

**BERKS CAREER & TECHNOLOGY CENTER
BERKS COUNTY, PENNSYLVANIA**



**SPECIFICATIONS
FOR
HEALTH OCCUPATIONS CLASSROOM
WELDING BUILDING CHANGING RM RENOVATIONS
WEST CAMPUS**

**CONTRACT A – GENERAL
CONTRACT B – ELECTRICAL**

MARCH 2026

Prepared by:
 **SYSTEMS DESIGN**
ENGINEERING, INC
1032 James Drive • Leesport, PA • 19533
Tel (610) 916-8500 • Fax (610) 916-8501 • sde@sdei.net

25-0485-0039 and 25-0485-0040

**BERKS CAREER & TECHNOLOGY CENTER
BERKS COUNTY, PENNSYLVANIA**

**HEALTH OCCUPATIONS CLASSROOM
WELDING BUILDING CHANGING RM RENOVATIONS
WEST CAMPUS**

INDEX

<u>SECTION DESCRIPTION</u>	<u>PAGES</u>
• INDEX.....	1 thru 3
• ADVERTISEMENT.....	1
• INSTRUCTIONS TO BIDDERS (EJCDC C-200).....	1 thru 14
• BID FORM- (EJCDC C-410)	1 thru 15
• QUALIFICATIONS OF BIDDER QUESTIONNAIRE	1 thru 6
• BID BOND - (EJCDC C-430)	1 and 2
• NOTICE OF INTENT TO AWARD	1 and 2
• PUBLIC WORKS EMPLOYMENT VERIFICATION FORM	1
• CONTRACTOR'S STATEMENT OF COMPLIANCE WITH CDL TESTING PROGRAM REQUIREMENTS	1
• PERFORMANCE BOND (EJCDC C-610).....	1 thru 3
• PAYMENT BOND (EJCDC C-615).....	1 thru 3
• AFFIDAVIT RE ACCEPTING PROVISIONS OF THE WORKERS COMPENSATION ACT	1
• AGREEMENT (EJCDC C-520)	1 thru 7
• NOTICE OF AWARD (EJCDC C-510)	1
• NOTICE TO PROCEED (EJCDC C-550).....	1
• GENERAL CONDITIONS (EJCDC C-700).....	1 thru 73
• SUPPLEMENTARY CONDITIONS (EJCDC C-800)	1 thru 22
• WORK CHANGE DIRECTIVE (EJCDC C-940)	1
• CHANGE ORDER (EJCDC C-941)	1
• FIELD ORDER (EJCDC C-942).....	1
• APPLICATION FOR PAYMENT	1 and 2
• CERTIFICATE OF SUBSTANTIAL COMPLETION (EJCDC C-625)	1 and 2
• ADDENDA	

**BERKS CAREER & TECHNOLOGY CENTER
BERKS COUNTY, PENNSYLVANIA**

**HEALTH OCCUPATIONS CLASSROOM
WELDING BUILDING CHANGING RM RENOVATIONS
WEST CAMPUS**

INDEX

SECTION DESCRIPTION (Cont'd.)

• **TECHNICAL SPECIFICATIONS**

DIVISION 1 – GENERAL REQUIREMENTS

01010	Summary of Work
01011	General Technical Specifications
01045	Cutting and Patching
01300	Submittals
01310	Construction Schedules
01370	Schedule of Values and Applications for Payment
01400	Quality Control
01500	Construction Facilities and Temporary Controls
01505	Mobilization and Demobilization
01600	Material and Equipment
01650	Starting of Systems
01700	Contract Closeout
01710	Cleaning and Adjusting
01720	Project Record Documents
01740	Warranties and Bonds

DIVISION 2 – EXISTING CONDITIONS

024119	Selective Structure Demolition

DIVISION 3 - CONCRETE

033000	Cast-In-Place Concrete
033050	Bollards

DIVISION 4 - MASONRY

042200	Concrete Unit Masonry

**BERKS CAREER & TECHNOLOGY CENTER
BERKS COUNTY, PENNSYLVANIA**

**HEALTH OCCUPATIONS CLASSROOM
WELDING BUILDING CHANGING RM RENOVATIONS
WEST CAMPUS**

INDEX

SECTION DESCRIPTION (Cont'd.)

- **TECHNICAL SPECIFICATIONS**

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

061000	Rough Carpentry
064116	Plastic-Laminate-Faced Architectural Cabinets

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

079200	Joint Sealants

DIVISION 9 - FINISHES

095113	Acoustical Panel Ceilings
096519	Resilient Flooring & Coatings
096723	Resinous Flooring & Coatings
096813	Carpet Tile
099113	Exterior Painting
099123	Interior Painting

DIVISION 10 - SPECIALTIES

102220	Changing Rooms
105113	Metal Lockers

DIVISION 12 - FURNISHINGS

123623.13	Plastic-Laminate-Clad Countertops

DIVISION 22 - PLUMBING

226313	Gas Piping for Welding Facilities

**BERKS CAREER & TECHNOLOGY CENTER
BERKS COUNTY, PENNSYLVANIA**

**HEALTH OCCUPATIONS CLASSROOM
WELDING BUILDING CHANGING RM RENOVATIONS
WEST CAMPUS**

INDEX

SECTION DESCRIPTION (Cont'd.)

- **TECHNICAL SPECIFICATIONS**

DIVISION 26 - ELECTRICAL

260519	Low-Voltage Electrical Power Conductors and Cables
260526	Grounding and Bonding for Electrical Systems
260529	Hangers and Supports for Electrical Systems
260533	Raceways and Boxes for Electrical Systems
260544	Sleeves and Sleeve Seals for Electrical Raceways and Cabling
260548	Vibration and Seismic Controls for Electrical Systems
260553	Identification for Electrical Systems
260923	Lighting Control Devices
262726	Wiring Devices
265119	LED Interior Lighting

DIVISION 31 - EARTHWORK

312141	Dewatering and Drainage of Excavation
312222	Excavation
312223	Backfilling

DIVISION 32 – EXTERIOR IMPROVEMENTS

323113	Vinyl Chain Link Fence

- **DRAWINGS (Attached Separately)**

- **APPENDICES**

APPENDIX “A”	Affidavit of Release of Liens and Final Waiver of Liens (Forms and Sample Forms)
APPENDIX “B”	Consent of Surety to Final Payment
APPENDIX “C”	Pennsylvania Wage Rated and Associated Notes and Definitions
APPENDIX “D”	Non-discrimination/Sexual Harassment Clause

ADVERTISEMENT FOR BIDS

**BERKS CAREER & TECHNOLOGY CENTER
BERKS COUNTY, PENNSYLVANIA**

**HEALTH OCCUPATIONS CLASSROOM
WELDING BUILDING CHANGING ROOM RENOVATION
WEST CAMPUS**

ADVERTISEMENT

Separate sealed bids will be received, in duplicate by Berks Career & Technology Center, Berks County, PA until 12:00 PM prevailing time, on April 16, 2026, for the Health Occupations Classroom and Welding Building Changing Room Renovations at the West Campus as follows:

CONTRACT A – GENERAL
CONTRACT B - ELECTRICAL

Bids should be mailed or hand delivered to the Administrative Office of Berks Career & Technology Center, 1057 County Welfare Road, Leesport, PA 19533. Bids will be opened immediately thereafter at the Administrative Offices. Bids will be presented and reviewed at the meeting of Berks Career & Technology Center Joint Operating Committee later in the month. It is expected that the Bids will be awarded to the lowest responsible Bidder(s) at that meeting.

All BIDDERS who will be submitting bids to the Berks Career & Technology Center must register to receive a complete set of the Bid Documents from Systems Design Engineering, Inc 1032 James Drive, Leesport, PA 19533. Bid Documents shall be obtained via a Dropbox link.

A pre-bid conference will be held on April 7, 2026, at 10:00 A.M. at the Berks Career & Technology Center – West Campus, 1057 County Welfare Road, Leesport, PA. Bidders are encouraged to attend.

Each Bid must be accompanied by a Certified Check or Surety Company's Bid Bond on the form provided in the Bid Documents, naming as payee or Obligee, Berks Career & Technology Center, Berks County in the amount of ten percent (10%) of the total bid submitted. The Surety Company must be acceptable to said Township.

Berks Career & Technology Center reserves the right to waive any informality in or to reject any or all Bids, and to delete any item or portion of an item without affecting the bids on the remaining items or portion of items.

Dr. Michael Stauffer
Executive Director
Berks Career & Technology Center

INSTRUCTIONS TO BIDDERS
(EJCDC C-200)

INSTRUCTIONS TO BIDDERS

TABLE OF CONTENTS

	<u>Page</u>
Article 1 – Defined Terms.....	1
Article 2 – Copies of Bidding Documents	1
Article 3 – Qualifications of Bidders.....	1
Article 4 – Site and Other Areas; Existing Site Conditions; Examination of Site; Owner’s Safety Program; Other Work at the Site	2
Article 5 – Bidder’s Representations.....	4
Article 6 – Pre-Bid Conference.....	5
Article 7 – Interpretations and Addenda	5
Article 8 – Bid Security	6
Article 9 – Contract Times.....	6
Article 10 – Liquidated Damages	6
Article 11 – Substitute and “Or-Equal” Items	6
Article 12 – Subcontractors, Suppliers, and Others	7
Article 13 – Preparation of Bid.....	7
Article 14 – Basis of Bid.....	8
Article 15 – Submittal of Bid	9
Article 16 – Modification and Withdrawal of Bid	9
Article 17 – Opening of Bids.....	9
Article 18 – Bids to Remain Subject to Acceptance	9
Article 19 – Evaluation of Bids and Award of Contract	10
Article 20 – Bonds and Insurance	11
Article 21 – Signing of Agreement	11
Article 22 – Sales and Use Taxes	11
Article 23 – Retainage	12
Article 24 – Performance Bond, Payment Bond, Agreement, Insurance, Schedule of Values	12
Article 25 – Pennsylvania Public Works Employment Verification Act	13
Article 26 – Availability of Appropriated Funds	13
Article 27 – Steel Products Procurement Act	13
Article 28 - CDL Program Contractor's Statement of Compliance	13

ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued. The issuing office for this project is Systems Design Engineering, Inc., 1032 James Drive, Leesport, PA 19533.
 - B. *Owner/Municipality* – Berks Career & Technology Center

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid. The purchase price is non-refundable.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder (for each Contract) shall submit with the Bid (a) the Qualifications of Bidder Questionnaire (included within the Bid Documents) establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:
- A. Evidence of Bidder's authority to do business in the Commonwealth of Pennsylvania.
 - B. Bidder's state or other contractor license number, if applicable.
 - C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."
 - D. Maintains a permanent place of business with at least five (5) years and preferably ten (10) years' experience with similar work;
 - E. Has adequate equipment to do the work properly and expeditiously.
 - F. Has successfully completed projects of similar character and magnitude of the Work (provide a list of projects completed within the past 5 years, including the Contract date and a description of the work items, quantities, county where project is located and the total bid price).
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

- 3.03 No requirement in this Article 3 to submit information shall prejudice the right of the Owner to seek additional pertinent information regarding Bidder's qualifications. **In particular, Bidders shall be prepared to submit a copy of their latest financial statement within 24 hours of bid opening if requested by the Owner/Engineer.**
- 3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
1. The Supplementary Conditions identify:
 - a. Those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
 - b. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
 2. Owner shall make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
 3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions shall apply.
- B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by Owners of such Underground Facilities, including Owner, or others.

- C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder may conduct any subsurface testing, or investigations of Site conditions as Bidder may find necessary to prepare their bid in addition to the information supplied by Owner.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner shall provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner shall not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

- A. Site visits and performance of all work at the Site are undertaken by the Contractor and Subcontractors at their own risk. The Contractor and Subcontractors are responsible for implementing their own safety program, and agree to hold harmless the Owner and Engineer against any injuries or damages that may occur during site visits or the performance of all work.

4.05 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner shall provide to each Bidder access to examine

such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER’S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
- E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs;
- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- J. agree that the submission of a Bid shall constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without

exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A pre-bid conference shall be held at the time and location stated in the advertisement to bid. Representatives of the Owner and Engineer shall be present to discuss the Project. Bidders are **encouraged** to attend and participate in the conference. The Engineer shall transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and shall not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted no less than ten (10) days prior to the date for opening Bids to the Engineer in writing, by email or standard mail at:

Systems Design Engineering, Inc., 1032 James Drive, Leesport, PA 19533
ATTN: Stephen Gribb, P.E., or email to s.gribb@sdei.net.
Telephone No. : 610-916-8500.

Interpretations or clarifications considered necessary by Engineer in response to such questions shall be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than ten (10) days or as stated elsewhere prior to the date for opening of Bids may not be answered. Only questions answered by Addenda shall be binding. Oral and other interpretations or clarifications shall be without legal effect.

- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.
- 7.03 Any questions answered outside of the parameters described above are neither valid, nor binding upon the Owner.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of ten (10) percent of Bidder's maximum Bid price (determined by adding the Base Bid, all alternate, and all supplemental bid items) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 If the Project contains more than one (1) Contract, and the Bidder is bidding on more than one (1) Contract, a single Bid bond equaling the combined amounts for the Contracts being bid may be submitted in lieu of separate Bid bonds for each Contract.
- 8.03 The Bid security of the apparent Successful Bidder shall be retained until Owner awards the Contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Intent to Award,

whereupon the Bid security shall be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within ten (10) days after the Notice of Intent to Award, Owner may consider Bidder to be in default, annul the Notice of Intent to Award, and the Bid security of that Bidder shall be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

- 8.04 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or sixty-one (61) days after the Bid opening, whereupon Bid security furnished by such Bidders shall be released.
- 8.05 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award shall be released within seven (7) days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in Article 4 of the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in Article 4 of the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract for the Work, as awarded, shall be on the basis of materials and equipment specified or described in the Bidding Documents, and those “or-equal” or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment shall be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least ten (10) days prior to the date for receipt of Bids. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item shall be final. If Engineer approves any such proposed item, such approval shall be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.
- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor shall furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder's sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.
- 12.03 The apparent Successful Bidder, and any other Bidder so requested, shall submit with the bid the list of Subcontractors or Suppliers proposed unless permitted otherwise, then within five (5) days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed.
- 12.04 If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price shall be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 12.05 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions shall constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award shall be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.
 - A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Base Bid item, Alternate and Supplemental Bid item, adjustment unit price item, and unit price item listed therein.
 - B. If the Bid Form expressly indicates that submitting pricing on a specific Alternate or Supplemental item is optional, and Bidder elects to not furnish pricing for such optional Alternate or Supplemental item, then Bidder may enter the words "No Bid" or "Not Applicable."

- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.
- 13.03 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.04 A Bid by an individual shall show the Bidder's name and official address.
- 13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.06 All names shall be printed in ink below the signatures.
- 13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the Commonwealth of Pennsylvania, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Lump Sum*

- A. Bidders shall submit a Bid on a lump sum basis for each lump sum item of Work listed in the Bid Form.

14.02 *Unit Price*

- A. Bidders shall submit a Bid on a unit price basis for each unit price item of Work listed in the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item shall be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items shall be the sum of these "Bid Prices"; such total shall be used by Owner for Bid comparison purposes. The final quantities and Contract Price shall be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices shall be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof shall be resolved in favor of the correct sum.

14.03 *Allowances*

- A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if

any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

14.04 *Submission of a Complete Bid*

- A. The Bidder shall submit a cost for all items listed on the Bid Form, unless specifically noted otherwise.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 The Bidder shall furnish two (2) separate unbound copies of the Bid Form, and if required, the Bid Bond Form, along with two (2) copies of all other documents required to be submitted under the terms of Article 7 of the Bid Form.
- 15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If mailing the Bid, the Bidder is totally responsible for the mail or delivery system delivering the Bid to the place and prior to the time in the Advertisement for Bid. A mailed Bid shall be addressed to the Owner.
- 15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, shall not be accepted and shall be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid shall be returned to the Bidder.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 48 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security shall be returned. Thereafter, if the Work is rebid, that Bidder shall be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids shall be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the Base Bids and major alternate and supplemental bid items, if any, shall be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 All Bids shall remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner shall reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner shall reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid shall be awarded by the Owner to the lowest responsible Bidder within sixty (60) days of the date of bid opening, or all bids shall be rejected except as otherwise provided. If the award is delayed by a required approval of another government agency, the sale of bonds, or the award of a grant or grants, the Owner shall reject all bids or award the Contract to the lowest responsible Bidder within one-hundred twenty (120) days of the date of bid opening. Thirty (30) day extensions of the date for the award may be made by the mutual written consent of the Owner and the lowest responsible Bidder.
- 19.03 Evaluation of Bids
- A. In evaluating Bids, Owner shall consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids shall be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 19.04 In evaluating whether a Bidder is responsible, Owner shall consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 In evaluating whether a Bidder is qualified, Owner may consider any Bidder who has demonstrated poor performance during either a present or previous contract with the Owner to be unqualified and reject their bid accordingly. The Owner reserves the right to exercise this option as is deemed proper and/or necessary.
- 19.06 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers. By submitting a Bid, Bidders consent to the release to the Owner of any and all information deemed necessary by the Owner to allow for such investigation.

- 19.07 If the Contract is to be awarded, Owner shall award the Contract to the responsible Bidder whose Bid is in the best interests of the project, conforming with all material terms and conditions of the Instructions to Bidders, is the lowest price and other factors considered.
- 19.08 Bidders shall note that the Owner reserves the right to award the Contract(s) to the lowest responsible Bidder respectively as follows (as applicable): Contract A & B individually. The Owner reserves the right to delete portions of the Project listed under the Base Bid Items for work under the Contract(s) based upon budget constraints. Each Bidder shall bid accordingly.
- 19.09 The lowest responsible Bidder must comply with the Public Works Employment Verification Act by submitting a Public Works Employment Verification Form to the Owner prior to award of each Contract. The Form and relevant information can be found on the Department of General Services' web site at www.dgs.state.pa.us. A copy of the Public Works Employment Verification Form has also been included in the Contract Documents.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to Performance and Payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by the required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

- 21.01 When Owner issues the Notice of Intent to Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within ten (10) days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds, insurance documentation, and other documentation required to be delivered by the Contract Documents) to Owner.

ARTICLE 22 – SALES AND USE TAXES

- 22.01 Owner may be exempt from Federal Excise and Pennsylvania sales and use taxes on certain materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. Refer to Paragraph SC-7.09 of the Supplementary Conditions for additional information.

ARTICLE 23 – RETAINAGE

- 23.01 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

ARTICLE 24 – PERFORMANCE BOND, PAYMENT BOND, AGREEMENT, INSURANCE, AND SCHEDULE OF VALUES

- 24.01 The Successful Bidder shall, within ten (10) calendar days from the date of receipt of the "Notice of Intent to Award" the Contract to such Bidder, furnish to the Owner an executed **Performance**

Bond, in the form set forth in the Contract Documents, with corporate surety guaranteeing that the Work shall be done according to the Contract Documents. The Performance Bond shall be in the amount of ONE-HUNDRED PERCENT (100%) of the Contract Price.

- 24.02 In addition to the Performance Bond the successful Bidder shall, within ten (10) calendar days from the date of receipt of the "Notice of Intent to Award" the Contract to such Bidder, furnish to the Owner an executed **Payment Bond**, in the form set forth in the Contract Documents, with corporate surety conditioned for the prompt payment for all material furnished and labor supplied or performed in the prosecution of the Work, whether or not the said material or labor entered into and became component parts of the Work or improvement contemplated by the Contract Documents. The Payment Bond shall be in the amount of the ONE-HUNDRED PERCENT (100%) of the Contract Price.
- 24.03 Bidders shall also note, the Successful Bidder within ten (10) calendar days from the date of receipt of the "Notice of Intent to Award" shall furnish to the Owner an executed **Agreement**, in the form set forth in the Contract Documents and the required Insurance Certificates as set forth in the Contract Documents naming all as required to be additional insured.
- 24.04 Corporate Surety of Sureties shall be approved Company or Companies authorized to do business in Pennsylvania as required by Public Works Contractor's Bond Law of 1967, approved on December 20, 1967 (P.O. 191, et seq.).
- 24.05 In addition to the Bonds, Agreement and Insurance, the successful Bidder, if requested, shall furnish an electronic Schedule of Values to the Owner and Engineer.

ARTICLE 25 – PENNSYLVANIA PUBLIC WORKS EMPLOYMENT VERIFICATION ACT

- 25.01 The Commonwealth of Pennsylvania enacted Act 127 of 2012 (43 P.S. Sections 167.1 – 167.11, effective January 1, 2014), known as the Public Works Employment Verification Act ('the Act') which requires all public work contractors and subcontractors to utilize the Federal Government's E-Verify system to ensure that all employees performing work on public work projects are authorized to work in the United States.
- 25.02 The Act provides that, as a precondition of being awarded a contract for a public work, a public works contractor shall provide the public body with a Verification Form acknowledging its responsibilities under, and its compliance with, the Act. The Verification Form shall be signed by a representative of the public works contractor who has sufficient knowledge and authority to make the representations and certifications contained in the Verification Form. Failure to file a Verification Form in compliance with these instructions shall result in the disqualification of the bid.
- 25.03 The successful Contractor(s) and all subcontractors shall submit with their contract forms an executed copy of the PA Public Works Employment Verification Form, a copy of which is included in this bid package.

ARTICLE 26 – AVAILABILITY OF APPROPRIATED FUNDS

- 26.01 The Bidder hereto agrees that any and all payments due from the Owner, as required under the terms of the Agreement, are contingent upon the availability of appropriated funds.

ARTICLE 27 – STEEL PRODUCTS PROCUREMENT ACT

27.01 Pursuant to the “Steel Products Procurement Act,” 73 P.S. §§ 1881 et seq., if any steel products are to be used or supplied in the performance of the Contract, only steel products as defined in the Act shall be used or supplied in the performance of the Contract, or any Subcontracts thereunder.

ARTICLE 28 – CDL PROGRAM CONTRACTOR’S STATEMENT OF COMPLIANCE

28.01 Due to the nature of the work that this Contractor may perform for the Owner, the Contractor must use employees who perform safety-sensitive functions for which a Commercial Driver’s License (CDL) is typically required. Section 49 CFR 382.301(c)(2) of the federal CDL regulations requires that, prior to the first time an employer uses a CDL employee employed by another entity (i.e. a contractor to whom the Owner is awarding a contract), and every six (6) months thereafter of the Contract, the Contractor must certify that any CDL employees used on the Project remains covered by a qualified CDL drug and alcohol testing program. **Additional forms shall be submitted for all subcontract haulers working on the actual Project.**

END OF INSTRUCTIONS TO BIDDERS

BID FORM

**BERKS CAREER & TECHNOLOGY CENTER
BERKS COUNTY, PENNSYLVANIA**

**HEALTH OCCUPATIONS CLASSROOM
WELDING BUILDING CHANGING RM RENOVATIONS
WEST CAMPUS**

**CONTRACT A – GENERAL
CONTRACT B – ELECTRICAL**

Date: _____

BID OF: _____ (Name)

_____ (Address)

TABLE OF CONTENTS

	<u>Page</u>
Article 1 – Bid Recipient	2
Article 2 – Bidder’s Acknowledgements.....	2
Article 3 – Bidder’s Representations	2
Article 4 – Bidder’s Certification	3
Article 5 – Time Of Completion	4
Article 6 – Pricing.....	4
Article 7 – Attachments to This Bid	5
Article 8 – Defined Terms	5
Article 9 – Bid Submittal.....	5
Article 10 – Basis of Bid	8
List of Subcontractors	11
Reference Form	12
Instructions for Non-Collusion Affidavit	13
Non-Collusion Affidavit	14

ARTICLE 1 – BID RECIPIENT

1.01 This Bid shall be addressed to:

Berks Career & Technology
1057 County Welfare Road
Leesport, PA 19533

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid shall be awarded by the Owner to the lowest responsible bidder within sixty (60) days of the date of bid opening or all bids shall be rejected except as otherwise provided. If the award is delayed by a required approval of another government agency, the sale of bonds, the award of a grant or grants, the Owner shall reject all bids or award the Contract to the lowest responsible bidder within one-hundred twenty (120) days of the date of bid opening. Thirty (30) day extensions of the date for the award may be made by the mutual written consent of the Owner and the lowest responsible bidder.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.

Addendum Date

_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Federal, State and Local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in

SC-5.03 as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in SC-5.06 as containing reliable "technical data."

- E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of any work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- J. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – TIME OF COMPLETION

- 5.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions, and any applicable Supplementary Conditions, on or before the dates or within the number of calendar days indicated in Article 4 of the Agreement.
- 5.02 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the work within the Contract Times.

ARTICLE 6 – PRICING

- 6.01 All prices noted on the Bid Form shall include all licenses, fees and/or expenses normally incurred with the type of work being bid. No additional trucking, freight or fuel surcharges will be considered or paid.
- 6.02 Discrepancies on the Bid Form between:
- A. For Unit Price bids, the multiplication of quantities requested and Unit Prices will be resolved in favor of the Unit Prices.
 - B. The indicated sum of any column of figures and the correct sum will be resolved in favor of the correct sum.
 - C. Words and figures will be resolved in favor of the words.
- 6.03 All prices quoted shall be “F.O.B. Destination”, furnished, delivered and installed at the Project location.

ARTICLE 7 – ATTACHMENTS TO THIS BID

- 7.01 The following documents are submitted with and made a condition of this Bid:
- A. Required Bid security in the form of a Bid Bond (EJCDC No. C-430) or certified check (circle type of security provided)
 - B. Non-Collusion Affidavit
 - C. List of Proposed Subcontractors
 - D. List of Proposed Suppliers, if applicable
 - E. List of References
 - F. Public Works Employment Verification Form
 - G. Evidence of authority to do business in the state of Pennsylvania; or a written covenant to obtain such license within the time for acceptance of Bids
 - H. Qualifications of Bidder Questionnaire with supporting data.

ARTICLE 8 – DEFINED TERMS

- 8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

- 9.01 This Bid is submitted by:

Contact Information of Individual Preparing Bid

Contact Person Name: _____

Contact Person Title: _____

Business Address: _____

Federal Tax ID No. : _____

Telephone No. : _____

Fax No. : _____

E-mail Address: _____

Authorized Signature of Bidder

If Bidder is:

An Individual

By: _____
(Individual's signature)

Name (typed or printed): _____

Doing business as: _____

A Partnership

Partnership Name: _____

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability):

By: _____
Signature (* see note below)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest (* see note below) _____

Date of Qualification to do business in Pennsylvania is ____ / ____ / ____.

