivity for tripping currents caused by overloads.
6. Provide adequate time margins between device characteristics such that selective operation is achieved.
7. Comments and recommendations for system improvements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance of the Work. Devices to be coordinated are indicated on Drawings.

1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.2 POWER SYSTEM DATA

A. Obtain all data necessary for conduct of the overcurrent protective device study.

1. Verify completeness of data supplied in one-line diagram on Drawings. Call any discrepancies to Engineer's attention.
2. For equipment included as Work of this Project, use characteristics submitted under provisions of action submittals and information submittals for this Project.

B. Gather and tabulate all required input data to support the coordination study. List below is a guide. Comply with recommendations in IEEE 551 for the amount of detail required to be acquired in the field. Field data gathering shall be under direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification.

3.3 COORDINATION STUDY

A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination time intervals.

B. Comply with IEEE 399 for general study procedures.

C. Base study on device characteristics supplied by device manufacturer.

D. Begin analysis at the service, extending down to system overcurrent protective devices as follows:

1. To all line voltage panelboards

E. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

F. Transformer Primary Overcurrent Protective Devices:

1. Device shall not operate in response to the following:
a. Inrush current when first energized.
b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.

2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.

G. Motor Protection:

1. Select protection for low-voltage motors according to IEEE 242 and NFPA 70.
2. Select protection for motors served at voltages more than 600 V according to IEEE 620.

H. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and protection recommendations in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

I. Generator Protection: Select protection according to manufacturer's written instructions and to IEEE 242.

J. Include the ac fault-current decay from induction motors and apply to low- and medium-voltage, three-phase ac systems. Also account for fault-current dc decrement, to address asymmetrical requirements of interrupting equipment.

K. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and a single line-to-ground fault at each equipment indicated on one-line diagram.

1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

L. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to short-circuit ratings.
2. Adequacy of switchgear, motor-control centers, and panelboard bus bars to withstand short-circuit stresses.
3. Include in the report identification of any protective device applied outside its capacity.

3.4 FIELD ADJUSTING

A. Adjust relay and protective device settings according to recommended settings provided by the coordination study. Field adjustments shall be completed by the engineering service division of equipment manufacturer under the "Startup and Acceptance Testing" contract portion.

B. Make minor modifications to equipment as required to accomplish compliance with short-circuit and protective device coordination studies.

C. Testing and adjusting shall be by a full-time employee of the Field Adjusting Agency, who holds NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification.
1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters. Perform NETA tests and inspections for all adjustable overcurrent protective devices.

3.5 DEMONSTRATION

A. Engage Power Systems Analysis Specialist to train Owner's maintenance personnel in the following:

1. Acquaint personnel in fundamentals of operating the power system in normal and emergency modes.
2. Hand-out and explain the coordination study objectives, study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpreting time-current coordination curves.
3. For Owner's maintenance staff certified as NETA ETT-Certified Technicians Level III or NICET Electrical Power Testing Level III Technicians, teach how to adjust, operate, and maintain overcurrent protective device settings.

END OF SECTION 260573.16
SECTION 260573.19 - ARC-FLASH HAZARD ANALYSIS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes a computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

1.2 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Study Submittals: Submit the following submittals after the approval of system protective devices submittals. Submittals shall be in digital form:

1. Arc-flash study input data, including completed computer program input data sheets.
2. Arc-flash study report; signed, dated, and sealed by Power Systems Analysis Specialist.
3. Submit study report for action prior to receiving final approval of distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that selection of devices and associated characteristics is satisfactory.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data:

1. For Power Systems Analysis Software Developer.
2. For Power System Analysis Specialist.
3. For Field Adjusting Agency.

B. Product Certificates: For arc-flash hazard analysis software, certifying compliance with IEEE 1584 and NFPA 70E.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Study shall be performed using commercially developed and distributed software designed specifically for power system analysis.

B. Software algorithms shall comply with requirements of standards and guides specified in this Section.

C. Manual calculations are unacceptable.

D. Power System Analysis Software Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
1. Computer program shall be designed to perform arc-flash analysis or have a function, component, or add-on module designed to perform arc-flash analysis.
2. Computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society’s Certified Software Development Professional certification.

E. Power Systems Analysis Specialist Qualifications: Professional engineer in charge of performing the arc-flash study, analyzing the arc flash, and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

F. Arc-Flash Study Certification: Arc-Flash Study Report shall be signed and sealed by Power Systems Analysis Specialist.

G. Field Adjusting Agency Qualifications:
   1. Employer of a NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification responsible for all field adjusting of the Work.
   2. A member company of NETA.
   3. Acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS
   A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. ESA Inc.
      2. SKM Systems Analysis, Inc.
   B. Comply with IEEE 1584 and NFPA 70E.
   C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory" features as listed in IEEE 399.

2.2 ARC-FLASH STUDY REPORT CONTENT
   A. Executive summary of study findings.
   B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of results.
   C. One-line diagram, showing the following:
      1. Protective device designations and ampere ratings.
      2. Conductor types, sizes, and lengths.
      3. Transformer kilovolt ampere (kVA) and voltage ratings, including derating factors and environmental conditions.
      4. Motor and generator designations and kVA ratings.
      5. Switchgear, switchboard, motor-control center, panelboard designations, and ratings.
   D. Study Input Data: As described in "Power System Data" Article.
E. Short-Circuit Study Output Data: As specified in "Short-Circuit Study Output Reports" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260573.13 "Short-Circuit Studies."

F. Protective Device Coordination Study Report Contents: As specified in "Coordination Study Report Contents" Article in Section 260573.16 "Coordination Studies."

G. Arc-Flash Study Output Reports:

1. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each equipment location included in the report:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. No AC Decrement (NACD) ratio.
   e. Equivalent impedance.
   f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
   g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

H. Incident Energy and Flash Protection Boundary Calculations:

1. Arcing fault magnitude.
2. Protective device clearing time.
3. Duration of arc.
5. Restricted approach boundary.
7. Working distance.
8. Incident energy.

I. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of computer printout.

2.3 ARC-FLASH WARNING LABELS

A. Comply with requirements in Section 260553 "Identification for Electrical Systems" for self-adhesive equipment labels. Produce a 3.5-by-5-inch self-adhesive equipment label for each work location included in the analysis.

B. Label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:

1. Location designation.
2. Nominal voltage.
3. Protection boundaries.
   a. Arc-flash boundary.
   b. Restricted approach boundary.
   c. Limited approach boundary.
4. Arc flash PPE category.
5. Required minimum arc rating of PPE in Cal/cm squared.
6. Available incident energy.
7. Working distance.
8. Engineering report number, revision number, and issue date.

C. Labels shall be machine printed, with no field-applied markings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals. Proceed with arc-flash study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to arc-flash study may not be used in study.

3.2 ARC-FLASH HAZARD ANALYSIS

A. Comply with NFPA 70E and its Annex D for hazard analysis study.

B. Preparatory Studies: Perform the Short-Circuit and Protective Device Coordination studies prior to starting the Arc-Flash Hazard Analysis.

2. Coordination Study Report Contents: As specified in "Coordination Study Report Contents" Article in Section 260573.16 "Coordination Studies."

C. Calculate maximum and minimum contributions of fault-current size.

1. Maximum calculation shall assume a maximum contribution from the utility and shall assume motors to be operating under full-load conditions.
2. Calculate arc-flash energy at 85 percent of maximum short-circuit current according to IEEE 1584 recommendations.
3. Calculate arc-flash energy at 38 percent of maximum short-circuit current according to NFPA 70E recommendations.
4. Calculate arc-flash energy with the utility contribution at a minimum and assume no motor contribution.

D. Calculate the arc-flash protection boundary and incident energy at locations in electrical distribution system where personnel could perform work on energized parts.

E. Include low-voltage equipment locations.

F. Calculate the limited, restricted, and prohibited approach boundaries for each location.

G. Incident energy calculations shall consider the accumulation of energy over time when performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators shall be decremented as follows:

1. Fault contribution from induction motors shall not be considered beyond three to five cycles.
H. Arc-flash energy shall generally be reported for the maximum of line or load side of a circuit breaker. However, arc-flash computation shall be performed and reported for both line and load side of a circuit breaker as follows:

1. When the circuit breaker is in a separate enclosure.
2. When the line terminals of the circuit breaker are separate from the work location.

I. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

3.3 POWER SYSTEM DATA

A. Obtain all data necessary for conduct of the arc-flash hazard analysis.

1. Verify completeness of data supplied on one-line diagram on Drawings and under "Preparatory Studies" Paragraph in "Arc-Flash Hazard Analysis" Article. Call discrepancies to Architect's attention.
2. For new equipment, use characteristics from approved submittals under provisions of action submittals and information submittals for this Project.

3.4 LABELING

A. Apply one arc-flash label on the front cover of each section of the equipment and on side or rear covers with accessible live parts and hinged doors or removable plates for each equipment included in the study. Base arc-flash label data on highest values calculated at each location.

B. Each piece of equipment listed below shall have an arc-flash label applied to it:

1. Motor-control center.
2. Low-voltage switchboard.
3. Switchgear.
4. Medium-voltage switch.
5. Medium voltage transformers
6. Low voltage transformers.
7. Panelboard and safety switch.

C. Note on report for record the location of equipment where the personnel could be exposed to arc-flash hazard during their work.

1. Indicate arc-flash energy.
2. Indicate protection level required.

3.5 APPLICATION OF WARNING LABELS

A. Install arc-flash warning labels under the direct supervision and control of Power System Analysis Specialist.

3.6 DEMONSTRATION

A. Engage Power Systems Analysis Specialist to train Owner's maintenance personnel in potential arc-flash hazards associated with working on energized equipment and the significance of arc-flash warning labels.

END OF SECTION 260573.19
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes pad-mounted, liquid-filled, medium-voltage distribution transformers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For pad-mounted, liquid-filled, medium-voltage transformers.

1. Include plans and elevations showing major components and features.
2. Include single-line diagram.
3. Manufacturer's published time-current curves of the transformer high-voltage fuses, with transformer damage curve, inrush curve, and thru fault current indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Source quality-control reports.

B. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

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

B. Comply with IEEE C2.

C. Comply with IEEE C57.12.00.
2.2 PERFORMANCE REQUIREMENTS

A. Windings Material: Copper.

B. Surge Arresters: Comply with IEEE C62.11, Distribution Class; metal-oxide-varistor type, fully shielded, separable-elbow type, suitable for plugging into the inserts provided in the high-voltage section of the transformer. Connected in each phase of incoming circuit and ahead of any disconnecting device.

C. Winding Connections: The connection of windings and terminal markings shall comply with IEEE C57.12.70.

D. Insulation: Transformer kVA rating shall be as follows: The average winding temperature rise above a 30 deg C ambient temperature shall not exceed 65 deg C and 80 deg C hottest-spot temperature rise at rated kVA when tested according to IEEE C57.12.90, using combination of connections and taps that give the highest average winding temperature rise.

E. Tap Changer: External handle, for de-energized operation.

F. Enclosure Integrity: Comply with IEEE C57.12.28 for pad-mounted enclosures that contain energized electrical equipment in excess of 600 V that may be exposed to the public.

G. Mounting: An integral skid mounting frame, suitable to allow skidding or rolling of transformer in any direction, and with provision for anchoring frame to pad.

H. Insulating Liquids:
   1. Mineral Oil: ASTM D3487, Type II, and tested for compliance with ASTM D117.

I. Corrosion Protection:
   1. Transformer coating system shall be factory applied, complying with requirements of IEEE C57.12.28, in manufacturer's standard color green.

2.3 THREE-PHASE TRANSFORMERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. ABB.
   2. Cooper Industries, Inc.
   3. Eaton.
   4. Howard Industries, Inc.

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

C. Compartment Construction:
1. Double-Compartment Construction: Individual compartments for high- and low-voltage sections, formed by steel isolating barriers that extend full height and depth of compartments, with hinged, lift-off doors and three-point latching, with a stop in the open position and provision for padlocking.

D. Primary Fusing: Designed and rated to provide thermal protection of transformer by sensing overcurrent and high liquid temperature.

1. 150-kV BIL current-limiting fuses, conforming to requirements of IEEE C37.47.
2. Interrupting Rating: 50,000 rms A symmetrical at system voltage.
3. Fuse Assembly: Bayonet-type, liquid-immersed, expulsion fuses in series with liquid-immersed, partial-range, current-limiting fuses. Bayonet fuse shall sense both high currents and high oil temperature to provide thermal protection to the transformer.
4. Provide bayonet fuse assembly with an oil retention valve and an external drip shield inside the housing to eliminate or minimize oil spills. Valve shall close when fuse holder is removed and an external drip shield is installed.
5. Provide a conspicuously displayed warning adjacent to bayonet fuse(s), cautioning against removing or inserting fuses unless transformer has been de-energized and tank pressure has been released.

E. High-Voltage Section: Dead-front design.

1. To connect primary cable, use separable insulated connectors. Bushings shall be one-piece units, with ampere and BIL ratings the same as connectors.
2. Bushing inserts:
   a. Conform to the requirements of IEEE 386.
   b. Rated at 200 A, with voltage class matching connectors. Provide a parking stand near each bushing well.
   c. Provide insulated protective caps for insulating and sealing out moisture from unused bushing inserts.
4. Dead-front surge arresters.
5. Tap-changer operator.

F. Low-Voltage Section:

1. Bushings with spade terminals drilled for terminating the number of conductors indicated on the Drawings, and the lugs that comply with requirements of Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

G. Capacities and Characteristics:

1. Power Rating (kVA): As Indicated on Drawings.
2. Voltage Ratings: As indicated on drawings
3. Taps: Comply with IEEE C57.12.26 requirements.
4. Transformer BIL (kV): Comply with IEEE C57.12.26 requirements.
5. Minimum Tested Impedance (Percent at 85 deg C): 4.03.

H. Transformer Accessories:

1. Drain and filter connection.
2. Filling and top filter press connections.
3. Pressure-vacuum gauge.
4. Dial-type analog thermometer with alarm contacts.
5. Magnetic liquid level indicator with high and low alarm contacts.
6. Automatically resetting pressure-relief device. Device flow shall be as recommended by manufacturer.
7. Stainless-steel ground connection pads.
9. Sudden pressure relay for remote alarm or trip when internal transformer pressure rises at field-set rate. Provide with seal-in delay.

2.4 SERVICE CONDITIONS

A. Transformers shall be suitable for operation under service conditions specified as usual service conditions in IEEE C57.12.00.

2.5 WARNING LABELS AND SIGNS

A. Comply with requirements for labels and signs specified in Section 260553 "Identification for Electrical Systems."

1. High-Voltage Warning Label: Provide self-adhesive warning signs on outside of high-voltage compartment door(s). Sign legend shall be "DANGER HIGH VOLTAGE" printed in two lines of nominal 2-inch- (50-mm-) high letters. The word "DANGER" shall be in white letters on a red background and the words "HIGH VOLTAGE" shall be in black letters on a white background.
2. Arc Flash Warning Label: Provide self-adhesive warning signs on outside of high-voltage compartment door(s), warning of potential electrical arc flash hazards and appropriate personal protective equipment required.

2.6 SOURCE QUALITY CONTROL

A. Provide manufacturer's certificate that the transformer design tests comply with IEEE C57.12.90.

1. Perform the following factory-certified routine tests on each transformer for this Project:
   a. Resistance.
   b. Turns ratio, polarity, and phase relation.
   c. Transformer no-load losses and excitation current at 100 percent of ratings.
   d. Transformer impedance voltage and load loss.
   e. Operation of all devices.
   f. Lightning impulse.
   g. Low frequency.
   h. Leak.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and space conditions for compliance with requirements for pad-mounted, liquid-filled, medium-voltage transformers and other conditions affecting performance of the Work.

B. Examine roughing-in of conduits and grounding systems to verify the following:
   1. Wiring entries comply with layout requirements.
   2. Entries are within conduit-entry tolerances specified by manufacturer, and no feeders will cross section barriers to reach load or line lugs.

C. Examine concrete bases for suitable conditions for transformer installation.

D. Verify that ground connections are in place and that requirements in Section 260526 "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at transformer location.

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

3.2 INSTALLATION

A. Install transformers on cast-in-place concrete equipment base(s). Indicate vibration isolation and seismic control device type and minimum deflection in supported equipment schedule on Drawings.

B. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and IEEE C2.

3.3 CONNECTIONS

A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
   1. For counterpoise, use tinned bare copper cable not smaller than No. 4/0 AWG, buried not less than 30 inches (765 mm) below grade interconnecting the grounding electrodes. Bond surge arrester and neutrals directly to transformer enclosure and then to grounding electrode system with bare copper conductors, sized as shown. Keep lead lengths as short as practicable, with no kinks or sharp bends.
   2. Make joints in grounding conductors and loops by exothermic weld or compression connector.
   3. Terminate all grounding and bonding conductors on a common equipment grounding terminal on transformer enclosure.
   4. Complete transformer tank grounding and lightning arrester connections prior to making any other electrical connections.

B. Terminate medium-voltage cables in incoming section of transformers.
3.4 SIGNS AND LABELS

A. Comply with installation requirements for labels and signs specified in Section 260553 "Identification for Electrical Systems."

B. Install warning signs as required to comply with 29 CFR 1910.269.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. General Field-Testing Requirements:
   b. After installing transformer but before primary is energized, verify that grounding system at the transformer is tested at specified value or less.

3.6 DEMONSTRATION

A. Train Owner’s maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 261219
1.1 SUMMARY

A. Section Includes:
   1. Service and distribution switchboards rated 600 V and less.
   2. Surge protection devices.
   3. Disconnecting and overcurrent protective devices.
   4. Instrumentation.
   5. Control power.
   6. Accessory components and features.
   7. Identification.

1.2 ACTION SUBMITTALS

A. Product Data: For each switchboard, overcurrent protective device, surge protection device, ground-fault protector, accessory, and component.

B. Shop Drawings: For each switchboard and related equipment.
   1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
   2. Detail enclosure types for types other than NEMA 250, Type 1.
   3. Detail bus configuration, current, and voltage ratings.
   5. Detail utility company's metering provisions with indication of approval by utility company.
   6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
   7. Include schematic and wiring diagrams for power, signal, and control wiring.

C. Delegated Design Submittal:
   1. For arc-flash hazard analysis.
   2. For arc-flash labels.

1.3 Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.
1.5 QUALITY ASSURANCE
A. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.
B. Testing Agency Qualifications: Member company of NETA or an NRTL.

1.6 FIELD CONDITIONS
A. Environmental Limitations:
   1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above switchboards is complete, and [temporary] HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
   2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
      a. Ambient Temperature: Not exceeding 104 deg F (40 deg C).

1.7 WARRANTY
A. Manufacturer's Warranty: Manufacturer agrees to repair or replace switchboard enclosures, buswork, overcurrent protective devices, accessories, and factory installed interconnection wiring that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Three years from date of Substantial Completion.
B. Manufacturer's Warranty: Manufacturer's agrees to repair or replace surge protection devices that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SWITCHBOARDS
A. Basis-of-Design Product: Subject to compliance with requirements, provide Square D; by Schneider Electric; or a comparable product by one of the following:
   1. Eaton.
B. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
C. Comply with NEMA PB 2.
D. Comply with NFPA 70.
E. Comply with UL 891.

F. Front-Connected, Front-Accessible Switchboards:
   1. Main Devices: Panel mounted.
   3. Sections front and rear aligned.

G. Nominal System Voltage: As scheduled

H. Main-Bus Continuous: As Scheduled.

I. Outdoor Enclosures: Type 3R.
   1. Finish: Factory-applied finish in manufacturer's standard color; undersurfaces treated with corrosion-resistant undercoating.
   2. Enclosure: Flat roof; bolt-on rear covers for each section, with provisions for padlocking.

J. Service Entrance Rating: Switchboards intended for use as service entrance equipment shall contain from one to six service disconnecting means with overcurrent protection, a neutral bus with disconnecting link, a grounding electrode conductor terminal, and a main bonding jumper.

K. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.

L. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.

M. Buses and Connections: Three phase, four wire unless otherwise indicated.
   1. Provide phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed from the front of the switchboard.
   3. Tin-plated aluminum feeder circuit-breaker line connections.
   4. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with compression connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
   5. Ground Bus: 1/4-by-2-inch- (6-by-50-mm-) hard-drawn copper of 98 percent conductivity, equipped with compression connectors for feeder and branch-circuit ground conductors.
   6. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
   7. Disconnect Links:
      a. Isolate neutral bus from incoming neutral conductors.
      b. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or separately derived systems.
   8. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with compression connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.

N. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.
2.2 SURGE PROTECTION DEVICES

A. SPDs: Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 1449, Type 1.

B. Features and Accessories:

1. Integral disconnect switch.
2. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
3. Indicator light display for protection status.
4. Surge counter.

C. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 200 kA. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

D. Protection modes and UL 1449 VPR for grounded wye circuits with 208Y/120 V, three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: 700 V for 208Y/120 V.
2. Line to Ground: 1200 V for 208Y/120 V.
3. Line to Line: 1000 V for 208Y/120 V.

E. Protection modes and UL 1449 VPR for 240/120 V, single-phase, three-wire circuits shall not exceed the following:

1. Line to Neutral: 700 V.
2. Line to Ground: 1000 V.
3. Line to Line: 1000 V.

F. SCCR: Equal or exceed 100 kA.

G. Nominal Rating: 20 kA.

2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replaceable electronic trip; and the following field-adjustable settings:
   a. Instantaneous trip.
   b. Long- and short-time pickup levels.
   c. Long and short time adjustments.
   d. Ground-fault pickup level, time delay, and I squared t response.
4. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
5. **Ground-Fault Equipment Protection (GFEP) Circuit Breakers:** Class B ground-fault protection (30-mA trip).

6. **MCCB Features and Accessories:**

   a. Standard frame sizes, trip ratings, and number of poles.
   b. Lugs: Compression style, suitable for number, size, trip ratings, and conductor material.
   c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
   d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

**B. Insulated-Case Circuit Breaker (ICCB):** 80 percent rated, sealed, insulated-case power circuit breaker with interrupting capacity rating to meet available fault current.

1. Fixed circuit-breaker mounting.
2. Two-step, stored-energy closing.
3. Standard-function, microprocessor-based trip units with interchangeable rating plug, trip indicators, and the following field-adjustable settings:

   a. Instantaneous trip.
   b. Time adjustments for long- and short-time pickup.
   c. Ground-fault pickup level, time delay, and I squared t response.

C. Fuses are specified in Section 262813 "Fuses."

### 2.4 INSTRUMENTATION

**A. Multifunction Digital-Metering Monitor:** Microprocessor-based unit suitable for three- or four-wire systems and with the following features:

1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:

   a. Phase Currents, Each Phase: Plus or minus 0.5 percent.
   b. Phase-to-Phase Voltages, Three Phase: Plus or minus 0.5 percent.
   c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 0.5 percent.
   d. Megawatts: Plus or minus 1 percent.
   e. Megavars: Plus or minus 1 percent.
   f. Power Factor: Plus or minus 1 percent.
   g. Frequency: Plus or minus 0.1 percent.
   h. Accumulated Energy, Megawatt Hours: Plus or minus 1 percent; accumulated values unaffected by power outages up to 72 hours.
   i. Megawatt Demand: Plus or minus 1 percent; demand interval programmable from five to 60 minutes.
   j. Contact devices to operate remote impulse-totalizing demand meter.

2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.
2.5 CONTROL POWER

A. Control Circuits: 120-V ac, supplied through secondary disconnecting devices from control-power transformer.

B. Control-Power Fuses: Primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits.

C. Control Wiring: Factory installed, with bundling, lacing, and protection included. Provide flexible conductors for No. 8 AWG and smaller, for conductors across hinges, and for conductors for interconnections between shipping units.

2.6 IDENTIFICATION

A. Service Equipment Label: NRTL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Receive, inspect, handle, and store switchboards according to NECA 400.

B. Install switchboards and accessories according to NECA 400.

C. Equipment Mounting: Install switchboards on concrete base, 4-inch (100-mm) nominal thickness. Comply with requirements for concrete base specified in Section 033000 "Cast-in-Place Concrete."

   1. Install conduits entering underneath the switchboard, entering under the vertical section where the conductors will terminate. Install with couplings flush with the concrete base. Extend 2 inches (50-mm) above concrete base after switchboard is anchored in place.
   2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.
   3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
   4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   5. Install anchor bolts to elevations required for proper attachment to switchboards.
   6. Anchor switchboard to building structure at the top of the switchboard if required or recommended by the manufacturer.

D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, straps and brackets, and temporary blocking of moving parts from switchboard units and components.

E. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.

F. Install filler plates in unused spaces of panel-mounted sections.
G. Install overcurrent protective devices, surge protection devices, and instrumentation.
   1. Set field-adjustable switches and circuit-breaker trip ranges.

H. Comply with NECA 1.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Acceptance Testing:
      a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit. Open control and metering circuits within the switchboard, and remove neutral connection to surge protection and other electronic devices prior to insulation test. Reconnect after test.
      b. Test continuity of each circuit.
   2. Test ground-fault protection of equipment for service equipment per NFPA 70.
   4. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
   5. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

B. Switchboard will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation, and accessories.
END OF SECTION 262413
SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Distribution panelboards.
   2. Lighting and appliance branch-circuit panelboards.

1.2 DEFINITIONS

A. MCCB: Molded-case circuit breaker.
B. SPD: Surge protective device.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of panelboard.
   B. Shop Drawings: For each panelboard and related equipment.
      1. Include dimensioned plans, elevations, sections, and details.
      2. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
      3. Detail bus configuration, current, and voltage ratings.
      4. Short-circuit current rating of panelboards and overcurrent protective devices.
      5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
      6. Include wiring diagrams for power, signal, and control wiring.
      7. Key interlock scheme drawing and sequence of operations.
      8. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards.

1.4 INFORMATIONAL SUBMITTALS

A. Panelboard schedules for installation in panelboards.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 FIELD CONDITIONS

A. Service Conditions: NEMA PB 1, usual service conditions, as follows:
   1. Ambient temperatures within limits specified.
   2. Altitude not exceeding 6600 feet.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.
1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

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

B. Comply with NEMA PB 1.

C. Comply with NFPA 70.

D. Enclosures: Flush and Surface-mounted, dead-front cabinets.
   1. Rated for environmental conditions at installed location.
      a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
      b. Outdoor Locations: NEMA 250, Type 3R.

2. Height: 84 inches maximum.
3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.

E. Incoming Mains Location: Top or Bottom, refer to drawings.

F. Phase, Neutral, and Ground Buses: Hard-drawn copper, 98 percent conductivity.

G. Conductor Connectors: Suitable for use with conductor material and sizes.
   2. Main and Neutral Lugs: Compression type, with a lug on the neutral bar for each pole in the panelboard.
   3. Ground Lugs and Bus-Configured Terminators: Compression type, with a lug on the bar for each pole in the panelboard.
   4. Feed-Through Lugs: Compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
   5. Subfeed (Double) Lugs: Compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

H. NRTL Label: Panelboards shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.

I. Future Devices: Panelboards shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.

2.2 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Square D Series NQ or NF; by Schneider Electric; or a comparable product by one of the following:
1. Square D Series NQ or NF; by Schneider Electric.
2. SIEMENS Industry, Inc.; Energy Management Division – Series P1 or P2.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: Circuit breaker or lugs only.

D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

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

1. Square D; by Schneider Electric.
2. SIEMENS Industry, Inc.; Energy Management Division.
3. Eaton.

B. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers:
   a. Inverse time-current element for low-level overloads.
   b. Instantaneous magnetic trip element for short circuits.
   c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

   1) Ground-fault pickup level, time delay, and I squared T response.

3. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
4. GFEP Circuit Breakers: Class B ground-fault protection (30-mA trip).
5. Arc-Fault Circuit Interrupter Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
7. MCCB Features and Accessories:
   a. Standard frame sizes, trip ratings, and number of poles.
   b. Breaker handle indicates tripped status.
   c. UL listed for reverse connection without restrictive line or load ratings.
   d. Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
   e. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
   f. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
   g. Communication Capability: Circuit-breaker-mounted integral communication module with functions and features compatible with power monitoring and control system specified in Section 262713 "Electrical Metering."
h. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.

i. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in off position.

j. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

2.4 IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.


2.5 ACCESSORY COMPONENTS AND FEATURES

A. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard. Include relay and meter test plugs suitable for testing panelboard meters and switchboard class relays.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install panelboards and accessories according to NECA 407.

C. Mount top of trim 90 inches above finished floor unless otherwise indicated.

D. Mount panelboard cabinet plumb and rigid without distortion of box.

E. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

F. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges.

G. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.

H. Install filler plates in unused spaces.

I. Stub six 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future.

J. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems." Nameplate shall be self-adhesive and screwed to panelboard cover.

D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

E. Install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems" identifying source of remote circuit.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:
   1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
   2. Test continuity of each circuit.

C. Tests and Inspections:
   2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Panelboards will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 FOLLOW-UP SERVICE

A. Infrared Inspection: Perform the survey during periods of maximum possible loading. Remove all necessary covers prior to the inspection.
   1. After Substantial Completion, but not more than 60 days after Final Acceptance, perform infrared inspection of the electrical power connections of the unit substation.
   2. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
3. Instrument: Inspect distribution systems with imaging equipment capable of detecting a minimum temperature difference of 1 deg.C at 30 deg. C.

4. Record of Infrared Inspection: Prepare a certified report that identifies the testing technician and equipment used, and lists the results as follows:
   a. Description of equipment to be tested.
   b. Discrepancies.
   c. Temperature difference between the area of concern and the reference area.
   d. Probable cause of temperature difference.
   e. Areas inspected. Identify inaccessible and unobservable areas and equipment.
   f. Identify load conditions at time of inspection.
   g. Provide photographs and thermograms of the deficient area.

5. Act on inspection results according to the recommendations of NETA ATS, Table 100.18. Correct possible and probable deficiencies as soon as Owner's operations permit. Retest until deficiencies are corrected.

END OF SECTION 262416
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Standard-grade receptacles, 125 V, 20 A.
   2. GFCI receptacles, 125 V, 20 A.
   3. Toggle switches, 120/277 V, 20 A.
   4. Wall plates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
C. Samples: One for each type of device and wall plate specified, in each color specified.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
B. Comply with NFPA 70.
C. RoHS compliant.
D. Comply with NEMA WD 1.
E. Device Color:
   1. Wiring Devices Connected to Normal Power System: Ivory unless otherwise indicated or required by NFPA 70 or device listing.
F. Wall Plate Color: For plastic covers, match device color.
G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.
H. Plug tail devices are not permitted.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Eaton (Arrow Hart).
   b. Hubbell Incorporated; Wiring Device-Kellems.
   c. Leviton Manufacturing Co., Inc.
   d. Pass & Seymour/Legrand (Pass & Seymour).

2. Description: Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.

B. Weather-Resistant Duplex Receptacle, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Eaton (Arrow Hart).
   b. Hubbell Incorporated; Wiring Device-Kellems.
   c. Leviton Manufacturing Co., Inc.
   d. Pass & Seymour/Legrand (Pass & Seymour).

2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
3. Configuration: NEMA WD 6, Configuration 5-20R.
5. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

2.3 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

B. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498 and UL 943 Class A.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.4 TOGGLE SWITCHES, 120/277 V, 20 A

A. Single-Pole Switches, 120/277 V, 20 A:

2.5 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.
   1. Plate-Securing Screws: Metal with head color to match plate finish.
   2. Material for Finished Spaces: 0.035-inch thick, satin-finished, Type 302 stainless steel.
   3. Material for Unfinished Spaces: 0.035-inch thick, satin-finished, Type 302 stainless steel.
   4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:
   1. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
   2. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
   3. Install wiring devices after all wall preparation, including painting, is complete.

C. Device Installation:
   1. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
   2. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

D. Receptacle Orientation:
   1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.

E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical. Group adjacent switches under single, multigang wall plates.

G. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
1. In healthcare facilities, prepare reports that comply with NFPA 99.
2. Test Instruments: Use instruments that comply with UL 1436.
3. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.

C. Wiring device will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 262726
SECTION 262813 - FUSES

1.1 SUMMARY

A. Section Includes:

1. Cartridge fuses rated 600 V ac and less for use in the following:
   a. Control circuits.
   b. Panelboards.
   c. Switchboards.
   d. Enclosed controllers.
   e. Enclosed switches.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Bussmann, an Eaton business.
2. Edison; a brand of Bussmann by Eaton.
3. Littelfuse, Inc.
4. Mersen USA.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

1. Type RK-1: 250 or 600-V, zero- to 600-A rating, 200 kAIC, time delay.
2. Type RK-5: 250 or 600-V, zero- to 600-A rating, 200 kAIC, time delay.
3. Type CC: 600-V, zero- to 30-A rating, 200 kAIC, fast acting.
4. Type J: 600-V, zero- to 600-A rating, 200 kAIC.
5. Type L: 600-V, 601- to 6000-A rating, 200 kAIC.

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

C. Comply with NEMA FU 1 for cartridge fuses.

D. Comply with NFPA 70.

E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.2 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Section 260553 “Identification for Electrical Systems” and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813
SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Molded-case circuit breakers (MCCBs).
4. Enclosures.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.

B. Shop Drawings: For enclosed switches and circuit breakers.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year(s) from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. 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.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

D. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

A. Basis-of-Design Product: Subject to compliance with requirements, provide Square D; by Schneider Electric; or a comparable product by one of the following:

1. Square D; by Schneider Electric.
2. SIEMENS Industry, Inc.; Energy Management Division.
3. Eaton.

B. Type HD, Heavy Duty:

1. Single throw.
2. Three pole.
3. 240 or 600-V ac.
4. Sized as scheduled.
5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. 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; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.

2.3 NONFUSIBLE SWITCHES

A. Basis-of-Design Product: Subject to compliance with requirements, provide Square D; by Schneider Electric; or a comparable product by one of the following:

1. Square D; by Schneider Electric.
2. SIEMENS Industry, Inc.; Energy Management Division.
3. Eaton.

B. Type HD, Heavy Duty, Three Pole, Single Throw, 240 or 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. 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; labeled for copper and aluminum neutral conductors.
   3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
   4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.

D. Basis-of-Design Product: Subject to compliance with requirements, provide Square D; by Schneider Electric; or a comparable product by one of the following:
   1. Square D; by Schneider Electric.
   2. SIEMENS Industry, Inc.; Energy Management Division.
   3. Eaton.

E. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

F. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

G. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated.

H. MCCBs shall be equipped with a device for locking in the isolated position.

I. Lugs shall be suitable for 194 deg F rated wire, sized according to the temperature rating in NFPA 70.

J. Standards: Comply with UL 489 with interrupting capacity to comply with available fault currents.


L. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

M. Features and Accessories:
1. Standard frame sizes, trip ratings, and number of poles.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
3. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
4. 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.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1), gray baked enamel paint, electrodeposited on cleaned, phosphatized galvannealed steel (NEMA 250 Types 3R, 12), or a brush finish on Type 304 stainless steel (NEMA 250 Type 4-4X stainless steel).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

D. Operating Mechanism: The circuit-breaker operating handle shall be directly operable through the front cover of the enclosure (NEMA 250 Type 1). The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

F. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

PART 3 - EXECUTION

3.1 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.

3.2 INSTALLATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
1. Notify Owner no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Owner's written permission.
4. Comply with NFPA 70E.

B. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

C. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

D. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

E. Install fuses in fusible devices.

F. Comply with NFPA 70 and NECA 1.

G. Set field-adjustable circuit-breaker trip ranges as specified in Section 260573.16 "Coordination Studies."

3.3 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections for Switches:

1. Visual and Mechanical Inspection:
   a. Inspect physical and mechanical condition.
   b. Inspect anchorage, alignment, grounding, and clearances.
   c. Verify that the unit is clean.
   d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
   e. Verify that fuse sizes and types match the Specifications and Drawings.
   f. Verify that each fuse has adequate mechanical support and contact integrity.
   g. Inspect bolted electrical connections for high resistance using one of the two following methods:
      1) Use a low-resistance ohmmeter.
         a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

   a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

   h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
   i. Verify correct phase barrier installation.
   j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

2. Electrical Tests:
   a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
   d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
   e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

C. Tests and Inspections for Molded Case Circuit Breakers:
   1. Visual and Mechanical Inspection:
      a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
      b. Inspect physical and mechanical condition.
      c. Inspect anchorage, alignment, grounding, and clearances.
      d. Verify that the unit is clean.
      e. Operate the circuit breaker to ensure smooth operation.
      f. Inspect bolted electrical connections for high resistance using one of the two following methods:

         1) Use a low-resistance ohmmeter.

            a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

   a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

2. Electrical Tests:

   a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

   b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.

   c. Perform a contact/pole resistance test. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

   d. Perform insulation resistance tests on all control wiring with respect to ground. Applied potential shall be 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable. Test duration shall be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values shall be no less than two megohms.

   e. Determine the following by primary current injection:

      1) Long-time pickup and delay. Pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.

      2) Short-time pickup and delay. Short-time pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.

      3) Ground-fault pickup and time delay. Ground-fault pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.

      4) Instantaneous pickup. Instantaneous pickup values shall be as specified and within manufacturer's published tolerances.

   f. Test functionality of the trip unit by means of primary current injection. Pickup values and trip characteristics shall be as specified and within manufacturer's published tolerances.

   g. Perform minimum pickup voltage tests on shunt trip and close coils in accordance with manufacturer's published data. Minimum pickup voltage of the shunt trip and close coils shall be as indicated by manufacturer.

   h. Verify correct operation of auxiliary features such as trip and pickup indicators; zone interlocking; electrical close and trip operation; trip-free, anti-pump function;
and trip unit battery condition. Reset all trip logs and indicators. Investigate units that do not function as designed.

i. Verify operation of charging mechanism. Investigate units that do not function as designed.

3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.
   1. Test procedures used.
   2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
   3. List deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 262816
SECTION 262913.03 - MANUAL AND MAGNETIC MOTOR CONTROLLERS

1.1 SUMMARY

A. Section Includes:
   2. Enclosed full-voltage magnetic motor controllers.
   3. Enclosures.
   4. Accessories.
   5. Identification.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Shop Drawings: For each type of magnetic controller.
   1. Include plans, elevations, sections, and mounting details.
   2. Indicate dimensions, weights, required clearances, and location and size of each field connection.
   3. Wire Termination Diagrams and Schedules: Include diagrams for signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features. Differentiate between manufacturer-installed and field-installed wiring.
   4. Include features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.
   1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
B. UL Compliance: Fabricate and label magnetic motor controllers to comply with UL 508 and UL 60947-4-1.
C. NEMA Compliance: Fabricate motor controllers to comply with ICS 2.
2.2 MANUAL MOTOR CONTROLLERS

A. Motor-Starting Switches (MSS): "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off or on.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Square D; by Schneider Electric; or a comparable product by one of the following:
   a. Square D; by Schneider Electric.
   b. Rockwell Automation, Inc.
   c. SIEMENS Industry, Inc.; Energy Management Division.
   d. Eaton.

2. Standard: Comply with NEMA ICS 2, general purpose, Class A.
3. Configuration: Nonreversing.
4. Surface mounting.
5. Red pilot light.

B. Fractional Horsepower Manual Controllers (FHPMC): "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Square D; by Schneider Electric; or a comparable product by one of the following:
   a. Square D; by Schneider Electric.
   b. Rockwell Automation, Inc.
   c. SIEMENS Industry, Inc.; Energy Management Division.
   d. Eaton.

2. Configuration: Nonreversing.
3. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters matched to nameplate full-load current of actual protected motor; external reset push button.

2.3 ACCESSORIES

A. General Requirements for Control Circuit and Pilot Devices: NEMA ICS 5; factory installed in controller enclosure cover unless otherwise indicated.

1. Push Buttons, Pilot Lights, and Selector Switches: Standard-duty, except as needed to match enclosure type. Heavy-duty or oil-tight where indicated in the controller schedule.
   a. Push Buttons: As indicated in the controller schedule.
   b. Pilot Lights: As indicated in the controller schedule.

2.4 IDENTIFICATION

A. Controller Nameplates: Laminated acrylic or melamine plastic signs, as described in Section 260553 "Identification for Electrical Systems," for each compartment, mounted with corrosion-resistant screws.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Wall-Mounted Controllers: Install magnetic controllers on walls with tops at uniform height indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems" unless otherwise indicated.

C. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.

D. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

E. Setting of Overload Relays: Select and set overloads on the basis of full-load current rating as shown on motor nameplate. Adjust setting value for special motors as required by NFPA 70 for motors that are high-torque, high-efficiency, and so on.

3.2 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

2. Visual and Mechanical Inspection
   a. Compare equipment nameplate data with drawings and specifications.
   b. Inspect physical and mechanical condition.
   c. Inspect anchorage, alignment, and grounding.
   d. Verify the unit is clean.
   e. Inspect contactors:
      1) Verify mechanical operation.
      2) Verify contact gap, wipe, alignment, and pressure are according to manufacturer's published data.
   f. Motor-Running Protection:
      1) Verify overload element rating is correct for its application.
      2) If motor-running protection is provided by fuses, verify correct fuse rating.
   g. Inspect bolted electrical connections for high resistance using one of the two following methods:
      1) Use a low-resistance ohmmeter. Compare bolted connection resistance values with values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

h. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.

3. Electrical Tests

a. For the contactor and circuit breaker, perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Insulation-resistance values shall be according to manufacturer's published data or NETA ATS Table 100.1. In the absence of manufacturer's published data, use Table 100.5. Values of insulation resistance less than those of this table or manufacturer's recommendations shall be investigated and corrected.

b. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.

c. Test motor protection devices according to manufacturer's published data.

d. Test circuit breakers as follows:

1) Operate the circuit breaker to ensure smooth operation.
2) For adjustable circuit breakers, adjust protective device settings according to the coordination study. Comply with coordination study recommendations.

e. Perform operational tests by initiating control devices.

B. Motor controller will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.4 SYSTEM FUNCTION TESTS

A. System function tests shall prove the correct interaction of sensing, processing, and action devices. Perform system function tests after field quality control tests have been completed and all components have passed specified tests.

1. Develop test parameters and perform tests for the purpose of evaluating performance of integral components and their functioning as a complete unit within design requirements and manufacturer's published data.

2. Verify the correct operation of interlock safety devices for fail-safe functions in addition to design function.

3. Verify the correct operation of sensing devices, alarms, and indicating devices.

B. Motor controller will be considered defective if it does not pass the system function tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 262913.03
TOWSON UNIVERSITY
8000 YORK ROAD
BALTIMORE, MARYLAND 21252

PRETTYMAN & SCARBOROUGH HALL AREA

REVISED 100% CD SUBMISSION
JANUARY 11, 2019

CLIENT
TOWSON UNIVERSITY
8000 York Rd.
Baltimore, Maryland 21252
www.towson.edu
410.704.2000

MECHANICAL AND ELECTRICAL ENGINEER
Henry Adams, LLC Consulting Engineers
600 Baltimore Avenue - 4th Floor
Baltimore, Maryland 21204
www.henryadams.com
410.296.6500

DRAWING LIST

G0.1 GENERAL COVER SHEET
G0.2 GENERAL COVER SHEET CONTINUED
A0.1 ABBREVIATIONS, KEYNOTES, AND SYMBOLS
A1.1 PRETTYMAN HALL - BASEMENT FLOOR PLAN
A1.2 PRETTYMAN HALL - FIRST FLOOR PLAN
A1.3 PRETTYMAN HALL - SECOND FLOOR PLAN
A1.4 PRETTYMAN HALL - THIRD FLOOR PLAN
A1.5 SCARBOROUGH HALL - BASEMENT FLOOR PLAN
A1.6 SCARBOROUGH HALL - FIRST FLOOR PLAN
A1.7 SCARBOROUGH HALL - SECOND FLOOR PLAN
A1.8 SCARBOROUGH HALL - THIRD FLOOR PLAN
A2.1 CONSTRUCTION TYPES & TYPICAL DETAILS
A2.2 DOOR & ACCESSORY SCHEDULES & DETAILS
A3.1 SPECIFICATIONS
A3.2 SPECIFICATIONS
M0.1 MECHANICAL COVER SHEET
M0.2 MECHANICAL COVER SHEET
M1.1 PRETTYMAN HALL - FIRST FLOOR PLAN - MECH NEW WORK
M1.2 PRETTYMAN HALL - SECOND FLOOR PLAN - MECH NEW WORK
M1.3 PRETTYMAN HALL - THIRD FLOOR PLAN - MECH NEW WORK
M2.1 SCARBOROUGH HALL - FIRST FLOOR PLAN - MECH NEW WORK
M2.2 SCARBOROUGH HALL - SECOND FLOOR PLAN - MECH NEW WORK
M2.3 SCARBOROUGH HALL - THIRD FLOOR PLAN - MECH NEW WORK
M2.3 MECHANICAL SPECIFICATIONS
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TOWSON UNIVERSITY
Prettyman & Scarborough Halls Air Conditioning

GENERAL COVER SHEET CONTINUED

Project No. 14-U009-H1

Sheet: 2 of 44
ABBREVIATIONS

ABBREVIATIONS APPLY TO ARCHITECTURAL SHEETS ONLY.

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KEY TO MATERIALS

KEY TO SYMBOLS

GENERAL NOTES

1. CONTRACTOR IS SUBJECT TO THE REQUIREMENTS OF ALL CODES, RULES, AND REGULATIONS GOVERNING THE PROJECT AS SET BY FEDERAL, STATE, AND LOCAL AGENCIES, BUILDING CODES, AND THE OWNER.

2. THESE DRAWINGS ARE NOT TO BE TAKEN AS SCALE OR MEASURE.

3. THE INFORMATION RELATING TO THESE DRAWINGS APPEARS TO BE THE EXISTING CONDITIONS BASED ON DRAWINGS AND INFORMATION PROVIDED BY THE OWNER. THE CONTRACTOR MAKES NO REPRESENTATION OR ASSUMPTION THAT THE INFORMATION PROVIDED WILL BE COMPLETE OR ACCURATE. THIS INFORMATION IS TO BE CONSIDERED APPROXIMATE AND PROVIDER ASSUMES NO RESPONSIBILITY FOR ANY ERRORS OR OMISSIONS.

4. PROVIDER REMAINS LIABLE FOR ERRORS AND OMISSIONS OF ALL DRAWINGS OR亿元以上 INFORMATION EVEN IF PROVIDED WITHOUT EXPLICITLY SPECIFYING THE LIMITATION OR IMPLICATION OF LIABILITY.

5. ALL DRAWINGS ARE TO BE KEPT CLEAN AND ORGANIZED.

ABBREVIATIONS, KEYNOTES, & SYMBOLS

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TOWSON UNIVERSITY

Prettyman & Scarborough Halls Air Conditioning

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Prettyman & Scarborough Halls Air Conditioning

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FIRST FLOOR PLAN - PRETTYMAN

CONSTRUCTION NOTES:

1. REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMODATE NEW CHASE.

2. REMOVE EXISTING SHELF.

3. CUT HOLE IN EXISTING PLYWOOD WINDOW INFILL TO ACCOMODATE NEW CONDUIT.

4. FLUSH WOOD DOOR.

5. NEW BULKHEAD ABOVE; SEE TYPICAL DETAIL. COORDINATE SIZE AND LOCATION WITH MEP REQUIREMENTS. REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMMODATE NEW BULKHEAD WHERE SUSPENDED CEILING SYSTEM IS PRESENT. ALIGN WITH EXISTING CEILING GRIDS WHERE POSSIBLE.

6. DEMOLISH PORTION OF EXISTING ACOUSTIC CEILING TILE BULKHEAD AS REQUIRED TO CONSTRUCT NEW BULKHEAD.

7. MECHANICAL EQUIPMENT; SEE MEP.

SCALE OF FEET

1" = 1'-0"
 THIRD FLOOR PLAN - PRETSMAN

CONSTRUCTION NOTES:

1. REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMODATE NEW CHASE.

2. REMOVE EXISTING SHELF.

3. CUT HOLE IN EXISTING PLYWOOD WINDOW INFILL TO ACCOMODATE NEW CONDUIT.

4. FLUSH WOOD DOOR.

5. NEW BULKHEAD ABOVE; SEE TYPICAL DETAIL. COORDINATE SIZE AND LOCATION WITH MEP REQUIREMENTS. REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMMODATE NEW BULKHEAD WHERE SUSPENDED CEILING SYSTEM IS PRESENT. ALIGN WITH EXISTING CEILING GRIDS WHERE POSSIBLE.

6. DEMOLISH PORTION OF EXISTING ACOUSTIC CEILING TILE BULKHEAD AS REQUIRED TO CONSTRUCT NEW BULKHEAD.

7. MECHANICAL EQUIPMENT; SEE MEP.

TOWSON UNIVERSITY
Prettyman & Scarborough Halls Air Conditioning

STAIRWAY #1
STAIRWAY #2
STAIRWAY #3

GWWO INC.
800 WYMAN PARK DRIVE, SUITE 300
BALTIMORE, MARYLAND 21211, 410-332-1009

HENRY ADAMS
Consulting Engineers
600 Baltimore Avenue
Baltimore, Maryland 21204
MECHANICAL, ELECTRICAL & PLUMBING ENGINEERS

8000 York Road
Towson, Maryland 21252-0001
TOWSON UNIVERSITY

43

1/8" = 1'-0"

SCALE OF FEET

CONSTRUCTION NOTES
NOTE # DESCRIPTION
1 REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMODATE NEW CHASE.
2 REMOVE EXISTING SHELF.
3 CUT HOLE IN EXISTING PLYWOOD WINDOW INFILL TO ACCOMODATE NEW CONDUIT.
4 FLUSH WOOD DOOR.
5 NEW BULKHEAD ABOVE; SEE TYPICAL DETAIL. COORDINATE SIZE AND LOCATION WITH MEP REQUIREMENTS. REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMMODATE NEW BULKHEAD WHERE SUSPENDED CEILING SYSTEM IS PRESENT. ALIGN WITH EXISTING CEILING GRIDS WHERE POSSIBLE.
6 DEMOLISH PORTION OF EXISTING ACOUSTIC CEILING TILE BULKHEAD AS REQUIRED TO CONSTRUCT NEW BULKHEAD.
7 MECHANICAL EQUIPMENT; SEE MEP.
Scale: 1/8" = 1' - 0"

1 REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMMODATE NEW CHASE.

2 REMOVE EXISTING SHELF

3 CUT HOLE IN EXISTING PLYWOOD WINDOW INFILL TO ACCOMMODATE NEW CONDUIT.

4 FLUSH WOOD DOOR.

5 NEW BULKHEAD ABOVE; SEE TYPICAL DETAIL. COORDINATE SIZE AND LOCATION WITH MEP REQUIREMENTS. REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMMODATE NEW BULKHEAD WHERE SUSPENDED CEILING SYSTEM IS PRESENT. ALIGN WITH EXISTING CEILING GRIDS WHERE POSSIBLE.

6 DEMOLISH PORTION OF EXISTING ACOUSTIC CEILING BULKHEAD AS REQUIRED TO CONSTRUCT NEW BULKHEAD.

7 MECHANICAL EQUIPMENT; SEE MEP.
**Construction Notes**

<table>
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<tbody>
<tr>
<td>1</td>
<td>REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMODATE NEW CHASE.</td>
</tr>
<tr>
<td>2</td>
<td>REMOVE EXISTING SHELF</td>
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<td>3</td>
<td>CUT HOLE IN EXISTING PLYWOOD WINDOW INFILL TO ACCOMODATE NEW CONDUIT.</td>
</tr>
<tr>
<td>4</td>
<td>FLUSH WOOD DOOR.</td>
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<td>NEW BULKHEAD ABOVE; SEE TYPICAL DETAIL. COORDINATE SIZE AND LOCATION WITH MEP REQUIREMENTS. REMOVE, CUT, AND REINSTALL EXISTING CEILING TILE AND GRID ABOVE TO ACCOMODATE NEW BULKHEAD WHERE SUSPENDED CEILING SYSTEM IS PRESENT. ALIGN WITH EXISTING CEILING GRIDS WHERE POSSIBLE.</td>
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<td>6</td>
<td>DEMOLISH PORTION OF EXISTING ACOUSTIC CEILING TILE BULKHEAD AS REQUIRED TO CONSTRUCT NEW BULKHEAD.</td>
</tr>
<tr>
<td>7</td>
<td>MECHANICAL EQUIPMENT; SEE MEP.</td>
</tr>
</tbody>
</table>

**Scale:** 1/8" = 1' - 0"

**Notes:**
- Prettyman & Scarborough Halls Air Conditioning
- SCARBOROUGH PLAN - FIRST FLOOR PLAN
- FIRST FLOOR PLAN - SCARBOROUGH
- TOWSON UNIVERSITY
3 5/8"
EXTEND ALL WALLS TO BOTTOM OF DECK ABOVE

5/8" ABUSE RESISTANT GYPSUM BOARD
NON-STRUCTURAL METAL STUD @ 16" O.C.
EXISTING CONCRETE FLOOR
TYPICAL PENETRATION - MASONRY WALL

NOTES:
1. MAINTAIN FIRE RESISTANCE RATING FOR RATED CONSTRUCTION.
2. DUCTS, PIPES, AND OTHER PENETRATIONS ARE NOT TO MAKE RIGID CONTACT WITH CMU OR MASONRY. CENTER IN PARTITION OPENING.
3. PROVIDE HANGERS TO SUPPORT DUCTS AND PIPES. DO NOT CARRY WEIGHT ON PARTITION.
4. USE CMU OR BRICK FILLER PIECES TO CLOSE OFF LARGE OPENINGS AROUND DUCTS.
5. SEAL ALL PENETRATIONS WITH RESILIENT SEALANT TO CLOSE GAPS. USE FIRE SEALANT AT RATED PARTITIONS.

EXISTING CONCRETE FLOOR
TYPICAL PENETRATION - CONCRETE FLOOR

NOTES:
1. COMPLY WITH REQUIREMENTS OF UL No. C-AJ-1557 WHERE FLOOR IS CONSTRUCTED AS A FIRE RESISTANT RATED ASSEMBLY.
2. DUCTS, PIPES, AND OTHER PENETRATIONS ARE NOT TO MAKE RIGID CONTACT WITH CONCRETE.

EXISTING CMU WALL
CONDUIT; SEE MEP
SCHEDULE 10 STEEL SLEEVE GROUTED INTO FLOOR
MINERAL WOOL BATT INSULATION PACKED FIRMLY INTO OPENING
1/4" MIN. A/D FIREBARRIER INTUMESCENT SEALANT
1/2" GYPSUM BOARD
2 - 1/2" NON-STRUCTURAL METAL FRAMING @ 16" O.C.
CONDUIT; SEE MEP
J-BEAD
MINIMIZE DEPTH OF BULKHEAD WALL ANGLE, EA SIDE
SUSPENDED ACOUSTIC CEILING TILE 3"
KICKER @ 32" O.C.
6'-8" AFF MIN.
SEE PLANS
EXISTING CONCRETE FLOOR
EXISTING WALL
CONDUIT; SEE MEP
PAINTED GALV. STEEL PIPE FLANGE. COLOR TO MATCH EX. PLYWD. EX. PAINTED PLYWD INTERIOR
CONT. SEALANT, EA. SIDE, TYP.

PIPE PENETRATION DETAIL

TYPICAL PENETRATION - MASONRY WALL
TYPICAL PENETRATION - CONCRETE FLOOR
PART 1  GENERAL

1.1 SECTION 07 2100

1.2 SECTION 04 0511

1.3 SUBMITTALS

FIRESTOPPING SYSTEMS

A. Color Cards for Selection

B. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Correct defective

C. Test Reports: Show compliance with specified test requirements; listing cards or sheets provided by UL will be considered sufficient substantiation; provide full reports from

D. Product Data: Manufacturer's data sheets on each product to be used, including: preparation instructions and recommendations, storage and handling requirements and

E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

FOAM BOARD INSULATION MATERIALS

A. Adhesive: Type recommended by insulation manufacturer for application.

B. Open Cell: 40 to 50 percent larger in diameter than joint width.

C. Insulation Fasteners: Appropriate for purpose intended.

D. Insulation Fasteners: Appropriate for purpose intended.

E. In sound rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction;

F. Part scheduling sequence indicated in DHI (H&S), unless otherwise indicated.

G. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing

H. Hardware Selection and Location: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI 100) in accordance

I. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI

J. Door is locked at all times, retract latchbolt with a key and then door closes and relocks.

K. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated

L. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

M. Door hardware sets provided represent the design intent, they are only a guideline and should not be considered a detailed or complete hardware schedule.

N. Deadlocking latchbolt.

O. Code F86; Storeroom Lock: Outside knob/lever always locked/rigid. Latchbolt retracted by key in outside knob/lever or by rotating inside knob/lever. Inside

P. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated

Q. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

R. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated

S. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

T. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

U. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

V. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

W. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

X. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

Y. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

Z. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and

2.1 BOMBAY ROYAL CHINOSERIE

2.2 BOMBAY ROYAL CHINOSERIE

2.3 BOMBAY ROYAL CHINOSERIE

2.4 BOMBAY ROYAL CHINOSERIE
PART 1 GENERAL
SECTION 09 2116

INTERIOR PAINT SCHEDULE: (PRODUCT NUMBERS LISTED HEREINAFTER ARE THOSE OF SHERWIN WILLIAMS PAINTS UNLESS SPECIFICALLY NOTED. THE LISTING CONTAINS SPECIFIC INFORMATION ON THE MANUFACTURERS, SUBMITTALS, AND ACCESSORIES PERMITTED TO BE USED IN THE CONSTRUCTION PROJECT.

1.1 Paints and Coatings

A. Provide paints and coatings prepared as specified in ASTM E2031 or E2031M, where in minimum parts in place, under specified conditions.

B. Materials:

1. Provide materials that are commercial quality.

2. Provide materials that are non-toxic and non-hazardous.

3. Provide materials that are resistant to chemicals and solvents.

4. Provide materials that are resistant to abrasion and wear.

5. Provide materials that are resistant to UV radiation.

6. Provide materials that are resistant to moisture and humidity.

7. Provide materials that are resistant to temperature changes.

8. Provide materials that are resistant to fire and smoke.

9. Provide materials that are resistant to biological contamination.

10. Provide materials that are resistant to electrical discharges.

B. Application:

1. Provide application of paint and coatings per manufacturer's recommendations.

2. Provide application of paint and coatings per ASTM D4427.

3. Provide application of paint and coatings per ASTM D5101.

4. Provide application of paint and coatings per ASTM D5207.

5. Provide application of paint and coatings per ASTM D5592.

6. Provide application of paint and coatings per ASTM D6337.

7. Provide application of paint and coatings per ASTM D6570.

8. Provide application of paint and coatings per ASTM D6975.

9. Provide application of paint and coatings per ASTM D7000.


C. Submittals:

1. Provide submittals per manufacturer's recommendations.

2. Provide submittals per ASTM D4427.

3. Provide submittals per ASTM D5101.

4. Provide submittals per ASTM D5207.

5. Provide submittals per ASTM D5592.

6. Provide submittals per ASTM D6337.

7. Provide submittals per ASTM D6570.

8. Provide submittals per ASTM D6975.

9. Provide submittals per ASTM D7000.


D. Accessories:

1. Provide accessories per manufacturer's recommendations.

2. Provide accessories per ASTM D4427.

3. Provide accessories per ASTM D5101.

4. Provide accessories per ASTM D5207.

5. Provide accessories per ASTM D5592.

6. Provide accessories per ASTM D6337.

7. Provide accessories per ASTM D6570.

8. Provide accessories per ASTM D6975.

9. Provide accessories per ASTM D7000.

10. Provide accessories per ASTM D7294.

END OF SECTION

SECTION 09 5100

PART 2 PRODUCTS

1.1 Gypsum Board Assemblies

A. Submittals:

1. Provide submittals per manufacturer's recommendations.

2. Provide submittals per ASTM D4427.

3. Provide submittals per ASTM D5101.

4. Provide submittals per ASTM D5207.

5. Provide submittals per ASTM D5592.

6. Provide submittals per ASTM D6337.

7. Provide submittals per ASTM D6570.

8. Provide submittals per ASTM D6975.

9. Provide submittals per ASTM D7000.


B. Accessories:

1. Provide accessories per manufacturer's recommendations.

2. Provide accessories per ASTM D4427.

3. Provide accessories per ASTM D5101.

4. Provide accessories per ASTM D5207.

5. Provide accessories per ASTM D5592.

6. Provide accessories per ASTM D6337.

7. Provide accessories per ASTM D6570.

8. Provide accessories per ASTM D6975.

9. Provide accessories per ASTM D7000.

10. Provide accessories per ASTM D7294.

END OF SECTION

SECTION 09 9000

PART 1 GENERAL

SECTION 09 9000

END OF SECTION
SCARBOROUGH HALL - SECOND FLOOR - MECHANICAL NEW WORK

SCALE: 1/8" = 1'-0"
**MECHANICAL SPECIFICATIONS**

**TOWSON UNIVERSITY**

Prettyman & Scarborough Halls Air Conditioning

<table>
<thead>
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GENERAL ELECTRICAL NOTES
G.1
G.2
G.3
G.4
G.5
G.6
G.7
G.8
G.9
G.10
G.11
G.12
G.13
G.14
G.15
G.16
G.17
G.18
G.19
G.20
G.21
G.22
G.23

G.24
G.25
G.26
G.27
G.28
G.29
G.30

PROVIDE LABOR, MATERIALS, TOOLS, EQUIPMENT, COORDINATION, DELEGATED DESIGN AND INCIDENTALS NECESSARY TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
PERFORM WORK AS REQUIRED BY APPLICABLE CODES, REGULATIONS AND LAWS OF LOCAL, STATE AND FEDERAL GOVERNMENTS AND OTHER AUTHORITIES WITH
LAWFUL JURISDICTION.
MATERIAL AND EQUIPMENT SHALL BE LISTED AND LABELED BY NATIONALLY RECOGNIZED TESTING LABORATORIES FOR INTENDED SERVICE.
GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACK CHARGES, AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION.
MAINTAIN RECORD DRAWINGS ON SITE. RECORD SET SHALL BE COMPLETE, CURRENT, AND AVAILABLE UPON REQUEST.
SUBMIT FOR APPROVAL, SHOP DRAWINGS FOR EQUIPMENT AND MATERIALS USED ON PROJECT. OBTAIN APPROVAL BY ENGINEER PRIOR TO PURCHASE OF EQUIPMENT AND
MATERIALS.
REPAIR OR REPLACE DAMAGE TO FACILITIES AND EQUIPMENT AT NO ADDITIONAL EXPENSE TO OWNER.
PATCH AND REPAIR DISTURBED AREAS TO MATCH ADJACENT SURFACES AND FINISHES.
PROVIDE TEMPORARY POWER AND LIGHTING FOR OTHER TRADES AS REQUIRED TO COMPLETE PROJECT IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.
DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS. PROVIDE COMPONENTS INDICATED ON RISER DIAGRAMS WHETHER OR NOT INDICATED ON
PLANS, AND VICE VERSA.
LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND REQUIRE COORDINATION WITH OTHER TRADES. ROUTING OF CONDUIT IS DIAGRAMMATIC IN NATURE AND NOT INTENDED
TO SHOW REQUIRED OFFSETS AND DETAILS. OBTAIN DRAWINGS AND SPECIFICATIONS FROM OTHER TRADES AND COORDINATE WITH OTHER TRADES.
COORDINATE ELECTRICAL INSTALLATION WITH FIELD CONDITIONS. LOCATIONS SHOWN ARE DIAGRAMMATIC AND MAY REQUIRE ADJUSTMENT IN FIELD.
COORDINATE LOCATIONS OF ELECTRICAL DEVICES WITH ARCHITECTURAL ELEVATIONS AND CASEWORK DETAILS PRIOR TO INSTALLATION.
REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION OF MECHANICAL EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS.
REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATED WALLS REQUIRING SPECIAL CONSTRUCTION.
PERMANENTLY LABEL NEW ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO, DEVICE DESIGNATION AND SUPPLY CIRCUIT DESIGNATION.
CORE DRILL CONCRETE WALLS AND FLOORS TO PROVIDE OPENINGS FOR CONDUIT INSTALLATION. MAXIMUM CORE DRILL SIZE SHALL BE 5-INCH DIAMETER. SPACE CORE DRILL
LOCATIONS A MINIMUM OF 6" FROM EACH OTHER, MEASURED FROM CORE DRILL OPENINGS. PROPERLY SEAL OPENINGS ACCORDING TO LOCATION AND APPLICATION.
PROVIDE EACH CIRCUIT WITH A DEDICATED NEUTRAL UNLESS NOTED OTHERWISE.
CONDUIT HOMERUNS SHOWN ON DRAWINGS WITH MORE THAN 3 CURRENT CARRYING CONDUCTORS ARE SHOWN DIAGRAMMATICALLY. DO NOT INSTALL MORE THAN 3
CURRENT CARRYING CONDUCTORS IN A SINGLE RACEWAY UNLESS INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
PROVIDE FIREPROOFING FOR ELECTRICAL PENETRATIONS IN FIRE RATED ASSEMBLIES.
INSTALL ELECTRICAL WORK IN A NEAT AND WORKMANLIKE MANNER, RECTILINEAR TO BUILDING STRUCTURE. INSTALL RACEWAYS TIGHT TO STRUCTURAL CEILING AND AS HIGH
AS POSSIBLE WITHIN CEILING SPACES TO MAINTAIN MAXIMUM AMOUNT OF CLEAR SPACE BELOW RACEWAY.
INSTALL RACEWAYS CONCEALED IN BUILDING FINISHES FOR ALL EXTERIOR MOUNTED DEVICES. DO NOT ROUTE EXPOSED ON BUILDING EXTERIOR.
INSTALL RACEWAYS CONCEALED IN WALLS, UNDER FLOORS, ABOVE CEILINGS, ETC., EXCEPT AS FOLLOWS:
-WHERE SUSPENDED CEILINGS ARE NOT PROVIDED
-IN VERTICAL SHAFTS, ELECTRICAL CLOSETS, ETC., MECHANICAL AND ELECTRICAL EQUIPMENT SPACES WHERE CONCEALMENT IS NOT PRACTICAL.
-AT SURFACE-MOUNT PANELBOARDS IN OTHERWISE FINISHED SPACES LIMITED TO VERTICAL RUNS ABOVE AND BELOW PANEL
-WHERE REQUIRED FOR EQUIPMENT CONNECTIONS
-WHERE SPECIFICALLY INDICATED ON DRAWINGS
OWNER-FURNISHED EQUIPMENT: VERIFY AND COORDINATE ELECTRICAL ROUGH-IN REQUIREMENTS FOR OWNER-FURNISHED EQUIPMENT WITH OWNER PRIOR TO PULLING
CONDUCTORS AND MAKING FINAL CONNECTIONS. LACK OF COORDINATION SHALL NOT JUSTIFY CHANGE ORDERS.
WHERE SUBMITTED EQUIPMENT REQUIRES REVISION TO OVERCURRENT PROTECTION, CONDUIT, AND WIRING, COORDINATE AND MAKE CHANGE TO PROVIDE A COMPLETE
INSTALLATION IN ACCORDANCE WITH APPLICABLE CODES.
PRIOR TO SUBMITTING BID, VISIT SITE AND BECOME THOROUGHLY FAMILIAR WITH EXISTING CONDITIONS AND PROPOSED CONSTRUCTION.
COORDINATE WORK WITH PHASES INDICATED ON DRAWINGS OF OTHER TRADES.
PROVIDE NECESSARY SUPPORTING STRUT CHANNEL AND ALL MISCELLANEOUS HARDWARE FOR MOUNTING ELECTRICAL EQUIPMENT. MAINTAIN NEC WORKING CLEARANCES.
COORDINATE EXACT LOCATION IN FIELD. DO NOT MOUNT ON EQUIPMENT ACCESS PANELS OR IN EQUIPMENT MANUFACTURER'S RECOMMENDED MAINTENANCE CLEARANCES.
PAINT ALL EXPOSED CONDUIT AND RACEWAYS TO MATCH BUILDING SURFACE COLOR.
BOTTOM OF EXPOSED CONDUIT SHALL BE A MINIMUM OF 6'-8" AFF.

WIRING

SYMBOL

5

INDICATES PANELBOARD CIRCUIT DESIGNATION
DEVICE TYPE
(SIMPLEX)
BRANCH CIRCUIT HOMERUN TO PANEL "LP-1", CIRCUITS #1,3,5
NUMBER OF CIRCUITS INDICATED BY QUANTITY OF ARROW
HEADS.

1,3,5(LP-1)

(QUAD)

CONDUIT IN OR UNDER FLOOR

1.

THE WARRANTY PERIOD FOR ALL PRODUCTS AND INSTALLATIONS FOR THE PROJECT IS A MINIMUM OF TWO YEAR, UNLESS SPECIFICALLY EXTENDED FOR CERTAIN ITEMS IN
THE SPECIFICATIONS.

$M

EXPOSED CONDUIT

MOUNTING
HEIGHT

DESCRIPTION

RECEPTACLE (SURFACE MOUNTED)- NEMA CONFIGURATION 5-20R (SHADING
INDICATES CONNECTED TO EMERGENCY/STANDBY POWER CIRCUIT)
SUBSCRIPTS:
GFI: WITH 5mA GROUND FAULT INTERRUPTER
IG: ISOLATED GROUND TYPE
SPD: INTEGRAL SURGE PROTECTION AND INDICATOR LIGHT
TR: TAMPER-RESISTANT
EXP: EXPLOSION PROOF
WP: WEATHER-RESISTANT RECEPTACLE WITH WEATHERPROOF
WHILE-IN-USE COVER

18"

FRACTIONAL HORSEPOWER MANUAL MOTOR SWITCH

46"

JUNCTION BOX (CEILING AND WALL MOUNTED)

8000 York Road
Towson, Maryland 21252-0001

TOWSON UNIVERSITY

HENRY ADAMS
Consulting Engineers
600 Baltimore Avenue
Baltimore, Maryland 21204

- - / AS NOTED

CONDUIT TURNING UP

MECHANICAL ELECTRICAL & P LUMBING E NGINEERS
PANELBOARD

78" TO TOP

SAFETY SWITCH

60" TO TOP

ENCLOSED CIRCUIT BREAKER

60" TO TOP

CONDUIT TURNING DOWN
CONDUIT, CAPPED
GENERAL NOTE: WHERE WIRE SIZE IS INDICATED AT THE
HOMERUN OR ON THE SCHEDULE TO BE LARGER THAN
THE SPECIFIED MINIMUM PROVIDE THE INDICATED WIRE SIZE
THROUGHOUT THE ENTIRE BRANCH CIRCUIT.

T#

REFERENCE

,

SECTION DESIGNATION
NUMBER DENOTES SECTION IDENTIFICATION
DRAWING NUMBER WHERE DETAIL IS LOCATED

1
E-1

DETAIL DESIGNATION
NUMBER DENOTES DETAIL IDENTIFICATION
DRAWING NUMBER WHERE DETAIL IS LOCATED

1
E-1

1

SPECIAL NOTE (APPLIES WHERE INDICATED
ON THE DRAWING)

D.1

DRAWING NOTE (APPLIES TO ENTIRE DRAWING)

GENERAL NOTE - APPLIES TO ENTIRE DRAWING SET

G.1

PANELBOARD REFERENCE
EMERGENCY PANEL TYPE PREFIX (IF APPLICABLE)
VOLTAGE (IF APPLICABLE)
PANEL TYPE
FLOOR NUMBER (IF APPLICABLE)
_____
EXAMPLES:
R1
LR1
LR11
LR1A1

RECEPTACLE PANELBOARD, 208/120V, NUMBER 1
RECEPTACLE PANELBOARD, 208/120V, NUMBER 1
RECEPTACLE PANELBOARD, 208/120V, FLOOR 1, NUMBER 1
RECEPTACLE PANELBOARD, 208/120V, FLOOR 1, CLOSET A, NUMBER 1

VOLTAGE:
L = 208/120V OR 240/120V PANELBOARD
H = 480/277V PANELBOARD
PANEL TYPE:
R = RECEPTACLE PANELBOARD
FLOOR NUMBER:
B = BASEMENT
1 = FIRST FLOOR
2 = SECOND FLOOR

MOUNTING HEIGHTS
+

INDICATES DEVICE TO BE MOUNTED
8" ABOVE COUNTERTOP BACKSPLASH
DEVICE TYPE

24"

INDICATES DEVICE MOUNTING HEIGHT ABOVE FINISHED FLOOR
OR ABOVE FINISHED GRADE (AS APPROPRIATE)
DEVICE TYPE

PRESENTATION
ELECTRICAL EQUIPMENT DESIGNATED BY SOLID HEAVY
LINEWEIGHT INDICATES NEW WORK TO BE PROVIDED.

WARRANTY (APPLICABLE TO ALL DIVISIONS)

(DUPLEX)

CONCEALED CONDUIT IN CEILING OR WALLS

GENERAL ELECTRICAL DEMOLITION/RENOVATION NOTES
GD.1 THE FACILITY WILL NOT REMAIN OCCUPIED DURING RENOVATIONS.
GD.2 MINIMIZE OUTAGES. COORDINATE OUTAGES WITH OWNER. PERFORM WORK REQUIRING SUSTAINED EQUIPMENT OUTAGE CONTINUOUSLY AROUND THE CLOCK UNTIL
WORK IS COMPLETE, UNLESS NOTED OTHERWISE.
GD.3 PRIOR TO DEMOLITION, FIELD VERIFY CONDUITS, CONDUCTORS, AND CABLES THAT PASS THROUGH AND SERVE AREAS OUTSIDE THE SCOPE OF WORK. MAINTAIN CONTINUITY
OF SYSTEMS. PROTECT OR RELOCATE SYSTEMS TO PREVENT DAMAGE. RESTORE SYSTEMS TO NORMAL OPERATION. COORDINATE SYSTEM OUTAGES WITH OWNER.
GD.4 IDENTIFY NONFUNCTIONING EQUIPMENT AND DEVICES TO REMAIN AFTER DEMOLITION. NOTIFY OWNER IN WRITING PRIOR TO DEMOLITION. UPON COMPLETION OF WORK, ENSURE
THAT EXISTING EQUIPMENT AND DEVICES OPERATE PROPERLY.
GD.5 IN AREAS REQUIRING THE PERFORMANCE OF WORK OF OTHER TRADES, CAREFULLY DISCONNECT, MAKE SAFE, REMOVE AND STORE ELECTRICAL ITEMS IN PATH OF WORK.
REINSTALL AND RECONNECT SAME AFTER COMPLETION OF OTHER TRADE'S WORK. COORDINATE REMOVAL OF EQUIPMENT WITH OTHER TRADES PRIOR TO DEMOLITION.
GD.6 AFTER DEMOLITION VERIFY AND SUPPORT REMAINING CABLES, WIRES, AND CONDUIT IN ACCORDANCE WITH THE APPLICABLE VERSION OF THE NEC. DISCONNECT, MAKE SAFE
AND REMOVE ABANDONED AND TEMPORARY WIRE WITHIN SPACE.
GD.7 EXISTING CONDITIONS REFLECT GENERAL OBSERVATIONS AND ARE NOT INTENDED TO INDICATE DETAILS OR DIMENSIONS. NO ATTEMPT HAS BEEN MADE TO SHOW ALL
ELECTRICAL EQUIPMENT. VERIFY EXISTING CONDITIONS PRIOR TO PERFORMING WORK. NOTIFY ARCHITECT IN WRITING IF CONDITIONS ARE DISCOVERED THAT
PREVENT EXECUTION OF WORK.
GD.8 PROTECT REMAINING ELECTRICAL SYSTEMS AND COMPONENTS FROM DAMAGE. REMOVE PROTECTIVE MATERIALS UPON COMPLETION OF WORK.
GD.9 IN AREAS NOTED TO REMOVE ELECTRICAL WORK, REMOVE CONDUITS AND ASSOCIATED SUPPORTS BACK TO POINT OF CONCEALMENT AND REMOVE WIRING BACK TO
REMAINING ACTIVE DEVICES OR SOURCE.
GD.10 DISPOSE OF LIGHTING BALLASTS AND CAPACITORS CONTAINING PCB'S, AS DEFINED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA), IN ACCORDANCE WITH APPLICABLE
LOCAL, STATE, FEDERAL AND EPA REGULATIONS.
GD.11 PROVIDE OWNER WITH INVENTORY OF MAJOR ELECTRICAL ITEMS TO BE REMOVED. OWNER WILL SELECT ITEMS TO BE SALVAGED. TURN SALVAGED ITEMS OVER TO OWNER.
ITEMS REJECTED BY THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR. REMOVE DEMOLISHED ITEMS FROM SITE.
GD.12 UPDATE PANELBOARD DIRECTORIES TO INCLUDE MODIFICATIONS BY THIS PROJECT. TRACE CIRCUITS TO IDENTIFY UNLABELED LOADS.
GD.13 REPAIR DISTURBED AREAS TO MATCH EXISTING CONDITIONS.
GD.14 PROVIDE BLANK COVER PLATES FOR DEVICES REMOVED WHEN A REPLACEMENT DEVICE IS NOT INDICATED.
GD.15 MAINTAIN CONTINUITY OF CIRCUITS AND FEEDERS REMAINING AFTER DEMOLITION IN PANELS INDICATED TO BE DEMOLISHED OR REPLACED. EXTEND EXISTING CIRCUITS AND
FEEDERS REMAINING AFTER DEMOLITION TO NEW PANELS. CIRCUIT BREAKER, CONDUIT, AND WIRE SHALL MATCH EXISTING TYPES AND SIZES.
GD.16 PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND CHALLENGES THAT WILL AFFECT DEMOLITION AND CONSTRUCTION. REPORT
DISCREPANCIES TO OWNER DURING BID PROCESS. ADDITIONAL COMPENSATION WILL NOT BE GRANTED FOR WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS.
GD.17 WHERE CIRCUITS ARE REMOVED BACK TO PANELS, ASSOCIATED BREAKERS WILL BE UTILIZED FOR NEW CIRCUITING.

ELECTRICAL LEGEND

ELECTRICAL CONVENTIONS

ELECTRICAL EQUIPMENT DESIGNATED BY SOLID LIGHT
LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN,
UNLESS OTHERWISE INDICATED.
ELECTRICAL EQUIPMENT DESIGNATED BY DASHED HEAVY
LINEWEIGHT REPRESENTS EXISTING EQUIPMENT TO BE
REMOVED AND DISPOSED, UNLESS INDICATED TO BE
REMOUNTED, RELOCATED, OR TURNED OVER TO OWNER.

TRANSFORMER - SIZE AS INDICATED (PAD MOUNTED SEE DETAIL)

--

EQUIPMENT, AS NOTED

--

GROUNDING SYSTEM - GROUND CONNECTION

--

MOLDED CASE CIRCUIT BREAKER (600V AND BELOW)

--

Professional Certification: I hereby certify that these
documents were prepared or approved by me, and
that I am a duly licensed professional engineer
under the laws of the State of Maryland.

TRANSFORMER

--

License No: 41408
Expiration Date: 01/05/2020

GROUNDING SYSTEM WYE GROUNDED NEUTRAL WINDING

--

ELECTRICAL ABBREVIATIONS

No.

Description

Date

1
2
3

50% CD
100% CD
REVISED 100% CD

11-16-18
12-21-18
1-11-19

LV
LSI
LSIG

LOW VOLTAGE
LONG TIME, SHORT TIME, INSTANTANEOUS
LONG TIME, SHORT TIME, INSTANTANEOUS,
GROUND-FAULT

MCB
MCC
MCP
MDP
MH
M/L
MOA
MSP
MTD
MV

MAIN CIRCUIT BREAKER
MOTOR CONTROL CENTER
MOTOR CIRCUIT PROTECTOR
MAIN DISTRIBUTION PANEL
MANHOLE
MAIN LUGS
MULTI OUTLET ASSEMBLY
MOTOR STARTER PANEL
MOUNTED
MEDIUM VOLTAGE

NC
NCEC
NF
NO
NTS

NORMALLY CLOSED
NURSE CALL EQUIP. CABINET
NON-FUSED
NORMALLY OPEN
NOT TO SCALE

OCP
OH

OVERCURRENT PROTECTION
OVERHEAD

EMERGENCY
ELECTRIC BASEBOARD HEATER
EQUIPMENT
EXISTING TO REMAIN
ELECTRIC WATER HEATER
EXISTING

P
PB
PH
PL
PP
PT
PVC

POLE(1P., 2P., 3P.)
PUSH BUTTON
PHASE
PILOT LIGHT
POWER PANEL
POTENTIAL TRANSFORMER
POLYVINYL CHLORIDE

F
FA
FCP
FCU
FDR

FUSED OR FUSIBLE
FIRE ALARM
FIRE ALARM CONTROL PANEL
FAN COIL UNIT
FEEDER

R
RCS
RP
RX

RACEWAY
REMOTE CONTROL SWITCH
RECEPTACLE PANEL
REMOVE EXISTING

GFI
GFEP
GW

GROUND FAULT INTERRUPTER
GROUND FAULT EQUIPMENT PROTECTION
GROUND WIRE

HOA
HP
HPU
HV
HZ

HAND-OFF-AUTOMATIC
HORSE POWER
HEAT PUMP UNIT
HIGH VOLTAGE
HERTZ

SN
SS
ST
SW
SWBD
SWGR
SYM

SOLID NEUTRAL
SAFETY SWITCH
SINGLE-THROW
SWITCH
SWITCHBOARD
SWITCHGEAR
SYMMETRICAL

ICEC
IG

INTERCOM EQUIPMENT CABINET
ISOLATED GROUND

TS
TTB
TYP

TIE SWITCH
TELEPHONE TERMINAL BOARD
TYPICAL

Date

JB

JUNCTION BOX
THOUSAND CIRCULAR MILS
KILO-VOLTS
KILO-VOLT-AMPERE
KILOWATTS

UNDERGROUND
UNIT HEATER
UNLESS OTHERWISE NOTED

Checked By

KCMIL
KV
KVA
KW

UG
UH
UON
V

VOLTS

LAD
LC
LP

LOCATE AS DIRECTED
LOAD CENTER
LIGHTING PANEL

W
WP

WIRE
WEATHER PROOF

XFMR

TRANSFORMER

A
ACH
ACU
AFF
AFG
AHU
AIC
AL
ASYM
ATS

AMPERE
ABOVE CABINET HEIGHT
AIR CONDITIONING UNIT
ABOVE FINISHED FLOOR
ABOVE FINISHED GRADE
AIR HANDLING UNIT
AMPERE INTERRUPTING CAPACITY
ALUMINUM
ASYMMETRICAL
AUTOMATIC TRANSFER SWITCH

C
CB
CCTV
CKT
CT
CU
CX

CONDUIT
CIRCUIT BREAKER
CLOSED CIRCUIT TELEVISION
CIRCUIT
CURRENT TRANSFORMER
COPPER
CONNECT TO EXISTING

DP
DT
DWC
DWG

DISTRIBUTION PANEL
DOUBLE THROW
DRINKING WATER COOLER
DRAWING

E
EBH
EQUIP
ETR
EWH
EX

TOWSON UNIVERSITY
Prettyman &
Scarborough Halls Air
Conditioning

ELECTRICAL COVER
SHEET
14-U009-H

Project Number

January 11, 2019
CLM
JFR

Drawn By

E0.1
Scale: As Noted
Sheet

25

of

44


SPECIAL NOTES:
(APPLICABLE TO THIS DRAWING ONLY)

1) TURN CONDUIT UP TO SERV. PANELS ON FLOOR ABOVE.
2) REFER TO LEGEND FOR CONTRACTION.

DRAWING NOTES:
(APPLICABLE TO THIS DRAWING ONLY)

1.1) ELECTRICAL ITEMS SHOWN THICK SOLID LINE (          ) SHALL BE NEW.
1.2) ELECTRICAL ITEMS SHOWN THIN SOLID LINE (          ) SHALL BE EXISTING.
1.3) UNLESS OTHERWISE NOTED, ALL LINES SHALL BE NEW.

INFORMATION SHOWN ON THIS DRAWING PERTAINING TO EXISTING CONDITIONS HAS BEEN OBTAINED FROM AVAILABLE BUILDING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITIONS IN DETAIL OR DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL CONDITIONS OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING AND WAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.

UNLESS OTHERWISE NOTED, ALL EXPOSED CONDUIT AND RACEWAYS TO MATCH BUILDING SURFACE COLOR.
A. BOTTOM OF EXPOSED CONDUIT SHALL BE A MINIMUM OF 6" AFF.
B. BOTTOM OF EXPOSED CONDUIT SHALL BE A MINIMUM OF 6" AFF.

Hub Room Location

STAIRWAY #1

STAIRWAY #2

STAIRWAY #3

MECH INCINERATOR ROOM

CRAWL SPACE

TOWSON UNIVERSITY
Prettyman & Scarborough Halls Air Conditioning

PRETTYMAN HALL - BASEMENT FLOOR PLAN - ELECTRICAL NEW WORK

Project No. 14-U009-H

January 11, 2019

CLM

E1.1
### Special Notes

- Provide 2" conduit through floor to serve Panel LR2PW on floor above. Coordinate routing of conduit through chase. Refer to architectural drawings for more information.
- Route four (4) 3/4" conduits through bulkhead. Coordinate exact location with architectural drawings.
- Typical conduit routing for all dorm rooms on this floor. Refer to DETAIL 3/E5.1 for conduit transition beneath beam and into dorm room. Typical for all dorm rooms.
- Bottom of exposed conduit shall be a minimum of 6'-8" above floor level. Paint all exposed conduit and raceways to match building surface color.
- Route WIREMOLD as high as practicable rectilinear to structure.

### Drawing Notes

- Concrete slab and corresponding rebar shall be shown on mechanical drawings. Provide for rebar only where shown on mechanical drawings.
- All conduit and raceways shown on this drawing shall be new and shall follow the general route shown. All existing conduits and raceways shown on this drawing shall be removed.
- Exceptions shall be indicated where shown on this drawing.

### Table of Contents

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PREC CD</td>
<td>12-21-18</td>
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<tr>
<td>2</td>
<td>REVISED PER CD</td>
<td>1-11-19</td>
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<tr>
<td>3</td>
<td>TOWSON UNIVERSITY</td>
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</tr>
</tbody>
</table>

**Prettyman & Scarborough Halls Air Conditioning**

**Prettyman Hall - First Floor Plan - Electrical New Work**

**Towson University**

**Henry Adams Consulting Engineers**

**GWWO**

**Garrett Wilhelm**

**Prettyman Hall - First Floor Plan - Electrical New Work**

- January 11, 2019
- CLM
- JFR

**Towson University**

**Prettyman & Scarborough Halls Air Conditioning**

**Prettyman Hall - First Floor Plan - Electrical New Work**

- January 11, 2019
- CLM
- JFR

**Towson University**

**Prettyman & Scarborough Halls Air Conditioning**

**Prettyman Hall - First Floor Plan - Electrical New Work**

- January 11, 2019
- CLM
- JFR
Prettyman & Scarborough Halls Air Conditioning

TOWSON UNIVERSITY
Prettyman Hall - Third Floor Plan - Electrical New Work

No. Description Date
1 50% CD 11-16-18
2 REVISED REVISED 100% CD 12-21-18
3 100% CD 1-11-19

REVISED 100% CD 11-16-18

SPECIAL NOTES:
(APPLICABLE TO THIS DRAWING ONLY)

1. CONNECTED THROUGH ACQUIS WITH MACHINERY.
   REFER TO MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE ON E1.2 FOR MORE INFORMATION.

2. TYPICAL CONDUIT ROUTING FOR ALL DORM ROOMS ON THIS FLOOR.

3. REFER TO DETAIL 1/E3 FOR CONDUIT TRANSITION INTERNAL DORM AND INTO DORM ROOM TYPICAL FOR ALL DORM ROOMS.

4. REFER TO DETAIL 1/E5.1 FOR CONDUIT TRANSITION INTERNAL DORM AND INTO DORM ROOM TYPICAL FOR ALL DORM ROOMS.

DRAWING NOTES:
(APPLICABLE TO THIS DRAWING ONLY)

1. ELECTRICAL ITEMS SHOWN THROUGHOUT THIS DRAWING NEW, ELECTRICAL ITEMS SHOWN THROUGHOUT DASHED ( ) SHALL BE REMOVED AND ELECTRICAL ITEMS SHOWN THROUGHOUT LIGHT SOLID ( ) SHALL BE EXISTING TO REMAIN.

2. INFORMATION SHOWN IN THIS DRAWING PERTAINING TO EXISTING CONDITION HAS BEEN OBTAINED FROM AVAILABLE BUILDING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITION IN DETAIL OR DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL CONDITION PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.

3. ROUTE ALL EXPOSED CONDUIT AND RACEWAYS TO MATCH BUILDING SURFACE COLOR.

4. BOTTOM OF EXPOSED CONDUIT SHALL BE A MINIMUM OF 6'-8" AFF.

5. ROUTE WIRE MOLD AS HIGH AS PRACTICABLE RECTILINEAR TO STRUCTURE. BOTTOM OF EXPOSED CONDUIT SHALL BE A MINIMUM OF 6'-8" AFF.

DRAWING SCALE: 1/8" = 1'-0"

SPECIAL NOTES:
(APPLICABLE TO THIS DRAWING ONLY)

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5. TYPICAL ROUTING OF EMT CONDUIT OR MC POWER CABLE SERVING DORM ROOMS ON EAST SIDE OF BUILDING.

6. CONNECTED THROUGH ACQUIS WITH MACHINERY.
   REFER TO MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE ON E1.2 FOR MORE INFORMATION.

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10. TYPICAL ROUTING OF EMT CONDUIT OR MC POWER CABLE SERVING DORM ROOMS ON EAST SIDE OF BUILDING.

11. CONNECTED THROUGH ACQUIS WITH MACHINERY.
    REFER TO MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE ON E1.2 FOR MORE INFORMATION.

12. TYPICAL CONDUIT ROUTING FOR ALL DORM ROOMS ON THIS FLOOR.

13. REFER TO DETAIL 1/E3 FOR CONDUIT TRANSITION INTERNAL DORM AND INTO DORM ROOM TYPICAL FOR ALL DORM ROOMS.

14. REFER TO DETAIL 1/E5.1 FOR CONDUIT TRANSITION INTERNAL DORM AND INTO DORM ROOM TYPICAL FOR ALL DORM ROOMS.

15. TYPICAL ROUTING OF EMT CONDUIT OR MC POWER CABLE SERVING DORM ROOMS ON EAST SIDE OF BUILDING.

16. CONNECTED THROUGH ACQUIS WITH MACHINERY.
    REFER TO MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE ON E1.2 FOR MORE INFORMATION.

17. TYPICAL CONDUIT ROUTING FOR ALL DORM ROOMS ON THIS FLOOR.

18. REFER TO DETAIL 1/E3 FOR CONDUIT TRANSITION INTERNAL DORM AND INTO DORM ROOM TYPICAL FOR ALL DORM ROOMS.

19. REFER TO DETAIL 1/E5.1 FOR CONDUIT TRANSITION INTERNAL DORM AND INTO DORM ROOM TYPICAL FOR ALL DORM ROOMS.

20. TYPICAL ROUTING OF EMT CONDUIT OR MC POWER CABLE SERVING DORM ROOMS ON EAST SIDE OF BUILDING.
SPECIAL NOTES:
(APPLICABLE TO THIS DRAWING ONLY)

D.1 INFORMATION SHOWN ON THIS DRAWING PERTAINING TO EXISTING CONDITIONS HAS BEEN OBTAINED FROM AVAILABLE BUILDING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITIONS IN DETAIL OR DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULDS CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.

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D.3 PAINT ALL EXPOSED CONDUIT AND RACEWAYS TO MATCH BUILDING SURFACE COLOR.

D.4 CONNECTED THROUGH ACCU-303S. REFER TO MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE ON E7.1 AND 1/E2.2 FOR MORE INFORMATION.

SPECIAL NOTES:
(APPLICABLE TO THIS DRAWING ONLY)

D.1 INFORMATION SHOWN ON THIS DRAWING PERTAINING TO EXISTING CONDITIONS HAS BEEN OBTAINED FROM AVAILABLE BUILDING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITIONS IN DETAIL OR DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULDS CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.

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D.3 PAINT ALL EXPOSED CONDUIT AND RACEWAYS TO MATCH BUILDING SURFACE COLOR.
**DIRECT BURIAL CONDUIT AND CABLE**

- **PREPARE GROUND CONDUCTOR**
  - Directly Buried Conduit & Cable: 610mm (24") Below Grade
  - Minimum 75mm (3") Sand Above and Below Conduit

**HANDHOLE INSTALLATION**

- **INSTALLATION**
  1. **BASE**
  2. **DIRECT BURIAL CONDUIT OR CABLE**
     - 610mm (24") Below Grade

**HANDHOLE SCHEDULE**

<table>
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<tr>
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<tr>
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<td>HANDHOLE INSTALLATION</td>
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**DETAILED WORKS**

- **FABRICATION**
- **INSTALLATION**
- **TESTING**
- **COMMUNICATIONS**
- **GROUNDING**
- **CONCRETE APRON**
- **PAVING**

**NOTES**

- **DIRECT BURIAL/SUBMERSIBLE UL486D RATED**
- **REUSABLE MECHANICAL CONNECTOR. TAPPED**
- **SPliced NOT ACCEPTABLE, TYPICAL**

**COLOR OF ENCLOSURE, BOX AND COVER**

- **LIGHT GREEN FOR APPLICATIONS IN GRASS**
- **LIGHT GRAY FOR APPLICATIONS IN CONCRETE**
- **DARK GRAY FOR APPLICATIONS IN MACADAM**
- **RED FOR APPLICATIONS IN RED BRICK PAVERS**
- **COORDINATE WITH ARCHITECT FOR OTHER APPLICATIONS**

**COORDINATE DEPTH OF HANDHOLES WITH CONDITIONS IN FIELD.**

**PROVIDE BOX EXTENSION AS REQUIRED TO MATCH DEPTHS OF DUCTS.**

**PROVIDE GROUND ROD IN EACH HANDHOLE CONTAINING GROUND CONDUCTORS.**

**MINIMUM ANSI SCTE TIER RATING, INSTALLATION IN:**

- **LAWN AND SIDEWALKS: 8**
- **PARKING LOT/DRIVEWAYS: 15**
- **LOADING DOCKS: 22**
- **AREAS SUBJECT TO HEAVY VEHICULAR TRAFFIC: 22**

**HANDHOLE WIRING/GROUNDING**

- **CONCRETE APRON FLUSH WITH FINISHED GRADE OR PAVEMENT**
- **CONSTRUCTION AS SPECIFIED BY CIVIL ENGINEER**
- **FINISHED GRADE**

**DIRECT BURIAL CONDUIT BENEATH PAVING**

- **HANDHOLE LID FLUSH WITH PAVEMENT, OTHER AREAS**
- **SET COVER 1" ABOVE FINISHED GRADE**

**HANDHOLE SCHEDULE**

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PVC TO STEEL ADAPTER
PVC CONDUIT IN DUCT BANK
FINISHED SLAB
PVC END BELL
PVC CONDUIT IN DUCT BANK
FINISHED SLAB
CONCRETE PAD
NOTE: THIS DETAIL IS TYPICAL FOR ALL CONDUIT TRANSITIONS AT PAD MOUNTED EQUIPMENT AND SLAB PENETRATIONS

DUCT BANK SECTIONS

CONCRETE POCKET
FINISHED SLAB

DUCT BANK BENEATH PAVING

REINFORCED DUCT BANK SECTIONS

EQUIPMENT TO DUCT BANK TRANSITION

GROUNDING RISER DIAGRAM

NOTES:
1. ALL DUCTS SHALL BE 100mm (4") UNLESS OTHERWISE INDICATED.
2. CONDUIT SECTIONS ARE SPECIFIED IN EACH ACTUAL CONFIGURATION.
3. MINIMUM 75mm (3") COMPACTED SAND.
4. MARKING TAPE.
5. LIGHTNING PROTECTION GROUND RING (IF ANY).

E5.3
GWB

TOWSON UNIVERSITY
Prettyman & Scarborough Halls Air Conditioning

UNDERGROUND DETAILS

No.
Description
Date
Scale

1
2
3
4
5

50% CD
100% CD
100% CD
100% CD
100% CD

January 11, 2019
November 12, 2018
December 21, 2018
January 11, 2019
November 12, 2018

E5.3
CLM
JFR

CIVIL ENGINEER
MECHANICAL
ELECTRICAL
MECHANICAL, ELECTRICAL & PLUMBING ENGINEERS

DESIGNATED ENGINEER/ARCHITECT/CONTRACTOR IS RESPONSIBLE FOR VALIDATION OF THE INFORMATION SHOWN.

Prettyman & Scarborough Halls Air Conditioning
2000 York Road
Towson, Maryland 21204-0001

TOWSON UNIVERSITY
14-U009-H
Sheet of 44

Prettyman & Scarborough Halls Air Conditioning

TOWSON UNIVERSITY

HARRY N. ELLIS

5050 Eastern Avenue
Baltimore, Maryland 21201

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No: 41408
Expiration Date: 01/05/2020

January 11, 2019

Prettyman & Scarborough Halls Air Conditioning

TOWSON UNIVERSITY

HARRY N. ELLIS

5050 Eastern Avenue
Baltimore, Maryland 21201

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

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January 11, 2019

Prettyman & Scarborough Halls Air Conditioning
EXISTING PAD MOUNTED SWITCH

2

2

3

3

1

1

1

1

4

5

6

7

8

500KVA

SWBD-SP

1200A

150A

100A

150A

100A

300A

400A

PANEL LR1PE

PANEL LR2PE

PANEL LR3PE

PRETTYMAN EAST

PRETTYMAN WEST

SCARBOROUGH WEST

SCARBOROUGH EAST

PANEL LR1SW

PANEL LR2PW

PANEL LR3PW

PANEL LR2SW

PANEL LR3SW

PANEL LR2SE

PANEL LR3SE

PRETTYMAN ELEC ROOM

EX PRETTYMAN

EX SCARBOROUGH

EXTERIOR

EXTERIOR

EXTERIOR

125A

125A

112.5KVA

112.5KVA

225KVA

SPD

9

9

13.2KV PRIMARY

208Y/120V SECONDARY

10

12

12

12

12

12

12

12

44

No.

Description

Date

Drawn By

Checked By

Project Number

Sheet

Scale: As Noted

January 11, 2019

Prettyman & Scarborough Halls Air Conditioning

TOWSON UNIVERSITY

ELECTRICAL ONE-LINE DIAGRAM

TOWSON UNIVERSITY

Henry Adams Consulting Engineers

600 Baltimore Avenue

Baltimore, Maryland 21204

MECHANICAL  ELECTRICAL  & PLUMBING ENGINEERS

11-16-18

50% CD

January 11, 2019

Grounding Electrode System

Bottom of exposed conduit shall be a minimum of 6'-8" AFF. Bottom of exposed conduit shall be a minimum of 6'-8" AFF.

Special Notes:

1. MISCELLANEOUS SIZE #350KCMIL+/#1/0GW IN 3"C.

4. MISCELLANEOUS SIZE #2/0/#4GW IN 2"C.

6. 4 SETS 4#350KCMIL+/#3/0GW IN 3-1/2"C.

7. 2 SETS MISCELLANEOUS SIZE #350KCMIL+/#4GW IN 3"C.

8. 1 SETS MISCELLANEOUS SIZE #4GW IN 2"C.

9. 3 SETS OF MISCELLANEOUS SIZE #3/0GW IN 2-1/2"C.

10. REMOVE EXISTING MEDIUM VOLTAGE CABLES AND RETAIN FOR REUSE UNDER NEW WORK.

11. PROVIDE #2 GROUNDING ELECTRODE CONDUCTOR TO GROUND BUS OF MAIN DISTRIBUTION PANEL IN BUILDING.

12. REMOVE EXISTING NEUTRAL TO GROUND BOND IN SWITCH OR PANEL.

13. RE-TERMINATE EXISTING MEDIUM VOLTAGE CABLES ON NEW TRANSFORMER.

14. PROVIDE #2 GROUNDING ELECTRODE CONDUCTOR TO GROUND BUS OF MAIN DISTRIBUTION PANEL IN BUILDING.

15. PROVIDE #2 GROUNDING ELECTRODE CONDUCTOR TO GROUND BUS OF MAIN DISTRIBUTION PANEL IN BUILDING.
CONTRACTOR INSTRUCTIONS FOR USING THIS SCHEDULE:

1. PROVIDE FUSEABLE DISCONNECT SWITCHES WITH CLASS R FUSE KIT. ELECTRICAL CONTRACTOR SHALL PROVIDE FUSE AND COORDINATE EXACT EQUIPMENT FUSE SIZE DURING CONSTRUCTION WITH MOTOR OR EQUIPMENT NAMEPLATE DATA. ALL DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE WITH GROUND LUG.

2. PROVIDE NEEDED SUPPORTING STRUT CHANNELS AND ALL MISCELLANEOUS HARDWARE FOR MOUNTING ELECTRICAL EQUIPMENT. MOUNT AND WIRING CLEARANCES PER CIRCUIT LOCATION. DO NOT MOUNT ON EQUIPMENT ACCESS PANELS OR IN EQUIPMENT MANUFACTURERS' RECOMMENDED MAINTENANCE CLEARANCES. COORDINATE EXACT LOCATION OF SAFETY SWITCHES WITH MECHANICAL EQUIPMENT CONTRACTOR.

3. CONNECTED THROUGH ASSOCIATED AIR COOLED UNIT.

MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE - PRETTYMAN HALL

<table>
<thead>
<tr>
<th>EQUIPMENT DESIGNATION</th>
<th>KW</th>
<th>HP</th>
<th>RICA</th>
<th>MOP</th>
<th>FLA</th>
<th>VOLTAGE</th>
<th>PHASE</th>
<th>LOAD (A)</th>
<th>WIRE</th>
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<tbody>
<tr>
<td>AC00-1000</td>
<td>1.0</td>
<td>5.0</td>
<td>10.0</td>
<td>5.0</td>
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<td>3P</td>
<td>72</td>
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NOTES: APPLICABLE TO MECHANICAL EQUIPMENT ELECTRICAL CONNECTION - PRETTYMAN HALL SCHEDULE ONLY

1. PROVIDE REQUIRED NUMBER OF TERMINAL BLOCKS OR INSTALL ELECTRICAL WIRING TO PER SPECIFICATIONS AS PER TABLED EQUIPMENT. PROVIDE A ACCESS SHEET FOR TERMINAL BLOCKS FOR TERMINAL WIRING CONDENSING UNIT.

2. PROVIDE EVAPO RADIATOR VOLTAGE DROP FOR BRANCH CIRCUIT MEDIAN TO BE LIMITED TO 3%.

3. PROVIDE NEEDED SUPPORTING STRUT CHANNELS AND ALL MISCELLANEOUS HARDWARE FOR MOUNTING ELECTRICAL EQUIPMENT. MOUNT AND WIRING CLEARANCES PER CIRCUIT LOCATION. DO NOT MOUNT ON EQUIPMENT ACCESS PANELS OR IN EQUIPMENT MANUFACTURERS' RECOMMENDED MAINTENANCE CLEARANCES. COORDINATE EXACT LOCATION OF SAFETY SWITCHES WITH MECHANICAL EQUIPMENT CONTRACTOR.

MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE - SCARBOROUGH HALL

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2. PROVIDE EVAPO RADIATOR VOLTAGE DROP FOR BRANCH CIRCUIT MEDIAN TO BE LIMITED TO 3%.

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BRANCH CIRCUIT VOLTAGE DROP TABLE

<table>
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<tr>
<th>DISTANCE</th>
<th>WIRE SIZE</th>
<th>VOLTAGE DROP %</th>
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<tbody>
<tr>
<td>0-5'</td>
<td>#4 AWG</td>
<td>0.1</td>
</tr>
<tr>
<td>6-10'</td>
<td>#2 AWG</td>
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<tr>
<td>11-25'</td>
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<td>26-40'</td>
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<td>41-60'</td>
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<td>61-80'</td>
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<tr>
<td>81-100'</td>
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DISCONNECT SWITCH SCHEDULE - PRETTYMAN HALL

<table>
<thead>
<tr>
<th>DESIGNATION</th>
<th>AMP</th>
<th>RATING</th>
<th>VOLTS</th>
<th>POLES</th>
<th>FUSE</th>
<th>VOLTAGE</th>
<th>PHASE</th>
<th>DISCONNECT</th>
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<tbody>
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### Panelboard LRIPE

**Service Type:** Normal  
**Manufacturer:** Square D  
**SRS Rating:** 220kV

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Date</th>
<th>Load Description</th>
<th>Note</th>
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<tr>
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<td>11-16-18</td>
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<td>2</td>
<td>January 11, 2019</td>
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**Switchboard SWBD-SP**

**Service Type:** Normal  
**Manufacturer:** Square D  
**SRS Rating:** 220kV

<table>
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<th>No.</th>
<th>Description</th>
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<tbody>
<tr>
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<td>January 11, 2019</td>
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### Electrical Schedules

**Service Type:** Normal  
**Manufacturer:** Square D  
**SRS Rating:** 220kV

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<th>Note</th>
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<td>11-16-18</td>
<td>50% CD</td>
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<tr>
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<td>Description</td>
<td>Date</td>
<td>Scale: As Noted</td>
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<td>-------------------------------------------------</td>
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<tr>
<td>1</td>
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<td>1-11-19</td>
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**ELECTRICAL SCHEDULES**

**TOWSON UNIVERSITY**

Prettyman & Scarborough Halls Air Conditioning

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**SCHEDULES**

**E7.3**

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**Professional Certification:** I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

- **License No:** 41408
- **Expiration Date:** 01/05/2020

---

**HENRY ADAMS**

Consulting Engineers

600 Baltimore Avenue
Baltimore, Maryland 21204

**MECHANICAL, ELECTRICAL & PLUMBING ENGINEERS**

8000 York Road
Towson, Maryland 21252-0001

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**TOWSON UNIVERSITY**

44

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**DRAWN BY:**

---

**CHECKED BY:**

---

**PROFESSIONAL CERTIFICATION:**

---

**DATE:**

---

**SCRIPT**

---

**SIGNATURE**

---

**REVISIONS:**

---

**DISTRIBUTION:**

---
BID/PRICE PROPOSAL FORM

BIDDER’S NAME:__________________________________________________________

PROJECT TITLE: Prettyman & Scarborough AC & Electrical Upgrades

PROJECT NUMBER: TU-1940-SBR

Failure to properly complete each blank may be cause for rejection of this proposal.

Having carefully examined the solicitation documents, including all addenda acknowledged on Exhibit K attached hereto, being collectively referred to as the Contract Documents, and having received clarification on all items of conflict or upon which any doubt arose, the undersigned proposes to furnish all labor, materials and equipment required by the said documents for the entire work, all in strict accordance with the Contract Documents, for the sum of:

TOTAL COST OF PROJECT

BASE BID ______________________________________________________________ $ __________________________

Words ____________________________ Numbers ____________________________

If the undersigned is notified by the Procurement Officer/Representative of the acceptance of the bid within 90 days after the bid date, Contractor agrees to guarantee the completion of this work as specified in the Contract Documents.

Firm License Number
(If Applicable) ____________________________ Date Issued ____________________________ Place of Issuance ____________________________

Minority Business Enterprises:

The undersigned certifies that the Bidder:

_____ IS NOT a Certified Minority Business Enterprise.

_____ IS a Minority Business Enterprise (MBE), certified by the Maryland Department of Transportation, and assigned the following certification number: ____________________________

(Certification Number)
The undersigned affirms, and it is a condition precedent to acceptance of this bid, that the bidder has not been a party to any agreement to bid a fixed or uniform price.

INDIVIDUAL PRINCIPAL

Firm Name: __________________________________________
Address: _____________________________________________

Phone/Fax No.: ________________________________________
E-mail Address: ________________________________________

Federal Tax ID or Social Security No.

Witness: _______________________________ Signed: ____________

__________

CO-PARTNERSHIP PRINCIPAL

Address: _____________________________________________

Phone/Fax No.: ________________________________________
E-mail Address: ________________________________________

Federal Tax ID or Social Security No.

In the Presence of

Witness: _______________________________ By: ______________
Witness: _______________________________ By: ______________
Witness: _______________________________ By: ______________

Partner

CORPORATE PRINCIPAL

Name of Corporation

Address: _____________________________________________

Phone/Fax No.: ________________________________________
E-mail Address: ________________________________________

Federal Tax ID Number

By: ____________________________ Signature of Officer or Authorized Agent
(Affix Corporate Seal)

Printed Name

Title

Witness: _______________________________
EXHIBIT A-1
ENVIRONMENTAL HEALTH AND SAFETY REQUIREMENTS

The Contractor must contact the TU’s Department of Environmental Health and Safety (EHS) (410-704-2949) immediately following any spill of a hazardous material in excess of one (1) quart.

1. Occupational Safety And Health Act (O.S.H.A.)
All materials, supplies, equipment, or services supplied as a result of this Contract shall comply with the applicable US and Maryland Occupational Safety and Health Act standards.

2. Hazard Communication Standard
The Contractor will be responsible for advising all of its employees of their rights under the University's Hazard Communication Program, or more commonly referred to as the Right To Know (RTK) Program. The University will supply the vendor with sufficient copies of its Employee Safety Program (ESP) booklet which outlines this program. Each and every Contractor who physically works on campus shall be required to sign a form acknowledging the receipt of the ESP booklet and their rights/responsibilities pursuant to this program. The University's Department of Environmental Health and Safety is responsible for administering the RTK program and will handle all information regarding this program. Failure to adhere to the requirements of the RTK Program may result in implementation of punitive action such as the cancellation of the contract(s).

Pursuant to the provisions of the RTK Program, the Contractor will be responsible for the following:

a. Submission to the Contract Services Office and EHS of a complete list of all chemicals or chemical products to be used on the University's property. This listing shall include the chemical name, common name, manufacturer's name, quantity and location (building and room number) for each product. This listing shall be given to EHS by no later than two (2) weeks prior to the start of any work under this contract. Changes, additions, or deletions to the complete campus chemical list must be submitted in writing five (5) working days prior to the actual change occurring. All proposed changes must be approved in writing by EHS prior to the actual use of the new product on campus.

b. Submission to the Contract Services Office and EHS of the manufacturer's Material Safety Data Sheet (MSDS) for all chemicals or chemical products to be used or in use at the University. These MSDS must be delivered, no later than two (2) weeks prior to the start of any work under this contract. There must be a MSDS for every product in use or present on the campus unless exempted in writing by EHS. MSDS's for any changes or additions to the complete campus chemical list must be submitted five (5) working days prior to the actual change occurring. All proposed changes must be approved in writing by EHS prior to the actual use of the new product on campus. The University, through EHS, reserves the right to order a change in the use, storage, or method of handling of any chemical/chemical product that it feels poses an unreasonable hazard to the University's community.

NOTE: In the absence of the original manufacturer's MSDS, EHS will accept a generic equivalent as long as a letter from the Contractor stating that the original is not available is attached.

c. The Contractor must warrant in writing to Towson University's Contract Administrator that all employees have been trained and will continue to be trained in the proper and safe storage, handling, use and disposal of all chemicals/chemical products in use.

d. The Contractor agrees to obey and follow all local, state, and federal regulations regarding the storage, handling, use and disposal of all chemicals/chemical products. The Contractor agrees to properly dispose of all regulated waste in accordance with all applicable regulations and to make available to EHS all records necessary to support such activity.

3. Asbestos
The Contractor is responsible for training and equipping all personnel concerning work in asbestos environments as applicable. They must be trained as prescribed by COMAR 26.11.21. All new employees must be trained within 30 days after they are hired by the Contractor. This is to be accomplished at no additional cost to this contract or the University. An initial report on all employees as to their asbestos training will be presented to the Contract Administrator within the first 90 days of the Contract and updated on a monthly basis. Thereafter, failure to comply with this requirement would place the Contractor in default status.

4. Lead Paint
The Contractor is responsible for training and equipping all personnel concerning work in lead paint containing environments as applicable. Employees must be trained as required within 60 days of contract commencement and all new employees must be trained within 30 days after they are hired by the Contractor. This training will be provided by the Contractor at no additional cost to this contract or the University. An initial report on all employees as to their lead paint training will be presented to the Contract Administrator within the first 90 days of the contract and updated on a monthly basis. Thereafter, failure to comply with this requirement would place the Contractor in default status.

5. Fire Safety
The Contractor agrees to comply with and follow all local, state, federal and University regulations regarding fire safety. It is the Contractor's sole responsibility to become familiar with all of the applicable regulations and policies. Copies of the University's policies and procedures are available from EHS.

The Contractor will be responsible for the following:

a. To provide all of its employees with sufficient training to ensure that they are fully aware of all pertinent regulations and policies in effect regarding fire safety.

b. To ensure that all of its employees are aware of and react to the University's Emergency Procedures including, but not limited to, fire
drills and evacuations. All employees must be instructed on the proper personnel to call to report an emergency.

c. All portable electrical devices including extension cords should be disconnected at the completion of the work assigned. All electrical equipment must be approved by Underwriters Laboratory and maintained in good working order. Under no circumstances shall damaged electrical equipment be utilized on this campus.

d. After pulling the fire alarm, evacuate the building to a safe location and contact the University Police by dialing extension 42133 immediately. If using a pay phone, dial 911 direct.

e. SMOKING IS NOT ALLOWED IN ANY OF THE BUILDINGS. Any employee of the Contractor, who wishes to smoke during a designated break, must do so outside.

The Contractor is responsible for fully complying with TU Hot Works Permitting Program. A Hot Works Permit is required any time a Contractor is doing any work on campus involving an actual or potential source of ignition (e.g., arc or gas welding, torch cutting, brazing, open flame soldering, grinding, fired space heaters, etc.); or may potentially cause the activation of a building fire alarm system; or may cause building occupants to notify emergency response agencies about the smell of smoke, heat, etc.

Hot Works Permits are issued prior to the start of the work by EHS at 410-704-2949.

The Contractor assumes all responsibility for any work delays associated with noncompliance with the Hot Works Permit Program.

6. Bloodborne Pathogens

The Contractor will be responsible for providing the required training dealing with occupational exposure to bloodborne pathogens. Employees who have received this training may be required to perform services in areas where they may be at risk of exposure to blood or other potentially infectious materials. Some responsibilities will include collection of domestic trash in areas that generate special medical waste, regular cleaning in these areas and spill response for accidents that occur on campus that involve blood. Employees must be informed on the potential hazards present in these areas and the proper protective measures that can be taken to prevent exposure. EHS is available to provide more information concerning the areas on campus where personnel are at risk of exposure.

7. Confined Space Entry

The Contractor agrees to comply with all local, state and federal regulations pertaining to the entry into confined spaces. The Contractor is responsible for communicating to the TU's Contract Services Manager in the Department of Facilities Management for the location of all campus-confined spaces and for identifying any confined space hazards prior to entry into a confined space. The Contractor is responsible for ensuring his/her workers and Subcontractors are adequately trained in confined space entry procedures in accordance with OSHA 1910.146, Permit Required Confined Spaces for General Industry.

The Contractor will provide the Contract Administrator with a written copy of their Confined Space Entry Plan (CSEP) for review and approval at least 5 working days in advance of the planned entry. Prior to work commencements, the Contractor will also certify in writing that all of his/her workers and Subcontractors have been trained in accordance with OSHA 1910.146, Permit Required Confined Spaces for General Industry. This certification will list all employees working on campus by name and social security number.

If the Contractor's CSEP is approved, the Contractor may utilize his/her CSEP for entering into campus confined spaces. If disapproved, or if the Contractor does not have a written CSEP, the Contractor will comply with the University's CSEP. Until such time as the Contractor provides written certification that all of his/her employees and Subcontractor employees working on campus have been adequately trained in confined space entry procedures, entry in TU confined spaces is strictly forbidden. Questions concerning TU CSEP should be directed to EHS.

The Contractor assumes all responsibility for any work delays associated with noncompliance with confined space regulations.

8. Respiratory Protection

The Contractor agrees to comply with all local, state and federal regulations pertaining to the use of respiratory protection equipment. It is the Contractor's responsibility to ensure their workers are provided and wearing the appropriate respiratory protection device suitable to the hazard.

The Contractor will provide the Contract Administrator with a written copy of their Respiratory Protection Plan (RPP) for review and approval at least 5 workdays in advance of the planned entry. If approved, the Contractor may utilize his/her RPP while on campus. If disapproved, or if the Contractor does not have a written RPP, the Contractor will comply with the University's RPP. Questions concerning TU RPP should be directed to EHS at 410-704-2949.

The Contractor assumes all responsibility for any work delays associated with noncompliance with respiratory protection regulations.

9. Waste Disposal

The Contractor is responsible for the removal and disposal of all non-hazardous waste products generated by his/her work on campus. All non-hazardous waste materials generated by the Contractor shall be removed from campus (unless otherwise specified) and disposed of in accordance with all applicable federal, state and county laws and regulations. The University reserves the right to require the use of a TU Non-Hazardous Waste Manifest for transport off-campus of any University non-hazardous waste. The University also reserves the right to approve or disapprove the facility(ies) the Contractor utilizes for disposal of any University non-hazardous wastes (as necessary). All costs will be borne by the Contractor for the disposal of all hazardous or non-hazardous waste, unless otherwise specified in the contract.

Under no circumstances is any Contractor generated hazardous waste to be disposed of on campus. The Contractor is responsible for the removal and proper disposal of all his/her hazardous waste, in accordance with all applicable federal, state and county laws and regulations. Contractor's generated hazardous waste is waste resulting from their operations/equipment on campus when using Contractor owned/supplied materials/chemicals. Disposal costs for this will be borne solely by the Contractor.

The University routinely performs wastewater monitoring in accordance with its Industrial Wastewater Discharge Permit and routinely screens campus discharges for hazardous wastes. The Contractor will be held liable for any assessed penalties attributable to the improper discharge of hazardous wastes from campus facilities.

Contracts that require Contractors to transport and/or dispose of regulated hazardous materials (i.e., hazardous wastes) owned and/or generated by Towson University will be disposed of by Towson University Environmental Health & Safety utilizing existing University hazardous waste disposal contractors. The Contractor should contact EHS as soon as the hazardous wastes have been identified to coordinate the disposal.
All transportation and disposal costs will be paid by Towson University and then back charged to the Contractor.

Any questions concerning the disposal of hazardous or non-hazardous waste should be directed to EHS at 410-704-2949.

10. The Control of Hazardous Energy Source (Lock Out/Tag Out)

The Contractor agrees to comply with all local, state and federal regulations pertaining to the control of hazardous energy sources. The Contractor is responsible for insuring his/her workers and any Subcontractors are adequately trained in Lockout/Tagout procedures in accordance with OSHA 1910.147, The Control of Hazardous Energy Sources (Lock Out/Tag Out).

The Contractor will provide the Contract Administrator with a written copy of their Lock Out/Tag Out policy (LO/TO) and/or procedures for review and approval at least five (5) working days in advance of the commencement date of the contract. Prior to work commencement, the Contractor will also certify in writing that all of his/her workers and Subcontractors have been trained in accordance with OSHA 1910.147. This certification will list all employees working on campus by name and social security number.

If the Contractor’s LO/TO is approved, the Contractor may utilize their LO/TO for work on hazardous energy sources. If disapproved, or if the Contractor does not have a written LO/TO, the Contractor will comply with TU LO/TO Policy/Procedures. Until such time as the Contractor provides written certification that all his/her employees and Subcontractors working on campus have been adequately trained in LO/TO procedures, work on hazardous energy sources is strictly forbidden. Questions concerning TU LO/TO Policy/Procedures shall be directed to EHS at 410-704-2949.

The Contractor assumes all responsibility for any work delays associated with noncompliance with the control of Hazardous Energy Sources regulations.

11. Wastewater/Sewer Discharge

The University’s Wastewater Discharge Permit strictly prohibits the disposal of waste chemicals and corrosives via the sanitary sewer system. NO waste chemicals (i.e., old, unused, excess, etc.), including, but not limited to, organic solvents and/or corrosives (pH less than or equal to 6 and greater than or equal to 10) will be disposed of on campus via the sanitary sewer system without advance written approval of the TU Department of Environmental Health & Safety (EHS). The Contractor shall submit MSDS’s for all waste chemicals they wish to dispose of in the sanitary sewer to EHS five (5) working days in advance for approval.

The University routinely performs wastewater monitoring in accordance with its Industrial Wastewater Discharge Permit and routinely screens campus discharges for waste chemicals and corrosives. The Contractor will be held liable for any assessed penalties attributable to the improper discharge of these materials from campus facilities.

The Contractor is subject to unannounced inspections of the chemicals their employees are using on campus. TU Department of Environmental Health & Safety will conduct these unannounced inspections.