* The President's or Vice-President's signature must be attested by the Corporate Secretary or Treasurer. If any employee other than the President or Vice-President signs on behalf of the Corporation, or if the President's or Vice-President's signature is not attested to by the Secretary or Treasurer, a copy of the corporate resolution authorizing said signature must be attached to this Bid. Failure to attach a copy of the appropriate authorization, if required, may result in rejection of the Bid.

A Joint Venture

Name of Joint Venture: _____

First Joint Venturer:

By: _____

(Signature of first joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer:

By: _____

(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

SUBMITTED on _____, 20 ____.

State Contractor License No. _____.

ARTICLE 10 – BASIS OF BID

10.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

To provide all materials, labor, equipment, supplies, and all else necessary to design, construct and properly complete all of the contracted Work described below and in the Summary of Work, Section 01010, to the satisfaction of the Owner/Engineer, at the following itemized lump sum and unit prices, to wit:

BID FORM

BASE BID – CONTRACT A – GENERAL

To provide all materials, labor, equipment, supplies, and all else necessary to construct and properly finish all of the contracted Work in accordance with the Bid Document Specifications and Drawings, to the satisfaction of the Owner and Engineer, at the following itemized lump sum or unit cost prices, as noted, to wit:

<u>Item</u>	<u>General Description</u>	<u>Est. Quantity</u>	<u>Unit Price</u>	<u>Extensions</u>
1.	Mobilization/demobilization, bonds, insurance, temporary facilities, all safeguards required to protect the public during construction, coordination with and adjustment of all conflicting utilities (not listed under separate bid items), PA One Call notifications, notifications and coordination with Berks Career & Technology Center during Project Work, all other Work not covered in other Bid Items below but necessary for a complete Project; as specified herein and shown on the Contract Drawings; complete per lump sum.	1	Lump Sum	\$ _____
2.	Site Work All site Work, including but not limited to: demolition/removal (as shown on Contract Drawings), excavation, dewatering, backfill, excess material removal and proper/legal disposal, unsuitable material removal and disposal, rock removal, concrete pad, all rough and fine grading for restoration, compaction, and fence, gate, posts, post foundations, grounding, bollards, asphalt patching/sealing; as specified herein and shown on the Contract Drawings; complete in place per lump sum.	1	Lump Sum	\$ _____
3.	General Trades All general trades work including but not limited to: demolition of walls, ceilings, benches, etc as indicated on the plans, furnish and install wall restorations, floor restoration, painting, ceilings, casework, changing rooms as indicated on the plans, relocate lockers, plumbing work for gas lines, and coordination of the work with electrician, along with submission of O&M manuals, and all			

additional Work not specifically shown on the Drawings and/or detailed in the specifications necessary for a complete functioning installation; complete per lump sum.

1 Lump Sum \$ _____

TOTAL BASE BID CONTRACT A – GENERAL (Bid Items #1. thru #3.) \$ _____

TOTAL BASE BID CONTRACT A – GENERAL (Written) _____

BASE BID – CONTRACT B – ELECTRICAL

To provide all materials, labor, equipment, supplies, and all else necessary to construct and properly finish all of the contracted work in accordance with the Bid Document Specifications and Drawings, to the satisfaction of the Owner and Engineer, at the following itemized lump sum prices, to wit:

<u>Item</u>	<u>General Description</u>	<u>Est. Quantity</u>	<u>Unit Price</u>	<u>Extensions</u>
1.	Electrical All electrical work indicated on the plans including but not limited to: Selective demolition, light fixtures, lighting controls, convenience receptacles, branch circuits from existing electric panels, with all associated conduit, wiring, wiring devices, circuit breakers, pull / junction boxes required to meet the intent of the design. Perform all testing, all hardware and associated appurtenances, final cleaning, submission of all O & M manuals, and all additional work not specifically shown on the Drawings and/or detailed in the Specifications required for a complete electrical installation; complete per lump sum.	1	Lump Sum	\$ _____

TOTAL BASE BID – CONTRACT B – ELECTRICAL (Bid Item #1.) \$ _____

TOTAL BASE BID CONTRACT B – ELECTRICAL (Written) _____

State Adverse Interest Act Disclosure/Certification

If applicable, fully disclose any potential conflict with the State Adverse Interest Act as State Advisor or State Consultant: _____

If there is no adverse interest, complete the following certification:

I hereby certify that _____ has no

Name of Bidder

potential conflict with the State Adverse Interest Act as State Advisor or State Consultant.

By: _____

(Individual's signature)

Name (typed or printed)

Title: _____

LIST OF SUBCONTRACTORS

Subcontractor's Name & Address	Portion of Work Assigned

Firm's Name: _____

Signature: _____ Title: _____

(Authorized Representative)

SEAL

REFERENCE FORM

Note: This reference form shall be completed and submitted by the Bidder and all subcontractors.

Name of Bidder or Subcontractor: _____

1. Company Name: _____

Address: _____

Contact Person: _____

Telephone: _____ FAX: _____

Email Address: _____

2. Company Name: _____

Address: _____

Contact Person: _____

Telephone: _____ FAX: _____

Email Address: _____

3. Company Name: _____

Address: _____

Contact Person: _____

Telephone: _____ FAX: _____

Email Address: _____

INSTRUCTIONS FOR NON-COLLUSION AFFIDAVIT

1. This Non-Collusion Affidavit is material to any contract awarded pursuant to this bid. According to the Pennsylvania Antirigging Act, 73 P.S. 1611 et seq., governmental agencies may require Non-Collusion Affidavits to be submitted together with bids.
2. This Non-Collusion affidavit must be executed by the member, officer, or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.
3. Bid rigging and other efforts to restrain competition, and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the Affidavit should examine it carefully before signing and assure himself or herself that each statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation, approval, or submission of the bid.
4. In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an Affidavit must be submitted separately on behalf of each party.
5. The term "complementary bid" as used in the Affidavit has the meaning commonly associated with that term in the bidding process and includes the knowing submission of bids higher than the bid of another firm, any intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.
6. Failure to file an Affidavit in compliance with these instructions will result in disqualification of the bid.

NON-COLLUSION AFFIDAVIT

State of Pennsylvania : Contract/Bid No. _____
 : S.S.
 County of _____ :

I state that I am _____ of _____
 (Title) (Name of Firm)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers.
 I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

- (1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder.
- (2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.
- (3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid.
- (4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.
- (5) _____, its affiliates,
 (Name of Firm)

subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last four (4) years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bedding on any public contract, except as follows:

NON-COLLUSION AFFIDAVIT

I state that _____ understands
(Name of Firm)

and acknowledges that the above representations are material and important and will be relied on by the Berks Career & Technology Center in awarding the Contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this Affidavit is and shall be treated as fraudulent concealment from the Berks Career & Technology Center of the true facts relating to the submission of bids for this contract.

(Name and Company Position)

SWORN TO AND SUBSCRIBED

BEFORE ME THIS ____

DAY OF _____, 2026

Notary Public

My Commission Expires _____

QUALIFICATIONS OF BIDDER QUESTIONNAIRE

QUALIFICATIONS OF BIDDER QUESTIONNAIRE

Berks Career & Technology Center Health Occupations Classroom / Welding Building Changing Room Renovations – West Campus

1. Company Name: _____
Address: _____
Phone: _____ Contact Person: _____
2. Do you have the necessary facilities, experience and financial resources to perform the work in a satisfactory manner and within the time stipulated? Circle One:

YesNo
3. What is the longest delivery date of any equipment and/or materials?
4. Do you maintain a permanent place of business? Circle One:

YesNo

Address: (if same as above, write same)

5. Do you have adequate equipment to do the work properly and expeditiously?
Circle One:

YesNo

List major pieces of equipment to be used on this project:

List number of crews to be assigned on this project and the number of men in each crew.

6. Do you have suitable financial status to meet obligations incident to the work? Circle One:

Yes

No

Name of Banker: _____

Address: _____

Phone Number: _____

7. Have you ever failed to complete any work awarded to you? Circle One:

Yes

No

If yes, describe the work and provide the reason for not completing the work:

8. Have you ever defaulted on a Contract? Circle One:

Yes

No

If yes, describe the work and provide the reason for defaulting:

9. Within the past two years have you not been paid in full for work performed?
Circle One:

Yes

No

If yes, describe the work and provide name, address and phone number of Municipality/Agency that refused payment to your firm:

10. List present contracts and the approximate bid amount that you have bid this year, along with the status of each bid, i.e. bid not yet opened, apparent low bidder, awarded the contract, not awarded the contract, etc. If necessary, provide the list on a separate sheet(s) of paper.

<u>Project Name</u>	<u>Bid Amount</u>	<u>Status of Bid</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

11. Do you have appropriate technical experience? Circle One:

Yes

No

Give brief statement:

Name of Superintendent to be assigned to this project:

Name: _____

Years & type of experience: _____

Name(s) of foremen to be assigned to this project:

Name: _____

Years & type of experience: _____

Name: _____

Years & type of experience: _____

Name: _____

Years & type of experience: _____

12. Name, address, phone number, contact person, type of construction, and dollar amount of most recent, previously performed contracts of similar nature.

Name of Contract: _____

Contact Person: (Owner or Engineer) _____

Phone Number: () _____

Type of Construction Work: _____

Contract Amount: _____

Date Completed: _____

Name of Contract: _____

Contact Person: (Owner or Engineer) _____

Phone Number: () _____

Type of Construction Work: _____

Contract Amount: _____

Date Completed: _____

Name of Contract: _____

Contact Person: (Owner or Engineer) _____

Phone Number: () _____

Type of Construction Work: _____

Contract Amount: _____

Date Completed: _____

13. Have you ever been a party to, or otherwise been involved in any action or legal proceeding involving matters related to race, color, nationality, or religion? Circle One:

Yes

No

If yes, give full details:

14. Have you ever been accused of discrimination based upon race, color, nationality, or religion in any action of legal proceeding, including any proceeding related to any Federal Agency? Circle One:

Yes

No

If yes, give full details:

NOTE: BIDDER shall attach a list of similar projects completed, per Qualifications of Contractor requirements in various sections of the Technical Specifications and/or the Instructions to Bidders.

This Questionnaire to be signed by an authorized representative of Bidder:

Name: _____

Title: _____

Date: _____

Notarization

State of _____, County of _____, being

duly sworn, deposes and says that he is _____ of
(Title)

_____, and that the answers to the foregoing questions
(Name of Organization)

and all statements therein contained are true and correct.

Sworn to and subscribed before me this _____ day of _____, 20_____.

Notary Public

My Commission Expires _____

BID BOND
(EJCDC C-430)

BID BOND – CONTRACT_____

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

BID

Bid Due Date:

Description (*Project Name— Include Location*):

BOND (Ten Percent (10%) of Total Bid Submitted)

Bond Number:

Date:

Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal

(Seal)

Surety's Name and Corporate Seal

(Seal)

By:

Signature

By:

Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest:

Signature

Attest:

Signature

Title

Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

NOTICE OF INTENT TO AWARD

Notice of Intent to Award

Date: _____

Project:

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.: 24-0485-0039

Bidder:

Bidder's Address:

Gentlemen:

It appears that you are the low bidder for the Berks Career & Technology Center – Health Occupations Classroom / Welding Building Changing Room Renovations - West Campus. Pursuant to the Specification under which your Bid was submitted, you are hereby notified that the Owner intends to award a Contract to you for the aforesaid work. The Contract Price is computed to be \$_____, on the basis of the acceptance of your Bid.

Enclosed herewith are three (3) copies of the Form of Agreement, Performance Bond, Payment Bond, Affidavit RE Provisions of the Workman's Compensation Act, and the Contractor's Statement of Compliance with CDL Testing Program Requirements to be executed by the contracting party and by an approved Corporate Surety, as required by the Specifications. The bonds shall be dated _____ and must be accompanied by proper Powers of Attorney from the Corporate Surety, bearing the same date as the bonds. Also enclosed are copies of the Contract insurance requirements/limits as specified in the General Conditions Section 6.03 and the Supplementary Conditions, Section 6.03.

All copies of the following items shall be executed and returned within ten (10) days after the date of receipt of this Notice before an award can be made and the Contract can be prepared:

1. Agreement (3 copies)
2. Performance Bond (3 copies)
3. Payment Bond (3 copies)
4. Workman's Compensation Affidavit (3 copies)
5. Insurance Certificate (1 copy)
6. Contractor's Statement of Compliance with CDL Testing Program Requirements for the Contractor and all applicable subcontractors (1 copy)

If you fail to execute and deliver the documents noted above within the time specified, the Owner will be entitled to consider all rights arising out of the acceptance of your Bid by the Owner as abandoned, including forfeiture of Bid Security. The Owner may choose to award the Work covered by your Bid to the next lowest responsible Bidder, re-advertise the Project, or otherwise dispose of all Bids, as the Owner deems is in their best interest.

This is not your "Notice to Proceed". Upon the award we will furnish you the assembled Contract and the "Notice to Proceed" will be given.

Dated this ____ day of _____ 2026.

For: _____
(Owner)

By: _____
(Engineer)
Systems Design Engineering, Inc.
1032 James Drive
Leesport, PA 19533

ACCEPTANCE OF NOTICE

Receipt of the above "Notice of Intent to Award" is hereby acknowledged this ____ day of _____ 2026.

(Contractor)

By _____

Title _____

PUBLIC WORKS EMPLOYMENT VERIFICATION FORM



COMMONWEALTH OF PENNSYLVANIA

PUBLIC WORKS EMPLOYMENT VERIFICATION FORM

Date _____

Business or Organization Name (Employer) _____

Address _____

City _____ State _____ Zip Code _____

☐ Contractor ☐ { ~~Subcontractor~~ ~~Subcontractor~~ }

Contracting Public Body _____

Contract/Project No _____

Project Description _____

Project Location _____

As a contractor/subcontractor for the above referenced public works contract, I hereby affirm that as of the above date, our company is in compliance with the Public Works Employment Verification Act ('the Act') through utilization of the federal E-Verify Program (EVP) operated by the United States Department of Homeland Security. To the best of my/our knowledge, all employees hired post January 1, 2013 are authorized to work in the United States.

It is also agreed to that all public works contractors/subcontractors will utilize the federal EVP to verify the employment eligibility of each new hire within five (5) business days of the employee start date throughout the duration of the public works contract. Documentation confirming the use of the federal EVP upon each new hire shall be maintained in the event of an investigation or audit.

I, _____, authorized representative of the company above, attest that the information contained in this verification form is true and correct and understand that the submission of false or misleading information in connection with the above verification shall be subject to sanctions provided by law.

Authorized Representative Signature

CONTRACTOR'S STATEMENT OF COMPLIANCE
WITH CDL TESTING PROGRAM REQUIREMENTS

Contractor's Statement of Compliance with CDL Testing Program Requirements

Project: Health Occupations CR/Welding Bldg Changing Rm Renov	Owner's Contract No.:
Name of Contractor:	
Owner: Berks Career & Technology Center	Engineer's Project No.: 25-0485-0039

Due to the nature of the work that this Contractor may perform for the Owner, the Contractor must use employees who perform safety-sensitive functions for which a Commercial Driver's License (CDL) is typically required. Section 49 CFR 382.301(c)(2) of the federal CDL regulations requires that, prior to the first time an employer uses a CDL employee employed by another entity (i.e. a contractor to whom the municipality is awarding a contract), and every six (6) months thereafter of the Contract, the Contractor must certify that any CDL employees used on the Project remains covered by a qualified CDL drug and alcohol testing program. **Additional forms shall be submitted for all subcontract haulers working on the actual Project.**

Note: An original signed copy of this form must be permanently retained by the Municipality with this Contract and a new form received every six (6) months of the Contract duration.

If the Contractor is not participating in a qualified CDL drug and alcohol testing program at the time of the awarding of the Contract, or at any six-month re-certification point, then all of the Contractor's CDL employees must obtain a negative result on a pre-employment drug test before beginning (or continuing) contracted work for this Project.

Contractor Name _____
By signing here, I, as the Contractor's authorized representative, verify that the Contractor named above is a current participant in the below identified CDL testing program conforming to 49 CFR Part 40.
Contractor's Authorized Representative _____
Today's Date ____/____/____
Signature of Authorized Representative _____

CDL Testing Program Name _____
Testing Program Contact Person _____
Testing Program Address _____
Phone #: (____) _____ City _____ State ____ Zip _____
Contact person confirms program conforms to 49 CFR Part 40? (____) Yes (____) No
Contact person confirms list of Contractor's CDL employees covered in this program and that all drivers are qualified to driver under 49 CFR Part 382.301? (____) Yes (____) No

PERFORMANCE BOND
(EJCDC C-610)

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*): SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

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

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
 - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract; or
 2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
 - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
 2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

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

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:

PAYMENT BOND
(EJCDC C-615)

PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
 - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

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

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

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

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other*):

AFFIDAVIT RE ACCEPTING PROVISIONS OF THE WORKERS
COMPENSATION ACT

AFFIDAVIT RE

ACCEPTING PROVISIONS OF THE WORKMEN'S COMPENSATION ACT

Owner: Berks Career & Technology Center

Project: Health Occupations Classroom / Welding Building Changing Room Renovations

Contract: _____

State of _____)
_____))
_____) ss:
_____))
County of _____)

_____ he has
being duly sworn according to law deposes and says that they have
it has

accepted the provisions of the Workmen's Compensation Act of 1915 of the Commonwealth of Pennsylvania, with

_____ has _____ his
its supplements and amendments, and have insured their liability thereunder in accordance with the terms of said
its

Act with _____
(SURETY COMPANY)

(TYPE OR PRINT)

CONTRACTOR

BY _____
SIGNATURE

Sworn to and subscribed before me this _____ day of _____ A.D. 20 ____.

SIGNATURE

My Commission Expires _____
(DATE)

AGREEMENT
(EJCDC C-520)

**AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between Berks Career & Technology Center (“Owner”) and
____ (“Contractor”).

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

See Section 01010 – Summary of Work

ARTICLE 2 – THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

**HEALTH OCCUPATIONS CLASSROOM / WELDING BUILDING CHANGING ROOMS RENOVATIONS
WEST CAMPUS**

ARTICLE 3 – ENGINEER

- 3.01 The Project has been designed by Systems Design Engineering, Inc.
- 3.02 The Owner has retained Systems Design Engineering, Inc. (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to the Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

- 4.01 *Time of the Essence*
- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.
- 4.02 *Contract Times: Days*
- A. The Work in the Health Occupations Classroom will be substantially completed on July 17, 2026 and all work completed and ready for final payment in accordance with the requirements of Paragraph 15.06 of the General Conditions on August 14, 2026.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 11 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$1,000.00 for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$1,000.00 for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:
- A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.
- B. The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 10.06 of the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment as recommended by Engineer on or about the end of each month during performance of the Work as provided in Paragraph 6.02.A.1 below; provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
 - a. Ninety percent (90%) of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
 - b. Zero percent (0%) of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent (100%) of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent (200%) of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – CONTRACTOR'S REPRESENTATIONS

- 7.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
 - A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
 - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
 - E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related

reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 8 – CONTRACT DOCUMENTS

8.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement.
 - 2. Bid Form and attachments.
 - 3. Bid Bond.
 - 4. Performance Bond.
 - 5. Payment Bond.
 - 6. General Conditions.
 - 7. Supplementary Conditions.
 - 8. Specifications as listed in the Index of the Project Manual.
 - 9. Drawings
 - 10. All Appendices to these Documents.
 - 11. Addenda (Numbers ____ to ____, inclusive).
 - 12. The following, which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice of Award.
 - b. Notice to Proceed.

- c. Work Change Directives.
 - d. Change Orders.
 - e. Field Orders.
 - f. Certificate of Substantial Completion.
- B. The documents listed in Paragraph 8.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 8.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 9 – MISCELLANEOUS

9.01 *Terms*

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

9.02 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

9.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

9.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

9.06 *Other Provisions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through the Supplementary Conditions.

9.07 *Choice of Law Firm*

- A. This Contract shall be governed by the laws of the Commonwealth of Pennsylvania, and venue for any dispute between parties to this Contract or which emanate from this Contract shall be in the United States District Court for the Eastern District of Pennsylvania or the Berks County Court of Common Pleas.

9.08 *Award of Contract*

- A. The Owner reserves the right to delete portions of the Work listed under the Base Bid Items, Alternate Bid Items, or Supplemental Bid Items for work under the Contract(s) based upon budget constraints.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER:

CONTRACTOR:

_____ Berks Career & Technology Center

By: _____

By: _____

Title: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

_____ 1057 County Welfare Road

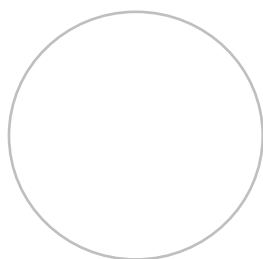
_____ Leesport, PA 19533

License No.: _____

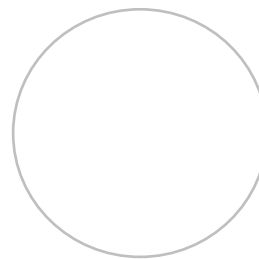
(where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.



Corporate Seal



Corporate Seal

NOTICE OF AWARD
(EJCDC C-510)

Notice of Award

Date: _____

Project: Health Occupations Classroom / Welding Building Changing Room Renovations – West Campus

Owner: Berks Career & Technology Center

Owner's Contract No.:

Contract (s):

Engineer's Project No.: 25-0485-0039

Bidder:

Bidder's Address:

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded the Contract for the _____.

The Contract Price of your Contract is _____ Dollars (\$_____).

We remind you this is **not** your "Notice to Proceed". When we furnish you the executed contract the "Notice to Proceed" will be given.

Enclosed herewith are six (6) copies of the "Notice of Award" form. Please execute and return six (6) signed copies to the office of the Engineer.

For: _____
(Owner)

By: _____
(Engineer)

Systems Design Engineering, Inc.
1032 James Drive
Leesport, PA 19533

Acceptance of Notice

Receipt of the above "Notice of Award" is hereby acknowledged this ____ day of _____, 20____.

By: _____

Title: _____
(Contractor)

NOTICE TO PROCEED
(EJCDC C-550)

Notice to Proceed

Date: _____

Project: Health Occupations Classroom / Welding Building Changing Room Renovations – West Campus

Owner: Berks Career & Technology Center

Owner's Contract No.:

Contract:

Engineer's Project No.: 25-0485-0039

Contractor:

Contractor's Address:

You are hereby notified that the contract times under the above Contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of substantial completion is July 17, 2026 for the Health Occupations Classroom and the date of Final Completion for all work is August 14, 2026. Please sign and return four (4) copies of the Notice to Proceed to the Engineer. Enclosed please find two (2) copies of the fully executed Contract manual for your records.

For: Berks Career & Technology Center
(Owner)

By: _____
(Engineer)

Systems Design Engineering, Inc.
1032 James Drive
Leesport, PA 19533

Acceptance of Notice

Receipt of the above "Notice to Proceed" is hereby acknowledged this ____ day of _____, 20____, and we hereby consider _____ as the official starting date for this Contract.

By: _____

Title: _____
(Contractor)

GENERAL CONDITIONS
(EJCDC C-700)

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	<u>Page</u>
ARTICLE 1 – Definitions and Terminology.....	1
1.01 Defined Terms.....	1
1.02 Terminology	5
ARTICLE 2 – Preliminary Matters	6
2.01 Delivery of Bonds and Evidence of Insurance	6
2.02 Copies of Documents	6
2.03 Before Starting Construction	7
2.04 Preconstruction Conference; Designation of Authorized Representatives	7
2.05 Initial Acceptance of Schedules	7
2.06 Electronic Transmittals	8
ARTICLE 3 – Documents: Intent, Requirements, Reuse	8
3.01 Intent	8
3.02 Reference Standards.....	8
3.03 Reporting and Resolving Discrepancies	9
3.04 Requirements of the Contract Documents	9
3.05 Reuse of Documents	10
ARTICLE 4 – Commencement and Progress of the Work	10
4.01 Commencement of Contract Times; Notice to Proceed	10
4.02 Starting the Work.....	10
4.03 Reference Points	10
4.04 Progress Schedule	11
4.05 Delays in Contractor’s Progress	11
ARTICLE 5 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions	12
5.01 Availability of Lands	12
5.02 Use of Site and Other Areas.....	12
5.03 Subsurface and Physical Conditions.....	13
5.04 Differing Subsurface or Physical Conditions	14

5.05	Underground Facilities.....	15
5.06	Hazardous Environmental Conditions at Site	17
ARTICLE 6 – Bonds and Insurance.....		19
6.01	Performance, Payment, and Other Bonds	19
6.02	Insurance—General Provisions	19
6.03	Contractor’s Insurance.....	20
6.04	Owner’s Liability Insurance.....	23
6.05	Property Insurance	23
6.06	Waiver of Rights.....	25
6.07	Receipt and Application of Property Insurance Proceeds.....	26
ARTICLE 7 – Contractor’s Responsibilities		26
7.01	Supervision and Superintendence	26
7.02	Labor; Working Hours	26
7.03	Services, Materials, and Equipment	26
7.04	“Or Equals”	27
7.05	Substitutes	28
7.06	Concerning Subcontractors, Suppliers, and Others	29
7.07	Patent Fees and Royalties.....	31
7.08	Permits.....	31
7.09	Taxes	32
7.10	Laws and Regulations.....	32
7.11	Record Documents.....	32
7.12	Safety and Protection	32
7.13	Safety Representative.....	33
7.14	Hazard Communication Programs	33
7.15	Emergencies.....	34
7.16	Shop Drawings, Samples, and Other Submittals.....	34
7.17	Contractor’s General Warranty and Guarantee.....	36
7.18	Indemnification	37
7.19	Delegation of Professional Design Services	37
ARTICLE 8 – Other Work at the Site.....		38
8.01	Other Work	38
8.02	Coordination	38