12. Safety Training/Inspections/Meetings

The Contractor is responsible to notify the Contract Administrator five (5) working days in advance of the date, time and location of their monthly safety meeting.

13. Materials

No asbestos, lead, or PCB containing materials (0%) are to be utilized /installed on campus unless prior written approval has been received from the University’s Department of Environmental Health & Safety (410-704-2949).

14. Stormwater Pollution Prevention/Prohibition of Illicit Discharges

No person shall cause or contribute discharge directly or indirectly into the Towson University municipal storm drain system or waterways any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.

Refer to 06-20.00 – University Policy on Stormwater Illicit Discharge Detection and Elimination for additional information.

No person may improperly store, handle, use or apply any pollutant in a manner that will cause its exposure to rainfall, runoff and discharge into the Towson University municipal stormwater drain system or campus waterways.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described:

a. The following discharges are exempt from discharge prohibitions:
   - water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire-fighting activities, and any other water source not containing pollutants.

b. Any discharges specified in writing by Towson University Environmental Health & Safety as being necessary to protect public health and safety.

c. Dye testing only with required verbal notification to Towson University Environmental Health & Safety [(410) 704-2949 or safety@towson.edu] prior to the time of the test.

d. The following discharges are exempt from discharge prohibitions:
   - water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire-fighting activities, and any other water source not containing pollutants.

15. Prohibition of Illicit Connections

The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited. This prohibition expressly includes, without limitation, any illicit connections made in the past. This is regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. A person is considered to be in violation if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.
16. Notification of Spills or Illicit Discharges
Notwithstanding other requirements by law, as soon as any contractor has information regarding any known or suspected release of materials that result or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, campus waterways said person shall take all necessary steps to ensure the discovery, immediate containment, and cleanup of such release. In the event of a release of hazardous materials or upon observing an illicit environmental discharge immediately contact the Towson University Police Department (TUPD) at (410) 704-4444. In the event of a release of non-hazardous materials, notify Towson University Environmental Health & Safety in person or by phone [(410) 704-2949] or e-mail [safety@towson.edu] no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to Environmental Health & Safety, Towson University, 8000 York Road, Towson, MD 21252 within three business days of the phone notice.

17. Enforcement
a. Enforcement for student violators will follow the TU Office of Student Conduct and Civility Education Code of Student Conduct.

b. Enforcement for University employees (Faculty and Staff) shall follow the Towson University Policy for discipline or termination Policy No. 07.05.25 – Disciplinary Action for Employees.

c. Enforcement for Visitors (Non-TU Faculty, Staff, Students or Contractors)

d. Individuals or Contractors, depending on the nature and severity of the violation, may be referred to MDE for prosecution for violation of federal and state laws and regulations.

e. Any fines, penalties, environmental monitoring or remediation expenses, etc., resulting from the illicit discharge, will be violator’s responsibility.

f. During normal University business hours (Monday-Friday, 8am-4pm), contact EHS at (410) 704-2949 to report violations.

g. If the violator is still on the scene, they should also immediately contact TUPD at (410) 704-4444.

h. After normal duty hours, weekends and holidays, contact TUPD at (410) 704-4444 to report violations.
EXHIBIT A-2
REQUIRED CONTRACT PROVISIONS
CONSTRUCTION AND MAINTENANCE

The provisions contained in this exhibit will be incorporated and be a part of the contract entered into between Towson University and any contractors as a result of this procurement.

1. Affirmation - Contingent Fees
The Contractor shall submit with its bid/proposal a Procurement Affirmation regarding contingent fees in the form required by USM Procurement Policies and Procedures.

2. Affirmation - Debarment
The Contractor shall submit with its bid/proposal a Procurement Affirmation in the form required by USM Procurement Policies and Procedures.

3. Affirmation Regarding Debarment of Related Entities
The Contractor shall submit with its bid/proposal a Procurement Affirmation regarding debarment of related entities in the form required by USM Procurement Policies and Procedures.

4. Affirmation - Non-Collusion
The Contractor shall submit with its bid/proposal a Non-Collusion Affirmation in the form required by USM Procurement Policies and Procedures.

5. Affirmation Regarding Bribery Convictions
The offeror warrants that neither it nor any of its officer, directors, or partners not any of its employees who are directly involved in obtaining or performing contracts with any public body has been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any state or of the federal government or has engaged in conduct since July 1, 1977, which would constitute bribery, attempted bribery, or conspiracy to bribe under the laws of any state or the federal government.

The Contractor shall submit with its bid/proposal a Procurement Affirmation regarding bribery convictions in the form required by University System of Maryland (USM) Procurement Policies and Procedures.

6. Affirmation Regarding Other Convictions
The Contractor shall submit with its bid/proposal a Procurement Affirmation regarding other convictions in the form required by USM Procurement Policies and Procedures.

7. Affirmation Regarding Sub-Contractors
The Contractor shall submit with its bid/proposal a Procurement Affirmation regarding debarment of sub-contractors in the form required by USM Procurement Policies and Procedures.

8. Affirmation - Drug and Alcohol Free Workplace
The contractor warrants that the contractor shall comply with COMAR 21.11.08 Drug and Alcohol Free Workplace, and that the contractor shall remain in compliance throughout the term of this contract.

9. Certification of Corporation Registration and Tax Payment
The Contractor shall submit with its bid/proposal a Procurement Affirmation regarding certification of corporation registration and tax payment in the form required by USM Procurement Policies and Procedures.

10. Affirmation - Financial Disclosure
The Contractor shall submit with its bid/proposal a Financial Disclosure Affirmation in the form required by USM Procurement Policies and Procedures.

11. Affirmation - Political Contribution Disclosure
The Contractor shall submit with its bid/proposal a Political Contribution Disclosure Affirmation in the form required by USM Procurement Policies and Procedures.

12. Contract Affidavit
The successful bidder shall submit, prior to contract award, a Contract Affidavit in the form required by USM Procurement Policies and Procedures.

13. Affirmative Action
The Contractor and all subcontractors shall develop and maintain affirmative action plans directed at increasing the utilization of women and members of minority groups on State public works projects, pursuant to the Executive Order 11246 of the President of the United States of America and guidelines on Affirmative Action issued by the Equal Employment Opportunities Commission (EEOC) 29 C.F.R. part 1608 and the Governor of Maryland's Executive Order 01.01.1993.16.

14. Amendments and Modifications
The contract documents, as defined within the contract, constitute the entire agreement between the parties hereto. All other communications between the parties prior to execution of the contract, whether written or oral, with reference to the subject matter of the contract are superseded by the agreement contained therein. No amendment of this contract shall be binding unless in writing and signed by the parties. Amendments may not significantly change the scope of the contract.

15. Civil Rights Act of 1964
Contractors providing materials, equipment, supplies or services to the State under the contract herewith assure the State that they are conforming to the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1988, the Civil Rights Act of 1991, and Section 202 of Executive Order 11246 of the President of the United States of America as amended by Executive Order 11375, as applicable.

16. Compliance with Laws
The Contractor hereby represents and warrants that:

a. It is qualified to do business in the State of Maryland, and that it will take such action, as from time to time hereafter, may be necessary to remain so qualified;

b. It is not in arrears with respect to the payment of any monies and owing the State of Maryland, or any department or agency thereof, including but not limited to the payment of taxes and employee benefits, and that it shall not become so in arrears during the term of the contract;

c. It shall comply with all federal, State and local laws, ordinances applicable to its activities and obligations under the contract; and;
17. Compensation and Method of Payment
Contractor agrees to include on the face of all invoices billed to the University, its Taxpayer Identification Number, which is the Social Security Number for individuals and sale proprietors and the Federal Employee Identification Number for all other types of organizations.

18. Confidentiality; dissemination of Information
Contractor shall not release any information related to services or performance of the services under this Contract, nor publish any final reports or documents without the prior written approval of the University. Contractor shall indemnify and hold harmless the State and the University, its officers, agents and employees from all harm which may be incurred by reason of dissemination, publication, distribution or circulation, in any manner whatsoever, of any information, data, documents, or materials pertaining in any way to this Contract by Contractor, its agents or employees.

19. Conflict of Interest Law
It is unlawful for any State officer, employee, or agent to participate personally in his official capacity through decision, approval, disapproval, recommendation, advice, or investigation in any contract or other matter in which he, his spouse, parent, child, brother, or sister has a financial interest or to which any firm, corporation, association, or other organization in which he has a financial interest or in which he is serving as an officer, director, trustee, partner, or employee, or any person or organization with whom he is negotiating or has any arrangement concerning prospective employment, is a party, unless such officer, employee, or agent has previously complied with the provisions of State Government Article § § 15-501 et seq. of the Annotated Code of Maryland.

20. Contract Modifications and Changes
a. The procurement officer unilaterally may, at any time, without notice to the sureties, if any, by written order designed or indicated to be a change order, make any change in work within the general scope of the contract, including but not limited to changes:
   (1) In the specifications (including drawings and designs);
   (2) In the method or manner of performance of the work;
   (3) In the State-furnished facilities, equipment, materials, services, or site; or
   (4) Directing acceleration in the performance of the work.

b. Any other written order or an oral order, including a direction, instruction, interpretation or determination, from the procurement officer that causes any such change, shall be treated as a change order under this clause, provided that the Contractor gives the procurement officer written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a change order.

c. Except as herein provided, no order, statement, or conduct of the procurement officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment hereunder.

d. Subject to paragraph f., if any change under this clause 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 this contract, whether or not changed by any order, an equitable adjustment shall be made and the contract modified in writing accordingly; provided, however, that except for claims based on defective specifications, no claim for any change under (b.) above shall be allowed for any costs incurred more than 20 days before the Contractor gives written notice as therein required; and provided further, that in the case of defective specifications for which the State is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with such defective specifications.

e. If the Contractor intends to assert a claim for an equitable adjustment under this clause, he shall, within 30 days after receipt of a written change order under a. above or the furnishing of written notice under b. above, submit to the procurement officer a written statement setting forth the general nature and monetary extent of such claim, unless this period is extended by the University. The statement of claim hereunder may be included in the notice under b. above.

f. Each contract modification or change order that affects contract price shall be subject to the prior written approval of the procurement officer and other appropriate authorities and to prior certification of the appropriate fiscal authority of fund availability and the effect of the modification or change order on the project budget or the total construction cost. If, according to the certification of the fiscal authority, the contract modification or change order will cause an increase in cost that will exceed budgeted and available funds, the modification or change order may not be made unless sufficient additional funds are made available or the scope of the project is adjusted to permit its completion within the project budget.

g. No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under the contract.

21. Contractor's On-Site Representative
The Contractor is required to maintain on site at all times when the work is in progress on this project an individual who represents the Contractor, is responsible for the entire project, and can communicate in English with the University's representative.

22. Contractor's Invoices
Contractor shall include its Taxpayer Identification Number on the face of each invoice billed to the University. If a Purchase Order document is issued, the Purchase Order Number must be included.

23. Cooperation with University and State Representatives
Before any of the work shall begin, the Contractor shall confer with the University's representative at the site and agree on a sequence of procedure, means of access to the premises, space for storage of materials and equipment, use of approaches, use of facilities, etc.

24. Cost and Price Certification
The Contractor, by submitting cost or price information certifies that, to the best of its knowledge, the information submitted is accurate, complete, and current as of a mutually determined specified date prior to the conclusion of any price discussions or negotiations for:

a. A negotiated contract, if the total contract price is expected to exceed $100,000 or a smaller amount set by the procurement officer; or

b. A change order or contract modification, expected to exceed $100,000 or a smaller amount set by the procurement officer.

c. The price under this contract and any change order or modification hereunder, including profit or fee, shall be adjusted to exclude any significant price increases occurring because the Contractor furnished cost or price information which, as of the date agreed upon between the parties, was inaccurate, incomplete, or not current.

25. Default Delay and Time Extension
Termination for Default — Damages for Delay — Time Extensions

(1) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as shall insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the State may, by written notice to the Contractor, terminate his right to proceed with the work or the part of the work as to which there has been delay. In this event the State may take over the work and prosecute the same to completion, by contract or otherwise, and may take possession of and
utilize in completing the work the materials, appliances, and plant as
may be on the site of the work and necessary therefor. Whether or not
the Contractor’s right to proceed with the work is terminated, he and his
sureties shall be liable for any damage to the State resulting from his
refusal or failure to complete the work within the specified time.

(2) If fixed and agreed liquidated damages are provided in the contract
and if the State so terminates the Contractor’s right to proceed, the
resulting damage shall consist of such liquidated damages until a
reasonable time as may be required for final completion of the work
thereof with any increased costs occasioned the State in completing
the work.

(3) If fixed and agreed liquidated damages are provided in the contract
and if the State does not so terminate the Contractor’s right to proceed,
the resulting damage shall consist of these liquidated damages until the
work is completed or accepted.

(4) The Contractor’s right to proceed may not be so terminated nor the
contractor charged with resulting damages if:

(a) 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 the State in either its sovereign or contractual capacity,
acts of another Contractor in the performance of a contract with the
State, fires, floods, epidemics, quarantine restrictions, strikes, freight
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
subcontractors or suppliers; and

(b) The Contractor, within 10 days from the beginning of any such
delay (unless the procurement officer grants a further period of time
before the date of final payment under the contract), notifies the
procurement officer in writing of the causes of delay. The procurement
officer shall ascertain the facts and the extent of the delay and extend
the time for completing the work when, in his judgement, the findings
of fact justify such an extension, and his findings of fact shall be final
and conclusive on the parties, subject only to appeal as provided in the
“Disputes” clause of this contract.

(5) If, after notice of termination of the Contractor’s right to proceed
under the provisions of this clause, it is determined for any reason that
the Contractor was not in default under the provisions of this clause, or
that the delay was excusable under the provisions of this clause, the
rights and obligations of the parties shall, if the contract contains a
clause providing for termination for convenience of the State, be the
same as if the notice of termination had been issued pursuant to the
clause. If, in the foregoing circumstances, this contract does not contain
a clause providing for termination for convenience of the State, the
contract shall be equitably adjusted to compensate for the termination
and the contract modified accordingly; failure to agree to any such
adjustment shall be a dispute concerning a question of fact within the
meaning of the clause of this contract entitled “Disputes”.

(6) The rights and remedies of the State provided in this clause are in
addition to any other rights and remedies provided by law or under this
contract.

(7) As used in paragraph (4)(a) of this clause, the term
“subcontractors or suppliers” means subcontractors or suppliers at any
tier.

26. Delivery and Acceptance

Delivery shall be made in accordance with the specifications. The
University reserves the right to test any materials, equipment, supplies,
or services delivered to determine if the specifications have been met.
The materials listed in the specifications shall be delivered FOB the
point or points specified prior to or on the date specified in the
solicitation. Any material that is defective or fails to meet the terms of
the specifications may be rejected. Rejected materials shall be
promptly replaced. The State reserves the right to purchase
replacement materials in the open market. Vendors failing to promptly
replace materials lawfully rejected shall be liable for any excess price
paid for the replacement, plus applicable expenses, if any.

27. Disputes

a. This contract is subject to the USM Procurement Policies and
Procedures.

b. Except as otherwise provided in this contract or by law, all disputes
arising under or as a result of a breach of this contract that are not
disposed of by mutual agreement shall be resolved in accordance with
this clause.

c. As used herein, claim means a written demand or assertion by one of
the parties seeking, as a legal right, the payment of money,
adjustment or interpretation of contract terms, or other relief, arising
under or relating to this contract. A voucher, invoice, or request for
payment that is not in dispute when submitted is not a claim under this
clause. However, if the submission subsequently is not acted upon in
a reasonable time, or is disputed as to liability or amount, it may be
converted to a claim for the purpose of this clause.

d. Within 30 days after contractor knows or should have known of the
basis for a claim relating to this contract, contractor shall file a written
notice of claim with the procurement officer.

e. Contemporaneously with, or within 30 days after, the filing of a
notice of claim, contractor shall submit the written claim to the
procurement officer. If contractor so requests, the procurement officer,
on conditions the procurement officer deems satisfactory to the unit,
may extend the time in which contractor must submit the claim. An
example of when a procurement officer may grant an extension includes
situations in which the procurement officer finds that a
temporaneous or timely cost quantification following the filing of the
notice of claim is impossible or impractical.

f. The claim shall set forth all the facts surrounding the controversy.
Contractor, at the discretion of the procurement officer, may be
afforded an opportunity to be heard and to offer evidence in support of
the claim.

(1) 90 days after the procurement officer receives the claim if the
claim is an amount for which the Appeals Board accelerated procedure,
set forth in COMAR 21.10.06.12, may be used;

(2) 180 days after the procurement officer receives the claim for a
claim not covered under §G(1) of this regulation; or

(3) A longer period that the procurement officer and contractor agree
to in writing.

h. The final decision may award a contract claim only for those
expenses incurred not more than 30 days before contractor was initially
required to have filed the notice of claim.

i. The procurement officer’s decision is the final action of the
University. If the procurement officer fails to render a final
decision within the time required, contractor may deem the failure to be a final
decision not to pay the claim.

j. If the final decision grants the claim in part and denies the claim in
part, the University shall pay contractor the undisputed amount.
Payment of the partial claim is not an admission of liability by the
University and does not preclude the University from recovering the
amount paid if a subsequent determination modifies the final decision.

k. Contractor may file a written appeal with the Maryland State Board
of Contract Appeals within 30 days of receipt of notice of the decision.
1. Pending resolution of a claim, contractor shall proceed diligently with the performance of the contract in accordance with the procurement officer’s decision.

26. Dissemination of Information
a. During the term of the contract, the Contractor shall not release any information related to the services or performance of the services under the contract nor publish any final reports or documents without the prior written approval of the University.

b. The Contractor shall indemnify and hold harmless the State and the University, its officers, agents and employees, from all liability which may be incurred by reason of dissemination, publication, distribution or circulation, in any manner whatsoever, of any information, data, documents, or materials pertaining in any way to the contract by the Contractor, its agents or employees.

29. EPA Compliance
Materials, supplies, equipment and services shall comply in all respects with the federal Noise Control Act of 1972, where applicable. Power equipment, to the greatest extent possible, shall be the quietest available. Equipment certified by the US EPA as a Low Noise Emission Product pursuant to the Federal Noise Control Act of 1972 shall be considered to meet the intent of the regulation.

The Contractor must supply and have immediately available to their employees spill containment equipment/supplies necessary to contain any hazards it may introduce to the job site. The Contractor is responsible for any and all costs incurred by the University in remediating spills or releases of materials introduced onto the job site.

Depending on the nature of the contract, the additional environmental and safety provisions contained in Exhibit A-1 may also be required.

30. FERPA
The Parties agree to maintain the privacy and security of personally identifiable educational records and health information and to prevent disclosure in compliance with Federal laws.

The Contractor agrees that in performing its obligations under this contract, the Contractor shall comply with all requirements of a non-affiliated third-party who receives a financial institution’s consumer or customer information, under the Gramm-Leach-Bliley Act of 1999 and applicable regulations thereto (the “GLB Act”) and other applicable federal and state consumer privacy acts, rules and regulations. Nonpublic personal information shall have the same meaning as that term is defined in the GLB Act.

a. The Contractor agrees to disclose such nonpublic personal information for the sole purpose of facilitating the Contractor’s performance of its duties and obligations under the contract and will not disclose such nonpublic personal information to any other party unless such disclosure is (i) allowed by the GLB Act and consented to by the University, or (ii) compelled by law, in which case the Contractor will provide notice of such disclosure to the University.

b. The Contractor represents and warrants that it will, for so long as it retains nonpublic personal information, implement and maintain in place the necessary information security policies and procedures for (i) protecting the confidentiality of such nonpublic personal information, (ii) protecting against any anticipated threats or hazards to the security or integrity of such nonpublic personal information, and (iii) protecting against the unauthorized access to or use of such nonpublic personal information. These terms apply to all subcontractors employed by the Contractor who perform work under the scope of the agreement.

If the Contractor’s price includes the cost of Contractor furnishing any other material, equipment, supplies, or other items in connection with the Contract, the Contractor shall pay the Maryland sales tax.

32. Incorporation by Reference
The terms of this solicitation and any amendments thereto are made a part of this Contract.

33. Indemnification
The University shall not assume any obligation to indemnify, hold harmless, or pay attorneys’ fees or any other such costs that may arise from or in any way be associated with the performance or operation of this agreement.

34. Inspection by the University
The University may provide for inspection, at any time, of any part of the Contractor’s work, and of any of the materials, supplies or equipment which the Contractor may have on hand or in the building. The Contractor shall provide adequate cooperation with any inspector assigned by the University to permit the inspector to determine the Contractor’s conformity with these specifications and the adequacy of the work being performed.

35. Intellectual Property
Contractor agrees to indemnify and save harmless the University, its officers, agents and employees with respect to any claim, action, cost or judgment for patent infringement, or trademark or copyright violation arising out of purchase or use of materials, supplies, equipment or services covered by the contract.

36. I-9 Requirement
Contractor warrants and represents that it is currently in compliance, and that during the term of the contract it will remain in compliance, with the Immigration Reform and Control Act of 1986, and that it will obtain original valid employment verification documentation from all its employees on a timely basis as required by law and regulation. This requirement also applies to all subcontractors hired by Contractor.

37. Insurance and Indemnification Provisions
a. The Contractor shall defend, indemnify and save harmless the University System of Maryland, its officers, employees and agents, from any and all claims, liability, losses and causes of actions which may arise out of the performance by the Contractor, employees or agents, of the work covered by the contract.

b. The Contractor shall secure, pay the premiums for, and keep in force until the expiration of the contract, and any renewal thereof, adequate insurance as provided below, such insurance to specifically include liability assumed by the Contractor under the contract.

(1) Commercial General Liability Insurance including all extensions
   $2,000,000 each occurrence;
   $2,000,000 personal injury;
   $2,000,000 products/completed operations;
   $2,000,000 general aggregate

(2) Workmen’s Compensation Insurance and Unemployment Insurance as required by the laws of the State of Maryland.

(3) Owner’s, Landlord’s and Tenant’s and Contractor’s bodily injury liability insurance, with limits of not less than $500,000 for each person and $2,000,000 for each accident.

(4) Property damage liability insurance with a limit of not less than $2,000,000 for each accident.

(5) If automotive equipment is used in the operation, automobile bodily injury liability insurance with limits of not less than $1,000,000 for each person and $2,000,000 for each accident, and property damage liability insurance, with a limit of not less than $2,000,000 for each accident.

c. Each policy for liability protection, bodily injury or property damage must specifically name, on its face, the University System of Maryland as an additional named insured as respects operations under the contract and premises occupied by the Contractor provided, however,
with respect to the Contractor’s liability for bodily injury or property
damage under items b(1) b(6) above, such insurance shall cover and
not exclude Contractor’s liability for injury to the property of the
University System and to the persons or property of employees,
students, faculty members, agents, officers, regents, invitees or guests of the University System.

d. Each insurance policy shall contain the following endorsements:
“IT is understood and agreed that the Insurance Company shall notify
in writing procurement officer forty-five (45) days in advance of the
effective date of any reduction in or cancellation of this policy.” A
certificate of each policy of insurance shall be furnished to the
procurement officer. With the exception of Workmen’s Compensation,
upon the request of the procurement officer, a certified true copy of
each policy of insurance, including the above endorsement, manually
countersigned by an authorized representative of the insurance
company, shall be furnished to the procurement officer. A certificate of
insurance for Workmen’s Compensation together with a properly
executed endorsement for cancellation notice shall also be furnished.
Following the notice of contract award, the requested certificates and
policies shall be delivered as directed by the procurement officer.
Notices of policy changes shall be furnished to the procurement officer.

e. All required insurance coverages must be acquired from insurers
authorized to do business in the State of Maryland and acceptable to
the University. The insurers must have a policyholders’ rating of “A-”
or better, and a financial size of “Class VII” or better in the latest edition
of Best’s Insurance Reports.

38. Fire and Extended Coverage Insurance

a. Contractor shall carry, at its own expense, builder’s risk insurance
for the full contract amount, insuring against the perils of fire, lightning,
extended coverage vandalism, and malicious mischief subject only to
the minimum standard deductible currently filed by the Insurance
Service Office with the State of Maryland Insurance Department. The
University will provide no coverage during the construction period.

b. The builder’s risk policy shall contain endorsements reading as follows:

(1) It is the intent of this insurance to cover specifically all the Work
being done under the Contract between the insureds, and as to such
Work this policy shall be primary insurance and shall not contribute or
claim contribution from any other insurance being carried which, by its
terms, would also cover the property covered hereunder in the absence
of this insurance.

(2) Coverage afforded under this policy will not be canceled until at
least fifteen (15) days prior written notice has been given to the
Procurement Officer.

c. Certificates of insurance shall be submitted to the Procurement
Officer for review and approval prior to commencement of work, and
shall be held for the duration of the contract. The University shall have
the absolute right to terminate the contract if the policy of insurance is
canceled at any time for any reason and a new policy is not obtained
by Contractor and approved by the Procurement Officer.

d. The above insurance shall remain in full force and effect until such
time as the University shall fully accept the work covered by this
contract.

39. Liquidated Damages

Time is an essential element of the contract and it is important that the
work be vigorously prosecuted until completion.

For each day that any work shall remain uncompleted beyond the
time(s) specified elsewhere in the contract, the Contractor shall be
liable for liquidated damages in the amount(s) provided for in the
solicitation, provided, however, that due account shall be taken of any
adjustment of specified completion time(s) for completion of work as
granted by approved change orders.

40. Local Conditions Covering Work

The Contractor shall cooperate with those in authority on the premises
to prevent the entrance and exit of all workmen and/or others whose
presence is forbidden or undesirable and in bringing, storing or removal
of all materials and equipment, to observe all rules and regulations in
force on the grounds, to avoid unnecessary dust or accumulated debris
or the undue interference with the convenience, sanitation or routine of
the University and to prevent the loss of, or damage to the property of
the University and/or its employees. The Contractor shall repair any
and all damage he may cause to the building or property, to the full
satisfaction of the University.

41. Mandated Contractor Reporting of Suspected Child Abuse &
Neglect

Maryland law contains mandatory reporting requirements for all
individuals who suspect child abuse or neglect. Contractors performing
work on campus also must comply with USM Board of Regents (BOR)
VI-1.50 – Policy on the Reporting of Suspected Child Abuse & Neglect,
as well as the University Procedures for Reporting Suspected Child
Abuse and Neglect. The above-referenced USM/University Policy and
Procedures are available in full at the following link:
https://inside.towson.edu/generalcampus/tupolicies/documents/06-
01.50%20Policy%20On%20the%20Reporting%20of%20Suspected%
20Child%20Abuse%20and%20Neglect.pdf, and are incorporated
herein. The University reserves the right to terminate the contract if
Contractor fails to comply with the above-referenced policy or
procedures, or if, in the judgment of the University, termination is
necessary to protect the safety and welfare of children who come into
contact with the University community.

42. Maryland Law Prevails

The contract shall be governed by the laws of the State of Maryland.
The parties agree that exclusive jurisdiction shall reside with the state
and federal courts in the State of Maryland.

43. Non-Hiring of Employees

No employee 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 the contract, shall,
while so employed, become or be an employee of the party or parties
hereby contracting with the State or any department, commission,
agency or branch thereof.

44. Non-Discrimination

The Contractor will comply with all applicable Federal and State laws,
rules and regulations involving non-discrimination on the basis of race,
color, creed, religion, national origin, age, sex, political affiliation,
marital status, veteran status, condition of disability, or other non-merit
factor. In addition, Towson University’s policies, programs, and
activities comply with federal and state laws and University System of
Maryland regulations prohibiting discrimination on the basis of race,
color, religion, age, national origin, sex, disability, and sexual
orientation. Provisions for reasonable accommodations shall be made
by the Contractor for handicapped applicants and qualified
handicapped individuals.

45. Non-Visual Access

The bidder or offeror warrants that the information technology offered
under this bid or proposal (1) provides equivalent access for effective
use by both visual and nonvisual means; (2) will present information,
including prompts used for interactive communications, in formats
intended for both visual and nonvisual use; (3) if intended for use in a
network, can be integrated into networks for obtaining, retrieving, and
disseminating information used by individuals who are not blind or
visually impaired; and (4) is available, whenever possible, without
modification for compatibility with software and hardware for nonvisual
access. The bidder or offeror further warrants that the costs, if any, of
modifying the information technology for compatibility with software
and hardware used for nonvisual access will not increase the cost of the
information technology by more than 5 percent.
For purposes of this section, the phrase “equivalent access” means that the ability to receive, use and manipulate information and operate controls necessary to access and use information technology by nonvisual means. Examples of equivalent access include keyboard controls used for input and synthesized speech, Braille, or other audible or tactile means used for output.

46. Ownership of Documents and Materials
The Contractor agrees that all documents and materials including, but not limited to, reports, drawings, studies, specifications, estimates, maps, photographs, designs, graphics, mechanical, artwork, and computations prepared by or for it under the terms of the contract shall at anytime during the performance of the services be made available to the University upon request by the University and shall become and remain the exclusive property of the University upon termination or completion of the services. The University shall have the right to use same without restriction or limitation and without compensation to the Contractor other than that provided by the contract. The University shall be the owner for purposes of copyright, patent or trademark registration.

47. Patents, Copyrights and Trade Secrets
a. If the Contractor furnishes any design, device, material, process or other item which is covered by a patent or copyright which is proprietary to or a trade secret of another, Contractor shall obtain the necessary permission or license to use such item.

b. Contractor will defend or settle, at its own expense, any claim or suit against the State alleging that any such item furnished by Contractor infringes any patent, trademark, copyright, or trade secret. Contractor also will pay all damages and costs that by final judgment may be assessed against the State due to such infringement and all attorneys’ fees and litigation expenses reasonably incurred by the State to defend against such a claim or suit. The obligations of this paragraph are in addition to those stated in paragraph c.

c. If any products furnished by Contractor become, or in Contractor’s opinion are likely to become, the subject of a claim of infringement, Contractor will, at its option: (1) procure for the State the right to continue using the applicable item; (2) replace the product with a non-infringing product substantially complying with the item’s specifications; or (3) modify the item so it becomes non-infringing and performs in a substantially similar manner to the original item.

48. Payment Bond
A payment bond is required for all construction contracts in excess of $100,000 in the amount equal to at least 100 percent of the contract price. The payment bond shall be delivered by the contractor to the State not later than the time the contract is executed. If a contractor fails to deliver the required payment bond, the contractor’s bid shall be rejected, its bid security shall be enforced, and award of the contract shall be made to the next lowest responsive and responsible bidder.

The required payment bond shall be in the State of Maryland form in effect at the time the contract is executed per COMAR 21.07.02.10B.

49. Performance Bond
A performance bond is required for all construction contracts in excess of $100,000 in the amount equal to at least 100 percent of the contract price. The performance bond shall be delivered by the contractor to the University not later than the time the contract is executed. If a contractor fails to deliver the required performance bond, the contractor’s bid shall be rejected, its bid security shall be enforced, and award of the contract may be made to the next lowest responsive and responsible bidder.

The required performance bond shall be in the State of Maryland form in effect at the time the contract is executed per COMAR 21.07.02.10A.

50. Payment of State Obligations
Payments to the Contractor pursuant to this contract shall be made no later than 30 days after the University’s receipt of a proper invoice from the Contractor. Charges of late payment of invoices, other than as prescribed by Title 15, subtitle 1, of the State Finance and Procurement Article, Annotated Code of Maryland, or by the Public Service Commission of Maryland with respect to regulated public utilities, as applicable, are prohibited.

51. Policies and Procedures
The USM Procurement Policies and Procedures in effect on the date of execution of this Contract are applicable to this Contract.

52. Responsibility of Contractor
a. The Contractor shall perform the services with that standard of care, skill, and diligence normally provided by a Contractor in the performance of services similar to the services hereunder.

b. Notwithstanding any review, approval, acceptance or payment for the services by the University, the Contractor shall be responsible for professional and technical accuracy of its work, design drawings, specifications and other materials furnished by the Contractor under the contract.

53. Prompt Payment of Subcontractors
a. This contract and all subcontracts issued under this contract are subject to the provisions of State Finance and Procurement Article, §15-226, Annotated Code of Maryland. References to “undisputed amount”, “prime contractor”, “contractor” and “subcontractor” have the meanings stated in Section 6.2 a-d herein have the meanings state in COMAR 21.10.08.01.

b. A contractor shall promptly pay its subcontractors an undisputed amount to which a subcontractor is entitled for work performed under this contract within 10 calendar days after the contractor receives a progress payment or final payment for work under this contract.

c. If a contractor fails to make payment within the period prescribed in b., a subcontractor may request a remedy in accordance with COMAR 21.10.08.

d. A contractor shall include in its subcontracts for work under the contract, wording that incorporates the provisions, duties, and obligations of 6.1 a-d: State Finance and Procurement Article, §15-226, Annotated Code of Maryland; and COMAR 21.10.08.

54. Responsibility for Claims and Liability
The Contractor shall be responsible for all damage to life and property due to its activities or those of its agents or employees, in connection with the services required under the contract. Further, it is expressly understood that the Contractor shall indemnify and save harmless the University, its officers, agents, and employees from and against all claims, suits, judgments, expenses, actions, damages and costs of every name and description, including reasonable attorney’s fees and litigation expenses arising out of or resulting from the negligent performance of the services of the Contractor under the contract.

55. Responsibility for Damage
a. The Contractor shall repair and restore to its original condition any equipment, materials or surfaces damaged by its operations.

b. The Contractor shall be entirely responsible for any loss or damage to its own materials, supplies, and equipment, and to the personal property of its employees while they are in the building.

c. The Contractor shall be solely responsible for any damage to the building or its contents for any loss or damage to any property belonging to the University or the University employees when such loss or damage may be attributable to their actions or negligence or the actions or negligence of their employees.
56. Retainage
   a. This section shall apply if the contractor has furnished 100 percent payment security and 100 percent performance security. The contractor and each subcontractor at any tier shall incorporate the mandatory provisions outlined below in paragraphs b. through d. of this section, into each subcontract for work related to this contract.

   b. The contractor may not retain from any payment due a subcontractor a percent of the payment greater than the percent for retainage specified in the contract.

   c. A subcontractor at any tier may not retain from any payment due a lower tier subcontractor a percent of the payment greater than the percent of payments retained from the subcontractor.

   d. A contractor and a subcontractor are not prohibited, by this section from withholding an amount in addition to retainage if the contractor or subcontractor determines that a subcontractor’s performance under the subcontract provides reasonable grounds for withholding an additional amount.

57. Retention of Records
The Contractor shall retain and maintain all records and documents relating to the contract for a minimum period of four years after payment by the University of the final invoice and shall make them available for inspection and audit by the State of Maryland.

58. Set-Off
The University may deduct from and set off against any amounts due and payable to the Contractor any back-charges or damages sustained by the University by virtue of any breach of the contract by the Contractor or by virtue of the failure or refusal of the Contractor to perform the services or any part of the services in a satisfactory manner. Nothing herein shall be construed to relieve the Contractor of liability for additional costs resulting from a failure to satisfactorily perform the services.

59. Site Investigation
The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the University, as well as from information presented by the drawings and specifications made a part of this contract. Any failure by the Contractor to acquaint himself with the available information may not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The University assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the University.

60. Software Contracts:
As specifically provided by § 21-104, Commercial Law Article, Annotated Code of Maryland, the parties agree that this Agreement shall not be governed by the Uniform Computer Information Transactions Act (UCITA), Title 21 of the Commercial Law Article of the Annotated Code of Maryland, as amended from time to time. This Agreement shall be governed by the common law of Maryland relating to written agreements, as well as other statutory provisions, other than UCITA, which may apply, and shall be interpreted and enforced as if UCITA had never been adopted in Maryland.

Contractor agrees that as delivered to buyer, the software does not contain any program code, virus, worm, trap door, back door, timer or clock that would erase data or programming or otherwise cause the software to become inoperable, inaccessible, or incapable of being used in accordance with its user manuals, either automatically upon the occurrence of selected conditions, or manually on command of Contractor.

61. Specifications
All materials, equipment, supplies or services shall conform to Federal and State laws and regulations and to the specifications contained in the solicitation. No asbestos, lead, or PCB-containing materials (0%) are to be utilized/installed on campus unless prior written approval has been received from the University’s Department of Environmental Health & Safety (410-704-2949).

62. Subcontracting or Assignment
The benefits and obligations hereunder shall take effect and be binding upon the parties hereto and neither the contract nor the services to be performed thereunder shall be subcontracted, or assigned or otherwise disposed of, either in whole or in part, except with the prior written consent of the University.

63. Suspension of Work
The procurement officer unilaterally may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as he may determine to be appropriate for the convenience of the University.

64. Tax Exemption
The State is generally exempt from federal excise taxes, Maryland sales and use taxes, District of Columbia sales taxes, and transportation taxes. Exemption certificates shall be provided upon request. Where a Contractor is required to furnish and install material in the construction of improvement to real property in performance of the Contract, the Contractor shall pay the Maryland sales tax and the exemption does not apply.

65. Termination of Contract for Default
If the Contractor fails to fulfill its obligation under the contract properly and on time, or otherwise violates any provision of the contract, the University may terminate the contract by written notice to the Contractor. The notice shall specify the acts or omissions relied on as cause for termination. All finished or unfinished services provided by the Contractor shall, at the University’s option, become the University’s property. The University shall pay the Contractor fair and equitable compensation for satisfactory performance prior to receipt of notice of termination, less the amount of damages caused by the Contractor’s breach. If the damages are more than the compensation payable to the Contractor, the Contractor will remain liable after termination and the University can affirmatively collect damages. The term “damages” as used in this paragraph may include attorney’s fees and litigation costs. Termination hereunder, including the determination of the rights and obligations of the parties, shall be governed by the provisions of USM Procurement Policies and Procedures.

66. Termination of Contract for Convenience
The performance of work under the contract may be terminated by the University in accordance with this clause in whole, or from time to time in part, whenever the University shall determine that such termination is in the best interest of the University. The University will pay all reasonable costs associated with the contract that the Contractor has incurred up to the date of termination and all reasonable costs associated with termination of the contract. However, the Contractor shall not be reimbursed for any anticipatory profits which have not been earned up to the date of termination. Termination hereunder, including the determination of the rights and obligations of the parties, shall be governed by the provisions of USM Procurement Policies and Procedures.
67. Termination of Multi-Year Contracts

If the General Assembly fails to appropriate funds or if funds are not otherwise made available for continued performance for any fiscal period of the contract succeeding the first fiscal period, the contract shall be canceled automatically as of the beginning of the fiscal year for which funds were not appropriated or otherwise made available; provided, however, that this will not affect either the State's rights or the Contractor's rights under any termination clause in the contract. The effect of termination of the contract hereunder will be to discharge both the Contractor and the State from future performance of the contract, but not from their rights and obligations existing at the time of termination. The Contractor shall be reimbursed for the reasonable value of any non-recurring costs incurred but not amortized in the price of the contract. The State will notify the Contractor as soon as it has knowledge that funds may not be available for the continuation of the contract for each succeeding fiscal period beyond the first.

68. Truth-In-Negotiation Certification

The Contractor by submitting cost or price information, including wage rates or other factual unit costs, certifies to the best of its knowledge, information and belief, that:

a. The wage rates and other factual unit costs supporting the firm's compensation, as set forth in the proposal, are accurate, complete and current as of the contract date;

b. If any of the items of compensation were increased due to the furnishing of inaccurate, incomplete or noncurrent wage rates or other units of costs, the State is entitled to an adjustment in all appropriate items of compensation, including profit or fee, to exclude any significant sum by which the price was increased because of the defective data. The State's right to adjustment includes the right to a price adjustment for defects in costs or pricing data submitted by a prospective or actual subcontractor; and

c. If additions are made to the original price of the contract, such additions may be adjusted to exclude any significant sums where it is determined the price has been increased due to inaccurate, incomplete or noncurrent wage rates and other factual costs."

69. Use of Contractor's Forms Not Binding on State

a. Except as provided in b., the use or execution by the State of any forms, orders, agreements, or other documents of any kind, other than the contract documents, used pursuant to or in the administration of any contract awarded by the State to Contractor, shall not bind the State to any of the terms and conditions contained therein except those provisions:

(1) generally describing, for the purposes of ordering: Equipment or services to be provided, locations, quantities, delivery or installation dates, and, to the extent consistent with the contract documents, prices; and

(2) not otherwise inconsistent with the contract documents.

b. Any such form, order, agreement or other document shall not vary, modify, or amend the terms and provisions of the contract documents, notwithstanding any provision to the contrary in such document, unless all of the following conditions are met:

(1) the document expressly refers to the particular document and provision of the contract documents being modified and plainly and conspicuously identifies any modification thereto as a modification:

(2) the document is executed on behalf of the State by the procurement officer; and

(3) execution of the document is approved by the procurement authority whose approval is required by law.