8.03	Legal Relationships	39
ARTICLE 9 – Owner’s Responsibilities		40
9.01	Communications to Contractor	40
9.02	Replacement of Engineer	40
9.03	Furnish Data	40
9.04	Pay When Due	40
9.05	Lands and Easements; Reports, Tests, and Drawings	40
9.06	Insurance	40
9.07	Change Orders	40
9.08	Inspections, Tests, and Approvals	40
9.09	Limitations on Owner’s Responsibilities	41
9.10	Undisclosed Hazardous Environmental Condition	41
9.11	Evidence of Financial Arrangements	41
9.12	Safety Programs	41
ARTICLE 10 – Engineer’s Status During Construction		41
10.01	Owner’s Representative	41
10.02	Visits to Site	41
10.03	Project Representative	42
10.04	Rejecting Defective Work	42
10.05	Shop Drawings, Change Orders and Payments	42
10.06	Determinations for Unit Price Work	42
10.07	Decisions on Requirements of Contract Documents and Acceptability of Work	42
10.08	Limitations on Engineer’s Authority and Responsibilities	42
10.09	Compliance with Safety Program	43
ARTICLE 11 – Amending the Contract Documents; Changes in the Work		43
11.01	Amending and Supplementing Contract Documents	43
11.02	Owner-Authorized Changes in the Work	44
11.03	Unauthorized Changes in the Work	44
11.04	Change of Contract Price	44
11.05	Change of Contract Times	45
11.06	Change Proposals	45
11.07	Execution of Change Orders	46
11.08	Notification to Surety	46

ARTICLE 12 – Claims.....	47
12.01 Claims.....	47
ARTICLE 13 – Cost of the Work; Allowances; Unit Price Work	48
13.01 Cost of the Work	48
13.02 Allowances	50
13.03 Unit Price Work.....	51
ARTICLE 14 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....	51
14.01 Access to Work	51
14.02 Tests, Inspections, and Approvals.....	52
14.03 Defective Work	52
14.04 Acceptance of Defective Work	53
14.05 Uncovering Work	53
14.06 Owner May Stop the Work	54
14.07 Owner May Correct Defective Work.....	54
ARTICLE 15 – Payments to Contractor; Set-Offs; Completion; Correction Period	54
15.01 Progress Payments.....	54
15.02 Contractor’s Warranty of Title	58
15.03 Substantial Completion.....	58
15.04 Partial Use or Occupancy	59
15.05 Final Inspection	59
15.06 Final Payment	59
15.07 Waiver of Claims	60
15.08 Correction Period.....	61
ARTICLE 16 – Suspension of Work and Termination	62
16.01 Owner May Suspend Work	62
16.02 Owner May Terminate for Cause.....	62
16.03 Owner May Terminate For Convenience	63
16.04 Contractor May Stop Work or Terminate	63
ARTICLE 17 – Final Resolution of Disputes	64
17.01 Methods and Procedures.....	64
ARTICLE 18 – Miscellaneous	64
18.01 Giving Notice.....	64
18.02 Computation of Times	64

18.03	Cumulative Remedies	64
18.04	Limitation of Damages	65
18.05	No Waiver	65
18.06	Survival of Obligations	65
18.07	Controlling Law	65
18.08	Headings	65
ARTICLE 19 – FEDERAL REQUIREMENTS (As APPLICABLE).....		65
19.01	Agency Not a Party	65
19.02	Contract Approval.....	65
19.03	Conflict of Interest	65
19.04	Gratuities	65
19.05	Audit and Access to Records.....	66
19.06	Small, Minority and Women’s Businesses	66
19.07	Anti-Kickback	66
19.08	Clean Air and Pollution Control Acts.....	67
19.09	State Energy Policy.....	67
19.10	Equal Opportunity Requirements	67
19.11	Restrictions on Lobbying.....	67
19.12	Environmental Requirements	68

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agency* – The Federal or state agency named as such in the Agreement.
 3. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 4. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 5. *Asbestos* – Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 6. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 7. *Bidder*—An individual or entity that submits a Bid to Owner.
 8. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 9. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 10. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 11. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 12. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work

under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

13. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
14. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
15. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
16. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
17. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
18. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
19. *Cost of the Work*—See Paragraph 13.01 for definition.
20. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
21. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *General Requirements* – Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
25. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are

controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

26. *Hazardous Waste* – The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
27. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
28. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
29. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
30. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
31. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
32. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
33. *PCBs* – Polychlorinated biphenyls.
34. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
35. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
36. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
37. *Related Entity* – An officer, director, partner, employee, agent, consultant, or subcontractor.
38. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
39. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

40. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
41. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
42. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
43. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
44. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
45. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
46. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
47. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
48. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
49. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
50. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
51. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any

encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

- 52. *Unit Price Work*—Work to be paid for on the basis of unit prices.
- 53. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
- 54. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives*:
 - 1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day*:
 - 1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective*:
 - 1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds:* When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance:* When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance:* After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents,

consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible

after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth (30th) day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty (30) days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth (60th) day after the day of Bid opening or the thirtieth (30th) day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work.

Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. abnormal weather conditions;
 - 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 - 4. acts of war or terrorism.

- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

- A. *Limitation on Use of Site and Other Areas:*
 - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise;

(b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments:*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

- b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
- 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
- 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 - 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 - 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than

30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous

Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a Performance bond and a Payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the

policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to

industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

- F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within 3 days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within 3 days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an

employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is

complete and Engineer determines that the proposed item is an “or-equal”, which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer’s Determination:* Neither approval nor denial of an “or-equal” request shall result in any change in Contract Price. The Engineer’s denial of an “or-equal” request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

- c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already

deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
 - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.
3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
 1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
 8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.
- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in

the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage 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 but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A 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 such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such

professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to

arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.
- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim

arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
 - 3. *Field Orders:* Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible

with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.
 1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15

days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but

not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval:* If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

- F. *Denial of Claim:* If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results:* If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work:* The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 - 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 - 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 - 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns

from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.

- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
 - C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:
 - 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
 - D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.
 - E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
 - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in

the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 Tests, Inspections, and Approvals

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 Defective Work

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of

others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after 7 days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the

provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

1. 10 days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - l. there are other items entitling Owner to a set off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefore.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefore. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefore. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

- A. *Application for Payment:*
1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.
 2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;

- c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
 - 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Application and Acceptance:*
- 1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* 30 days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from

Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When

exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon 7 days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

ARTICLE 19 – FEDERAL REQUIREMENTS (AS APPLICABLE)

19.01 *Agency Not a Party*

- A. This Contract is expected to be funded in part with funds provided by Agency. Neither Agency, nor any of its departments, entities, or employees is a party to this Contract.

19.02 *Contract Approval*

- A. Concurrence by Agency in the award of the Contract is required before the Contract is effective.

19.03 *Conflict of Interest*

- A. Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer.
- B. Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest in Contractor. Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.

19.04 *Gratuities*

- A. If Owner finds after a notice and hearing that Contractor, or any of Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to

any official, employee, or agent of Owner or Agency in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.

- B. In the event this Contract is terminated as provided in paragraph 18.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, Owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.

19.05 *Audit and Access to Records*

- A. For all negotiated contracts and negotiated modifications (except those of \$10,000 or less), Owner, Agency, the Comptroller General, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the Contractor, which are pertinent to the Contract, for the purpose of making audits, examinations, excerpts and transcriptions. Contractor shall maintain all required records for three years after final payment is made and all other pending matters are closed.

19.06 *Small, Minority and Women's Businesses*

- A. If Contractor intends to let any subcontracts for a portion of the work, Contractor shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services. Affirmative steps shall consist of: (1) including qualified small, minority and women's businesses on solicitation lists; (2) assuring that small, minority and women's businesses are solicited whenever they are potential sources; (3) dividing total requirements when economically feasible, into small tasks or quantities to permit maximum participation of small, minority, and women's businesses; (4) establishing delivery schedules, where the requirements of the work permit, which will encourage participation by small, minority and women's businesses; (5) using the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce; (6) requiring each party to a subcontract to take the affirmative steps of this section; and (7) Contractor is encouraged to procure goods and services from labor surplus area firms.

19.07 *Anti-Kickback*

- A. Contractor shall comply with the Copeland Anti-Kickback Act (18 USC 874 and 40 USC 276c) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that Contractor or subcontractor shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. Owner shall report all suspected or reported violations to Agency.

19.08 *Clean Air and Pollution Control Acts*

- A. If this Contract exceeds \$100,000, Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 USC 7401 *et seq.*) and the Federal Water Pollution Control Act as amended (33 USC 1251 *et seq.*). Contractor will report violations to the Agency and the Regional Office of the EPA.

19.09 *State Energy Policy*

- A. Contractor shall comply with the Energy Policy and Conservation Act (P.L. 94-163). Mandatory standards and policies relating to energy efficiency, contained in any applicable State Energy Conservation Plan, shall be utilized.

19.10 *Equal Opportunity Requirements*

- A. If this Contract exceeds \$10,000, Contractor shall comply with Executive Order 11246, "Equal Employment Opportunity," as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and as supplemented by regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."
- B. Contractor's compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical area where the Contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting Contractor's goals shall be a violation of the Contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.
- C. Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the Contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the Contract is to be performed.

19.11 *Restrictions on Lobbying*

- A. Contractor and each subcontractor shall comply with Restrictions on Lobbying (Public Law 101-121, Section 319) as supplemented by applicable Agency regulations. This Law applies to the recipients of contracts and subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. If applicable, Contractor must complete a certification form on lobbying activities related to a specific Federal loan or grant that is a funding source for this Contract. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or

any other award covered by 31 USC 1352. Each tier shall disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Certifications and disclosures are forwarded from tier to tier up to the Owner. Necessary certification and disclosure forms shall be provided by Owner.

19.12 *Environmental Requirements*

- A. When constructing a project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental constraints:
1. Wetlands – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
 2. Floodplains – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100 year floodplain areas delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, i.e., alluvial soils on NRCS Soil Survey Maps.
 3. Historic Preservation – Any excavation by Contractor that uncovers an historical or archaeological artifact shall be immediately reported to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the State Historic Preservation Officer (SHPO).
 4. Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.

END OF GENERAL CONDITIONS

SUPPLEMENTARY CONDITIONS

Supplementary Conditions

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

Where reference is made in the Contract Documents to refer to Division 1, Section 01300, the Contractor shall also refer to the appropriate title in the General Conditions as supplemented in the Supplementary Conditions.

TABLE OF CONTENTS

SC-1.01	Defined Terms	3
SC-2.01	Delivery of Bonds and Evidence of Insurance	3
SC-2.02	Copies of Documents	4
SC-2.05	Initial Acceptance of Schedules	4
SC-3.02	Reference Standards	4
SC-3.03	Reporting and Resolving Discrepancies	5
SC-4.01	Commencement of Contract Times; Notice to Proceed	6
SC-4.03	Reference Points	6
SC-5.03	Subsurface and Physical Conditions	6
SC-5.06	Hazardous Environmental Conditions at Site	7
SC-6.03	Contractor's Insurance	7
SC-7.02	Labor; Working Hours	9
SC-7.04	"Or Equals"	9
SC-7.08	Permits	10
SC-7.09	Taxes	10
SC-7.10	Laws and Regulations	11
SC-7.11	Record Documents	11
SC-7.16	Shop Drawings, Samples, and Other Submittals	11
SC-7.17	Contractor's General Warranty and Guarantee	12
SC-8.02	Coordination	13
SC-10.03	Project Representative	14

SC-15.01	Progress Payments	17
SC-15.03	Substantial Completion	18
SC-15.06	Final Payment	18
SC-17.02	Court of Competent Jurisdiction	19
SC-18.00	Miscellaneous	19
SC-18.09	Responsibilities of the Contractor	19
SC-18.10	Unsuitable Material	19
SC-18.11	Verbal Instructions	20
SC-18.12	Attendance of Contractor at Meetings	20
SC-18.13	Contractor to Prepare Site	21
SC-18.14	Contractor's Relationship with Owner	21
SC-18.15	Nondiscrimination/Sexual Harassment Clause	21
SC-18.16	PennDOT Pub. 408 Specifications References to Owner	21
SC-18.17	PennDOT Publication 408 Specifications	21
SC-18.18	Site Accessibility	21
SC-18.19	OSHA Regulations	21
SC-18.20	Steel Products	21
SC-18.21	Contractor Responsibility	21
SC-18.22	Contractor Integrity	22
SC-18.23	Clean Air Pollution Contract Acts	22
SC-18.24	Illegal Alien Labor on Assisted Projects Act	22

SUPPLEMENTARY CONDITIONS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01. Defined Terms

Add the following language to the end of Paragraph 1.01.A.3:

The Application for Payment form to be used on this Project is included in the Contract. The appropriate funding Agency, if applicable, must approve all Applications for Payment before payment is made.

Add the following language to the end of Paragraph 1.01.A.8:

The Change Order form to be used on this Project is EJCDC No. C-941. Funding Agency approval is required before Change Orders are effective.

Add the following language to the end of Paragraph 1.01.A.20:

The Owner's Engineer on this project is: Systems Design Engineering, Inc.

Delete Paragraph 1.01.A.26 in its entirety and insert the following in its place:

Notice of Award – The written notice by Owner/Engineer to the successful bidder that, due to compliance with and delivery of the executed agreement, required bonds and insurance as set forth in the "Notice of Intent to Award" that he is the successful bidder and is awarded the respective Contract.

Add the following language to the end of paragraph 1.01.A.28:

The Owner for this project is Berks Career & Technology Center.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01 Delivery of Bonds and Evidence of Insurance

Delete Paragraphs 2.01 B. and C. in their entirety and insert the following in their place:

- B. Evidence of Contractor's Insurance: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies of insurance (including all endorsements, and identification of applicable self-insured retentions and deductibles) required to be provided by Contractor in Article 6. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. Evidence of Owner's Insurance: After receipt from Contractor of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of

insurance to be provided by Owner under Article 6 (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

SC-2.02.A. Copies of Documents

Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor two (2) copies of the Contract Documents and one copy in electronic portable document format (PDF), if requested. Additional copies will be furnished upon request at the cost of reproduction.

SC-2.05 Initial Acceptance of Schedules

Add the following paragraph after 2.05.A.3:

2:05.B. Maintaining Construction Schedule

1. After approval of the preliminary construction schedule, the General Contractor shall update the construction schedule on a monthly basis.
2. The General Contractor shall coordinate the construction schedule with other Prime Contractors.
3. A written plan shall be submitted to amend the construction progress when any Work item becomes behind schedule by more than two (2) weeks.
4. The construction schedule shall be reviewed at all construction meetings.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.02 Reference Standards

Add the following new paragraphs immediately after paragraph 3.02.A.2:

3. All referenced standards, specifications, and codes for the construction, alteration, and repair of structures in the Commonwealth of Pennsylvania, whether such reference be specific or by implication, shall fall within the scope and application of the Pennsylvania Uniform Construction Code, Act 45.
4. Under The Pennsylvania Uniform Construction Code, Act 45, the International Construction Codes, or their successor triennial codes, are adopted and incorporated by reference. Standards are included as part of the Uniform Construction Code to the extent that they are referenced in the "Referenced Standards" chapter in each of the respective adopted International Construction Codes.
5. When a conflict occurs between the provisions of the Pennsylvania Uniform Construction Code, Local, State, Federal Codes/ Regulations and the Contract Documents the more stringent requirement prevails.

SC-3.03 Reporting and Resolving Discrepancies

Add the following new paragraphs immediately after paragraph 3.03.B.1.b.:

2. The Contract Documents comprise the entire Agreement between Owner and Contractor concerning the Work. They may be altered only by a Modification.
 - a. The drawings and specifications whether taken separately or together, are to be interpreted according to their full intent, meaning and spirit and shall be deemed to mutually explain each other and to be descriptive of the Work to be done under this Contract. Should any discrepancy appear between the specifications and the drawings, the more stringent of the two shall take precedence and/or the interpretation and intent as determined by the Engineer shall be final.
 - b. It is the intent of the Specifications and Drawings to describe a complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment, such words shall be interpreted in accordance with such meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the code of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual or code in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specifications, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of Owner, Contractor and Engineer, or any of their agents or employees from those set forth in the Contract Documents. Clarifications and interpretations of the Contract Documents shall be issued by Engineer.
 - c. On the drawings, figured dimensions shall be taken in preference to scaled dimensions; large scale drawings shall be followed in preference to smaller scale drawings; descriptions in preference to material codes. Should there be anything shown on the drawings and not called for in the specifications, or vice versa, the same shall be carried out as if called for in both. Should any error or discrepancy appear in the drawings or specifications, the same is to be referred to the Engineer for correction in writing before the bids are submitted or the Work proceeded with. The Contractor is not to make any alterations or corrections without consulting the Engineer beforehand.

The Contract Documents will be governed by the law of the Commonwealth of Pennsylvania.

ARTICLE 4 - COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01 Commencement of Contract Times; Notice to Proceed

Add the following sentence to the end of Paragraph 4.01.A:

These maximum time periods for commencement of the Contract Times may be extended upon mutual consent of the Owner and Contractor.

SC-4.03 Reference Points

Delete Paragraph 4.03.A. in its entirety and replace with the following paragraphs:

- A. The Owner shall provide construction stakeout as necessary to establish reference points for construction which in the Engineer's judgment are necessary to enable the Contractor to proceed with the Work.
- B. The Contractor shall protect and preserve any established reference points, layout points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point, layout point or monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points, layout points or property monuments by a Commonwealth of Pennsylvania registered Professional Land Surveyor at Contractor's expense.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.03. Subsurface and Physical Conditions

Delete Paragraph 5.03.A of the General Conditions in its entirety and replace with the following:

Subsurface and Physical Conditions

- A. Reports and Drawings: The Supplementary Conditions hereby identify:
 - 1. Those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site, and Technical Data contained in such reports. Such reports are as follows:
 - a. **Refer to Appendix 'F' for Geotechnical Report**
 - 2. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), and Technical Data contained in such drawings. Such drawings are as follows:
 - a. **Refer to Appendix 'F' for Geotechnical Report**

SC-5.06 Hazardous Environmental Conditions at Site

Delete Paragraphs 5.06.A, 5.06.B and 5.06.C in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. All Contractors agree to abide by all applicable federal, state, provincial and local environmental laws as part of their contractual relationship with the Owner. All Contractors performing services related to environmental compliance, planning or remediation shall provide assurance that they have , and will maintain in effect, insurance that provides coverage for risks resulting from the release of hazardous substances or contaminants to the environment.
- C. All Contractors shall be responsible for the removal of all hazardous wastes or substances (i.e. asbestos pipe, lead, underground storage tanks, etc.) generated and/or uncovered during the course of their onsite Work. All Contractors agree to indemnify the Owner and/or Engineer against any claim by any entity, private or governmental in nature, arising out of environmental contamination caused or exacerbated by the Contractor during the course of its Work for the Owner. All Contractors shall respond to spills and to releases of hazardous substances, dispose of contaminated clean-up materials, dispose of contaminated soils and report immediately each spill or release event to the onsite Owner/Engineer Representative.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.03 Contractor's Insurance

Delete paragraph 6.03.C.1 in its entirety and insert the following in its place:

- 1. Products and completed operations coverage:
 - a. Such insurance shall be maintained at least until final payment.

Delete paragraph 6.03.F in its entirety.

Add the following new paragraph immediately after Paragraph 6.03.J:

- K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:
 - 1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

State:

Statutory

Federal, if applicable (e.g., Longshoreman's):	<u>Statutory</u>
Jones Act coverage, if applicable:	
Bodily injury by accident, each accident	\$ <u>N/A</u>
Bodily injury by disease, aggregate	\$ <u>N/A</u>
Employer's Liability:	
Bodily injury, each accident	\$ <u>1,000,000</u>
Bodily injury by disease, each employee	\$ <u>1,000,000</u>
Bodily injury/disease aggregate	\$ <u>1,000,000</u>
Foreign voluntary worker compensation	<u>Statutory</u>

2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

General Aggregate	\$ <u>2,000,000</u>
Products - Completed Operations Aggregate	\$ <u>1,000,000</u>
Personal and Advertising Injury	\$ <u>1,000,000</u>
Each Occurrence (Bodily Injury and Property Damage)	\$ <u>1,000,000</u>

3. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Combined Single Limit of	\$ <u>1,000,000</u>

4. Excess or Umbrella Liability:

Per Occurrence	\$ <u>5,000,000</u>
General Aggregate	\$ <u>5,000,000</u>

5. Additional Insureds: Include as additional insureds the following:

- a. Owner/Municipality – Berks Career & Technology Center
- b. Engineer – Systems Design Engineering, Inc.

ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES

SC-7.02. Labor; Working Hours

Add the following new paragraphs immediately after Paragraph 7.02.B:

- C. Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer’s services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day unless approved otherwise by Owner. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

Add the following new subparagraph immediately after Paragraph 7.02.C:

1. For purposes of administering the foregoing requirement, additional overtime costs are defined as *hours worked over forty (40) hours per week, for hours spent due to lack of notification when crews do not work as planned (maximum 2 hours per day) and all hours spent on replacement of inferior prior Work.*

SC-7.04 “Or-Equals”

Amend paragraph 7.04.C. Engineer’s Evaluation by making two subparagraphs. The existing paragraph text shall be retitled, 7.04.C.2. After Effective Date of Agreement. A new paragraph shall be added before this paragraph to read as follows:

1. *During Bidding.* The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or “or-equal” materials and equipment as defined in paragraph 7.04 of the General Conditions, or those substitute materials and equipment approved by the Engineer and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function, and quality to be met by any proposed substitute or “or-equal” item. Request for Engineer’s clarification of materials and equipment considered “or-equal” prior to the Effective Date of the Agreement must be received by the Engineer at least 5 days prior to the date for receipt of Bids. No item of material or equipment will be considered by Engineer as a substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each request shall conform to the requirements of Paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon the Bidder. Engineer’s decision of approval or disapproval of a proposed item will be final. If Engineer approves any proposed substitute item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

Add the following new paragraphs immediately following paragraph 7.05.F:

- H. For all construction regulated by the Pennsylvania Uniform Construction Code, acceptable alternative construction materials and methods are determined as follows:
- a. Materials, products, and methods of construction that are evaluated as meeting codes by the ICC Evaluation Service, Inc. or an evaluation service accredited under the "General Requirements for Bodies Operating Product Certifications Systems" issued by the ISO (ISO Guide 65) are approved for use; or
 - b. Materials, equipment, and devices bearing the label or listed by a testing laboratory or quality assurance agency accredited by the International Accreditation Service, Inc. or another agency accredited under the "Calibration and Testing Laboratory Accreditation Systems-General Requirements for Operation and Recognition" issued by ISO (ISO Guide 58) are approved for use if:
 - i. The testing laboratory or quality assurance agency deemed the material as meeting Uniform Construction Code-required standards.
 - ii. The scope of accreditation is applicable to the Uniform Construction Code-required standards; or
 - c. Construction which complies with the International Performance Code shall also be in compliance with the Uniform Construction Code.

SC-7.08 Permits

Add new paragraph immediately after paragraph 7.08.A.:

- B. Such permits and licenses shall include, without limitations, all associated costs with the transportation and disposal of hazardous materials and substances including road use taxes or fees, material inspection or testing fees and costs, disposal or storage site fees and costs, and road cutting permits or bonds.

SC-7.09 Taxes

Add a new paragraph immediately after Paragraph 7.09.A:

- B. Owner may be exempt from payment of sales and compensating use taxes of the State of Pennsylvania and of cities and counties thereof on materials to be incorporated into the Work as provided by law.
- 1. Owner will sign the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.

2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

SC-7.10 Laws and Regulations

Add the following new paragraphs immediately after Paragraph 7.10.C:

- D. The Contractor shall be responsible for all fines and penalties imposed by PADEP or other agencies due to Contractor's negligence and/or noncompliance with Contract requirement.

SC-7.11 Record Documents

Add a new paragraphs immediately after Paragraph 7.11.A:

- B. If Contract Drawings are included in the Contract Documents and depict the horizontal and/or vertical locations of improvements constructed or installed under the Contract, the Contractor shall submit project Record Drawings in accordance with the Technical Specifications, Section 01720, Project Record Documents, Paragraphs 1:03 and 1:04 with the final application for payment. The horizontal locations and all inverts, rim and grate elevations for all storm and utility structures, as well as the top of pipe elevations for all utility lines constructed during the course of the Work shall be noted on the drawings. These locations and elevations shall be certified by a surveyor registered in the Commonwealth of Pennsylvania.
- C. Record Documents shall be received from each Contractor of each Contract for this Project.
- D. Final payment will not be released until Record Drawings are received and approved by the Owner/Engineer.

SC-7.16 Shop Drawings, Samples and Other Submittals

Add the following new paragraphs immediately after paragraph 7.16.A.3.

4. All shop drawings (including product data) that are either called out as required in the Contract Specifications, shown on the submittal schedule, required by the Engineer or of materials, equipment, and/or related accessories which are required to make a complete project shall be submitted to the Engineer for approval prior to installation.
5. Data shall be explicit with regard to details of the products being furnished and complete enough to enable the Engineer to readily determine that the products submitted conform to the requirements of the Specifications. If a submittal indicates more than one (1) style, size, capacity, etc., of a product on a sheet, the Contractor shall clearly indicate by specifically marking exactly which product type is being submitted for approval. Failure to indicate exactly which product is being submitted

shall be cause for rejection of the submittal. Catalog data shall bear the name of manufacturer of the product.

6. Submittals describing structural and mechanical items shall be drawn to scale.

Delete paragraph 7.16.B.3. in its entirety and insert the following in its place:

- B. Where a shop drawing, sample or certification is required by the Contract Specifications, submittal schedule and/or Engineer, no related Work shall be commenced until the submittal has been approved by the Engineer. Installing materials, equipment and/or related accessories without prior approval by the Engineer is at the risk of the Contractor. If the materials, equipment and/or related accessories are installed prior to approval and found to be unacceptable, the Contractor shall be responsible for all cost associated with removal and replacement.

Add the following new paragraphs immediately after paragraph 7.16.E.3.:

4. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples, or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time.

Add the following new paragraph immediately after paragraph 7.16.E.4.:

- F. Contractor shall submit a minimum of five (5) copies of submittals for review and approval. Engineer will retain three (3) copies. Electronic submission of shop drawings must be discussed with the Engineer for acceptability.