70. Variations in Estimated Quantities

Where the quantity of a pay item in this contract is an estimated quantity and where the actual quantity of such pay item varies more than twenty-five percent (25%) above or below the estimated quantity stated in this contract, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above one hundred twenty-five percent (125%) or below seventy-five percent (75%) of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the procurement officer shall, upon receipt of a written request for an extension of time within ten (10) days from the beginning of the delay, or within a further period of time which may be granted by the procurement officer before the date of final settlement of the contract, ascertain the facts and make the adjustment for extending the completion date as in his judgment the findings justify.
EXHIBIT B
BID/PROPOSAL AFFIDAVIT

A. AUTHORITY

I HEREBY AFFIRM THAT:

I am the (title) _____________________________________________ and the duly authorized representative of (business) ____________________________________________ and that I possess the legal authority to make this Affidavit on behalf of myself and the business for which I am acting.

B. AFFIRMATION REGARDING BRIBERY CONVICTIONS

I FURTHER AFFIRM THAT: Neither I, nor to the best of my knowledge, information, and belief, the above business (as is defined in Section 16-101(b) of the State Finance and Procurement Article of the Annotated Code of Maryland), or any of its officers, directors, partners, controlling stockholders, or any of its employees directly involved in the business's contracting activities including obtaining or performing contracts with public bodies has been convicted of, or has had probation before judgment imposed pursuant to Criminal Procedure Article, §6-220, Annotated Code of Maryland, or has pleaded nolo contendere to a charge of, bribery, attempted bribery, or conspiracy to bribe in violation of Maryland law, or of the law of any other state or federal law, except as follows (indicate the reasons why the affirmation cannot be given and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of person(s) involved, and current positions and responsibilities with the business):

C. AFFIRMATION REGARDING OTHER CONVICTIONS RETAINED

I FURTHER AFFIRM THAT: Neither I, nor to the best of my knowledge, information, and belief, the above business, or any of its officers, directors, partners, controlling stockholders, or any of its employees directly involved in the business's contracting activities including obtaining or performing contracts with public bodies, has:

(1) Been convicted under state or federal statute of:

(a) A criminal offense incident to obtaining, attempting to obtain, or performing a public or private contract; or

(b) Fraud, embezzlement, theft, forgery, falsification or destruction of records or receiving stolen property;

(2) Been convicted of any criminal violation of a state or federal antitrust statute;

(3) Been convicted under the provisions of Title 18 of the United States Code for violation of the Racketeer Influenced and Corrupt Organization Act, 18 U.S.C. §1961 et seq., or the Mail Fraud Act, 18 U.S.C. §1341 et seq., for acts in connection with the submission of bids or proposals for a public or private contract;

(4) Been convicted of a violation of the State Minority Business Enterprise Law, §14-308 of the State Finance and Procurement Article of the Annotated Code of Maryland;
(5) Been convicted of a violation of §11-205.1 of the State Finance and Procurement Article of the Annotated Code of Maryland;

(6) Been convicted of conspiracy to commit any act or omission that would constitute grounds for conviction or liability under any law or statute described in subsections (1) - (5) above;

(7) Been found civilly liable under a state or federal antitrust statute for acts or omissions in connection with the submission of bids or proposals for a public or private contract;

(8) Been found in a final adjudicated decision to have violated the Commercial Nondiscrimination Policy under Title 19 of the State Finance and Procurement Article of the Annotated Code of Maryland with regard to a public or private contract; or

(9) Admitted in writing or under oath, during the course of an official investigation or other proceedings, acts or omissions that would constitute grounds for conviction or liability under any law or statute described in §§B and C and subsections D(1)—(8) above, except as follows (indicate reasons why the affirmations cannot be given, and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of the person(s) involved and their current positions and responsibilities with the business, and the status of any debarment):

D. AFFIRMATION REGARDING DEBARMENT

I FURTHER AFFIRM THAT: Neither I, nor to the best of my knowledge, information, and belief, the above business, or any of its officers, directors, partners, controlling stockholders, or any of its employees directly involved in the business's contracting activities, including obtaining or performing contracts with public bodies, has ever been suspended or debarred (including being issued a limited denial of participation) by any public entity, except as follows (list each debarment or suspension providing the dates of the suspension or debarment, the name of the public entity and the status of the proceedings, the name(s) of the person(s) involved and their current positions and responsibilities with the business, the grounds of the debarment or suspension, and the details of each person's involvement in any activity that formed the grounds of the debarment or suspension):

E. AFFIRMATION REGARDING DEBARMENT OF RELATED ENTITIES

I FURTHER AFFIRM THAT:

(1) The business was not established and it does not operate in a manner designed to evade the application of or defeat the purpose of debarment pursuant to Sections 16-101, et seq., of the State Finance and Procurement Article of the Annotated Code of Maryland; and
(2) The business is not a successor, assignee, subsidiary, or affiliate of a suspended or debarred business, except as follows (indicate reasons why the affirmations cannot be given without qualification):


F. SUB-CONTRACT AFFIRMATION

I FURTHER AFFIRM THAT: Neither I, nor to the best of my knowledge, information, and belief, the above business, has knowingly entered into a contract with a public body under which a person debarred or suspended under Title 16 of the State Finance and Procurement Article of the Annotated Code of Maryland will provide, directly or indirectly, supplies, services, architectural services, construction related services, leases of real property, or construction.

G. AFFIRMATION REGARDING COLLUSION

I FURTHER AFFIRM THAT: Neither I, nor to the best of my knowledge, information, and belief, the above business has:

(1) Agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the accompanying bid or offer that is being submitted;

(2) In any manner, directly or indirectly, entered into any agreement of any kind to fix the bid price or price proposal of the bidder or offeror or of any competitor, or otherwise taken any action in restraint of free competitive bidding in connection with the contract for which the accompanying bid or offer is submitted.

H. CERTIFICATION OF TAX PAYMENT

I FURTHER AFFIRM THAT: Except as validly contested, the business has paid, or has arranged for payment of, all taxes due the State of Maryland and has filed all required returns and reports with the Comptroller of the Treasury, the State Department of Assessments and Taxation, and the Department of Labor, Licensing, and Regulation, as applicable, and will have paid all withholding taxes due the State of Maryland prior to final settlement.

I. CONTINGENT FEES

I FURTHER AFFIRM THAT: The business has not employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee, bona fide agent, bona fide salesperson, or commercial selling agency working for the business, to solicit or secure the Contract, and that the business has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee, bona fide agent, bona fide salesperson, or commercial selling agency, any fee or any other consideration contingent on making of the Contract.

J. CERTIFICATION REGARDING INVESTMENTS IN IRAN

(1) The undersigned bidder or offeror certifies that, in accordance with State Finance & Procurement Article, §17-705:

   (i) it is not identified on the list created by the Board of Public Works as a person engaging in investment activities in Iran as described in §17-702 of State Finance & Procurement; and

   (ii) it is not engaging in investment activities in Iran as described in State Finance & Procurement Article, §17-702.
The undersigned bidder or offeror is unable to make the above certification regarding its investment activities in Iran due to the following activities:

K. ACKNOWLEDGEMENT

I ACKNOWLEDGE THAT: This Affidavit is to be furnished to the Procurement Officer and may be distributed to units of: (1) the State of Maryland; (2) counties or other subdivisions of the State of Maryland; (3) other states; and (4) the federal government. I further acknowledge that this Affidavit is subject to applicable laws of the United States and the State of Maryland, both criminal and civil, and that nothing in this Affidavit or any contract resulting from the submission of this bid or proposal shall be construed to supersede, amend, modify or waive, on behalf of the State of Maryland, or any unit of the State of Maryland having jurisdiction, the exercise of any statutory right or remedy conferred by the Constitution and the laws of Maryland with respect to any misrepresentation made or any violation of the obligations, terms and covenants undertaken by the above business with respect to (1) this Affidavit, (2) the contract, and (3) other Affidavits comprising part of the contract.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

Date: __________________________

By: ______________________________

(Print Name of Authorized Representative and Affiant)

(Signature of Authorized Representative and Affiant)

(Title of Authorized Representative and Affiant)
EXHIBIT C
CONTRACT AFFIDAVIT

A. AUTHORIZED REPRESENTATIVE

I HEREBY AFFIRM THAT:

I am the __________________________ (title) and the duly authorized representative of __________________________ (business) and that I possess the legal authority to make this Affidavit on behalf of myself and the business for which I am acting.

B. CERTIFICATION OF CORPORATION REGISTRATION AND TAX PAYMENT OR QUALIFICATION WITH THE STATE DEPARTMENT OF ASSESSMENTS AND TAXATION

I FURTHER AFFIRM THAT: The business named above is a (X applicable items):

(1) □ Corporation □ domestic (i.e., organized in Maryland) or □ foreign;
(2) □ Limited Liability Co. □ domestic or □ foreign;
(3) □ Partnership □ domestic or □ foreign;
(4) □ Statutory Trust □ domestic or □ foreign;
(5) □ Sole Proprietorship

and is registered or qualified as required under Maryland Law.

I further affirm that the above business is in good standing both in Maryland and (IF APPLICABLE) in the jurisdiction where it is presently organized, and has filed all of its annual reports, together with filing fees, with the Maryland State Department of Assessments and Taxation. The name and address of its resident agent (IF APPLICABLE) filed with the State Department of Assessments and Taxation is:

Name and Department ID Number: ________________________________________________

Address: ____________________________________________________________________

and that if it does business under a trade name, it has filed a certificate with the State Department of Assessments and Taxation that correctly identifies that true name and address of the principal or owner as:

Name and Department ID Number: ________________________________________________

Address: ____________________________________________________________________

C. FINANCIAL DISCLOSURE AFFIRMATION

I FURTHER AFFIRM THAT: I am aware of, and the above business will comply with, the provisions of Section 13-221 of the State Finance and Procurement Article of the Annotated Code of Maryland, which require that every business that enters into contracts, leases, or other agreements with the State of Maryland or its agencies during a calendar year under which the business is to receive in the aggregate $100,000 or more shall, within 30 days of the time when the aggregate value of the contracts, leases, or other agreements reaches $100,000, file with the Secretary of State of Maryland certain specified information to include disclosure of beneficial ownership of the business.
D. POLITICAL CONTRIBUTION DISCLOSURE AFFIRMATION

I FURTHER AFFIRM THAT: I am aware of, and the above business will comply with, Election Law Article, §§14-101 through 14-108, Annotated Code of Maryland, which requires that every person that enters into contracts, leases, or other agreements with the State of Maryland, including its agencies or a political subdivision of the State valued at $200,000 or more, shall file with the State Board of Elections a statement disclosing contributions in excess of $500 made during the reporting period to a candidate for elective office in any primary or general election.

E. DRUG AND ALCOHOL FREE WORKPLACE

I CERTIFY THAT:

(1) Terms defined in COMAR 21.11.08 shall have the same meanings when used in this certification.

(2) By submission of its bid or offer, the business, if other than an individual, certifies and agrees that, with respect to its employees to be employed under a contract resulting from this solicitation, the business shall:

(a) Maintain a workplace free of drug and alcohol abuse during the term of the contract;

(b) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of drugs, and the abuse of drugs or alcohol is prohibited in the business’s workplace and specifying the actions that will be taken against employees for violation of these prohibitions;

(c) Prohibit its employees from working under the influence of drugs or alcohol;

(d) Not hire or assign to work on the contract anyone whom the business knows, or in the exercise of due diligence should know, currently abuses drugs or alcohol and is not actively engaged in a bona fide drug or alcohol abuse assistance or rehabilitation program;

(e) Promptly inform the appropriate law enforcement agency of every drug-related crime that occurs in its workplace if the business has observed the violation or otherwise has reliable information that a violation has occurred;

(f) Establish drug and alcohol abuse awareness programs to inform its employees about:

(i) The dangers of drug and alcohol abuse in the workplace;

(ii) The business’s policy of maintaining a drug and alcohol free workplace;

(iii) Any available drug and alcohol counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees who abuse drugs and alcohol in the workplace;

(g) Provide all employees engaged in the performance of the contract with a copy of the statement required by §(2)(b), above;

(h) Notify its employees in the statement required by §(2)(b) above, that as a condition of continued employment on the contract, the employee shall:

(i) Abide by the terms of the statement; and

(ii) Notify the employer of any criminal drug or alcohol abuse conviction for an offense occurring in the workplace not later than 5 days after a conviction;

(i) Notify the procurement officer within 10 days after receiving notice under §(2)(h)(ii), above, or otherwise receiving actual notice of a conviction;

(j) Within 30 days after receiving notice under §(2)(h)(ii) above, or otherwise receiving actual notice of a conviction, impose either of the following sanctions or remedial measures on any employee who is convicted of a drug or alcohol abuse offense occurring in the workplace:
(i) Take appropriate personnel action against an employee, up to and including termination; or

(ii) Require an employee to satisfactorily participate in a bona fide drug or alcohol abuse assistance or rehabilitation program; and

(k) Make a good faith effort to maintain a drug and alcohol free workplace through implementation of §(2)(a) through (j), above.

(3) If the business is an individual, the individual shall certify and agree as set forth in §(4), below, that the individual shall not engage in the unlawful manufacture, distribution, dispensing, possession, or use of drugs or the abuse of drugs or alcohol in the performance of the contract.

(4) I acknowledge and agree that:

(a) The award of the contract is conditional upon compliance with COMAR 21.11.08 and this certification;

(b) The violation of the provisions of COMAR 21.11.08 or this certification shall be cause to suspend payments under, or terminate the contract for default under COMAR 21.07.01.11 or 21.07.03.15, as applicable; and

(c) The violation of the provisions of COMAR 21.11.08 or this certification in connection with the contract may, in the exercise of the discretion of the Board of Public Works, result in suspension and debarment of the business under COMAR 21.08.03.

F. CERTAIN AFFIRMATIONS VALID

I FURTHER AFFIRM THAT:

To the best of my knowledge, information, and belief, each of the affirmations, certifications, or acknowledgments contained in that certain Bid/Proposal Affidavit dated ___________, 20___ and executed by me for the purpose of obtaining the contract to which this Exhibit is attached remains true and correct in all respects as if made as of the date of this Contract Affidavit and as if fully set forth herein.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

DATE: ____________________________

BY: __________________________________________

(Printed Name and Title of Authorized Representative and Affiant)

(Signature of Authorized Representative and Affiant)
EXHIBIT D
SAMPLE AGREEMENT

This Agreement made the _________ day of __________________________, Two Thousand and _____, by and between _________________________, herein called "Contractor" and Towson University, herein called "University." Witnesseth, that the Contractor and the University, for the consideration here mentioned agree as follows:

Article 1. Scope of Contract - The Contractor shall furnish all materials and perform all of the work described in the Contract Documents, and shall comply with all of the terms and conditions of the Contract Documents, all of which are made a part hereof and are referred to herein as "the Contract."

Article 2. Contract Documents - The Contract between the parties is set forth in the Contract Documents which consist of the following, listed in their order of precedence:
   A. This Contract,
   B. Towson University - Request for Proposal, for the Procurement of ____________________________, Towson University, RFP No. ______________ including all attachments, exhibits, and addenda, and subsequent Purchase Order, and
   C. Contractor's Proposal dated ______________, submitted in response to the RFP (hereinafter referred to as the "Proposal").

   In the event of a conflict between the terms and conditions of any of the Contract Documents, the controlling terms and conditions shall be in the above listed order of precedence.

Article 3. Services - The Contractor's performance under this Contract shall be in accordance with the requirements generally set forth in the RFP and specifically described in Section V., Specifications and as set forth in the Contractor's Technical Proposal.

Article 4. Term of Contract – The term of the contract shall be one year from the date that the University provides the Contractor with a Notice to Proceed. The University shall have the option to exercise four annual renewal options, said options to be exercised at the sole discretion of the University. Should the University elect to renew the contract, all prices, terms and conditions will remain in effect.

Article 5. Contract Price - The University shall pay the Contractors as follows:

   Total Project Cost $ _______________

Article 6. Payment of State Obligations - Contractor will be paid for services rendered in accordance with the terms and conditions of the Contract Documents and upon submission of proper invoices submitted to the Towson University, Accounts Payable Office. The Contractor's Federal Identification Number and the University's Purchase Order number must be included on all invoices. Towson University is exempt from the payment of taxes and shall provide the Contractor with a copy of tax-exempt certificate upon request.
Electronic funds will be used by the State to pay Contractor for this Contract and any other State payments due Contractor unless the State Comptroller's Office grants Contractor an exemption.

Electronic funds will be used by the State to pay Contractor for this Contract and any other State payments due Contractor unless the State Comptroller's Office grants Contractor an exemption.

Article 7. Limitation of Liability - The University shall not be liable for any indirect, special or consequential damages, such as loss of anticipated profits or other economic loss in connection with or arising out of the services provided in the Contract.

Article 8. Assignment - University may assign this Contract with Contractor's written consent, which shall not be unreasonably withheld.

Article 9. Entire Agreement - This Contract, including all Contract Documents, constitutes the entire agreement between the University and the Contractor. No waiver, modification or amendment of any of the terms or conditions hereof shall be effective unless set forth in writing and duly signed by the Contractor and the University.

IN WITNESS WHEREOF, the parties have executed this Contract by their duly authorized officer, agents or official on the day and year first above written.

CONTRACTOR

Witness

Corporate Officer or Authorized Agent Date

Printed Name and Title

AFFIX CORPORATE SEAL

TOWSON UNIVERSITY

Witness

Authorized Agent Date

Printed Name and Title
EXHIBIT E

MINORITY BUSINESS ENTERPRISE (MBE) PARTICIPATION
MBE ATTACHMENT-1A:
MBE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT
& MBE PARTICIPATION SCHEDULE

PART 1 - INSTRUCTIONS
PLEASE READ BEFORE COMPLETING THIS DOCUMENT

This form includes Instructions and the MBE Utilization and Fair Solicitation Affidavit & MBE Participation Schedule which must be submitted with the bid/proposal. If the bidder/offeror fails to accurately complete and submit this Affidavit and Schedule with the bid or proposal, the Procurement Officer shall deem the bid non-responsive or shall determine that the proposal is not reasonably susceptible of being selected for award.

1. Contractor shall structure its procedures for the performance of the work required in this Contract to attempt to achieve the minority business enterprise (MBE) subcontractor participation goal stated in the Invitation for Bids or Request for Proposals. Contractor agrees to exercise good faith efforts to carry out the requirements set forth in these Instructions, as authorized by the Code of Maryland Regulations (COMAR) 21.11.03.

2. MBE Goals and Subgoals: Please review the solicitation for information regarding the Contract’s MBE overall participation goals and subgoals. After satisfying the requirements for any established subgoals, the Contractor is encouraged to use a diverse group of subcontractors and suppliers from the various MBE classifications to meet the remainder of the overall MBE participation goal.

3. MBE means a minority business enterprise that is certified by the Maryland Department of Transportation (“MDOT”). Only MBEs certified by MDOT may be counted for purposes of achieving the MBE participation goals. In order to be counted for purposes of achieving the MBE participation goals, the MBE firm, including a MBE prime, must be MDOT-certified for the services, materials or supplies that it is committed to perform on the MBE Participation Schedule. A firm whose MBE certification application is pending may not be counted.

4. Please refer to the MDOT MBE Directory at https://mbe.mdot.maryland.gov/directory/ to determine if a firm is certified with the appropriate North American Industry Classification System (“NAICS”) code and the product/services description (specific product that a firm is certified to provide or specific areas of work that a firm is certified to perform). For more general information about NAICS codes, please visit https://www.census.gov/eos/www/naics/. Only those specific products and/or services for which a firm is certified in the MDOT Directory can be used for purposes of achieving the MBE participation goals.
   **CAUTION:** If the firm’s NAICS code is in graduated status, such services/products may not be counted for purposes of achieving the MBE participation goals. A NAICS code in the graduated status if the term “Graduated” follows the code in the MDOT MBE Directory.

5. **Guidelines Regarding MBE Prime Self-Performance.** Please note that when a certified MBE firm participates as a prime contractor on a Contract, a procurement agency may count the distinct, clearly defined portion of the work of the Contract that the certified MBE firm performs with its own workforce toward fulfilling up to, but no more than, fifty-percent (50%) of the overall MBE participation goal, including up to one hundred percent (100%) of not more than one of the MBE participation subgoals, if any, established for the Contract.
In order to receive credit for self-performance, an MBE prime must be certified in the appropriate NAICS code to do the work and must list its firm in the MBE Participation Schedule, including the certification category under which the MBE prime is self-performing and include information regarding the work it will self-perform.

For the remaining portion of the overall goal and the remaining subgoals, the MBE prime must also identify on the MBE Participation Schedule the other certified MBE subcontractors used to meet those goals or request a waiver.

These guidelines apply to the work performed by the MBE Prime that can be counted for purposes of meeting the MBE participation goals. These requirements do not affect the MBE Prime’s ability to self-perform a greater portion of the work in excess of what is counted for purposes of meeting the MBE participation goals.

Please note that the requirements to meet the MBE participation overall goal and subgoals are distinct and separate. If the contract has subgoals, regardless of MBE Prime’s ability to self-perform up to 50% of the overall goal (including up to 100% of any subgoal), the MBE Prime must either commit to use other MBEs for each of any remaining subgoals or request a waiver. As set forth in Attachment 1-B Waiver Guidance, the MBE Prime’s ability to self-perform certain portions of the work of the Contract will not be deemed a substitute for the good faith efforts to meet any remaining subgoal or the balance of the overall goal.

In certain instances where the percentages allocated to MBE participation subgoals add up to more than 50% of the overall goal, the portion of self-performed work that an MBE Prime may count toward the overall goal may be limited to less than 50%. Please refer to the Governor’s Office of Small Minority & Women Business Affairs’ website for the MBE Prime Regulations Q&A for illustrative examples.

Subject to items 1 through 5 above, when a certified MBE performs as a participant in a joint venture, a procurement agency may count a portion of the total dollar value of the Contract equal to the distinct, clearly-defined portion of the work of the Contract that the certified MBE performs with its own forces toward fulfilling the Contract goal, and not more than one of the Contract subgoals, if any.

The work performed by a certified MBE firm, including an MBE prime, can only be counted towards the MBE participation goal(s) if the MBE firm is performing a commercially useful function on the Contract. Please refer to COMAR 21.11.03.12-1 for more information regarding these requirements.
8. **Materials and Supplies: New Guidelines Regarding MBE Participation.**

- **Regular Dealer** (generally identified as a wholesaler or supplier in the MDOT Directory): Up to 60% of the costs of materials and supplies provided by a certified MBE may be counted towards the MBE participation goal(s) if such MBE is a Regular Dealer of such materials and supplies. Regular Dealer is defined as a firm that owns, operates, or maintains a store, a warehouse, or any other establishment in which the materials, supplies, articles, or equipment are of the general character described by the specifications required under the contract and are bought, kept in stock, or regularly sold or leased to the public in the usual course of business; and does not include a packager, a broker, a manufacturer’s representative, or any other person that arranges or expedites transactions.

**Example for illustrative purposes of applying the 60% rule**

*Overall contract value: $2,000,000
Total value of supplies: $100,000*

*Calculate Percentage of Supplies to overall contract value: $100,000 divided by $2,000,000 = 5%
Apply 60% Rule - Total percentage of Supplies/Products 5% x 60% = 3%

3% would be counted towards achieving the MBE Participation Goal and Subgoal, if any, for the MBE supplier in this example.*

- **Manufacturer:** A certified MBE firm’s participation may be counted in full if the MBE is certified in the appropriate NAICS code(s) to provide products and services as a manufacturer.

- **Broker:** With respect to materials or supplies purchased from a certified MBE that is neither a manufacturer nor a regular dealer, a unit may apply the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, fees, or transportation charges for the delivery of materials and supplies required on a procurement toward the MBE contract goals, provided a unit determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. A unit may not apply any portion of the costs of the materials and supplies toward MBE goals.

- **Furnish and Install and other Services:** The participation of a certified MBE supplier, wholesaler, and/or regular dealer certified in the proper NAICS code(s) to furnish and install materials necessary for successful contract completion may be counted in full. Includes the participation of other MBE service providers in the proper NAICS code(s) may be counted in full.

9. **Dually certified firms.** An MBE that is certified in more than one subgroup category may only be counted toward goal fulfillment of ONE of those categories with regard to a particular contract.

Example: A woman-owned Hispanic American (dually certified) firm may be used to fulfill the women-owned OR Hispanic American subgoal, but not both on the same contract.

10. **CAUTION:** The percentage of MBE participation, computed using the percentage amounts determined for all of the MBE firms listed in Part 3, MUST meet or exceed the MBE participation goal and subgoals (if applicable) as set forth in Part 2- for this solicitation. If a bidder/offeror is unable to meet the MBE participation goal or any subgoals (if applicable), then the bidder/offeror must request a waiver in Part 2 or the bid will be deemed not responsive, or the proposal not reasonably susceptible of being selected...
for award. You may wish to use the attached Goal/Subgoal Worksheet to assist in calculating the percentages and confirming that your commitment meets or exceeds the applicable MBE participation goal and subgoals (if any).

11. If you have any questions as to whether a firm is certified to perform the specific services or provide specific products, please contact MDOT’s Office of Minority Business Enterprise at 1-800-544-6056 or via email to mbe@mdot.state.md.us sufficiently prior to the submission due date.

**Subgoals (if applicable)**

<table>
<thead>
<tr>
<th>Subgoal</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total African American MBE Participation:</td>
<td>%</td>
</tr>
<tr>
<td>Total Asian American MBE Participation:</td>
<td>%</td>
</tr>
<tr>
<td>Total Hispanic American MBE Participation:</td>
<td>%</td>
</tr>
<tr>
<td>Total Women-Owned MBE Participation:</td>
<td>%</td>
</tr>
</tbody>
</table>

**Overall Goal**

| Total MBE Participation (include all categories): | 15% |
PART 2 - MBE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT

This MBE Utilization and Fair Solicitation Affidavit and MBE Participation Schedule must be completed and included with the bid/proposal. If the bidder/offeror fails to accurately complete and submit this Affidavit and the Schedule in Part 3 with the bid or proposal as required, the Procurement Officer shall deem the bid non-responsive or shall determine that the proposal is not reasonably susceptible of being selected for award.

In connection with the bid/proposal submitted in response to Solicitation No. _____, I affirm the following:

1. MBE Participation (PLEASE CHECK ONLY ONE)

☐ I acknowledge and intend to meet IN FULL both the overall certified Minority Business Enterprise (MBE) participation goal of ___15___ percent and all of the following subgoals:

   ____ percent for African American-owned MBE firms
   ____ percent for Hispanic American-owned MBE firms
   ____ percent for Asian American-owned MBE firms
   ____ percent for Women-owned MBE firms

Therefore, I am not seeking a waiver pursuant to COMAR 21.11.03.11. I acknowledge that by checking the above box and agreeing to meet the stated goal and subgoal(s), if any, I must complete Part 3 - MBE Participation Schedule and Part 4 Signature Page in order to be considered for award.

OR

☐ I conclude that I am unable to achieve the MBE participation goal and/or subgoals. I hereby request a waiver, in whole or in part, of the overall goal and/or subgoal(s). I acknowledge that by checking this box and requesting a partial waiver of the stated goal and/or one or more of the stated subgoal(s) if any, I must complete Part 3, the MBE Participation Schedule and Part 4 Signature Page for the portion of the goal and/or subgoal(s) if any, for which I am not seeking a waiver, in order to be considered for award. I acknowledge that by checking this box and requesting a full waiver of the stated goal and the stated subgoal(s) if any, I must complete Part 4 Signature Page in order to be considered for award.
Additional MBE Documentation

I understand that if I am notified that I am the apparent awardee or as requested by the Procurement Officer, I must submit the following documentation within 10 working days of receiving notice of the potential award or from the date of conditional award (per COMAR 21.11.03.10), whichever is earlier:

(a) Good Faith Efforts Documentation to Support Waiver Request (Attachment __-1C)
(b) Outreach Efforts Compliance Statement (Attachment __-2);
(c) MBE Subcontractor/MBE Prime Project Participation Statement (Attachments __-3A and 3B);
(d) Any other documentation, including additional waiver documentation if applicable, required by the Procurement Officer to ascertain bidder or offeror responsibility in connection with the certified MBE participation goal and subgoals, if any.

I understand that if I fail to return each completed document within the required time, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award. If the contract has already been awarded, the award is voidable.

Information Provided to MBE firms

In the solicitation of subcontract quotations or offers, MBE firms were provided not less than the same information and amount of time to respond as were non-MBE firms.
PART 3 - MBE PARTICIPATION SCHEDULE

Set forth below are the (i) certified MBEs I intend to use, (ii) the percentage of the total Contract value allocated to each MBE for this project and, (iii) the items of work each MBE will provide under the Contract. I have confirmed with the MDOT database that the MBE firms identified below (including any self-performing MBE prime firms) are performing work activities for which they are MDOT-certified.

<table>
<thead>
<tr>
<th>Prime Contractor</th>
<th>Project Description</th>
<th>Project/Contract Number</th>
</tr>
</thead>
</table>

LIST INFORMATION FOR EACH CERTIFIED MBE FIRM YOU AGREE TO USE TO ACHIEVE THE MBE PARTICIPATION GOAL AND SUBGOALS, IF ANY. MBE PRIMES: PLEASE COMPLETE BOTH SECTIONS A AND B BELOW.

SECTION A: For MBE Prime Contractors ONLY (including MBE Primes in a Joint Venture)

| MBE Prime Firm Name: __________________________ |
| MBE Certification Number: __________ |
| (If dually certified, check only one box.) |

- [ ] African American-Owned
- [ ] Hispanic American-Owned
- [ ] Asian American-Owned
- [ ] Women-Owned
- [ ] Other MBE Classification

NAICS code: _________________________________

| Percentage of total Contract Value to be performed with own forces and counted towards the MBE overall participation goal (up to 50% of the overall goal): _________% |
| Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies. |

| Percentage of total Contract Value to be performed with own forces and counted towards the subgoal, if any, for my MBE classification (up to 100% of not more than one subgoal): _________% |
| [ ] Supplier, wholesaler and/or regular dealer (count 60%) |
| [ ] Manufacturer (count 100%) |
| [ ] Broker (count reasonable fee/commission only) |
| [ ] Furnish and Install and other Services (count 100%) |

Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work your firm is self-performing to calculate amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.

A. Percentage amount of subcontract where the MBE Prime firm is being used for manufacturer, furnish and install, and/or services (excluding products / services from suppliers, wholesalers, regular dealers and brokers) _________% |

B. Percentage amount for items of work where the MBE Prime firm is being used as supplier, wholesaler, and/or regular dealer (60% Rule). Total percentage of Supplies/Products _________% x 60% = _________% |

C. Percentage amount of fee where the MBE Prime firm is being used as broker (count reasonable fee/commission only) _________% |

Description of the Work to be performed with MBE prime’s own forces: ____________________________________________________________
### SECTION B: For all Contractors (including MBE Primes and MBE Primes in a Joint Venture)

<table>
<thead>
<tr>
<th>MBE Firm</th>
<th>Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: ____________________________</td>
<td>□ Supplier, wholesaler and/or regular dealer (count 60%)</td>
</tr>
<tr>
<td>MBE Certification Number: __________</td>
<td>□ Manufacturer (count 100%)</td>
</tr>
<tr>
<td>(If dually certified, check only one box.)</td>
<td>□ Broker (count reasonable fee/commission only)</td>
</tr>
<tr>
<td>□ African American-Owned</td>
<td>□ Furnish and Install and other Services (count 100%)</td>
</tr>
<tr>
<td>□ Hispanic American-Owned</td>
<td></td>
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<tr>
<td>□ Asian American-Owned</td>
<td></td>
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<tr>
<td>□ Women-Owned</td>
<td></td>
</tr>
<tr>
<td>□ Other MBE Classification</td>
<td></td>
</tr>
<tr>
<td>NAICS code: ______________________</td>
<td></td>
</tr>
</tbody>
</table>

Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work that the MBE Firm named to the left will be performing to calculate the amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.

**A. Percentage amount of subcontract where the MBE Firm is being used for manufacturer, furnish and install, and/or services (excluding products/services from suppliers, wholesalers, regular dealers and brokers) ______%**

**B. Percentage amount for items of work where the MBE Firm is being used as supplier, wholesaler, and/or regular dealer (60% Rule).**

Total percentage of Supplies/Products ______% × 60% = ______%

**C. Percentage amount of fee where the MBE Firm is being used as broker (count reasonable fee/commission only) ______ %**

Description of the Work to be Performed:

_________________________________________________________
_________________________________________________________
_________________________________________________________

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<table>
<thead>
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<th>MBE Firm</th>
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<td>□ Broker (count reasonable fee/commission only)</td>
</tr>
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<td>□ African American-Owned</td>
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<tr>
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<td></td>
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<td>□ Other MBE Classification</td>
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<td>NAICS code: ______________________</td>
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Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work that the MBE Firm named to the left will be performing to calculate the amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.

**A. Percentage amount of subcontract where the MBE Firm is being used for manufacturer, furnish and install, and/or services (excluding products/services from suppliers, wholesalers, regular dealers and brokers) ______%**

**B. Percentage amount for items of work where the MBE Firm is being used as supplier, wholesaler, and/or regular dealer (60% Rule).**

Total percentage of Supplies/Products ______% × 60% = ______%

**C. Percentage amount of fee where the MBE Firm is being used as broker (count reasonable fee/commission only) ______ %**

Description of the Work to be Performed:

_________________________________________________________
_________________________________________________________
_________________________________________________________
MBE Firm
Name:______________________________________

MBE Certification Number: ______________________
(If dually certified, check only one box.)
☐ African American-Owned
☐ Hispanic American- Owned
☐ Asian American-Owned
☐ Women-Owned
☐ Other MBE Classification

NAICS code: _______________________________

Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies.

☐ Supplier, wholesaler and/or regular dealer (count 60%)
☐ Manufacturer (count 100%)
☐ Broker (count reasonable fee/commission only)
☐ Furnish and Install and other Services (count 100%)

Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work that for the MBE firm named to the left will be performing to calculate the amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.

A. Percentage amount of subcontract where the MBE firm is being used for manufacturer, furnish and install, and/or services (excluding products/services from suppliers, wholesalers, regular dealers and brokers) ______%

B. Percentage amount for items of work where the MBE firm is being used as supplier, wholesaler, and/or regular dealer (60% Rule).
   Total percentage of Supplies/Products ______%  X  60%  =  _____%

C. Percentage amount of fee where the MBE firm is being used as broker ______ %

Description of the Work to be Performed:
_________________________________________________________
_____________________________________

CONTINUE ON SEPARATE PAGE IF NEEDED
PART 4 – SIGNATURE PAGE
To complete Affidavit committing to MBE(s) or requesting waiver, bidder/offeror must sign below

I solemnly affirm under the penalties of perjury that: (i) I have reviewed the instructions for the MBE Utilization & Fair Solicitation Affidavit and MBE Schedule, and (ii) the information contained in the MBE Utilization & Fair Solicitation Affidavit and MBE Schedule is true to the best of my knowledge, information and belief.

Bidder/Offeror Name (PLEASE PRINT OR TYPE) Signature of Authorized Representative

Address Printed Name and Title

City, State and Zip Code Date

SUBMIT THIS AFFIDAVIT WITH BID/PROPOSAL
GUIDANCE FOR DOCUMENTING GOOD FAITH EFFORTS TO MEET MBE PARTICIPATION GOALS

In order to show that it has made good faith efforts to meet the Minority Business Enterprise (MBE) participation goal (including any MBE subgoals) on a contract, the bidder/offeror must either (1) meet the MBE Goal(s) and document its commitments for participation of MBE Firms, or (2) when it does not meet the MBE Goal(s), document its Good Faith Efforts to meet the goal(s).

I. Definitions

MBE Goal(s) – “MBE Goal(s)” refers to the MBE participation goal and MBE participation subgoal(s).

Good Faith Efforts – The “Good Faith Efforts” requirement means that when requesting a waiver, the bidder/offeror must demonstrate that it took all necessary and reasonable steps to achieve the MBE Goal(s), which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient MBE participation, even if those steps were not fully successful. Whether a bidder/offeror that requests a waiver made adequate good faith efforts will be determined by considering the quality, quantity, and intensity of the different kinds of efforts that the bidder/offeror has made. The efforts employed by the bidder/offeror should be those that one could reasonably expect a bidder/offeror to take if the bidder/offeror were actively and aggressively trying to obtain MBE participation sufficient to meet the MBE contract goal and subgoals. Mere pro forma efforts are not good faith efforts to meet the MBE contract requirements. The determination concerning the sufficiency of the bidder's/offeror's good faith efforts is a judgment call; meeting quantitative formulas is not required.

Identified Firms – “Identified Firms” means a list of the MBEs identified by the procuring agency during the goal setting process and listed in the procurement as available to perform the Identified Items of Work. It also may include additional MBEs identified by the bidder/offeror as available to perform the Identified Items of Work, such as MBEs certified or granted an expansion of services after the procurement was issued. If the procurement does not include a list of Identified Firms, this term refers to all of the MBE Firms (if State-funded) the bidder/offeror identified as available to perform the Identified Items of Work and should include all appropriately certified firms that are reasonably identifiable.

Identified Items of Work – “Identified Items of Work” means the bid items identified by the procuring agency during the goal setting process and listed in the procurement as possible items of work for performance by MBE Firms. It also may include additional portions of items of work the bidder/offeror identified for performance by MBE Firms to increase the likelihood that the MBE Goal(s) will be achieved. If the procurement does not include a list of Identified Items of Work, this term refers to all of the items of work the bidder/offeror identified as possible items of work for performance by MBE Firms and should include all reasonably identifiable work opportunities.

MBE Firms – “MBE Firms” refers to a firm certified by the Maryland Department of Transportation (“MDOT”) under COMAR 21.11.03. Only MDOT-certified MBE Firms can participate in the State’s MBE Program.

II. Types of Actions Agency Will Consider

The bidder/offeror is responsible for making relevant portions of the work available to MBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available MBE subcontractors and suppliers, so as to facilitate MBE participation. The following is a list of types of actions the procuring agency will consider as part of the bidder's/offeror's Good Faith Efforts when the bidder/offeror fails to meet the MBE Goal(s). This list is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.
A. Identify Bid Items as Work for MBE Firms

1. Identified Items of Work in Procurements
   (a) Certain procurements will include a list of bid items identified during the goal setting process as possible work for performance by MBE Firms. If the procurement provides a list of Identified Items of Work, the bidder/offeror shall make all reasonable efforts to solicit quotes from MBE Firms to perform that work.
   (b) Bidders/Offerors may, and are encouraged to, select additional items of work to be performed by MBE Firms to increase the likelihood that the MBE Goal(s) will be achieved.

2. Identified Items of Work by Bidders/Offerors
   (a) When the procurement does not include a list of Identified Items of Work or for additional Identified Items of Work, bidders/offerors should reasonably identify sufficient items of work to be performed by MBE Firms.
   (b) Where appropriate, bidders/offerors should break out contract work items into economically feasible units to facilitate MBE participation, rather than perform these work items with their own forces. The ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder/offeror of the responsibility to make Good Faith Efforts.

B. Identify MBE Firms to Solicit

1. MBE Firms Identified in Procurements
   (a) Certain procurements will include a list of the MBE Firms identified during the goal setting process as available to perform the items of work. If the procurement provides a list of Identified MBE Firms, the bidder/offeror shall make all reasonable efforts to solicit those MBE firms.
   (b) Bidders/offerors may, and are encouraged to, search the MBE Directory to identify additional MBEs who may be available to perform the items of work, such as MBEs certified or granted an expansion of services after the solicitation was issued.

2. MBE Firms Identified by Bidders/Offerors
   (a) When the procurement does not include a list of Identified MBE Firms, bidders/offerors should reasonably identify the MBE Firms that are available to perform the Identified Items of Work.
   (b) Any MBE Firms identified as available by the bidder/offeror should be certified to perform the Identified Items of Work.