SC-7.17 Contractors General Warranty and Guarantee

Add the following new paragraphs immediately after paragraph 7.17.D:

- E. All Contractors shall keep their entire portion of the Work in repair without further charges so far as concerns settlement, shrinkage, cracks, etc. or defect in workmanship, apparatus, materials or construction for a warranty period of one (1) year from the date of issuance of final acceptance (final certificate of payment approved) and shall be responsible for and make good any damage caused by same; but this clause shall not be interpreted as holding them responsible for making good any deterioration of the Work due to abuse after date of issuance of final certificate of payment.

If within one (1) year after the date of final acceptance of the Work or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, either correct such defective Work, or, if it has been rejected by Owner, remove it from the site and replace it with non-defective Work. If Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause

serious risk of loss or damage, Owner may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, shall be paid by Contractor.

The Contractor is responsible to correct or replace any portion of the Work that has been determined by the Owner/Engineer to be defective during the warranty period. Defective Work shall be corrected or replaced by the Contractor to the satisfaction of the Owner/Engineer even if the time required to perform the corrective or replacement Work extends beyond the expiration date of the warranty period.

- F. In the event that Contractor requests a change of a previously approved item, Contractor shall reimburse Owner for Engineer's charges for its review time unless the need for such change is beyond the control of Contractor
- G. Neither the final payment nor any provision in the Contract Documents, nor the use of the Work by the Owner shall constitute an acceptance of the items that do not comply with all of the specifications or the Contract Documents.

ARTICLE 8 – OTHER WORK AT THE SITE (AS APPLICABLE)

SC-8.02 Coordination

Delete paragraph 8.02. in its entirety and insert the following in its place:

- A. Where multiple prime Contracts exist for the Project, the General Contractor shall be responsible for coordinating the other prime contractors. Coordination shall include, but not be limited to:
 - 1. Compilation of individual schedules into a master schedule.
 - 2. Notification of prime Contractors to schedule Work.
 - 3. Maintaining a list of individuals or entities that will have the authority and responsibility for coordination of the activities among the prime contractors.
- B. The Contractor shall provide a list of his subcontractors to the Engineer at the time his bid is submitted. No Contractor will be allowed to change subcontractors without written approval of the Owner. The Contractor shall use the sheet provided by the Engineer to list all his subcontractors.
- C. The Contractor shall coordinate his Work so as to maintain existing operations and/or facilities which are located within the Project limits. No interruptions will be permitted unless approved by the Owner/Engineer. The Contractor shall be responsible for providing all temporary facilities (as applicable) or controls for existing operations to be maintained during construction.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

Add the following new paragraphs immediately after Paragraph 10.03.A:

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
 2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
 3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.
 4. Liaison:
 - a. Serve as Engineer’s liaison with Contractor. Working principally through Contractor’s authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner’s liaison with Contractor when Contractor’s operations affect Owner’s onsite operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
 5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
 6. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
 7. Modifications: Consider and evaluate Contractor’s suggestions for modifications in Drawings or Specifications and report such suggestions,

together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.

8. Review of Work and Rejection of Defective Work:

- a. Conduct onsite observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
- b. Report to Engineer whenever RPR believes that any part of Contractor's Work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of Work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

9. Inspections, Tests, and System Start-ups:

- a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
- b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

10. Records:

- a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
- b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- c. Maintain records for use in preparing Project documentation.

11. Reports:

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.

- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
 - c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.
 - 12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.
 - 13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
 - 14. Completion:
 - a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.
 - b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.
 - c. Observe whether all items on the final punch list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the Work.
- C. The RPR shall not:
- 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 - 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 - 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
 - 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's Work.

5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted offsite by others except as specifically authorized by Engineer.
7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01 Progress Payments

Add the following paragraphs after paragraph 15.01.A.3:

4. Owner may retain ten percent (10%) of the amount of all progress payments due until fifty percent (50%) of the Work has been completed. When the Contract is fifty percent (50%) complete, up to one-half (½) of the amount retained by the Owner may be returned to the Contractor provided that the Engineer approves the Application for Payment, and provided further, that the Contractor is making satisfactory progress and there is no specific cause for greater withholding. The amounts retained by the Owner after the Contract is fifty percent (50%) complete shall be five percent (5%) or greater of the value of the completed Work based on approved monthly progress payment requests.

Add the following paragraphs after paragraph 15.01.B.3:

4. Payment for Stored Materials: (Onsite or Offsite)

Payment may, at the discretion of the Owner/Engineer, be made for materials stored on the site, if approved by the Engineer, and under the following conditions:

- a. Payment will be made for the value of equipment or material only, not including the cost of installation.
- b. The Contractor will certify that items for which payment is requested while stored on site or offsite have been paid for, Titles, Bill of Sale for such items shall pass to the Owner upon the Owner's payment to the Contractor. The Owner and the Engineer may require certified paid invoices for items for which payment will be made to the Contractor.
- c. All items for which payment is made shall be stored, as approved by the Owner and Engineer.
- d. Notwithstanding any payment for materials and equipment stored on or off the site, the Contractor shall retain responsibility for loss or damage to materials and equipment stored on or off the site.

- e. All materials paid for by the Owner that are remaining at the completion of the Work shall be transported by the Contractor to a location designated by the Owner and stored by the Contractor as directed by the Owner.
- f. Representatives of the Owner and the funding agency (if applicable) shall have the right to make inspections of the storage areas at any time.
- g. Submit three (3) copies of Application for Payment in accordance with the General Conditions, Article 14 as applicable.
- h. Submit Application for Payment on form which has been included in the contract documents and/or used for the Schedule of Values and accepted by the Engineer. Applications that have not been reviewed and approved by the Engineer will not be reviewed.

Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

- 1. The Application for Payment with Engineer's recommendations will be presented to the Owner and, if applicable, the funding Agency for consideration. If both the Owner and Agency/Agencies find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 14.02.D will become due and when due will be paid by Owner to Contractor as soon as practicable subject to source of funding restrictions.

SC-15.03 Substantial Completion

Add the following paragraph after Paragraph 15.03.F:

- G. No partial substantial completion will be granted unless authorized by the Engineer.

SC-15.06 Final Payment

Delete paragraph 15.06.D. in its entirety and insert the following paragraphs in its place:

- 1. The final Application for Payment with the Engineer's recommendations will be presented to the Owner for consideration. If the Owner finds the final Application for Payment acceptable, the amount recommended by the Engineer less any sum Owner is entitled to set off against the Engineer's recommendation, including but not limited to liquidated damages, will become due and when due will be paid by the Owner to the Contractor as soon as practicable subject to the source of funding restrictions.
- 2. In addition to any other documentation required prior to final payment, the Contractor shall submit the following documentation with the final Application for Payment, as applicable to the Project:
 - A. Two (2) copies of the Affidavit of Release of Liens form and the Final Waiver of Liens form.

- B. Two (2) copies of the Consent of Surety to Final Payment form.
- C. Material certifications for all quantities of asphalt paving materials, emulsions, stone, concrete, paving geotextile, storm sewer piping, storm inlets, grates, frames, manholes and lids, cement, slips, etc. used for the Contract Work.
- D. Delivery slips for all materials used for the Contract Work, unless previously supplied to the Engineer or Owner.
- E. Certified as-built plans/record documents required by the Contract documents.
- F. Executed maintenance bond (for the time period required by the Contract documents), if required by the Contract documents.
- G. Two (2) copies of the PennDOT MS-NCP Notice of Completion form, signed by the Contractor (for projects utilizing PennDOT funds for non-maintenance Work).
- H. Payroll certifications for projects requiring payment of prevailing wages.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.02 Court of Competent Jurisdiction

Add the following new paragraph immediately after Paragraph 17.01B.

Court of Competent Jurisdiction – All matters subject to final resolution under this Article shall be decided by Court of Competent Jurisdiction in Berks County, Pennsylvania.

ARTICLE 18 - MISCELLANEOUS

SC-18.00 Miscellaneous

Add the following paragraphs after paragraph 18.08.A:

SC-18.09 Responsibilities of the Contractor

See Section 01500 Construction Facilities and Temporary Controls for responsibilities of Contractor as applicable.

SC-18.10 Unsuitable Material

- A. Unsuitable materials shall be defined as one or more of the following:
 - 1. Any material containing topsoil, wood, and/or other organic substances.
 - 2. Any material containing bio-degradable substance.
 - 3. Any material containing scrap metals.
 - 4. Any material that is frozen or containing water-logged substances.

5. Any material susceptible to combustion, spontaneous or otherwise.
 6. Any material which by virtue of its particle size, shape, or hazardous chemical or physical nature cannot be properly handled and effectively compacted.
 7. Any material not meeting the requirements for subgrade bearing in the specifications and/or Geotechnical Report contained in the specifications, if provided.
- B. If unsuitable materials are encountered during the Project such unsuitable materials, also referred to as “soft and yielding” material elsewhere in the Contract Documents, shall be removed to the limits and depths as directed by the Owner/Engineer. PennDOT Class 4B stabilization geotextile shall only be placed on the subgrade prior to backfilling at the direction of the Owner/Engineer. The excavated area shall be backfilled in one of the following ways as directed by the Owner/Engineer:
1. Place either AASHTO No. 1 coarse aggregate or R-3 rock to a depth of approximately 6” below the bottom of the lowest asphalt course. Backfill the remainder of the excavation with compacted 2A aggregate.
 2. Backfill the entire excavation with compacted 2A aggregate, placed in maximum 6” lifts prior to compaction.
- C. The removal and replacement of unsuitable material shall be measured and paid for in accordance with the Contract Documents.

SC-18.11 Verbal Instructions

Although the Contractor may request from the Engineer, or Engineer may give verbal instructions to contractor concerning the manner in which the Work is carried out, such verbal instructions shall in no event be binding upon the Owner. Upon request by the Contractor, a written confirmation of such verbal instructions is to be given and confirmation requested. Any Work performed or omitted by Contractor in accordance with verbal instructions of Engineer and not confirmed in writing as above provided, shall be at the sole risk of the Contractor and shall not obligate the Owner in any manner whatsoever.

SC-18.12 Attendance of Contractor at Meetings

Unless otherwise notified by Owner in writing, the Contractor shall attend at least one (1) meeting covered by Owner each month, from the time the Agreement is executed by Owner and Contractor until the time of acceptance by Contractor of final payment, as well as any additional meetings Contractor may be requested by the Owner in writing to attend during said period, and any representative appearing on behalf of Contractor at such meeting shall be conclusively presumed to be authorized to act for and on behalf of the Contractor. Owner shall notify Contractor at least three (3) days in advance, in writing of the date, time and place of said meeting.

SC-18.13 Contractor to Prepare Site

The Contractor shall do everything necessary to prepare the site of the sewers for construction operations, including the demolition and removal of any portions of structures and obstacles located thereon at or below the elevation of the present grade.

SC-18.14 Contractor's Relationship with Owner

Contractor shall not engage any personnel of the Owner as a subcontractor or for the performance of any Work or the supplier of any materials under this Agreement.

SC-18.15 Nondiscrimination / Sexual Harassment Clause

The Contractor shall note that all Contractors and Subcontractors for this Project shall abide by all applicable Nondiscrimination / Sexual Harassment policies.

SC-18.16 Not Used

SC-18.17 PennDOT Publication 408 Specifications

When a conflict occurs between the provisions of the Department of Transportation, (PennDOT) and the Contract Documents, the PennDOT Publication 408 Specifications requirements prevail.

SC-18.18 Site Accessibility

Where applicable, Contractor shall comply with the Architectural Barriers Act of 1968 and Section 504 of the Rehabilitation Act of 1973; PA Act 235 of 1965, as amended, Universal Accessibility Act, and Americans with Disabilities Act (ADA) of 1990, as amended.

SC-18.19 OSHA Regulations

The Contractor shall comply with the Federal Occupational Safety and Health Act of 1970 (OSHA).

SC-18.20 Steel Products

The Contractor agrees to comply with the provisions of the Steel Products Procurement Act, March 3, 1978, P.L. 6, No. 3, 73 P.S. § 1881 et seq., in every construction contract awarded for this Project.

SC-18.21 Contractor Responsibility

Consistent with Commonwealth Management Directive 215.9, Contractor Responsibility Program, dated April 16, 1999, the Contractor certifies that neither he nor any subcontractor or supplier providing services on this Project are under suspension or debarment by the Commonwealth of Pennsylvania, any other state, or the federal government. Contractor further certifies that he has no delinquent tax liabilities or other Commonwealth obligations. If any suspension, debarment or delinquent obligation arises during the term of the Agreement with the Owner for financial assistance, Contractor agrees to notify the Owner within fifteen (15) days. Moreover, Contractor agrees that

failure to provide such notice shall constitute a default of the Agreement. Contractor agrees to be responsible for all necessary and reasonable costs incurred by the Office of Inspector General in investigating compliance with this provision when such investigation results in suspension or debarment of the Contractor.

SC-18.22 Contractor Integrity

Contractor agrees to comply, and to require compliance by any subcontractors providing services on this Project, with the contractor integrity provisions set forth in Management Directive 215.8, Contractor Integrity Provisions for Commonwealth Contracts, dated December 20, 1991.

SC-18.23 Clean Air and Pollution Contract Acts

If this Contract exceeds \$100,000, the Contractor shall comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 USC §1857(h)), Section 508 of the Clean Water Act (33 USC §1368), Executive Order 11738, and Environmental Protection Agency Regulations (40 CFR Part 15).