C. Solicit MBEs

1. Solicit all Identified Firms for all Identified Items of Work by providing written notice. The bidder/offeror should:
   (a) provide the written solicitation at least 10 days prior to bid opening to allow sufficient time for the MBE Firms to respond;
   (b) send the written solicitation by first-class mail, facsimile, or email using contact information in the MBE Directory, unless the bidder/offeror has a valid basis for using different contact information; and
   (c) provide adequate information about the plans, specifications, anticipated time schedule for portions of the work to be performed by the MBE, and other requirements of the contract to assist MBE Firms in responding. (This information may be provided by including hard copies in the written solicitation or by electronic means as described in C.3 below.)

2. “All” Identified Firms includes the MBEs listed in the procurement and any MBE Firms you identify as potentially available to perform the Identified Items of Work, but it does not include MBE Firms who are no longer certified to perform the work as of the date the bidder/offeror provides written solicitations.
3. “Electronic Means” includes, for example, information provided via a website or file transfer protocol (FTP) site containing the plans, specifications, and other requirements of the contract. If an interested MBE cannot access the information provided by electronic means, the bidder/offeror must make the information available in a manner that is accessible to the interested MBE.

4. Follow up on initial written solicitations by contacting MBEs to determine if they are interested. The follow up contact may be made:

   (a) by telephone using the contact information in the MBE Directory, unless the bidder/offeror has a valid basis for using different contact information; or

   (b) in writing via a method that differs from the method used for the initial written solicitation.

5. In addition to the written solicitation set forth in C.1 and the follow up required in C.4, use all other reasonable and available means to solicit the interest of MBE Firms certified to perform the work of the contract. Examples of other means include:

   (a) attending any pre-bid meetings at which MBE Firms could be informed of contracting and subcontracting opportunities; and

   (b) if recommended by the procurement, advertising with or effectively using the services of at least two minority focused entities or media, including trade associations, minority/women community organizations, minority/women contractors’ groups, and local, state, and federal minority/women business assistance offices listed on the MDOT Office of Minority Business Enterprise website.

D. Negotiate With Interested MBE Firms

Bidders/Offerors must negotiate in good faith with interested MBE Firms.

1. Evidence of negotiation includes, without limitation, the following:

   (a) the names, addresses, and telephone numbers of MBE Firms that were considered;

   (b) a description of the information provided regarding the plans and specifications for the work selected for subcontracting and the means used to provide that information; and

   (c) evidence as to why additional agreements could not be reached for MBE Firms to perform the work.

2. A bidder/offeror using good business judgment would consider a number of factors in negotiating with subcontractors, including MBE subcontractors, and would take a firm’s price and capabilities as well as contract goals into consideration.

3. The fact that there may be some additional costs involved in finding and using MBE Firms is not in itself sufficient reason for a bidder/offeror’s failure to meet the contract MBE goal(s), as long as such costs are reasonable. Factors to take into consideration when determining whether a MBE Firm’s quote is excessive or unreasonable include, without limitation, the following:

   (a) the dollar difference between the MBE subcontractor’s quote and the average of the other subcontractors’ quotes received by the bidder/offeror;

   (b) the percentage difference between the MBE subcontractor’s quote and the average of the other subcontractors’ quotes received by the bidder/offeror;

   (c) the percentage that the MBE subcontractor’s quote represents of the overall contract amount;

   (d) the number of MBE firms that the bidder/offeror solicited for that portion of the work;

   (e) whether the work described in the MBE and Non-MBE subcontractor quotes (or portions thereof) submitted for review is the same or comparable; and
(f) the number of quotes received by the bidder/offeror for that portion of the work.

4. The above factors are not intended to be mandatory, exclusive, or exhaustive, and other evidence of an excessive or unreasonable price may be relevant.

5. The bidder/offeror may not use its price for self-performing work as a basis for rejecting a MBE Firm’s quote as excessive or unreasonable.

6. The “average of the other subcontractors’ quotes received” by the bidder/offeror refers to the average of the quotes received from all subcontractors. Bidder/offeror should attempt to receive quotes from at least three subcontractors, including one quote from a MBE and one quote from a Non-MBE.

7. A bidder/offeror shall not reject a MBE Firm as unqualified without sound reasons based on a thorough investigation of the firm’s capabilities. For each certified MBE that is rejected as unqualified or that placed a subcontract quotation or offer that the bidder/offeror concludes is not acceptable, the bidder/offeror must provide a written detailed statement listing the reasons for this conclusion. The bidder/offeror also must document the steps taken to verify the capabilities of the MBE and Non-MBE Firms quoting similar work.

   (a) The factors to take into consideration when assessing the capabilities of a MBE Firm, include, but are not limited to the following: financial capability, physical capacity to perform, available personnel and equipment, existing workload, experience performing the type of work, conduct and performance in previous contracts, and ability to meet reasonable contract requirements.

   (b) The MBE Firm’s standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the efforts to meet the project goal.

E. Assisting Interested MBE Firms

When appropriate under the circumstances, the decision-maker will consider whether the bidder/offeror:

1. made reasonable efforts to assist interested MBE Firms in obtaining the bonding, lines of credit, or insurance required by the procuring agency or the bidder/offeror; and

2. made reasonable efforts to assist interested MBE Firms in obtaining necessary equipment, supplies, materials, or related assistance or services.

III. Other Considerations

In making a determination of Good Faith Efforts the decision-maker may consider engineering estimates, catalogue prices, general market availability and availability of certified MBE Firms in the area in which the work is to be performed, other bids or offers and subcontract bids or offers substantiating significant variances between certified MBE and Non-MBE costs of participation, and their impact on the overall cost of the contract to the University and any other relevant factors.

The decision-maker may take into account whether a bidder/offeror decided to self-perform subcontract work with its own forces, especially where the self-performed work is Identified Items of Work in the procurement. The decision-maker also may take into account the performance of other bidders/offerors in meeting the contract. For example, when the apparent successful bidder/offeror fails to meet the contract goal, but others meet it, this reasonably raises the question of whether, with additional reasonable efforts, the apparent successful bidder/offeror could have met the goal. If the apparent successful bidder/offeror fails to meet the goal, but meets or exceeds the average MBE participation obtained by other bidders/offerors, this, when viewed in conjunction with other factors, could be evidence of the apparent successful bidder/offeror having made Good Faith Efforts.

IV. Documenting Good Faith Efforts

At a minimum, a bidder/offeror seeking a waiver of the MBE Goal(s) or a portion thereof must provide written documentation of its Good Faith Efforts, in accordance with COMAR 21.11.03.11, within 10 business days after receiving notice that it is the apparent awardee. The written documentation shall include the following:
A. Items of Work (Complete Good Faith Efforts Documentation Attachment 1-C, Part 1)

A detailed statement of the efforts made to select portions of the work proposed to be performed by certified MBE Firms in order to increase the likelihood of achieving the stated MBE Goal(s).

B. Outreach/Solicitation/Negotiation

1. The record of the bidder’s/offoror’s compliance with the outreach efforts prescribed by COMAR 21.11.03.09C(2)(a). (Complete Outreach Efforts Compliance Statement – Attachment 2).

2. A detailed statement of the efforts made to contact and negotiate with MBE Firms including:

   (a) the names, addresses, and telephone numbers of the MBE Firms who were contacted, with the dates and manner of contacts (letter, fax, email, telephone, etc.) (Complete Good Faith Efforts Attachment 1-C- Part 2, and submit letters, fax cover sheets, emails, etc. documenting solicitations); and

   (b) a description of the information provided to MBE Firms regarding the plans, specifications, and anticipated time schedule for portions of the work to be performed and the means used to provide that information.

C. Rejected MBE Firms (Complete Good Faith Efforts Attachment 1-C, Part 3)

1. For each MBE Firm that the bidder/offeror concludes is not acceptable or qualified, a detailed statement of the reasons for the bidder's/offeror’s conclusion, including the steps taken to verify the capabilities of the MBE and Non-MBE Firms quoting similar work.

2. For each certified MBE Firm that the bidder/offeror concludes has provided an excessive or unreasonable price, a detailed statement of the reasons for the bidder's/offeror’s conclusion, including the quotes received from all MBE and Non-MBE firms bidding on the same or comparable work. (Include copies of all quotes received.)

3. A list of MBE Firms contacted but found to be unavailable. This list should be accompanied by a MBE Unavailability Certificate (see Exhibit A to this Part 1) signed by the MBE contractor or a statement from the bidder/offeror that the MBE contractor refused to sign the MBE Unavailability Certificate.

D. Other Documentation

1. Submit any other documentation requested by the Procurement Officer to ascertain the bidder's/offeror’s Good Faith Efforts.

2. Submit any other documentation the bidder/offeror believes will help the Procurement Officer ascertain its Good Faith Efforts.
Exhibit A

MBE Subcontractor Unavailability Certificate

1. It is hereby certified that the firm of ____________________________
   (name of minority firm)

   Located at ____________________________
   (Number) ____________________________
   (Street) ____________________________
   (City) ____________________________
   (State) ____________________________
   (Zip) ____________________________

   Was offered an opportunity to bid on Solicitation No. ____________________________

   In County by ____________________________
   (Name of Prime Contractor’s Firm)

   ****************************************************************************************************************************

2. ____________________________ (Minority Firm) is either unavailable for the work/service or unable to
   Bid for this project for the following reason(s)? ____________________________
   ____________________________
   ____________________________
   ____________________________

   Signature of Minority Firm’s MBE Representative ____________________________
   Title ____________________________
   Date ____________________________

   MDOT Certification # ____________________________
   Telephone # ____________________________

   ****************************************************************************************************************************

3. To be completed by the prime contractor if Section 2 of this form is not completed by the minority firm.

   To the best of my knowledge and belief, said Certified Minority Business Enterprise is either unavailable
   for the work/service for this project, is unable to prepare a bid, or did not respond to a request for a price
   proposal and has not completed the above portion of this submittal.

   Signature of Prime Contractor ____________________________
   Title ____________________________
   Date ____________________________
# MBE ATTACHMENT 1C

## GOOD FAITH EFFORTS DOCUMENTATION TO SUPPORT WAIVER REQUEST

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<th>Prime Contractor</th>
<th>Project Description</th>
<th>Solicitation Number</th>
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**Parts 1, 2, and 3 must be included with this certificate along with all documents supporting your waiver request.**

I affirm that I have reviewed Attachment 1B, Waiver Guidance. I further affirm under penalties of perjury that the contents of Parts 1, 2, and 3 of this Attachment 1C Good Faith Efforts Documentation Form are true to the best of my knowledge, information, and belief.

____________________________________  ______________________________________
Company Name      Signature of Representative

____________________________________  ______________________________________
Address       Printed Name and Title

____________________________________  ______________________________________
City, State and Zip Code     Date
GOOD FAITH EFFORTS DOCUMENTATION
TO SUPPORT WAIVER REQUEST

PART 1 – IDENTIFIED ITEMS OF WORK BIDDER/OFFEROR MADE AVAILABLE TO
MBE FIRMS

Identify those items of work that the bidder/offeror made available to MBE Firms. This includes, where appropriate, those items the bidder/offeror identified and determined to subdivide into economically feasible units to facilitate the MBE participation. For each item listed, show the anticipated percentage of the total contract amount. It is the bidder’s/offeror’s responsibility to demonstrate that sufficient work to meet the goal was made available to MBE Firms, and the total percentage of the items of work identified for MBE participation equals or exceeds the percentage MBE goal set for the procurement. Note: If the procurement includes a list of bid items identified during the goal setting process as possible items of work for performance by MBE Firms, the bidder/offeror should make all of those items of work available to MBE Firms or explain why that item was not made available. If the bidder/offeror selects additional items of work to make available to MBE Firms, those additional items should also be included below.

<table>
<thead>
<tr>
<th>Identified Items of Work</th>
<th>Was this work listed in the procurement?</th>
<th>Does bidder/offeror normally self-perform this work?</th>
<th>Was this work made available to MBE Firms? If no, explain why?</th>
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☐ Please check if Additional Sheets are attached.
GOOD FAITH EFFORTS DOCUMENTATION 
TO SUPPORT WAIVER REQUEST

PART 2 – IDENTIFIED MBE FIRMS AND RECORD OF SOLICITATIONS

PAGE ___ OF ___

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<th>Prime Contractor</th>
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Identify the MBE Firms solicited to provide quotes for the Identified Items of Work made available for MBE participation. Include the name of the MBE Firm solicited, items of work for which bids/quotes were solicited, date and manner of initial and follow-up solicitations, whether the MBE provided a quote, and whether the MBE is being used to meet the MBE participation goal. MBE Firms used to meet the participation goal must be included on the MBE Participation Schedule. Note: If the procurement includes a list of the MBE Firms identified during the goal setting process as potentially available to perform the items of work, the bidder/offeror should solicit all of those MBE Firms or explain why a specific MBE was not solicited. If the bidder/offeror identifies additional MBE Firms who may be available to perform Identified Items of Work, those additional MBE Firms should also be included below. Copies of all written solicitations and documentation of follow-up calls to MBE Firms must be attached to this form. This list should be accompanied by a Minority Contractor Unavailability Certificate signed by the MBE contractor or a statement from the bidder/offeror that the MBE contractor refused to sign the Minority Contractor Unavailability Certificate (see Exhibit A to MBE Attachment 1-B). If the bidder/offeror used a Non-MBE or is self-performing the identified items of work, Part 4 must be completed.

<table>
<thead>
<tr>
<th>Name of Identified MBE Firm &amp; MBE Classification</th>
<th>Describe Item of Work Solicited</th>
<th>Initial Solicitation Date &amp; Method</th>
<th>Follow-up Solicitation Date &amp; Method</th>
<th>Details for Follow-up Calls</th>
<th>Quote Rec’d</th>
<th>Quote Used</th>
<th>Reason Quote Rejected</th>
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<tr>
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<td>Date: _______</td>
<td>Date: _______</td>
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<td>□ Yes</td>
<td>□ Used Other MBE</td>
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<tr>
<td>MBE Classification (Check only if requesting waiver of MBE subgoal.)</td>
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<td>□ Mail</td>
<td>□ Phone</td>
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<td>□ No</td>
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| Firm Name:                                    |                                 | Date: _______                      | Date: _______                       |                             | □ Yes       | □ Yes       | □ Used Other MBE      |
| MBE Classification (Check only if requesting waiver of MBE subgoal.) |                   | □ Mail                             | □ Phone                             |                             | □ No        | □ No        | □ Used Non-MBE        |
| □ African American-Owned                     |                                 | □ Facsimile                        | □ Mail                              |                             |             |             | □ Self-performing      |
| □ Hispanic American-Owned                    |                                 | □ Email                            | □ Facsimile                         |                             |             |             |                       |
| □ Asian American-Owned                       |                                 |                                  | □ Email                             |                             |             |             |                       |
| □ Women-Owned                                |                                 |                                  |                                     |                             |             |             |                       |
| □ Other MBE Classification                    |                                 |                                  |                                     |                             |             |             |                       |

☐ Please check if Additional Sheets are attached.
GOOD FAITH EFFORTS DOCUMENTATION
TO SUPPORT WAIVER REQUEST

PART 3 – ADDITIONAL INFORMATION REGARDING REJECTED MBE QUOTES

This form must be completed if Part 1 indicates that a MBE quote was rejected because the bidder/offor is using a Non-MBE or is self-performing the Identified Items of Work. Provide the Identified Items Work, indicate whether the work will be self-performed or performed by a Non-MBE, and if applicable, state the name of the Non-MBE. Also include the names of all MBE and Non-MBE Firms that provided a quote and the amount of each quote.

<table>
<thead>
<tr>
<th>Prime Contractor</th>
<th>Project Description</th>
<th>Solicitation Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Describe Identified Items of Work Not Being Performed by MBE (include spec/section number from bid)</th>
<th>Self-performing or Using Non-MBE (Provide name)</th>
<th>Amount of Non-MBE Quote</th>
<th>Name of Other Firms who Provided Quotes &amp; Whether MBE or Non-MBE</th>
<th>Amount Quoted</th>
<th>Indicate Reason Why MBE Quote Rejected &amp; Briefly Explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Self-performing □ Using Non-MBE</td>
<td>$_________</td>
<td></td>
<td>□ MBE □ Non-MBE</td>
<td>$_________</td>
<td>□ Price □ Capabilities □ Other</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>□ Price □ Capabilities □ Other</td>
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<td></td>
<td>□ Price □ Capabilities □ Other</td>
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<td>□ Price □ Capabilities □ Other</td>
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<td>□ Price □ Capabilities □ Other</td>
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<td></td>
<td></td>
<td></td>
<td>□ Price □ Capabilities □ Other</td>
</tr>
</tbody>
</table>

☐ Please check if Additional Sheets are attached.
MBE Attachment 2
OUTREACH EFFORTS COMPLIANCE STATEMENT

Complete and submit this form within 10 working days of notification of apparent award or actual award, whichever is earlier.

In conjunction with the bid/proposal submitted in response to Solicitation No.___________, I state the following:

1. Bidder/Offeror identified subcontracting opportunities in these specific work categories:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

2. Attached to this form are copies of written solicitations (with bidding/proposal instructions) used to solicit certified MBE firms for these subcontract opportunities.

3. Bidder/Offeror made the following attempts to personally contact the solicited MDOT-certified MBE firms:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

4. Please Check One:

☐ This project does not involve bonding requirements.

☐ Bidder/Offeror assisted MDOT-certified MBE firms to fulfill or seek waiver of bonding requirements.

(DESCRIBE EFFORTS): ______________________________________________________

____________________________________________________________________________

5. Please Check One:

☐ Bidder/Offeror did attend the pre-bid/pre-proposal conference.

☐ No pre-bid/pre-proposal meeting/conference was held.

☐ Bidder/Offeror did not attend the pre-bid/pre-proposal conference.

_________________________________  _____________________________
Company Name       Signature of Representative

_________________________________  _____________________________
Address        Printed Name and Title

_________________________________  _____________________________
City, State and Zip Code       Date
MBE Attachment 3A

MBE SUBCONTRACTOR PROJECT PARTICIPATION CERTIFICATION

PLEASE COMPLETE AND SUBMIT ONE FORM FOR EACH CERTIFIED MBE FIRM LISTED ON THE MBE PARTICIPATION SCHEDULE (ATTACHMENT 1A) WITHIN 10 WORKING DAYS OF NOTIFICATION OF APPARENT AWARD. IF THE BIDDER/OFFEROR FAILS TO RETURN THIS AFFIDAVIT WITHIN THE REQUIRED TIME, THE PROCUREMENT OFFICER MAY DETERMINE THAT THE BIDDER/OFFEROR IS NOT RESPONSIBLE AND THEREFORE NOT ELIGIBLE FOR CONTRACT AWARD.

Provided that __________________________ (Prime Contractor's Name) is awarded the contract in conjunction with Solicitation No. ____________, such Prime Contractor intends to enter into a subcontract with_________________________ (Subcontractor's Name) committing to participation by the MBE firm ____________________________ (MBE Name) with MDOT Certification Number _______________ which will receive at least $___________ which equals to_____% of the Total Contract Amount for performing the following products/services for the Contract:

<table>
<thead>
<tr>
<th>NAICS CODE</th>
<th>WORK ITEM, SPECIFICATION NUMBER, LINE ITEMS OR WORK CATEGORIES (IF APPLICABLE)</th>
<th>DESCRIPTION OF SPECIFIC PRODUCTS AND/OR SERVICES</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

Each of the Contractor and Subcontractor acknowledges that, for purposes of determining the accuracy of the information provided herein, the Procurement Officer may request additional information, including, without limitation, copies of the subcontract agreements and quotes. Each of the Contractor and Subcontractor solemnly affirms under the penalties of perjury that: (i) the information provided in this MBE Subcontractor Project Participation Affidavit is true to the best of its knowledge, information and belief, and (ii) has fully complied with the State Minority Business Enterprise law, State Finance and Procurement Article §14-308(a)(2), Annotated Code of Maryland which provides that, except as otherwise provided by law, a contractor may not identify a certified minority business enterprise in a Bid/Proposal and:

1. fail to request, receive, or otherwise obtain authorization from the certified minority business enterprise to identify the certified Minority Business Enterprise in its Bid/Proposal;
2. fail to notify the certified Minority Business Enterprise before execution of the Contract of its inclusion of the Bid/Proposal;
3. fail to use the certified Minority Business Enterprise in the performance of the Contract; or
4. pay the certified Minority Business Enterprise solely for the use of its name in the Bid/Proposal.

PRIME CONTRACTOR

Signature of Representative: ____________________________

Printed Name and Title: ____________________________

Firm's Name: ____________________________

Federal Identification Number: ____________________________

Address: ____________________________

________________________________________________________________________

Telephone: ____________________________ Date: ____________________________

SUBCONTRACTOR

Signature of Representative: ____________________________

Printed Name and Title: ____________________________

Firm's Name: ____________________________

Federal Identification Number: ____________________________

Address: ____________________________

________________________________________________________________________

Telephone: ____________________________ Date: ____________________________

TOWSON UNIVERSITY
MBE PRIME PROJECT PARTICIPATION CERTIFICATION

PLEASE COMPLETE AND SUBMIT THIS FORM TO ATTEST EACH SPECIFIC ITEM OF WORK THAT YOUR MBE FIRM HAS LISTED ON THE MBE PARTICIPATION SCHEDULE (ATTACHMENT __-1A) FOR PURPOSES OF MEETING THE MBE PARTICIPATION GOALS. THIS FORM MUST BE SUBMITTED WITHIN 10 WORKING DAYS OF NOTIFICATION OF APPARENT AWARD. IF THE BIDDER/OFFEROR FAILS TO RETURN THIS AFFIDAVIT WITHIN THE REQUIRED TIME, THE PROCUREMENT OFFICER MAY DETERMINE THAT THE BIDDER/OFFEROR IS NOT RESPONSIBLE AND THEREFORE NOT ELIGIBLE FOR CONTRACT AWARD.

Provided that _________________________________ (Prime Contractor's Name) with Certification Number ___________ is awarded the contract in conjunction with Solicitation No. _____________________, such MBE Prime Contractor intends to perform with its own forces at least $___________ which equals to ___% of the Total Contract Amount for performing the following products/services for the Contract:

<table>
<thead>
<tr>
<th>NAICS CODE</th>
<th>WORK ITEM, SPECIFICATION NUMBER, LINE ITEMS OR WORK CATEGORIES (IF APPLICABLE), FOR CONSTRUCTION PROJECTS, GENERAL CONDITIONS MUST BE LISTED SEPARATELY.</th>
<th>DESCRIPTION OF SPECIFIC PRODUCTS AND/OR SERVICES</th>
<th>VALUE OF THE WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**MBE PRIME CONTRACTOR**

Signature of Representative: ________________________________

Printed Name and Title: ____________________________________________________________________________

Firm's Name: ___________________________________________________________________________________

Federal Identification Number: ________________________________________________________________

Address: _____________________________________________________________________________________

Telephone: __________________________ Date: ________________
MBE Attachment 4A

Minority Business Enterprise Participation
Prime Contractor Paid/Unpaid MBE Invoice Report

Report #: ____________________________

Reporting Period (Month/Year): __________

Prime Contractor: Report is due to the MBE Liaison, by the 10th of the month following the month the services were provided.

Note: Please number reports in sequence

Prime Contractor: ____________________________

Contract #: ____________________________

Contracting Unit: ____________________________

Contract Amount: ____________________________

MBE Subcontract Amt: ____________________________

Project Begin Date: ____________________________

Project End Date: ____________________________

Services Provided: ____________________________

---

Prime Contractor: ____________________________

Address:

City: ____________________________ State: ____________________________ ZIP: ____________________________

Phone: ____________________________ Fax: ____________________________

MBE Subcontractor Name: ____________________________

Contact Person: ____________________________

Phone: ____________________________ Fax: ____________________________

Subcontractor Services Provided: ____________________________

---

List all payments made to MBE subcontractor named above during this reporting period:

<table>
<thead>
<tr>
<th>Invoice #</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$ _____</td>
</tr>
<tr>
<td>2.</td>
<td>$ _____</td>
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<tr>
<td>3.</td>
<td>$ _____</td>
</tr>
<tr>
<td>4.</td>
<td>$ _____</td>
</tr>
</tbody>
</table>

Total Dollars Paid: $ _____

List dates and amounts of any outstanding invoices:

<table>
<thead>
<tr>
<th>Invoice #</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$ _____</td>
</tr>
<tr>
<td>2.</td>
<td>$ _____</td>
</tr>
<tr>
<td>3.</td>
<td>$ _____</td>
</tr>
<tr>
<td>4.</td>
<td>$ _____</td>
</tr>
</tbody>
</table>

Total Dollars Paid: $ _____

---

- If more than one MBE subcontractor is used for this contract, you must use separate 4A forms for each subcontractor.
- Information regarding payments that the MBE prime will use for purposes of meeting the MBE participation goals must be reported separately in Attachment 4B
- Return one copy (hard or electronic) of this form to the following address (electronic copy with signature and date is preferred):

  Victoria Nellis
  Towson University
  Procurement Department
  8000 York Road
  Towson, MD 21252
  MBE@towson.edu
  Ph: 410-704-2697
  Fax: 410-704-8233

Prime Contractor Signature: ____________________________

(Required)

Date: ____________________________
### Minor Business Enterprise Participation

**MBE Prime Contractor Report**

<table>
<thead>
<tr>
<th>Invoice Number</th>
<th>Value of the Work</th>
<th>NAICS Code</th>
<th>Description of the Work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**MBE Prime Contractor:** Report is due to the MBE Liaison, by the 10th of the month following the month the services were provided.

**Note:** Please number reports in sequence

<table>
<thead>
<tr>
<th>Contract #:</th>
<th>Contracting Unit:</th>
<th>Contract Amount:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MBE Prime Contractor:**  
Certification Number:  
Report #:  
Reporting Period (Month/Year):  

**MBE Prime Contractor:** Report is due to the MBE Liaison, by the 10th of the month following the month the services were provided.

**Contact Person:**

<table>
<thead>
<tr>
<th>Address:</th>
<th>City:</th>
<th>State:</th>
<th>ZIP:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone:</th>
<th>Fax:</th>
<th>E-mail:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Return one copy (hard or electronic) of this form to the following address (electronic copy with signature and date is preferred):

Victoria Nellis  
Towson University  
Procurement Department  
8000 York Road  
Towson, MD 21252  
[MBE@towson.edu](mailto:MBE@towson.edu)  
Phone: 410-704-2697  
Fax: 410-704-8233

Signature: ___________________________  Date: ___________________________

(Required)
This form must be completed monthly by all MBE subcontractors.

**MBE Attachment 5**

Minority Business Enterprise Participation
Subcontractor Paid/Unpaid MBE Invoice Report

---

Report #: __________________

Reporting Period (Month/Year): ______________

Report is due by the 10th of the month following the month the services were provided.

---

<table>
<thead>
<tr>
<th>Contract #:</th>
<th>Contracting Unit:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Contract Amount:</th>
<th>MBE Subcontract Amt:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Project Begin Date:</th>
<th>Project End Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Services Provided:</th>
</tr>
</thead>
</table>

---

<table>
<thead>
<tr>
<th>MBE Subcontractor Name:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>MDOT Certification #:</th>
</tr>
</thead>
</table>

Contact Person: __________________ Email: __________________

<table>
<thead>
<tr>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City:</th>
<th>State:</th>
<th>ZIP:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Phone:</th>
<th>Fax:</th>
<th>E-mail:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Subcontractor Services Provided:</th>
</tr>
</thead>
</table>

---

List all payments received from Prime Contractor during reporting period indicated above:

<table>
<thead>
<tr>
<th>Invoice Amt.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $ ________</td>
<td></td>
</tr>
<tr>
<td>2. $ ________</td>
<td></td>
</tr>
<tr>
<td>3. $ ________</td>
<td></td>
</tr>
<tr>
<td>4. $ ________</td>
<td></td>
</tr>
</tbody>
</table>

| Total Dollars Paid: $ |

---

List dates and amounts of any unpaid invoices over 30 days old:

<table>
<thead>
<tr>
<th>Invoice Amt.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $ ________</td>
<td></td>
</tr>
<tr>
<td>2. $ ________</td>
<td></td>
</tr>
<tr>
<td>3. $ ________</td>
<td></td>
</tr>
<tr>
<td>4. $ ________</td>
<td></td>
</tr>
</tbody>
</table>

| Total Dollars Paid: $ |

---

Prime Contractor: __________________ Contact Person: __________________

Signature: ____________________ (Required) Date: ________________

Victoria Nellis
Towson University Procurement Dept.
MBE@towson.edu
Phone: 410-704-2697
Fax: 410-704-8233
COMPANY PROFILE

COMPANY NAME: ____________________________________________________________

DATE OF INCORPORATION: ___________ STATE OF INCORPORATION: _______________

TYPE OF WORK PERFORMED: __________________________________________________

__________________________________________________________________________

NUMBER OF YEARS IN BUSINESS: _____________________________________________

OTHER OR FORMER NAMES UNDER WHICH YOUR ORGANIZATION HAS OPERATED:
__________________________________________________________________________

TYPE OR ORGANIZATION: (I.E., CORP., PARTNERSHIP, INDIVIDUAL, JOINT VENTURE, OTHER):
__________________________________________________________________________

NAME OF PRINCIPAL(S) AND TITLE(S): _________________________________________

__________________________________________________________________________

__________________________________________________________________________

BRIEF HISTORY OF COMPANY: _______________________________________________

__________________________________________________________________________

__________________________________________________________________________

TOTAL NUMBER OF EMPLOYEES: _____________________________________________

NUMBER OF FIELD EMPLOYEES (Excluding Supervisory): _______________________

NUMBER OF FIELD SUPERVISORY PERSONNEL: _________________________________

NUMBER OF OFFICE PERSONNEL (Excluding Supervisory): _______________________

NUMBER OF OFFICE SUPERVISORY PERSONNEL: ________________________________

BONDING CO.: ___________________ BONDING CAPACITY: ________________
EXHIBIT G
FIRM EXPERIENCE

Duplicate as necessary to provide all required experience.

PROPOSER: ________________________________

PROJECT NAME: ______________________________

PROJECT DOLLAR SIZE: __________________________

START DATE: _________________________________

COMPLETION DATE: ____________________________

CLIENT/CUSTOMER: ____________________________

ADDRESS: _________________________________

CONTACT PERSON: ____________________________

TELEPHONE NUMBER: __________________________

FAX NUMBER: _______________________________

EMAIL: _________________________________

PROJECT MANAGER: __________________________

BRIEF, BUT DETAILED DESCRIPTION OF THE PROJECT:

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

SIMILARITIES BETWEEN THIS PROJECT AND TU PROJECT:

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
EXHIBIT H
BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, ________________ (Bidding Company)
as Principal, hereinafter called the Principal, and ________________ (Bonding Company)
as a corporation duly organized under the laws of the State of ________________, as Surety,
hereinafter called the Surety, are held and firmly bound unto the State of Maryland, hereinafter called “State,”
for the sum of ________________ Dollars (or $ ________________), for the payment of which sum, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors
and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for ________________

NOW, THEREFORE, if the Principal, upon acceptance by the State of its bid identified above, within the period specified therein for acceptance (ninety (90) days, if no period is specified), shall execute such further contractual documents, if any, and give such bond(s) as may be required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms, or in the event of failure so to execute such further contractual documents and give such bonds, if the Principal shall pay the State the difference not to exceed the penalty hereof between the amount specified in the Principal’s bid and such larger amount for which the State may in good faith contract with another party to perform the work covered by said bid, then the above obligation shall be void and of no effect.

The Surety executing this instrument hereby agrees that its obligation shall not be impaired by any extension(s) of the time for acceptance of the bid that the Principal may grant to the State, notice of which extension(s) to the Surety being hereby waived; provided that such waiver of notice shall apply only with respect to extensions aggregating not more than ninety (90) calendar days in addition to the period originally allowed for acceptance of the bid.

In Presence of:
Witness

________________________________________ as to

In Presence of:
Witness

________________________________________ as to

In Presence of:
Witness

________________________________________ as to

Attest:

________________________________________ as to

Individual Principal

________________________________________ (Name)

________________________________________ (SEAL)

Partnership Principal

________________________________________ (Name)

By: __________________________ (SEAL)
Partner

By: __________________________ (SEAL)
Partner

By: __________________________ (SEAL)
Partner

Corporate Principal

________________________________________ (Name of Corporation)
CORPORATE Secretary

Attest:

CORPORATE Bonding Agent

Agent’s Address

Approved as to form and legal sufficiency
this ____ day of _________________, 20____

Associate University Counsel
EXHIBIT I
PERFORMANCE BOND

Principal

Surety

a corporation of the State of ____________________________
and authorized to do business in the State of Maryland

Obligee

STATE OF MARYLAND
By and through the following Administration
TOWSON UNIVERSITY

Penal Sum of Bond (express in words and figures)

Description of Contract

Date of Contract

Date Bond Executed

Contract Number

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal named above and Surety named above, being authorized to do business in Maryland, and having business addresses as shown above, are held and firmly bound unto the Obligee named above in the Penal Sum of this Performance Bond stated above, for the payment of which Penal Sum we bind ourselves, our heirs, executors, administrators, personal representatives, successors, and assigns, jointly and severally, firmly by these presents. However, where Surety is composed of corporations acting as co-sureties, we, the co-sureties, bind ourselves, our successors and assigns, in such Penal Sum jointly and severally as well as severally only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each co-surety binds itself, jointly and severally with the Principal, for the payment of such sum as appears above its name below, but if no limit of liability is indicated, the limit of such liability shall be the full amount of Penal Sum.

WHEREAS, Principal has entered into or will enter into a contract with the State of Maryland, by and through the Administration named above acting for the State of Maryland, which contract is described and dated as shown above, and incorporated herein by reference. The contract and all items incorporated into the contract, together with any and all changes, extensions of time, alterations, modifications, or additions to the contract or to the work to be performed thereunder or to the Plans, Specifications, and Special Provisions, or any of them, or to any other items incorporated into the contract shall hereinafter be referred to as “the Contract.”

WHEREAS, it is one of the conditions precedent to the final award of the Contract that these presents be executed.

NOW, THEREFORE, during the original term of said Contract, during any extensions thereto that may be granted by the Administration, and during the guarantee and warranty period, if any, required under the Contract, unless otherwise stated therein, this Performance Bond shall remain in full force and effect unless and until the following terms and conditions are met:

1. Principal shall well and truly perform the Contract; and
2. Principal and Surety shall comply with the terms and conditions contained in this Performance Bond.

Whenever Principal shall be declared by the Administration to be in default under the Contract, the Surety may, within 15 days after notice of default from the Administration, notify the Administration of its election to either promptly proceed to remedy the default or promptly proceed to complete the contract in accordance with and subject to its terms and conditions. In the event the Surety does not elect to exercise either of the above stated options, then the Administration thereupon shall have the remaining contract work completed, Surety to remain liable hereunder for all expenses of completion up to but not exceeding the penal sum stated above.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or to the Specifications accompanying the same shall in any way affect its obligations on this Performance Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

This Performance Bond shall be governed by and construed in accordance with the laws of the State of Maryland and any reference herein to Principal or Surety in the singular shall include all entities in the plural who or which are signatories under the Principal or Surety heading below.

IN WITNESS WHEREOF, Principal and Surety have set their hands and seals to this Performance Bond. If any individual is a signatory under the Principal heading below, then each such individual has signed below on his or her own behalf, has set forth below the name of
the firm, if any, in whose name he or she is doing business, and has set forth below his or her title as a sole proprietor. If any partnership or joint venture is a signatory under the Principal heading below, then all members of each such partnership or joint venture have signed below, each member has set forth below the name of the partnership or joint venture, and each member has set forth below his or her title as a general partner, limited partner, or member of joint venture, whichever is applicable. If any corporation is a signatory under the Principal or Surety heading below, then each such corporation has caused the following: the corporation's name to be set forth below, a duly authorized representative of the corporation to affix below the corporation's seal and to attach hereto a notarized corporate resolution or power of attorney authorizing such action, and each such duly authorized representative to sign below and to set forth below his or her title as a representative of the corporation. If any individual acts as a witness to any signature below, then each such individual has signed below and has set forth below his or her title as a witness. All of the above has been done as of the Date of Bond shown above.

In Presence of:
Witness
____________________________ as to ____________________________ (SEAL)

In Presence of:
Witness
____________________________ as to ____________________________ (SEAL)
____________________________ as to ____________________________ (SEAL)
____________________________ as to ____________________________ (SEAL)

Corporate Principal
Name of Corporation
____________________________
Attest:
____________________________ By: _________________ Corporate President with Title SEAL
Corporate Secretary

Surety
____________________________
Attest:
____________________________ Title: ____________________________
Signature

Bonding Agent’s Name: ____________________ Business Address of Surety

Agent’s Address: ____________________

Approved as to legal form and sufficiency this ____ day of ________, 20____

_______________________________________________________
Director of Procurement
EXHIBIT J
PAYMENT BOND

Principal

Business Address of Principal

Surety

Obligee

STATE OF MARYLAND
By and through the following Administration
TOWSON UNIVERSITY

Penal Sum of Bond (express in words and figures)

Description of Contract

Date of Contract, 20

Date Bond Executed, 20

Contract Number

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal named above and Surety named above, being authorized to do business in Maryland, and having business addresses as shown above, are held and firmly bound unto the Obligee named above, for the use and benefit of claimants as hereinafter defined, in the Penal Sum of this Payment Bond stated above, for the payment of which Penal Sum we bind ourselves, our heirs, executors, administrators, personal representatives, successors, and assigns, jointly and severally, jointly and severally, jointly and severally for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each co-surety binds itself, jointly and severally with the Principal, for the payment of such sum as appears above its name below, but if no limit of liability is indicated, the limit of such liability shall be the full amount of the Penal Sum.

WHEREAS, Principal has entered into or will enter into a contract with the State, by and through the Administration named above acting for the State of Maryland, which contract is described and dated as shown above, and incorporated herein by reference. The contract and all items incorporated into the contract, together with any and all changes, extensions of time, alterations, modifications, or additions to the contract or to the work to be performed thereunder or to the Plans, Specifications, and Special Provisions, or any of them, or to any other items incorporated into the contract shall hereinafter be referred to as “the Contract.”

WHEREAS, it is one of the conditions precedent to the final award of the Contract that these presents be executed.

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and materials furnished, supplied and reasonably required for use in the performance of the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject to the following conditions:

1. A claimant is defined to be any and all of those persons supplying labor and materials (including lessors of the equipment to the extent of the fair market value be thereof) to the Principal or its subcontractors and subcontractors in the prosecution of the work provided for in the Contract, entitled to the protection provided by Section 9-113 of the Real Property Article of the Annotated Code of Maryland, as from time to time amended.

2. The above named Principal and Surety hereby jointly and severally agree with the Obligee that every claimant as herein defined, who has not been paid in full may, pursuant to and when in compliance with the provisions of the aforesaid Section 9-113, sue on this Bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant and have execution thereon. The Obligee shall not be liable for the payment of any costs or expenses of any such suit.
The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligations on this Payment Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

This Payment Bond shall be governed by and construed in accordance with the laws of the State of Maryland and any reference herein to the Principal or Surety in the singular shall include all entities in the plural who or which are signatories under the Principal or Surety heading below.

IN WITNESS WHEREOF, Principal and Surety have set their hands and seals to this Payment Bond. If any individual is a signatory under the Principal heading below, then each such individual has signed below on his or her own behalf, has set forth below the name of the firm, if any, in whose name he or she is doing business, and has set forth below his or her title as a sole proprietor. If any partnership or joint venture is a signatory under the Principal heading below, then all members of each such partnership or joint venture have signed below, each member has set forth below the name of the partnership or joint venture, and each member has set forth below his or her title as a general partner, limited partner, or member of joint venture, whichever is applicable. If any corporation is a signatory under the Principal or Surety heading below, then each such corporation has caused the following: the corporation's name to be set forth below, a duly authorized representative of the corporation to affix below the corporation's seal and to attach hereto a notarized corporate resolution or power of attorney authorizing such action, and each such duly authorized representative to sign below and to set forth below his or her title as a representative of the corporation. If any individual acts as a witness to any signature below, then each such individual has signed below and has set forth below his or her title as a witness. All of the above has been done as of the Date of Bond shown above.

In Presence of:
Witness

Individual Principal

In Presence of:
Witness

Co-Partnership Principal

Name of Co-Partnership

By: __________________________ (SEAL)

In Presence of:
Witness

Corporate Principal

Name of Corporation

By: __________________________ (SEAL)  AFFIX CORPORATE SEAL

Attest:

Corporate Secretary

By: __________________________ (SEAL)  AFFIX CORPORATE SEAL

Surety

Attest:

Signature

Title: __________________________

Bonding Agent's Name: __________________________

Business Address of Surety

Agent's Address: __________________________

Approved as to legal form and sufficiency this _____ day of __________, 20____

____________________________

Director of Procurement
EXHIBIT K
ADDENDA ACKNOWLEDGMENT

NAME OF BIDDER: ______________________________________________________

SOLICITATION NUMBER: ______________________________________________

PROJECT TITLE: ______________________________________________________

DUE DATE: __________________________________________________________

ACKNOWLEDGMENT

I hereby acknowledge receipt of the following addenda which have been issued
regarding the above referenced solicitation:

Addendum #1, issue date ______________________________

Addendum #2, issue date ______________________________

Addendum #3, issue date ______________________________

Addendum #4, issue date ______________________________

Addendum #5, issue date ______________________________

Addendum #6, issue date ______________________________

Addendum #7, issue date ______________________________

Addendum #8, issue date ______________________________

Addendum #9, issue date ______________________________

Addendum #10, issue date ______________________________

____________________________________________________________________

____________________________________________________________________

Signature                        Printed Name

Title                             Company

Date
EXHIBIT L
KEY PERSONNEL FORM

SOLICITATION/CONTRACT TITLE: __________________________________________________________

SOLICITATION/CONTRACT NUMBER: ______________________________________________________

1. BIDDER/OFFEROR NAME: ____________________________________________________________

2. KEY PERSONNEL NAME: ____________________________________________________________

3. POSITION TO BE ASSIGNED: Check applicable
   _____ Project Manager          _____ Other. Title ________________________________
   _____ Field Superintendent

4. EDUCATIONAL BACKGROUND:

   Institution               Degree/Diploma/ Certification          Major (if any)      Date of Degree

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

5. EMPLOYMENT HISTORY. If key personnel have more than three (3) previous employers, provide complete employment history via supplemental page(s) attached to this form.

5.1 CURRENT EMPLOYER: _______________________________________________________________

   DATES OF EMPLOYMENT: _____________________________________________________________

   POSITION(S) HELD                                      DURATION BY DATE

   ____________________________________________________________
   ____________________________________________________________

5.2 PRIOR EMPLOYER: _________________________________________________________________

   DATES OF EMPLOYMENT: _____________________________________________________________

   POSITION(S) HELD                                      DURATION BY DATE

   ____________________________________________________________
   ____________________________________________________________

NOTE: If space provided is insufficient, attach additional page(s) and indicate “See attached.”
CONTRACT NAME ________________________________________________________________

CONTRACT NUMBER ____________________________________________________________

EXHIBIT L - KEY PERSONNEL FORM

5.3 PRIOR EMPLOYER: ____________________________________________________________

DATES OF EMPLOYMENT: ________________________________________________________

POSITION(S) HELD

DURATION BY DATE

_________________________________________  ________________________________

_________________________________________  ________________________________

6. PROJECT REFERENCES. Furnish reference data for project owners/clients for specific projects

to which key personnel were assigned. References from projects listed on Attachment A are

preferred.

6.1 CONTACT PERSON: ________________________ TELEPHONE #: _______________

COMPANY NAME: _____________________________________________________________

EMAIL ADDRESS: __________________________________________________________________

DESCRIPTION OF CONTRACT/PROJECT: ___________________________________________

6.2 CONTACT PERSON: ________________________ TELEPHONE #: _______________

COMPANY NAME: _____________________________________________________________

EMAIL ADDRESS: __________________________________________________________________

DESCRIPTION OF CONTRACT/PROJECT: ___________________________________________

6.3 CONTACT PERSON: ________________________ TELEPHONE #: _______________

COMPANY NAME: _____________________________________________________________

EMAIL ADDRESS: __________________________________________________________________

DESCRIPTION OF CONTRACT/PROJECT DONE: _______________________________________

7. ACHIEVEMENTS/OTHER NOTATIONS (Optional):

______________________________________________________________________________

______________________________________________________________________________

8. SIMILAR PROJECT/CONTRACT EXPERIENCE. Complete a separate *Attachment A to Key

Personnel Form for all key personnel proposed. At a minimum, include Project Manager and, if

applicable, Field Superintendent(s). List at least three (3) prior projects for each.

NOTE: If space provided is insufficient, attach additional page(s) and indicate “See attached.”
8. SIMILAR PROJECT/CONTRACT EXPERIENCE

KEY PERSONNEL NAME: ________________________________ BIDDER OFFEROR NAME: ________________________________

ROLE TO BE ASSIGNED (check one): PROJECT MANAGER _____ FIELD SUPERINTENDENT _____ OTHER ______ Title: ________________________________

<table>
<thead>
<tr>
<th>PROJECT NAME/LOCATION</th>
<th>PROJECT DESCRIPTION</th>
<th>KEY PERSONNEL ROLE</th>
<th>PROJECT VALUE</th>
<th>START AND COMPLETION DATES (MM/YY-MM/YY)</th>
<th>OWNER/CLIENT CONTACT/TELEPHONE #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: List a minimum of three (3) projects for all key personnel proposed.
# General Conditions for Construction and Maintenance Contracts

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SECTION 1 - DEFINITIONS AND RESPONSIBILITIES</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1.01</td>
<td>DEFINITIONS</td>
<td>1</td>
</tr>
<tr>
<td>1.02</td>
<td>OWNER'S RESPONSIBILITIES</td>
<td>2</td>
</tr>
<tr>
<td>1.03</td>
<td>CONTRACTOR'S RESPONSIBILITIES</td>
<td>2</td>
</tr>
<tr>
<td>SECTION 2 - CONTRACT DOCUMENTS</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>2.01</td>
<td>CONTRACT DOCUMENTS</td>
<td>4</td>
</tr>
<tr>
<td>2.02</td>
<td>SHOP DRAWINGS</td>
<td>5</td>
</tr>
<tr>
<td>SECTION 3 - SCOPE OF WORK</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>3.01</td>
<td>INTENT OF THE CONTRACT DOCUMENTS</td>
<td>6</td>
</tr>
<tr>
<td>3.02</td>
<td>GENERAL CONDITIONS CONTROLLING</td>
<td>6</td>
</tr>
<tr>
<td>3.03</td>
<td>DIFFERING SITE CONDITIONS</td>
<td>6</td>
</tr>
<tr>
<td>3.04</td>
<td>SITE INVESTIGATION</td>
<td>6</td>
</tr>
<tr>
<td>3.05</td>
<td>CONDITIONS AFFECTING THE WORK</td>
<td>7</td>
</tr>
<tr>
<td>3.06</td>
<td>CHANGES IN THE WORK</td>
<td>7</td>
</tr>
<tr>
<td>SECTION 4 - CONTROL OF THE WORK</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>4.01</td>
<td>CONFORMITY WITH CONTRACT REQUIREMENTS</td>
<td>7</td>
</tr>
<tr>
<td>4.02</td>
<td>ADJACENT WORK</td>
<td>7</td>
</tr>
<tr>
<td>4.03</td>
<td>CONTROL BY THE CONTRACTOR</td>
<td>7</td>
</tr>
<tr>
<td>4.04</td>
<td>COOPERATION WITH UTILITIES</td>
<td>7</td>
</tr>
<tr>
<td>4.05</td>
<td>AUTHORITY AND DUTIES OF UNIVERSITY INSPECTORS</td>
<td>8</td>
</tr>
<tr>
<td>4.06</td>
<td>INSPECTION OF THE WORK</td>
<td>9</td>
</tr>
<tr>
<td>4.07</td>
<td>REMOVAL OF DEFECTIVE WORK</td>
<td>9</td>
</tr>
<tr>
<td>4.08</td>
<td>MAINTENANCE OF WORK DURING CONSTRUCTION</td>
<td>10</td>
</tr>
<tr>
<td>4.09</td>
<td>FAILURE TO MAINTAIN ENTIRE PROJECT</td>
<td>10</td>
</tr>
<tr>
<td>4.10</td>
<td>UNIVERSITY'S RIGHT TO DO WORK</td>
<td>10</td>
</tr>
<tr>
<td>4.11</td>
<td>PARKING (See also Section 12.02)</td>
<td>10</td>
</tr>
<tr>
<td>SECTION 5 - MATERIALS</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>5.01</td>
<td>GENERAL</td>
<td>11</td>
</tr>
<tr>
<td>5.02</td>
<td>STORAGE AND HANDLING OF MATERIALS</td>
<td>12</td>
</tr>
<tr>
<td>5.03</td>
<td>TESTS</td>
<td>13</td>
</tr>
<tr>
<td>5.04</td>
<td>BUY AMERICAN STEEL</td>
<td>14</td>
</tr>
<tr>
<td>SECTION 6 - LEGAL RELATIONS AND RESPONSIBILITIES</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>6.01</td>
<td>LAWS TO BE OBSERVED</td>
<td>14</td>
</tr>
<tr>
<td>6.02</td>
<td>PERMITS AND LICENSES</td>
<td>14</td>
</tr>
<tr>
<td>6.03</td>
<td>PATENTED DEVICES, MATERIALS, AND PROCESSES</td>
<td>14</td>
</tr>
<tr>
<td>6.04</td>
<td>LAND, AIR, AND WATER POLLUTION</td>
<td>14</td>
</tr>
<tr>
<td>6.05</td>
<td>CONTRACTOR'S LIABILITY INSURANCE</td>
<td>15</td>
</tr>
<tr>
<td>6.06</td>
<td>FIRE AND EXTENDED COVERAGE INSURANCE</td>
<td>16</td>
</tr>
<tr>
<td>6.07</td>
<td>ASSIGNMENTS</td>
<td>16</td>
</tr>
<tr>
<td>6.08</td>
<td>SEPARATE CONTRACTS</td>
<td>16</td>
</tr>
<tr>
<td>6.09</td>
<td>RELATIONSHIP OF CONTRACTOR TO PUBLIC OFFICIALS AND EMPLOYEES</td>
<td>16</td>
</tr>
<tr>
<td>6.10</td>
<td>NO WAIVER OF LEGAL RIGHTS</td>
<td>17</td>
</tr>
<tr>
<td>6.11</td>
<td>COVENANT AGAINST CONTINGENT FEES</td>
<td>17</td>
</tr>
<tr>
<td>6.12</td>
<td>ASSIGNMENT OF ANTITRUST CLAIMS</td>
<td>18</td>
</tr>
<tr>
<td>6.13</td>
<td>FEDERAL PARTICIPATION</td>
<td>18</td>
</tr>
<tr>
<td>6.14</td>
<td>DISPUTES</td>
<td>18</td>
</tr>
<tr>
<td>6.15</td>
<td>CLAIMS</td>
<td>18</td>
</tr>
</tbody>
</table>
SECTION 1 - DEFINITIONS AND RESPONSIBILITIES

1.01 DEFINITIONS

A. “Contract.” The written agreement executed between the University and Contractor, covering performance of the work and furnishing of labor, services, equipment, and materials, and by which Contractor is bound to perform the work and furnish the labor, services, equipment and materials, and by which the University is obligated to compensate Contractor at the established and accepted rate or price. The contract documents shall include the proposal, contract forms and bonds, general conditions, specifications, addenda, supplemental specifications, all special provisions, all technical provisions, all plans, and notice to proceed; also any written change orders and supplemental agreements that are required to complete the work in an acceptable manner, including authorized extensions thereof.

B. “Contractor.” The person or organization having a direct contractual relationship with the University for execution of the Work. If Contractor hereunder is comprised of more than one legal entity, each such entity shall be jointly and severally liable under the Contract.

C. “Contract Time and Completion Date.” The number of working or calendar days shown in the proposal indicating the time allowed for the completion of the work contemplated in the contract. In case a calendar date of completion is shown in the proposal, in lieu of the number of working or calendar days, such work shall be completed on or before that calendar date.

D. “Day.” Means calendar day unless otherwise designated.

E. “Towson University” or “the University.” Refers to Towson University, an agency and instrumentality of the State of Maryland. In particular, the University refers to the campus or administrative unit of the University or its authorized representative that issues information relative to a particular transaction.

F. “Notice to Proceed.” A written notice to Contractor of the date on or before which it shall begin the prosecution of the work to be done under the Contract.

G. “Procurement Officer.” The person identified at the work initiation conference and designated by the University to make decisions with respect to administration of the work.

H. “Repair.” Where used in the Contract documents repair shall mean to restore after injury, deterioration, or wear; to mend, to renovate by such means as appropriate, and to supply such materials and labor as necessary to render the item to be repaired sound, solid, true, plumb, square, even, smooth and fully serviceable. Upon completion, such repair must be, unless otherwise stated, rendered to such condition as to present a first-class finished work, or in instances where the repaired item serves as a base for additional finish, the repaired work must be such as to permit a first-class finish, to be applied without extra cost to the University. When the word "repair" is used in connection with machinery or mechanical equipment it shall mean, in addition to the above, rendering the equipment completely serviceable and efficient, ready for normal use for which it was intended originally.
I. “Owner” or “State” or “University.” The State of Maryland acts only through its Board of Public Works. No action or representation is binding upon the State or Towson University unless it is made by, ratified by, or delegated by the Board of Public Works. Actions or representations made by the University staff do not bind the State or the University unless so provided in law.

J. “Subcontractor.” As employed herein includes only those having a direct contract with the Contractor. It includes one who furnishes material worked to a special design according to the plans and specifications for the Work, but excludes one who merely furnishes material not so worked.

K. “Supplemental Agreement.” A written agreement covering added or changed work which is beyond the scope of the contract and the changes clause. A supplemental agreement becomes a part of the contract when approved and properly executed by all parties to the contract.

L. “Surety.” The corporate body bound with and for Contractor for the full and complete performance of the Contract and payment of all debts pertaining to the Work.

M. “Work.” Work shall be understood to mean the furnishing of all labor, materials, equipment, services, utilities and other incidentals necessary to successful completion of the project and all the duties and obligations imposed upon Contractor by the Contract.

N. “Written Notice.” Shall be deemed to have been duly served 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 intended, or if delivered to or sent by registered mail, to the last business address known to him who gives notice.

1.02 OWNER RESPONSIBILITIES

A. To the best of its abilities, the University will provide all relevant information relating to the project’s buildings, structures, and their nearby utility infrastructure, including underground utilities. This information is not guaranteed to be accurate, however, and must be field verified by the Contractor through inspection, investigation, utility locating, etc. MISS UTILITY will not locate underground utilities on University property.

B. Information or services under the Owner's control shall be furnished by the University with reasonable promptness to avoid delay in the orderly progress of the Work.

1.03 CONTRACTOR RESPONSIBILITIES

A. Contractor shall supervise and direct the work using his best skill and attention, and shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract.

B. Contractor shall be responsible to the University for the acts and omissions of Contractor employees, subcontractors and their agents and employees, and other persons performing any of the Work under the Contract.
C. Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents by inspections, tests, or approvals required or performed by persons other than Contractor.

D. Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, and the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment.

E. Contractor shall design and coordinate its installation with sensitivity to aesthetics, particularly where exterior systems or components must be installed in a prominent location. The University has the right to reject or amend intended installations that are not considered within the intent of this guidance.

F. Cutting and Patching of Work

1. Contractor shall be responsible for all cutting, fitting, or patching that may be required to complete the Work or to make its several parts fit together properly in a workmanlike manner. Contractor shall clearly show on his installation drawings the locations proposed to be cut, penetrated, or otherwise altered, and provide details as to their final closure or condition.

2. Contractor shall not damage or endanger any portion of the Work or the work of the University or any separate contractors by cutting, patching or otherwise altering any work or by excavation. Contractor shall not cut or otherwise alter the work of the University or any separate contractor except with the written consent of the University and of such separate contractor. Contractor shall not unreasonably withhold from the University or any separate contractor its consent to cutting or otherwise altering the Work.

G. Indemnification

1. To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless the University, the State of Maryland, Baltimore County, (if requested by the University), and their agents and employees from and against all claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of or resulting from the performance of the Work, provided that any such claim, damage, or loss or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any one of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise exist as to any party or person described in this paragraph.

2. In any and all claims against the University or the State of Maryland or any of their agents or employees by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not be limited in any way by any limitation on the amount or
type of damages, compensation, or benefits payable by or for Contractor or any subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

H. Security

1. Doors to the work areas and/or buildings shall be kept locked before, during and after normal work hours, except as necessary to provide reasonable access to the Work.

2. Contractor will provide, when necessary, temporary closures at door, window, and louver openings to secure the area and building from theft, damage, and weather.

3. Contractor shall be responsible for the security of the work area, and security deficiencies in the work area shall be immediately corrected as required by the University.

4. The TU Project Manager may, at his/her discretion, issue keys or access cards to Contractor for the duration of the job or require Contractor to sign out keys/cards at Facilities Management’s Work Control Office on a daily basis. Contractor must request access to other areas through the TU Project Manager. At closeout, Contractor must return all keys or access cards to the TU Project Manager. Contractor will be held responsible for all expenses related to the replacement of lost keys and all lock cylinders that can be opened with lost keys.

SECTION 2 - CONTRACT DOCUMENTS

2.01 CONTRACT DOCUMENTS

A. The Contract Documents are complementary unless specified otherwise in the solicitation notice; that which is called for by any one document shall be as binding as if called for by all.

1. Intent of the documents is to include all work necessary for proper completion of the project, ready for continual efficient operation. It is not intended, however, to include any work not properly inferable.

2. Clarification. Contractor shall obtain clarification of all questions as to intent of the Contract Documents, or any conflict between two or more items in the Contract Documents. If Contractor fails to obtain such clarification, University may direct that the Work proceed by any method indicated, specified, or required by the Contract Documents in the interest of maintaining the best construction practice, and such direction shall not constitute the basis of Contractor claims for extra costs.

3. Jargon. Work described in words that have a well-known technical or trade meaning shall be held to refer to such recognized standard use.
B. **University-Provided Drawings.** All University-provided drawings are given for general information only. These drawings reflect the as-built conditions of the buildings/structure and the campus infrastructure to the best of the University's knowledge. The University cannot guarantee the accuracy of this information. Contractor shall inspect, investigate, and verify all field conditions prior to submission of its proposal.

C. **Contractor Drawings.** Contractor shall do no work without proper drawings and/or instructions that have been approved by the University. Drawings in general shall be drawn to scale and symbols used to indicate materials and architectural, structural, mechanical, and electrical requirements. Contractor shall keep on the job site a complete set of all drawings, specifications, shop drawings, schedules, etc., in good order and available to the University.

D. **Dimensions.** Contractor shall carefully check all dimensions prior to execution of the particular work affected and, if inaccuracies or discrepancies are found, consult the University prior to any construction or demolition. Dimensions for items to be fitted into constructed conditions at the job will be taken at the job and will be the responsibility of Contractor. The obvious intent of the documents, and obvious requirements dictated by conditions existing or being constructed, supersedes dimensions or notes that may be in conflict therewith. Whenever a stock size manufactured item or piece of equipment is specified by its normal size, it is Contractor's responsibility to determine the actual space requirements for setting or entrance to the setting space. No extra will be allowed by reason of work requiring adjustments in order to accommodate a particular item of equipment.

2.02 **SHOP DRAWINGS**

A. Contractor shall submit for approval shop drawings, including setting drawings, and schedules as required by the University for the work of the various trades. These drawings shall be prepared in conformity with the best practice and standards for the trade concerned, with due regard for speed and economy of fabrication and erection.

B. All shop drawings must show the name of the project and the University contract number.

C. **Size of Drawings.** All shop drawings and details submitted for approval shall be printed on 24” x 36” drawing sheets or larger. Shop detail supplied on letter size (8 1/2” x 11”) sheets are acceptable for schedules and small details. An electronic copy is also required.

D. **Items For Which Shop Drawings Will Be Required.** Shop drawings are required for all items specifically fabricated for the Work, or when assembly of several items is required for a working unit. They must also be provided showing all points of connection, fastening, anchorage, cutting, penetrating, altering, etc. of any existing surfaces.

E. **Copies Required.** Contractor shall supply two (2) paper copies for the University's Office of Facilities Management, in addition to such copies as Contractor may desire to be returned for its own use. An electronic copy shall also be submitted.
F. **Examination and Approval.** The University will examine shop drawings with reasonable promptness, noting desired corrections or granting approval or rejecting them.

G. **Field Dimensions and Conditions.** Contractor is solely responsible for the check of dimensions or existing conditions in the field.

H. **Resubmission.** When the University notes corrections or rejects shop drawings, Contractor shall resubmit with corrective changes.

**SECTION 3 - SCOPE OF WORK**

3.01 **INTENT OF THE CONTRACT DOCUMENTS**

It is the intent of the Contract Documents to show all of the work necessary to complete the project.

3.02 **GENERAL CONDITIONS CONTROLLING**

In event of a conflict between these General Conditions and any other provision of the Contract Documents, these General Conditions shall prevail unless such other provision expressly provides to the contrary.

3.03 **DIFFERING SITE CONDITIONS**

A. Contractor shall promptly, and before such conditions are disturbed, notify the Procurement Officer in writing of: (1) Subsurface or latent physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract. The Procurement Officer shall promptly investigate the conditions, and if he finds that such conditions materially differ and cause an increase or decrease in the cost of, or the time required for, performance of any part of the Work under this Contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the contract modified in writing accordingly.

B. No claim by Contractor under this clause shall be allowed unless Contractor has given the notice required in A. above, provided, however, the time prescribed therefore may be extended by the University.

3.04 **SITE INVESTIGATION**

Contractor acknowledges that it has investigated and satisfied itself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment, and facilities needed preliminary to and during prosecution of the work. Contractor further acknowledges that it has satisfied itself as to the character, quality and quantity of surface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the University, as well as from information
presented by the drawings and specifications made a part of this contract. Any failure by Contractor to acquaint itself with the available information will not relieve it of responsibility for estimating properly the difficulty of cost of successfully performing this work. The University assumes no responsibility for any conclusions or interpretations made by Contractor on the basis of the information made available by the University.

3.05 CONDITIONS AFFECTING THE WORK

Contractor shall be responsible for taking steps reasonably necessary to ascertain the nature and location of the work or the cost thereof. Any failure by Contractor to do so will not relieve it of responsibility for successfully performing the work without additional expense to the University. Contractor agrees not to place any credence in any understanding or representation concerning conditions made by any University employee or agent prior to the execution of this contract, unless such understanding or representation is expressly stated in the contract.

3.06 CHANGES IN THE WORK [Intentionally omitted; see Exhibit A-2, Section 20]

SECTION 4 - CONTROL OF THE WORK

4.01 CONFORMITY WITH CONTRACT REQUIREMENTS

All work performed and all materials furnished shall be in conformity with the contract requirements.

4.02 ADJACENT WORK

A. The University shall have the right, at any time, to contract for and/or perform other work on, near, over, or under the work covered by this contract. In addition, other work may be performed under the jurisdiction of another state agency. Contractor shall cooperate fully with such other contractors and carefully fit its own work to such other work as may be directed by the University.

B. Contractor agrees that in event of dispute as to cooperation or coordination with adjacent contractors, the decision of the University will be binding. Contractor agrees to make no claims against the University or the State of Maryland for any inconvenience, delay, or loss attributable to the presence and operations of other contractors.

4.03 CONTROL BY THE CONTRACTOR

Contractor shall constantly maintain efficient supervision of the Work, using its best skill and coordinating ability. It shall carefully study and compare all drawings, specifications, and other instructions, and check them against conditions existing or being constructed on the project, and at once report any error, inconsistency, or omission discovered.

4.04 COOPERATION WITH UTILITIES

A. It is understood and agreed that Contractor has considered in its price all of the permanent and temporary utility appurtenances in their present or relocated...
positions, and that no additional compensation will be allowed for normal delays, inconvenience, or damage sustained by him due to any interference, from the said utility appurtenances, the operation of moving them, or the making of new connections thereto if required by the contract documents.

B. Contractor shall be responsible for notifying all affected utility companies prior to performing any work on their utilities, and shall cooperate with them in achieving the desired results. Contractor shall be the responsible for all damage to utility facilities caused by Contractor’s operations.

C. At points where Contractor’s operations are adjacent to properties of railway, telegraph, telephone, water, and power companies, or are adjacent to other property, damage to which might result in expense, loss, or inconvenience, work shall not be commenced until Contractor makes all arrangements necessary for the protection thereof.

D. Contractor shall cooperate with owners of any underground or overhead utility lines in removal and rearrangement operations, so that these operations may progress in a reasonable manner, duplication or rearrangement is minimized, and services rendered by those parties are not unnecessarily interrupted.

E. In the event of interruption to utility services as a result of accidental breakage, or as a result of utility lines being exposed or unsupported, Contractor shall promptly notify the proper authority, and shall cooperate with said authority in restoration of service. No work shall be undertaken around fire hydrants until provisions for continued service are approved by the local fire authority.

F. Utility outages shall be kept to a minimum, and will be permitted only with the written approval of OFM. All requests for outages shall include identification of all areas to be affected by the proposed outage, and shall be made not less than 48 hours in advance of the need.

G. Contractor may use sanitary facilities located near the project site, if available. Should a nuisance in or an abuse of University facilities occur, and continue after notice from the University, then access to University facilities will be withdrawn, and Contractor shall provide its own facilities. Contractor shall keep all such facilities in clean and sanitary condition throughout the period of use, and repaint such facilities at the completion of the work, if required, at no cost to the University.

4.05 AUTHORITY AND DUTIES OF UNIVERSITY INSPECTORS

A. University inspectors are authorized to inspect all work done and all material furnished. Such inspections may extend to all or any part of the Work and to the preparation, fabrication, or manufacture of the materials to be used. The inspector is not authorized to revoke, alter, or waive any requirements of the contract, nor to approve or accept any portion of the complete project. He is authorized to call to Contractor’s attention any failure of the work or materials to conform to the Contract. He is authorized to reject materials or suspend the work until any questions or issues are resolved. Inspectors shall perform their duties at such times and in such times and in such manner as will not unnecessarily impede progress on the Contract.
B. Inspector shall in no case act as foreman, or perform other duties for Contractor, nor interfere with management of the work by Contractor.

C. Any advice the inspector may give Contractor shall not be construed as binding the University in any way, or releasing Contractor from fulfilling the terms of the Contract. The duty of the inspector is to observe progress of the Work and report any deviations from the requirements of the Contract Documents; however, should the inspector fail to report any such deviation from the Contract requirements, Contractor is not released from its obligation to fulfill all terms of the Contract.

D. Where there is disagreement between Contractor and the inspector, the inspector will immediately direct the University's attention to the issues of disagreement, and if Contractor still refuses to make corrections, comply, or suspend work, the University will prepare and deliver in writing to Contractor a written order suspending the work. As soon as the inspector is advised of delivery of the shutdown order, the inspector shall immediately leave the site, and any work performed during the inspector's absence will not be accepted or paid for, and may be required to be removed and disposed of at Contractor expense.

4.06 INSPECTION OF THE WORK

A. All work, including the fabrication and source of supply, is subject to observation by the University and by those agencies required by law to inspect specific items.

B. Contractor shall provide facilities for access and inspection as required by the University.

C. If the specifications, the University's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, Contractor shall give the University timely notice of its readiness for inspection, and if the inspection is by another authority, the date fixed for such inspection. Inspections by the University shall be made promptly and, where practicable, at the source of supply. Any work covered without approval must, if required by the University, be uncovered for examination at Contractor's expense.

4.07 REMOVAL OF DEFECTIVE WORK

A. All work and materials that do not conform to the requirements of the Contract will be considered unacceptable.

B. Any unacceptable or defective work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause shall be removed and replaced by work and materials that conform to the contract requirements, or shall be remedied otherwise in an acceptable manner authorized by the University.

C. If Contractor fails to comply promptly with any order made under this section, the University shall cause defective or unacceptable work to be remedied or replaced, and unauthorized work to be removed, and shall hold Contractor responsible for the costs thereof.
4.08 MAINTENANCE OF WORK DURING CONSTRUCTION

A. Contractor shall maintain the work during construction and until acceptance. This maintenance shall be continuous and effective, and prosecuted with adequate equipment and forces to the end that all parts of the Work are kept in satisfactory condition at all times, and protected from damage of any kind from external sources.

B. Particular attention shall be given to drainage, both permanent and temporary. Contractor shall use all reasonable precautionary measures to avoid damage or loss that might result from accumulations and concentrations of drainage water, and material carried by such waters and such drainage shall be diverted or dispensed when necessary to prevent damage to excavation, embankments, surfaces, structures, or property. Contractor shall take suitable measures to prevent erosion in all construction areas where existing ground cover has been removed. All such measures shall be in compliance with the requirements of any governmental entity having jurisdiction.

C. All costs of maintenance during construction and before final acceptance shall be included in the bid price; Contractor will not be paid additional amounts for such work.

D. If Contractor’s work is halted by the University for failure to comply with the Contract, Contractor shall maintain the entire project as provided herein, and provide such ingress and egress for local residents or tenants adjacent to the project site, for tenants of the project site, and for the general public as may be necessary during the period of suspended work, or until Contractor has been declared in default.

E. On projects where traffic flow is maintained, Contractor shall be responsible for repair and restoration of all traffic damage to the work, either partially or totally completed, until the University accepts the work.

4.09 FAILURE TO MAINTAIN ENTIRE PROJECT

Contractor’s failure to comply with Section 4.4.08 shall result in notice by the University to comply with the required maintenance provisions. If Contractor fails to remedy unsatisfactory maintenance within 24 hours after receipt of such notice, the University will immediately proceed to maintain the project, and the entire cost of this maintenance will be charged to Contractor.

4.10 UNIVERSITY’S RIGHT TO DO WORK

If Contractor fails to prosecute the Work properly or to perform any provision of the Contract, the University, after three (3) days’ written notice to Contractor, may make good such deficiencies and deduct the cost thereof from the monies then or thereafter due to Contractor.

4.11 PARKING (See also Section 12.02)

A. Parking is allowed in only designated areas. Parking on sidewalks or unpaved areas is prohibited at all times.
B. All vehicles parked on Towson University property must strictly observe University parking regulations. Each vehicle parked on campus between 6 am and 8 pm, Monday through Thursday, and from 6 am to 3 pm on Fridays, must display a valid University permit unless parked at a paid meter. All fines for parking or other vehicle violations are the responsibility of Contractor.

C. This section applies to vendors, salespersons, company vehicles, and contractor employees’ personal vehicles. Long- and short-term permits are available, at designated rates, for vendors with contracts that require them to park regularly on the campus; see the parking website at http://wwwnew.towson.edu/adminfinance/auxservices/parking/ for permit rates and information to support preparation of bids and price proposals.

SECTION 5 - MATERIALS

5.01 GENERAL

A. All materials shall meet all quality requirements of the Contract. To expedite inspection and testing of materials, Contractor shall notify the University, in writing, of the sources from which Contractor proposes to obtain materials requiring approval, testing, inspection, or certification prior to incorporation into the work, as soon possible after notice of contract award.

B. Materials include all manufactured products and processed and unprocessed natural substances required for completion of the Contract. Contractor, in accepting the Contract, is assumed to be thoroughly familiar with the materials required and their limitations as to use, and requirements for connection, setting, maintenance, and operation. Whenever an article, material, or equipment is specified and a fastening, furring, connection (including utility connections), access hole, flashing closure piece, bed, or accessory is normally considered essential to its installation in good quality construction, such shall be included as if fully specified. Nothing in the specifications shall be interpreted as authorizing any work in a manner contrary to applicable laws, codes, or regulations.

C. Approval. All materials are subject to University approval for conformity with the specifications, quality, design, color, etc. No work for which approval is necessary shall be used until written approval is given. Approval of a subcontractor or supplier does not constitute approval of materials other than those included in the specifications.

D. New Materials. Unless otherwise specified, all materials shall be new. Old materials must not be used as substitutes for new, regardless of condition or repair, unless approved in writing by the University.

E. Quality. Unless otherwise specified, all materials shall be of the best quality of the respective kinds.

F. Samples. Contractor shall furnish all samples for approval as directed. Materials used shall be the same as the approved samples.
G. **Proof of Quality.** Contractor shall, if requested, furnish satisfactory evidence of the kind and quality of materials, either before or after installation, and shall pay for tests deemed necessary for substitutions as set forth in paragraph 5.03 of these General Conditions.

H. **Standard Specifications.** When no specification is cited and the quality, processing, composition, or method of installation of a thing is only generally referred to, then:

1. For items not otherwise specified below, the latest edition of the applicable American Society for Testing and Materials (ASTM) specification applies.

2. For items generally considered as plumbing and those items requiring plumbing connections, the applicable portions of the latest edition of the BOCA Code apply.

3. For items generally considered as heating, refrigeration, air conditioning, or ventilating, the applicable portions of the latest edition of the ASHRAE Handbook published by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., apply.

4. For items generally considered as site work, the applicable portions of the Maryland State Highway Administration (SHA) Standard Specifications apply.

5. For items generally considered as electrical, the applicable provisions of the latest edition of the National Electrical Code apply.

6. For items generally considered as fire protection, the applicable portions of the latest edition of the National Fire Protection Association (NFPA) code apply.

I. Contractor is solely responsible for safeguarding its tools, materials, and equipment at the work site and elsewhere on the campus. The University shall not assume responsibility for vandalism and/or theft of Contractor materials, tools, or equipment.

J. Existing equipment and materials removed from the project shall become the property of the Contractor, who shall be responsible for removing same from the campus, absent a written agreement with the University. Contractor shall be responsible for proper handling of all materials removed for the purpose of recycling or salvage. Salvaged materials shall not be released to University staff without written approval from the Associate Vice President for Facilities Management. Under no circumstances shall Contractor provide salvage service on behalf of or for the benefit of University employees.

K. No asbestos, lead, or PCB-containing materials shall be used or installed on campus without prior written approval from the University's Department of Environmental Health & Safety (410-704-2949).

5.02 **STORAGE AND HANDLING OF MATERIALS**

A. Materials shall be stored and handled so as to assure the preservation of their quality and acceptability for the work. Stored materials, even though approved before
storage, may again be inspected prior to their use in the work. Stored materials shall be located so as to facilitate prompt inspection. Though not guaranteed, limited areas of the University may be used for some storage of materials and equipment, depending on the site location, time of the year, and the quantity of material/equipment; such storage areas shall be restored to their original condition at Contractor expense.

B. Contractor shall confine his tools and equipment and the storage of materials to the area designated by the TU Project Manager, and will not load or permit any part of the structure to be loaded with a weight that will endanger the safety of the structure or any part thereof.

C. Explosives

1. Explosives shall not be stored anywhere on University property.

2. Contractor may use explosives only upon written approval from the University. Approval will stipulate the time, place, and quantity of explosives to be used, and the manner of use.

3. Contractor assumes all responsibility for injury to persons or damage to property damage resulting from the use or transportation of explosives, and for complying with any and all ordinances, regulations, and restrictions related to the use of explosives.

D. Paints

1. Contractor shall not store oil-based paints or flammable liquids on the project site in containers larger than five (5) gallon size. Any liquid with a flash point of less than one hundred (100) degrees shall be contained in UL-approved safety cans; liquids with higher flash points shall be stored in rigid cans. Glass containers shall not be used.

2. Contractor shall remove all oily rags, waste, etc. from the work site at the close of each working day.

5.03 TESTS

A. If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested, or approved, Contractor shall give timely notice of its readiness so the University may observe such inspection, testing, or approval. Contractor shall bear all costs of such inspections, tests, or approval conducted by public authorities.

B. If the University determines that any work requires special inspection, testing, or approval in addition to that required by the Contract Documents, Contractor will, upon written authorization from the University, order such special inspection, testing, or approval, and give notice as provided in 5.06 A above. If such special inspection or testing reveals that work does not comply with the Contract, Contractor shall bear all costs of testing; otherwise the University shall bear such costs.
C. Contractor shall promptly secure all required certificates of inspection, testing, or approval and promptly delivered same to the University.

5.04 BUY AMERICAN STEEL

Only steel products made in the United States shall be used or supplied in the performance of the contract or any subcontract thereunder. Steel products include products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated, or otherwise similarly processed from steel made in the United States. This requirement shall not apply if the University determines that the cost of such steel products is unreasonable or inconsistent with the public interest. The provisions of this paragraph shall not apply where they are in conflict with any Federal grant or regulation affecting this contract.

SECTION 6 - LEGAL RELATIONS AND RESPONSIBILITIES

6.01 LAWS TO BE OBSERVED

A. Contractor shall keep fully informed of all federal, state, and local laws, ordinances, and regulations, and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the Work, or in which any way affect the conduct of the Work. He shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees. He shall protect and indemnify the University and its representatives against such claim or liability arising from or based on the violation of any law, ordinance, regulation, order, or decree, whether by himself or his employees or subcontractors.

B. Contractor must comply with the provisions of the Workmen's Compensation Act and federal, state, and local laws relating to hours of labor.

C. The provisions of the Contract shall be governed by the Laws of Maryland.

D. Contractor shall give all notices and comply with all state and federal laws, ordinances, rules, and regulations bearing on the conduct of the Work as drawn and specified.

E. If Contractor observes that the drawings and specifications are at variance with any law, he shall promptly notify the University, and make all necessary changes as provided in the contract for changes in the work. If Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without such notice to the University, he shall bear all costs arising therefrom.

6.02 PERMITS AND LICENSES [Intentionally omitted]

6.03 PATENTED DEVICES, MATERIALS, AND PROCESSES [Intentionally omitted; see Exhibit A-2, Section 26]

6.04 LAND, AIR, AND WATER POLLUTION

A. Contractor shall incorporate all permanent erosion control features into the work at the earliest practicable time. Temporary pollution control measures will be used to
correct unforeseen conditions that develop during construction, that are needed prior to installation of permanent pollution control features, or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

B. Contractor is advised that temporary pollution control may include measures outside the project site, where such work is necessary as a direct result of project construction. Contractor shall keep the University advised of all such off-site control measures undertaken; however, this shall not relieve Contractor of basic responsibilities for such work.

C. If Contractor fails to control erosion pollution and/or siltation, the University reserves the right to employ outside assistance or to use its own forces to provide the necessary corrective measures. All expenses incurred by the University in the performance of such duties for Contractor shall be the responsibility of Contractor.

D. Contractor must submit evidence to the University that governing federal, state, and local air pollution criteria are met. This evidence and related documents will be retained by the University.

E. If the performance of all or any part of the work is suspended, delayed, or interrupted by order of a court of competent jurisdiction as a result of environmental litigation as defined below, the Procurement Officer, at the request of Contractor, shall determine whether the order is due in any part to the acts or omissions of Contractor required by the University under the terms of the contract. If it is determined that the order is due in any part to acts or omissions of Contractor required by the Procurement Officer in the administration of the Contract, such suspension, delay, or interruption shall be considered as if ordered by the Procurement Officer under the Suspension of Work clause of the contract. The period of such suspension, delay, or interruption shall be considered reasonable, and an adjustment shall be made for any increase in the cost of performance of the contract (excluding profit) as provided that clause, subject to all the provisions thereof.

F. The term "environmental litigation" as used herein means a lawsuit alleging that the work will have an adverse effect on the environment, or that the University has not duly considered, either substantively or procedurally, the effect of the work on the environment.

6.05 CONTRACTOR'S LIABILITY INSURANCE

A. Contractor and each subcontractor shall maintain such insurance as will protect from claims under Workmen's Compensation Act, and the Federal Longshoremen's and Harbor Workers' Compensation Act, and the Federal Employers Liability Act by coverage with insurance companies or by methods acceptable to the State Insurance Commissioner and by no other method, for damages which may arise from operations under this contract, whether such operations be by Contractor or by any subcontractor or anyone directly or indirectly employed by either. All insurance except Workmen’s Compensation shall name the Towson University, the University System of Maryland, and the State of Maryland as additional insureds.
B. Contractor shall protect itself, the University, and the State from any claims for bodily injury, liability, and property damage liability.

C. Limits for bodily injury liability shall be not less than $1,000,000/2,000,000; i.e., $1,000,000 is the limit for injury per occurrence and $2,000,000 in the aggregate. The minimum limit for property damage liability shall be $1,000,000 per accident and $2,000,000 aggregate.

D. The above policies for bodily injury and property damage liability insurance shall be so written as to include contingent bodily injury and property damage liability Insurance to protect Contractor against claims from the operations of subcontractors.

E. Contractor's certificates of insurance containing evidence of the Hold Harmless Clause protecting the University and the State of Maryland shall be filed with the Procurement Officer and shall be subject to approval for adequacy of protection. No work shall be started at the site until appropriate certificates of insurance are filed with and approved by the Procurement Officer.

6.06 FIRE AND EXTENDED COVERAGE INSURANCE [Intentionally omitted; see Exhibit A-2, Section 38]

6.07 ASSIGNMENT [Intentionally omitted; see Exhibit A-2, Section 28]

6.08 SEPARATE CONTRACTS

A. The University reserves the right to let other contracts in connection with this Work. Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work, and shall properly connect and coordinate his Work with theirs.

B. If any part of Contractor's work depends for proper execution or results upon the work of any other contractor, Contractor shall inspect and promptly report any defects in such work that render it unsuitable for such proper execution and results. Failure to so inspect and report shall constitute acceptance of the other contractor's work as fit and proper for the reception of Contractor's work, except as to the defects that may develop in the other contractor's Work after the execution of Contractor's work.

C. To insure proper execution of his subsequent work, Contractor shall measure work already in place and shall at once report to the University any discrepancy between the executed work and the drawings.

6.09 RELATIONSHIP OF CONTRACTOR TO PUBLIC OFFICIALS AND EMPLOYEES

A. In carrying out any of the provisions of the Contract, or in exercising any power or authority granted to them by or within the scope of the Contract, there shall be no liability upon the Procurement Officer or other authorized representatives of the University, it being understood that in all such matters they act solely as agents and representatives of the University.
B. The University may terminate the Contractor’s right to proceed under the Contract if the Procurement Officer finds that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by Contractor or any agent or representative of Contractor to any officer or employee of the University with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or the making of any determinations with respect to the performing of such contract. The facts upon which the Procurement Officer makes such findings may be reviewed in any competent court.

C. In the event the Contract is terminated as provided in paragraph B above, the University shall be entitled (1) to pursue the same remedies against Contractor as it could pursue in the event of Contractor’s breach of the contract, and (2) in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Procurement Officer) which shall be not less than three, nor more than ten times the costs incurred by Contractor in providing any such gratuities to any such officer or employee.

D. The rights and remedies of the University provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

E. Conflict of Interest. No official or employee of the State of Maryland whose duties as such official or employee include matters relating to or affecting the subject matter of this contract, shall, during the pendency and term of this Contract and while serving as an official or employee of the State, become or be an employee of Contractor or any subcontractor on this contract.

6.10 NO WAIVER OF LEGAL RIGHTS

A. The University and the State of Maryland shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the work and payment therefore, from showing the true amount and character of the work performed and materials furnished by Contractor, or from showing that any such measurement, estimate, or certificate is untrue or is incorrectly made, or from showing that the Work or materials do not in fact conform to the requirements of the contract. The University and the State of Maryland shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate, and payment from recovering from Contractor or his sureties, or both, such damage as it may sustain by reason of failure to comply with the terms of the Contract. Neither the acceptance by the University or any representative of the University, 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 University shall operate as a waiver of any portion of the contract or of any power herein reserved, or of any right to damages.

B. Waiver by the University of any breach of the Contract shall not be held to be a waiver of any other or subsequent breach.

6.11 COVENANT AGAINST CONTINGENT FEES [Intentionally omitted; see Exhibit A-2, Sec. 1]
6.12 ASSIGNMENT OF ANTITRUST CLAIMS

Contractor sells, transfers, and assigns to the University and the State of Maryland all rights, title, and interest of and in and to any causes of action arising at any time before the date of this assignment or during the performance of this contract under the Antitrust Laws of the United States, including Section 1 of the Sherman Act, and the Antitrust Law of Maryland relating to the purchase by him or the University or the State of Maryland of any products from any supplier or source whatever that are incorporated in structures built under the terms of this agreement. Contractor hereby certifies that the above causes of action are lawfully owned and that no previous assignment of same, has been made nor has the same heretofore been attached or pledged in any manner whatsoever.

6.13 FEDERAL PARTICIPATION [Intentionally omitted]

6.14 DISPUTES [Intentionally omitted; see Exhibit A-2, Section 27]

6.15 CLAIMS

A. Under no circumstances will overhead or profit be permitted as items of a claim, when such overhead or profit is for periods during which a "Stop Work" order is in effect due to an act, error, omission for which the contractor is responsible.

B. No profit or overhead that includes rental of equipment and the salaries of supervisory personnel will be allowed Contractor for stoppage of work when written notice of such stoppage, or impending stoppage, is not given sufficiently far in advance to prevent such stoppage.

C. No claim will be granted that includes cost of delays or work stoppage due to strikes lockouts, fire, unusually severe weather, avoidable casualties, or damage or delay in transportation for which the University or its agents are responsible; only time extensions, in accordance with Section 7.03 will be granted.

D. Contractor and the University agree that no prejudgment or post-judgment interest on any claims asserted by either party will be allowed.

E. No claim for damage caused by a delay will be allowed unless, within five (5) days of the act or omission causing the delay, Contractor notifies the University of the existence of the delay.

SECTION 7 - PROSECUTION AND PROGRESS OF THE WORK

7.01 NOTICE TO PROCEED

After the Contract has been executed, the University will issue Contractor a "Notice to Proceed" that stipulates the date on or before which Contractor is expected to begin work. The specified contract time shall begin on the day work (other than the erection of the inspector's office, construction stakeout, and mobilization) actually starts, or on the day stipulated in the Notice to Proceed, whichever is earlier. Any preliminary work started or materials ordered before receipt of Notice to Proceed shall be at contractor's risk.
7.02 SIGNS

A. General. The University shall provide one project sign for each major entrance to the project. The contractor shall be responsible for placement and maintenance of the sign(s).

B. Installation. Posts for sign(s) shall be supplied by the contractor and made of 4 x 6 inch construction grade lumber, pressure-preservative treated, 10 feet long. The sign(s) shall be bolted to the posts using at least two 2 inch bolts per post. Washers shall be used between the bolts and the sign faces and the posts and nuts. The posts shall be set into the ground to a depth of three feet, six inches with the bottom of the signs two feet six inches above the ground.

C. Removal. The University shall be responsible for removing the sign(s) after final acceptance of the work.

7.03 PROSECUTION OF THE WORK

A. All time limits in the Contract Documents are of the essence of the Contract.

B. The date of commencement of the work is the date established in a Notice to Proceed signed by the Procurement Officer.

C. If Contractor is delayed at any time in the progress of the work by any act or neglect of the University or any of its officers, agents, or employees, or by any separate contractor employed by the University, or by any changes ordered in the work, or by labor disputes, fire, unusual delay in transportation, unavoidable casualties, or by any cause which the Procurement Officer determines may justify any delay, then the contract time shall be extended for such time as the Procurement Officer may authorize.

D. It is expressly understood and agreed by and between Contractor and the University that the time for the completion of the work is a reasonable time, taking into consideration average climatic range and usual business conditions prevailing in the locality of the project.

7.04 PUBLIC CONVENIENCE AND SAFETY

Contractor at all times shall conduct the work in such a manner as to create the least practicable obstruction to all forms of traffic. The convenience of the general public, tenants, and of the residents along and/or adjacent to the improvement shall be respected. Material stored upon the project shall be placed so as to cause a minimum of obstruction to the public. Contractor shall, unless otherwise specified, provide and maintain in passable condition such temporary access roads and bridges as may be necessary to accommodate traffic diverted from the project under construction, or using the project under construction, and shall provide and maintain in a safe condition temporary approaches to, and crossings of, the project. Existing facilities scheduled to be removed, but which might be of service to the public during construction, will not be disturbed until other and adequate provisions are made. Fire hydrants on or adjacent to the project shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within 15 feet of any such hydrant. Work closed down for the winter or at any other times shall be left entirely accessible at all
points to fire apparatus. All footways, gutters, sewer inlets, and portions of the project the work under construction shall not be obstructed more than is absolutely necessary.

7.05 BARRICADES AND WARNING SIGNS

A. Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs, and other control devices, and shall take all necessary precautions for the protection of the work and safety of the public. All highways and other facilities closed to traffic shall be protected by effective barricades, and obstructions shall be illuminated during hours of darkness with electric lights.

B. Contractor shall erect warning signs in advance of any place on the project where its operations may interfere with vehicular or pedestrian traffic, and at all other points where the new work crosses or coincides with an existing roadway or traffic lane(s). Such warning signs shall be constructed and erected in accordance with the FHWA Manual on Uniform Traffic Control Devices, or as directed.

7.06 PRESERVATION PROTECTION AND RESTORATION OF PROPERTY

A. Contractor shall continuously maintain adequate protection of its work from damage, and shall protect University property from injury or loss arising in connection with the Contract. Contractor shall repair, and shall indemnify the University against any such damage, injury, or loss, except such as may be directly due to errors in the Contract Documents, or caused by agents or employees of the University. Contractor shall adequately protect adjacent property as provided by law, and by the Contract Documents.

B. Contractor shall box all trees that are liable to injury by the moving, storing, and working up of materials. He shall use no tree for any attachment or anchorage.

C. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for the protection of workmen and the public, and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hod hoists, well holes, elevator hatchways, scaffolding, window openings, stairways, and falling materials.

D. In any emergency affecting the safety of life or of the Work or of the adjoining property, Contractor, without special instruction or authorization, is permitted to act, at his discretion, to prevent such threatened loss or injury. If specifically instructed by the University to do work in an emergency, Contractor shall do the work and be compensated as outlined in Section 3.06.

7.07 PROGRESS SCHEDULE AND TIME

Preparation of Work Schedule. Contractor shall prepare a schedule setting forth dates for completing various portions of the work. Included among the tasks set forth on the schedule shall be the dates for submittals, and dates for the return of the approved submittals. The schedule shall be reviewed for approval of the time within which the University must evaluate Contractor submittals. Approval of Contractor's schedule does not constitute approval of the entire schedule, but merely an approval of that portion of the schedule that relates to the
review of submittals. If Contractor fails to prepare and submit to the University a schedule 
before the occurrence of a delay, then no claim for extra costs due to delay in the work shall 
be recognized or asserted.

7.08 PROGRESS PHOTOGRAPHS

Contractor shall submit to the University photographs, taken on or about the first of each 
month, showing the status of the Work. Contractor shall photograph all disputed items of 
work.

7.09 SUSPENSION OF THE WORK [Intentionally omitted; see Exhibit A-2, Section 63]

7.10 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the Work should be stopped under an order of any court, or other public authority, for a 
period of three (3) months, through no act or fault of the contractor, or of anyone employed 
by him, then Contractor may, upon seven (7) days’ written notice to the Procurement Officer, 
stop work or terminate this contract.

7.11 UNIVERSITY'S RIGHT TO TERMINATE FOR ITS CONVENIENCE [Intentionally omitted; 
see Exhibit A-2, Section 66]

7.12 TERMINATION FOR DEFAULT--DAMAGES FOR DELAY--TIME EXTENSIONS 
[Intentionally omitted; see Exhibit A-2, Sections 25 and 65]

7.13 PARTIAL ACCEPTANCE

A. If during the construction of work the University desires to occupy any portion of the 
project, the University shall have the right to occupy and use those portions of the 
project which, in the opinion of the Procurement Officer, can be used for their 
tended purpose; provided that the conditions of occupancy and use are 
established and the responsibilities of Contractor and the University for maintenance, 
heat, light, utilities, and insurance are mutually agreed.

B. Partial occupancy shall in no way relieve Contractor of its responsibilities under the 
contract.

7.14 FAILURE TO COMPLETE ON TIME/LIQUIDATED DAMAGES

A. Time is an essential element of the Contract and the work shall be vigorously 
prosecuted until completion.

B. For each day that any work shall remain uncompleted beyond the time(s) specified 
elsewhere in the Contract, Contractor may be liable for liquidated damages in the 
amount(s) provided for in the solicitation, provided, however, that due account shall 
be taken of any adjustment of specified completion time(s) for completion of work as 
granted by approved change orders.
7.15 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

A. When the work is substantially completed, the contractor shall notify the Procurement Officer that the work will be ready for final inspection and test on a definite date. Sufficient notice shall be given to permit the Procurement Officer to schedule the final inspection.

B. On the basis of the inspection, if the Procurement Officer determines that the work is substantially complete and the project can be occupied or used for its intended purpose, the Procurement Officer shall establish the date of substantial completion and shall state the responsibilities of the University and the contractor for maintenance, heat, utilities, and insurance, and shall fix the time for which the guarantee will begin.

7.16 CLEANING UP

Contractor shall at all times keep the construction area, including storage areas, free from accumulations of waste materials or rubbish and, prior to completion of the work, remove all rubbish from the premises and all tools, scaffolding, equipment, and materials not the property of the University. Contractor shall give special attention to any materials used on rooftops or exposed areas that may become windborne and be hazards, public nuisances, or litter on nearby grounds. Upon completion, Contractor shall leave the work and premises in a clean, neat, and workmanlike condition satisfactory to the Procurement Officer.

7.17 GUARANTEES

The contractor guarantees for a two (2) year period (unless another period is specified), commencing on the date fixed by the parties:

A. That the work contains no faulty or imperfect material or equipment or any imperfect, careless, or unskilled workmanship.

B. 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.

C. That he will re-execute, correct, repair, or remove and replace with proper work, without cost to the University, any work found not be as guaranteed by this Section. The contractor shall also make good all damages caused to other work or materials in the process of complying with this Section.

D. That the entire work shall be water-tight and leak-proof in every particular.

7.18 NOTICE TO UNIVERSITY OF LABOR DISPUTES

A. Whenever the contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Procurement Officer.

B. The contractor agrees to insert the substance of this clause, including this Paragraph B., in any subcontract hereunder as to which a labor dispute may delay the timely
performance of this contract; except that each such subcontract shall provide that in
the event its timely performance is delayed or threatened by delay by any actual or
potential labor dispute, the subcontractor shall immediately notify his next higher tier
subcontractor, or the prime contractor, as the case may be, of all relevant
information with respect to such dispute.

SECTION 8 - PAYMENTS

8.01 CORRECTION OF WORK BEFORE COMPLETION

A. Contractor shall promptly remove from the premises all materials condemned as
falling to conform to the contract, whether incorporated in the work or not. Contractor
shall promptly replace and re-execute its own work in accordance with the contract
and without expense to the University, and shall bear the expense of making good all
work of other contractors destroyed or damaged by such removal or replacement.

B. If Contractor does not remove such condemned work and materials within a
reasonable time, fixed by written notice, the University may remove and store the
materials at Contractor expense. If Contractor does not pay the expense of such
removal within ten (10) days thereafter, the University may, upon ten (10) days
notice, sell such materials and shall account for the net proceeds thereof, after
deducting all the costs and expenses that should have been borne by Contractor.

8.02 PAYMENT OF INTEREST [Intentionally omitted; see Exhibit A-2, Section 50]

8.03 AUDITS BY THE STATE

A. Contractor agrees that the State or any of its duly authorized representatives shall,
until the expiration of three years after final payment under this contract have access
to and the right to examine any directly pertinent books, documents, papers, and
records of the contractor involving transactions related to this contract.

B. Contractor further agrees to include in all subcontracts hereunder a provision to the
effect that the subcontractor agrees that the University or any of its duly authorized
representatives shall, until the expiration of three years after final payment under the
subcontract, have access to and the right to examine any directly pertinent books,
documents, papers, and records of such subcontractor, involving transactions
related to the subcontract.

SECTION 9 - EMPLOYEES, SUBCONTRACTORS A WORK CONDITIONS

9.01 EMPLOYEES AND WORKMANSHIP

A. Qualification of Employees. Contractor shall employ only personnel thoroughly
trained and skilled in the tasks assigned on any portion of the work. Any employee
found to be unskilled or untrained shall be removed from the work.
B. **Licensed Employees.** When municipal, county, state, or federal laws require that certain personal (electricians, plumbers, etc.) be licensed, all such personal employed on the work shall be so licensed.

C. **Quantity of Labor.** Contractor shall employ on the work, at all times, sufficient personnel to complete the work within the time stated in the contract.

D. **Work Areas.** Contractor shall confine the operations of his employees to the limits as provided by law, ordinance, permits, or directions of the University. Generally, the work area will be the same as the "Limit of Contract" line indicated in the construction documents.

E. **Methods and Quality**

   1. All workmanship shall be of good quality. Where the method of work or manner of procedure is not specifically stated in the contract documents, it is intended that the best standard practice shall be followed. Recommendations of the manufacturers of approved materials shall be considered part of these specifications and all materials shall be applied, installed, connected, erected, used, cleaned, and conditioned as so called for thereby.

   2. All materials shall be accurately, assembled, set, etc., and when so required in good construction, shall be true to line, even, square, plumb, level, and regularly spaced, coursed, etc. Under no circumstances, either in new or old work, shall any material be applied over another which has not been thoroughly cleaned, sanded, or otherwise treated so as not to impair the finish, adhesion, or efficiency of the next applied item.

F. **Scheduling**

   1. Contractor shall so schedule the Work as to ensure efficient and uninterrupted progress, and to minimize cutting and patching of new Work. All cutting, patching, and digging necessary to the execution of the Work is included.

   2. Contractor shall so schedule the construction performed by each group or trade that each installation or portion of the construction shall member with and join with every other new or old Work as required for a complete installation, all according to accepted good construction practice.

G. **Superintendent.** Contractor shall keep on the Work, at all times during its progress, a competent English-speaking superintendent and any necessary assistants, all approved by the University prior to commencement of the Work. Contractor shall submit in writing to the University the name of the person it intends to employ as superintendent for the execution of this contract, with a statement of the proposed superintendent's qualifications, to be reviewed by the University and approved or rejected in writing. Persons who have previously proved unsatisfactory on work executed for the University or the State of Maryland, or who lack sufficient qualifications, will not be approved, and this procedure will be repeated. A single Contractor Superintendent may superintend two or more jobs located at the same
institution or nearby only when approved by the University in writing. The Superintendent shall represent the contractor, and all directions given to the Superintendent shall be as binding as if given directly to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed upon written request. A Superintendent who proves unsatisfactory to the University shall be removed from the work, and Contractor shall submit a new Superintendent for approval as described above.

H. Discipline. Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ or permit to remain on the work any unfit person. He shall enforce all instructions relative to use of water, heat, power, no smoking, and control and use of fires as required by law, and the University. Employees must not be allowed to loiter on the premises before or after working hours.

9.02 NON-DISCRIMINATION EMPLOYMENT POLICIES [Intentionally omitted; see Exhibit A-2, Section 44]

9.03 SUBCONTRACTS

A. Contractor shall, as soon as practicable and before execution of the contract, notify the University, in writing, of the names of subcontractors proposed for the principal parts of the work, and shall not employ any to which the University may object as incompetent or unfit.

B. Contractor shall be as fully responsible to the University for the acts and omissions of subcontractors, and of persons either directly employed by them, as for the acts and omissions of persons directly employed by Contractor.

C. Nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the University and nothing in the contract documents is intended to make the subcontractor a beneficiary of the contract between the University and the contractor.

9.04 RELATION OF CONTRACTOR AND SUBCONTRACTOR

A. Contractor agrees to bind every subcontractor, and will see that every subcontractor agrees to be bound by the terms of the Agreement, the General Conditions, the Drawings, and Specifications as far as applicable to its work, unless specifically noted to the contrary in a subcontract approved in writing by the University.

B. Contractor agrees to include the following provision in all subcontracts and supply contracts applicable to the work:

1. Subcontractor agrees to be bound to Contractor by the terms of the Agreement, General Conditions, Drawings, and Specifications, and to assume toward him all obligations and responsibilities that Contractor, by those documents, assumes toward the University.

2. Subcontractor agrees, upon completion of its work, to promptly pay all labor, material suppliers, vendors, subcontractors, and others, to permit simultaneous final payment by Contractor.
C. Contractor agrees to be bound to subcontractor by all the obligations that the University assumes to the Contractor under the Agreement, General Conditions, Drawings, and Specifications, and by all the provisions thereof affording remedies and redress to the Contractor from the University.

1. To pay the subcontractor to such extent as may be provided by the contract documents or the subcontract;

2. To pay the subcontractor on demand for his work or materials as far as executed and fixed in place, less the retained percentage;

3. To pay the subcontractor a just share of any fire insurance money received by Contractor; and

4. To give the subcontractor an opportunity to be present and to submit evidence in any matter involving his rights.

D. Prompt Payment of Subcontractors: This contract is subject to the provisions of COMAR 21.10.08. Contractor shall promptly pay subcontractor any undisputed amount to which the subcontractor is entitled. In the event Contractor fails to pay promptly, subcontractors may request remedy in accordance with COMAR 21.10.08. Contractor shall include in each subcontract a clause that contains substantially the same provisions as this clause.

E. Contractor and subcontractor agree that nothing in this section shall create any obligation on the part of the University to pay to or to see to the payment of any sums to any subcontractor.

9.05 PREVAILING WAGE RATES

Please be advised that Prevailing Wage Rates prescribed by the Maryland Department of Labor, Licensing and Regulation (DLLR) will apply to this project. The project specific wage rate instructions are incorporated into these General Conditions for Construction/Maintenance Contracts as Attachment A – Prevailing Wage Rate Instructions.

9.06 CONSTRUCTION SAFETY AND HEALTH STANDARDS

It is a condition of the Contract and shall be made a condition of each subcontract that neither Contractor nor any subcontractor shall require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to health or safety, as determined under construction safety and health standards, laws and regulations of the locality in which the work is done, the state, and the federal government.

SECTION 10 [Intentionally omitted]
SECTION 11 - ENVIRONMENTAL HEALTH AND SAFETY

11.01 STORM WATER POLLUTION PREVENTION/PROHIBITION OF ILLICIT DISCHARGES

No person shall cause or contribute discharge directly or indirectly into the Towson University municipal storm drain system or waterways any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.

Refer to 06-20.00 – University Policy on Storm Water Illicit Discharge Detection and Elimination for additional information.

No person may improperly store, handle, use or apply any pollutant in a manner that will cause its exposure to rainfall, runoff and discharge into the Towson University municipal storm water drain system or campus waterways.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described:

A. The following discharges are exempt from discharge prohibitions:
   - water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire-fighting activities, and any other water source not containing pollutants.

B. Any discharges specified in writing by Towson University Environmental Health & Safety as being necessary to protect public health and safety.

C. Dye testing only with required verbal notification to Towson University Environmental Health & Safety [(410) 704-2949 or safety@towson.edu] prior to the time of the test.

D. The following discharges are exempt from discharge prohibitions: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire-fighting activities, and any other water source not containing pollutants.
11.02 PROHIBITION OF ILLICIT CONNECTIONS

The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited. This prohibition expressly includes, without limitation, any illicit connections made in the past. This is regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. A person is considered to be in violation if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

11.03 NOTIFICATION OF SPILLS OR ILLICIT DISCHARGES

Notwithstanding other requirements by law, as soon as any contractor has information regarding any known or suspected release of materials that result or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, campus waterways said person shall take all necessary steps to ensure the discovery, immediate containment, and cleanup of such release. In the event of a release of hazardous materials or upon observing an illicit environmental discharge immediately contact the Towson University Police Department (TUPD) at (410) 704-4444. In the event of a release of non-hazardous materials, notify Towson University Environmental Health & Safety in person or by phone [(410) 704-2949] or e-mail [safety@towson.edu] no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to Environmental Health & Safety, Towson University, 8000 York Road, Towson, MD 21252 within three business days of the phone notice.

11.04 ENFORCEMENT

A. Enforcement for student violators will follow the TU Office of Student Conduct and Civility Educations Code of Student Conduct.

B. Enforcement for University employees (Faculty and Staff) shall follow the Towson University Policy for discipline or termination Policy No. 07.05.25 – Disciplinary Action for Employees.

C. Enforcement for Visitors (Non-TU Faculty, Staff, Students or Contractors)

D. Individuals or Contractors, depending on the nature and severity of the violation, may be referred to MDE for prosecution for violation of federal and state laws and regulations.

E. Any fines, penalties, environmental monitoring or remediation expenses, etc., resulting from the illicit discharge, will be violator’s responsibility.

F. During normal University business hours (Monday-Friday, 8am-4pm), contact EHS at (410) 704-2949 to report violations.

G. If the violator is still on the scene, they should also immediately contact TUPD at (410) 704-4444.

H. After normal duty hours, weekends and holidays, contact TUPD at (410) 704-4444 to report violations.
SECTION 12: OFM SUPPLEMENTAL CONDITIONS

12.01 STORAGE OF MATERIALS

The University has very limited storage space for any materials or equipment and may not be able to meet Contractor’s requests for such depending on the site location, time of year, and amount of equipment/materials.

12.02 PARKING

Parking must be coordinated prior to commencement of work. Designated parking areas will be provided for limited construction-related vehicles close to the work site; these may also require a fee-based permit. Contractor employees may need to use remote off-campus parking and carpool to the construction site. Contractor shall be responsible for securing any necessary permits for designated areas, for the duration of the project. Vehicles other than construction-related vehicles are not permitted on campus; boats, trailers, campers, etc. will be towed immediately, at vehicle owner’s expense.

12.03 INSPECTIONS

Inspections will be performed by the appropriate agencies as specified in the Contract documents. Towson University and independent inspection agencies, as required, will perform most required inspections. Other agencies that may be required for inspection are:

- Maryland Department of the Environment (MDE)
- State Fire Marshall

12.05 AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE

All work performed shall be in compliance with current ADA regulations. Contractor shall notify the Owner of any deficiencies in design bearing on ADA compliance, prior to commencement of work.

12.06 VEHICULAR ACCESS

Contractors will use only the vehicle access routes approved by OFM prior to commencement of the project. Under no circumstances shall Contractor park or drive motor vehicles on grass or landscaped areas. Contractor shall bear all costs of repair or replacement of areas damaged by its vehicles.

12.07 CONTRACTOR MOTOR VEHICLES

Under no circumstances shall a contractor vehicle exceed 15 mph while on university property. Pedestrians have right of way at all times, with no exceptions. Any Contractor vehicle over 1 ton shall have operational back-up signals. Flat beds, box trailers and all 18-wheel vehicles shall be accompanied by an assistant during the back-up process to ensure the safety of pedestrians and property in the path of the vehicle.
12.08 CONTRACTOR’S EMPLOYEE BEHAVIOR

Contractor is responsible for its employees' behavior at all times. Unprofessional behavior will not be tolerated and will be cause for immediate removal of the employee(s) from campus property. Contractor employees should refrain from unsolicited conversation with the general campus public.

12.09 NOISE RESTRICTIONS

Due to the close proximity of residential communities and hospitals to University property, noise limitations are imposed during certain hours. Normal work hours (7:00am - 5:00pm) are not limited except as may be specified in regard to the adjacent classroom building schedules. When Contractor anticipates work before or after normal hours, it shall confirm with the University’s Project Manager that the work to be accomplished is within acceptable noise limits.

12.10 ELECTRICAL/MECHANICAL TIE-IN

Contractor shall coordinate all electrical and mechanical tie-ins through the University Project Manager at least 72 hours in advance. Contractor shall not enter any electrical panel for inspection, installation, or otherwise without the consent of the Project Manager. Where Contractor anticipates mechanical tie-in, he shall verify with the University Project Manager that existing valves and other control systems are functional. The University plumbing shop shall drain down all mechanical equipment.

12.11 WORK HOURS. Normal work hours shall be as follows:

- Weekdays: 7:00am - 4:00pm
- Weekends: 7:00am - 4:00pm, with written authorization
- Holidays: Only with advanced authorization

Deviations from normal work hours must be requested from the University's Project Manager not less than 72 hours prior to the start of anticipated work.

12.12 RADIOS

Playing of radios, CD players, etc. is not permitted on any construction site.

12.13 MAINTENANCE OF PROPERTY

Contractor is solely responsible for maintaining, at its expense, all property within the Limit of Disturbance (L.O.D.) or the established construction fence, which ever has the greater perimeter, including:

A. Cutting grass to a maximum 4” height and, where a construction or safety fence exists; trimming both sides.

B. Establishing and maintaining safety fence at the drip line of all trees and shrubs marked to remain.
C. Maintaining clean walkways and entrances to trailers used as site offices.

12.14 CONTRACT AND ADMINISTRATIVE PROTOCOL

Contractor and all contractor representatives shall clearly understand and strictly adhere to the following University protocols prior to work commencement:

A. All coordination between Contractor and Owner shall be through the University’s designated Project Manager. At no time shall Contractor request or demand support or assistance from the University’s maintenance department, trades shops, or grounds department. Failure to observe this protocol shall result in dismissal of Contractor’s superintendent from the site.

B. Coordination for submission of administrative and contractual documents shall be as outlined in pre-construction or work initiation meeting.
REQUEST FOR ADVERTISEMENT AND NOTICE TO PROCEED

Michelle Compton - Procurement Officer
Towson University
8000 York Road
Towson, MD 21252

Re: Prettyman & Scarborough Air Conditioning & Electrical Upgrades
Project No: TU-1940-SBR

Enclosed please find the Prevailing Wage Determination and Instructions for Contractors for the project referenced above.

Upon advertisement for bid or proposal of this project, you are requested to submit to this office the date and name of publication in which such advertisement appeared.

Once awarded, you are further directed to submit to this office, the NOTICE TO PROCEED for the project, complete with the date of notice, the name of the general contractor, and the dollar amount of the project. In addition, we ask that a representative of the prevailing wage Unit be invited to attend the Pre-Construction Conference.

Any questions concerning this matter may be referred to PrevailingWage@dllr.state.md.us

Sincerely,

Michelle Compton
Procurement Officer
Towson University
8000 York Road
Towson, MD 21252

Enclosures
Wage Determination
Instruction for the Contractor
Prevailing Wage Unit
The contractor shall electronically submit completed copies of certified payroll records to the Commissioner of Labor & Industry, Prevailing Wage Unit by going on-line to https://www.dllr.state.md.us/prevwage and following the instructions for submitting payroll information (NOTE: A contractor must register prior to submitting on-line certified payroll information).

If you have technical questions regarding electronic submittal, contact the Department at dlliprevailingwage-dllr@maryland.gov.

All certified payroll records shall have an accurate week beginning and ending date. The contractor shall be responsible for certifying and submitting to the Commissioner of Labor and Industry, Prevailing Wage Unit all of their subcontractors' payroll records covering work performed directly at the work site. By certifying the payroll records, the contractor is attesting to the fact that the wage rates contained in the payroll records are not less than those established by the Commissioner as set forth in the contract, the classification set forth for each worker or apprentice conforms with the work performed, and the contractor or subcontractor has complied with the provisions of the law.

A contractor or subcontractor may make deductions that are (1) required by law; (2) required by a collective bargaining agreement between a bona fide labor organization and the contractor or subcontractor; or (3) contained in a written agreement between an employee and an employer undertaken at the beginning of employment, if the agreement is submitted by the employer to the public body awarding the public work and is approved by the public body as fair and reasonable.

A contractor or subcontractor is required to submit information on-line on their fringe benefit packages including a list of fringe benefits for each craft employed by the contractor or subcontractor, by benefit and hourly amount. Where fringe benefits are paid in cash to the employee or to an approved plan, fund, or program, the contribution is required to be indicated.

Payroll records must be electronically submitted and received within 14 calendar days after the end of each payroll period. If the contractor is delinquent in submitting payroll records, processing of partial payment estimates may be held in abeyance pending receipt of the records. In addition, if the contractor is delinquent in submitting the payroll records, the contractor shall be liable to the contracting public body for liquidated damages. The liquidated damages are $10.00 for each calendar day the records are late.

Only apprentices registered with the Maryland Apprenticeship and Training Council shall be employed on prevailing wage projects. Apprentices shall be paid a percentage of the determined journey person's wage for the specific craft.

Overtime rates shall be paid by the contractor and any subcontractors under its contracts and agreements with their employees which in no event shall be less than time and one-half the prevailing hourly rate of wages for all hours worked in excess of ten (10) hours in any one calendar day; in excess of forty (40) hours per workweek; and work performed on Sundays and legal holidays.

Contractors and subcontractors employing a classification of worker for which a wage rate was not issued SHALL notify the Commissioner of Labor & Industry, Prevailing Wage Unit, for the purpose of obtaining the wage rate for said classification PRIOR TO BEING EMPLOYED on the project. To obtain a prevailing wage rate which was NOT listed on the Wage Determination, a contractor or subcontractor can look on the DLLR webpage under prevailing wage.

Contractors and subcontractors shall maintain a valid copy of proper State and county licenses that permit the contractor and a subcontractor to perform construction work in the State of Maryland. These licenses must be retained at the worksite and available for review upon request by the Commissioner of Labor and Industry’s designee.

**Each contractor under a public work contract subject to Section 17-219 shall:**

1. Post a clearly legible statement of each prevailing wage rate to be paid under the public work contract; and
2. Keep the statement posted during the full time that any employee is employed on the public work contract.
3. The statement of prevailing wage rates shall be posted in a prominent and easily accessible place at the site of the public work.
**Penalty - Subject to Section 10-1001 of the State Goverment Article, the Commissioner may impose on a person that violates this section a civil penalty of up to $50.00 per violation.**

Under the Maryland Apprenticeship and Training Council requirements, consistent with proper supervision, training and continuity of employment and applicable provisions in collective bargaining agreements, a ratio of one journey person regularly employed to one apprentice shall be allowed. No deviation from this ratio shall be permitted without prior written approval from the Maryland Apprenticeship and Training Council.

Laborers may NOT assist mechanics in the performance of the mechanic's work, NOR USE TOOLS peculiar to established trades.

ALL contractors and subcontractors shall employ only competent workers and apprentices and may NOT employ any individual classified as a HELPER or TRAINEE on a prevailing wage project.

The State Apprenticeship and Training Fund (Fund) law provides that contractors and certain subcontractors performing work on certain public work contracts are required to make contributions toward apprenticeship. See §17-601 through 17-606, State Finance and Procurement, Annotated Code of Maryland. Contractors and subcontractors have three options where they can choose to make their contributions: (1) participate in a registered apprenticeship training program; (2) contribute to an organization that has a registered apprenticeship training program; or (3) contribute to the State Apprenticeship and Training Fund.

The Department of Labor, Licensing and Regulation (DLLR) is moving forward with final adoption of regulations. The regulations were published in the December 14, 2012 edition of the Maryland Register.

**IMPORTANT:** Please note that the obligations under this law will become effective on JULY 1, 2013. This law will require that contractors and certain subcontractors make contributions toward apprenticeship and report those contributions on their certified payroll records that they submit pursuant to the prevailing wage law.

The Department is offering outreach seminars to any interested parties including contractors, trade associations, and any other stakeholders. Please contact the Department atdlliprevailingwagedllr@maryland.gov or (410) 767-2968 for seminar times and locations. In addition, information regarding this law will be provided at pre-construction meetings for projects covered by the Prevailing Wage law.

For additional information, contact:
Division of Labor and Industry
Maryland Apprenticeship and Training
1100 North Eutaw Street, Room 606
Baltimore, Maryland 21201
(410) 767-2246
E-Mail Address: matp@dllr.state.md.us.
The wage rates to be paid laborers and mechanics for the locality described below is announced by order of Commissioner of Labor and Industry.

It is mandatory upon the successful bidder and any subcontractor under him, to pay not less than the specific rates to all workers employed by them in executing contracts in this locality. Reference: Annotated Code of Maryland State Finance and Procurement, Section 17-201 thru 17-226.

These wage rates were taken from the locality survey of 2018 for Baltimore County, issued pursuant to the Commissioner's authority under State Finance and Procurement Article Section 17-209, Annotated Code of Maryland or subsequent modification.

**Note: If additional Prevailing Wage Rates are needed for this project beyond those listed below, contact the Prevailing Wage Unit. Phone: (410) 767-2342, email: prevailingwage@dllr.state.md.us.

Name and Title of Requesting Officer: Michelle Compton - Procurement Officer
Department, Agency or Bureau: Towson University
Location and Description of work: Baltimore County: This solicitation is seeking qualified Contractors to provide air condition system installation and associated electrical upgrades in the Prettyman and Scarborough residence halls.

<table>
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<tr>
<th>BUILDING CONSTRUCTION</th>
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<tr>
<td><strong>CLASSIFICATION</strong></td>
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<td>BALANCING TECHNICIAN</td>
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<td>BOILERMAKER</td>
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<td>BRICKLAYER</td>
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<td>BRICKLAYER/SAWMAN</td>
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<td>CARPENTER</td>
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<td>CARPENTER - SHORING SCAFFOLD BUILDER</td>
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<td>CARPET LAYER</td>
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<td>CEMENT MASON</td>
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<td>COMMUNICATION INSTALLER TECHNICIAN</td>
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<tr>
<td>DRYWALL - SPACKLING, TAPING, &amp; FINISHING</td>
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<td>ELECTRICIAN</td>
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<td>Occupation</td>
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<tr>
<td>ELEVATOR MECHANIC</td>
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<td>FIRESTOPPER</td>
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<td>GLAZIER</td>
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<td>INSULATION WORKER</td>
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<td>IRONWORKER - FENCE ERECTOR</td>
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<td>IRONWORKER - ORNAMENTAL</td>
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<td>IRONWORKER - REINFORCING</td>
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<td>PLASTERER - MIXER</td>
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<td>PLUMBER</td>
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<td>POWER EQUIPMENT OPERATOR - BACKHOE</td>
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<td>POWER EQUIPMENT OPERATOR - BROOM / SWEEPER</td>
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<td>POWER EQUIPMENT OPERATOR - BULLDOZER</td>
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<td>POWER EQUIPMENT OPERATOR - CONCRETE CURB AND GUTTER PAN</td>
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<td>POWER EQUIPMENT OPERATOR - CONCRETE CEMENT PUMP</td>
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<td>POWER EQUIPMENT OPERATOR - SHOULDER MACHINE</td>
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<td>POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)</td>
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<td>POWER EQUIPMENT OPERATOR - SKIDDER</td>
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<td>POWER EQUIPMENT OPERATOR - SPREADER</td>
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<td>POWER EQUIPMENT OPERATOR - TRENCHER</td>
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<td>POWER EQUIPMENT OPERATOR - VACUUM TRUCK</td>
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<td>RESILIENT FLOOR</td>
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<td>ROOFER/WATERPROOFER</td>
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<td>SHEETMETAL WORKER</td>
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<td>SPRINKLERFITTER</td>
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FRINGE REFERENCES AS NOTED:


b. PAID VACATIONS: Employees with 1 year service - 1 week paid vacation; 2 years service - 2 weeks paid vacation; 10 years service - 3 weeks paid vacation.

Incidental Craft Data: Caulker, Man Lift Operator, Rigger, Scaffold Builder, and Welder receive the wage and fringe rates prescribed for the craft performing the operation to which welding, scaffold building, rigging, operating a Man Lift, or caulking is incidental.
These **Informational Prevailing Wage Rates** may not be substituted for the requirements of pre-advertisement or onsite job posting for a public work contract that exceeds $500,000 in value and either of the following criteria are met: (1) the contracting body is a unit of State government or an instrumentality of the State and there is any State funding for the project; or (2) the contracting body is a political subdivision, agency, person or entity (such as a county) and the State funds 50% or more of the project.

Modification Codes:

(AD) 17-209 Annual Determination from Survey Wage Data Received
(CH) 17-211 Commissioners' Hearing
(CR) 17-208 Commissioners' Review
(SR) 17-208 Survey Review by Staff

Each "Borrowed From" county is identified with the FIPS 3-digit county code unique for the specific jurisdiction in Maryland.

For additional information on the FIPS (Federal Information Processing Standard) code, see [http://www.census.gov/datamap/fipslist/AllSt.txt](http://www.census.gov/datamap/fipslist/AllSt.txt)

The Prevailing Wage rates appearing on this form were originally derived from Maryland’s annual Wage Survey. The Commissioner of Labor & Industry encourages all contractors and interested groups to participate in the voluntary Wage Survey, detailing wage rates paid to workers on various types of construction throughout Maryland.

A mail list of both street and email addresses is maintained by the Prevailing Wage Unit to enable up-to-date prevailing wage information, including Wage Survey notices to be sent to contractors and other interested parties. If you would like to be included in the mailing list, please forward (1) your Name, (2) the name of your company (if applicable), (3) your complete postal mailing address, (4) your email address and (5) your telephone number to PWMAILINGLIST@dllr.state.md.us. Requests for inclusion can also be mailed to: Prevailing Wage, 1100 N. Eutaw Street - Room 607, Baltimore MD 21201-2201.