SC-18.24 Illegal Alien Labor on Assisted Projects Act

Pursuant to the Act of May 11, 2006 (P.L. 173, No.43), known as the Prohibition of Illegal Alien Labor on Assisted Projects Act, The Contractor shall not knowingly employ, or knowingly permit any of its subcontractors to knowingly employ, the labor services of an illegal alien on activities funded in whole or in part by a grant or loan issued by an executive agency of the Commonwealth of Pennsylvania.

WORK CHANGE DIRECTIVE
(EJCDC C-940)

Work Change Directive

No. _____

Date of Issuance: _____

Effective Date: _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engr's Project No.:

Contractor is directed to proceed promptly with the following change(s):

Item No.	Description

Attachments (list documents supporting change):

Purpose for Work Change Directive:

Authorization for Work described herein to proceed on the basis of Cost of the Work due to:

- ☐ Nonagreement on pricing of proposed change.
- ☐ Necessity to expedite Work described herein prior to agreeing to changes on Contract Price and Contract Time.

Estimated change in Contract Price and Contract Times:

Contract Price \$ _____ (increase/decrease) Contract Time _____ (increase/decrease)
days

Recommended for Approval by Engineer:	Date
Authorized for Owner by:	Date
Received for Contractor by:	Date
Received by Funding Agency (if applicable):	Date:

CONTRACT CHANGE ORDER
(EJCDC C-941)

Change Order No. _____

Date of Issuance:

Effective Date:

Owner:

Owner's Contract No.:

Contractor:

Contractor's Project No.:

Engineer:

Engineer's Project No.:

Project:

Contract Name:

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments: *[List documents supporting change]*

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ____ to No. ____: \$ _____	[Increase] [Decrease] from previously approved Change Orders No. ____ to No. ____: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: \$ _____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:

ACCEPTED:

ACCEPTED:

By: _____ Engineer (if required)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____
Title: _____

FIELD ORDER
(EJCDC C-942)

Field Order

No. _____

Date of Issuance:

Effective Date:

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

Attention:

You are hereby directed to promptly execute this Field Order issued in accordance with General Conditions Paragraph 9.04.A, for minor changes in the Work without changes in Contract Price or Contract Times. If you consider that a change in Contract Price or Contract Times is required, please notify the Engineer immediately and before proceeding with this Work.

Reference:

(Specification Section(s))

(Drawing(s) / Detail(s))

Description:

Attachments:

Engineer:

Receipt Acknowledged by Contractor:

Date:

Copy to Owner

APPLICATION FOR PAYMENT

TO (OWNER):
Berks Career & Technology Center

PROJECT: Health Occ CR / WB Changing Rooms
CONTRACT: _____

APPLICATION NO:

FROM (CONTRACTOR):

VIA (ENGINEER): Systems Design Engineering, Inc.
1032 James Drive
Leesport, PA 19533

APPLICATION DATE:
PERIOD TO:
ENGINEER'S PROJECT NO: 25-0485-0039
CONTRACT DATE:

CONTRACT FOR:

CONTRACTOR'S APPLICATION FOR PAYMENT

CHANGE ORDER SUMMARY			
Change orders approved in previous months by Owner		ADDITIONS	DEDUCTIONS
Total			
Approved this Month			
Number	Date Approved		
TOTALS			
Net change by Change Orders			

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that to the best of its knowledge: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

CONTRACTOR:

By: _____ Date: _____

State of: _____ Notary Public:

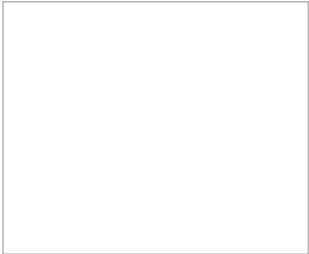
Subscribed and sworn to before _____ My Commission expires:

me this ____ day of _____, 20 ____.

Application is made for Payment, as shown below, in connection with the Contract.
Continuation Sheet, (is attached).

1. ORIGINAL CONTRACT PRICE.....	\$ -
2. NET CHANGE BY CHANGE ORDERS.....	\$ -
3. CURRENT CONTRACT PRICE (Line 1+2).....	\$ -
4. TOTAL COMPLETED & STORED TO DATE.....	\$ -
(Column L)	
5. RETAINAGE:	
a. _____ % of Completed Work _____	
(10% of L)	
b. _____ % of \$ _____	
c. Total Retainage:	
(Total in Column O).....	\$ -
6. AMOUNT ELIGIBLE TO DATE.....	\$ -
(Line 4 less Line 5 Total)	
7. LESS PREVIOUS PAYMENTS	
(Line 6 from prior application).....	\$ -
8. AMOUNT DUE THIS APPLICATION(Line 6-7).....	\$ -
9. BALANCE TO FINISH, PLUS RETAINAGE.....	\$ -
(Line 3 Less Line 6)	

SEAL



ENGINEER'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the above application, the Engineer certifies to the Owner that to the best of the Engineer's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

SEE SUPPLEMENTARY CONDITIONS SC-15.06 FOR REQUIRED DOCUMENTATION TO BE PROVIDED BY THE CONTRACTOR WITH THE FINAL PAYMENT APPLICATION.

PAYMENT OF: _____ \$ -
(Attach explanation if amount certified differs from the amount applied for.)

RECOMMENDED BY: (ENGINEER) SYSTEMS DESIGN ENGINEERING, INC.

This certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

APPROVED BY: _____ Date: _____

Funding Agency (If Applicable)

PROGRESS ESTIMATE

CONTRACT: _____

PERIOD TO:

ENGINEER'S PROJECT NO: 25-0485-0039

[illegible]

**CERTIFICATE OF SUBSTANTIAL COMPLETION
(EJCDC C-625)**

Certificate of Substantial Completion

Project: Health Occupations Classroom / Welding Building Changing Room Renovations – West Campus

Owner: Berks Career & Technology Center

Owner's Contract No.:

Contract:

Engineer's Project No.: 25-0485-0039

This [tentative] [definitive] Certificate of Substantial Completion applies to:

☐ All Work under the Contract Documents: ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [definitive] list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

☐ Amended Responsibilities ☐ Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:

The following documents are attached to and made part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Executed by Engineer	Date

Accepted by Contractor	Date

Accepted by Owner	Date

TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01010	Summary of Work
01011	General Technical Specifications
01045	Cutting and Patching
01300	Submittals
01310	Construction Schedules
01370	Schedule of Values and Applications for Payment
01400	Quality Control
01500	Construction Facilities and Temporary Controls
01505	Mobilization-Demobilization
01600	Material and Equipment
01650	Starting of Systems
01700	Contract Closeout
01710	Cleaning and Adjusting
01720	Project Record Documents
01740	Warranties and Bonds

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1:01 LOCATION AND SCOPE OF WORK

The Work covered by these Specifications is at the locations shown on the Contract Drawings in Bern Township, Berks County, Pennsylvania. The overall intent of the Work to be performed under this Contract is to furnish and install the necessary materials, equipment and labor to:

- A. Renovate an existing classroom into a Health Occupations Classroom;
- B. Renovate the existing Welding Building locker rooms into changing rooms;
- C. Renovate two (2) existing Welding Building offices into locker rooms;
- D. Add outdoor welding gas tanks at the Welding Building

all at the West Campus for the Berks Career & Technology Center.

Bidders shall review all plans and specifications to determine the Scope of Work required for their individual contracts.

The Contractor shall bid on all items listed in the Bid Form for each Contract for which he/she submits a Bid, unless specifically noted otherwise.

1:02 CONTRACT WORK/RESPONSIBILITIES

Each successful Bidder awarded any Contract shall be responsible to provide all labor, materials, equipment, machinery, apparatus and tools to perform all operations necessary to construct, install, equip, adjust and put into satisfactory operation, the Work awarded, specified and shown on the Drawings, and shall so connect the various items or sections or the Work awarded as to form a complete and properly operating whole. Any labor, material, equipment or apparatus not specifically mentioned herein, or shown on the Drawings, which may be necessary for the proper completion of the entire Work awarded or of the individual items thereof within the intent of these Specifications and Drawings, shall be furnished by the Bidder without additional compensation.

All Bidders shall perform the Work as outlined in the Contract description as follows and in the Contract Documents to provide a complete installation of the building.

A. **Contract A – General**

The Work to be completed under Contract A is as described as follows:

1. The Bidder shall be responsible for all non-electrical construction within the limit of Work as shown on the Drawings and as indicated in the Specifications as applicable to this Contract.
2. **General Site Construction:** All site Work, including but not limited to: demolition/removal (as shown on Contract Drawings), excavation, dewatering, backfill, excess material removal and proper/legal disposal, unsuitable material removal and disposal, rock removal, concrete pad (sloped to drain water away from the building), all rough and fine grading for restoration, compaction, and fence, gate, posts, post foundations, grounding of fence, bollards, asphalt patching/sealing; as specified herein and shown on the Contract Drawings including, but not limited to: Excavation, stone, concrete, anchor bolts, gate, posts, fencing, grounding of fence for a complete installation.
3. **General Trades Construction:** All general trades work including but not limited to: demolition of walls, ceilings, benches, etc as indicated on the plans, furnish and install wall restorations, floor restoration, painting, ceilings, casework, changing rooms as indicated on the plans, relocate lockers, plumbing work for gas lines, and coordination of the work with electrician, along with submission of O&M manuals, and all additional Work not specifically shown on the Drawings and/or detailed in the specifications necessary for a complete functioning installation.
4. Maintaining access to site during construction to include all temporary parking, barriers, storm water control, field office (if applicable) and storage area preparation and removal for all Work.
5. Furnish and pay for all **temporary construction utilities** required for construction including sanitary facilities.
6. Furnish and install all safety equipment.
7. Provide Owner with all Operation and Maintenance Manuals.
8. Minimum of one (1) year guarantees for all General Work, or longer if specified.
9. The General Contractor shall coordinate the Work of all Prime Contractor(s).

B. **Contract B – Electrical**

The Work to be completed under Contract B is as described as follows:

1. All electrical work indicated on the plans including but not limited to: Selective demolition, light fixtures, lighting controls, convenience receptacles, branch circuits from existing electric panels, with all associated conduit, wiring, wiring devices, circuit breakers, pull / junction boxes required to meet the intent of the design. Perform all testing, all hardware and associated appurtenances, final cleaning, submission of all O & M manuals, and all additional work not specifically shown on the Drawings and/or detailed in the Specifications.
2. Provide Owner with all Operation and Maintenance Manuals for all Electrical equipment.
3. Minimum of one (1) year guarantees for all Electrical Work, or longer if specified.

1:03 **SPECIAL REQUIREMENTS**

- A. Any excavation Work under this Contract is considered unclassified and the removal of any rock encountered shall be considered part of the Total Bid. Rock removal shall be accomplished by mechanical methods only.
- B. The Contractor may encounter water in the excavation, and this water shall be pumped out of the construction area at all times to a suitable discharge point through an approved sediment filtering system as part of the Total Bid Price.
- C. The Contractor shall coordinate the shut off any utilities, where necessary, with the Utility Owner.
- D. The Contractor is responsible for obtaining and paying for all other permits, licenses, Engineers inspection fees and inspections required to perform and complete all Work in accordance with all federal, state and local regulations and requirements.
- E. The Contractor is responsible for notifying and coordinating with local police, fire departments and other emergency services, school district(s) and homeowners/businesses that may be affected by any Contract Work performed. The Contractor shall notify the parties noted above at least 48 hours before starting the Work. **If the construction schedule changes, the Contractor shall make the notifications again.**

- F. The Contractor shall **note** that all Contract Work shall **only** be performed during daylight hours, 7:00 AM to 5:00 PM, Monday through Friday. No other hours of operation will be permitted unless prior approvals by the Owner and/or Engineer have been obtained.

PART 2 – PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01011

GENERAL TECHNICAL SPECIFICATIONS

PART 1 – GENERAL

1:01 CONTRACT DRAWINGS

The Contract Drawings herein referred to bear the general title:

<u>Drawing Number</u>	<u>Description</u>	<u>Latest Revision</u>
<u>WELDING BUILDING</u>		
AD100	DEMOLITION FLOOR PLAN	01/06/2026
A100	PROPOSED NEW FLOOR PLAN	01/06/2026
A101	NEW OUTSIDE TANK ENCLOSURE	01/06/2026
P101	WELDING GAS NEW WORK	03/27/2026
E001	LEGEND & ABBREVIATIONS	03/30/2026
E101	PARTIAL FLOOR PLANS	03/30/2026
E102	PARTIAL FLOOR PLAN	03/30/2026
<u>HEALTH OCCUPATIONS</u>		
A100	PROPOSED FLOOR PLAN	01/30/2026
E001	LEGEND & ABBREVIATIONS	03/10/2026
E101	ELECTRICAL FLOOR PLAN	03/10/2026

1:02 INTENT OF DRAWINGS AND SPECIFICATIONS

- A. Any drawings accompanying the Specifications are herein designated Contract Drawings (Drawings) and are diagrammatic, the purpose of which is to illustrate the general character and extent of the Work and are subject to such modifications as may be found necessary or advisable either before or during the prosecution of the Work. The Contractor shall conform to and abide by whatever supplementary drawings and explanations may be furnished by the Engineer for the purpose of illustrating the Work. The Contractor shall check the Drawings and verify all dimensions prior to the start of Work. The Owner with the Engineer shall decide as to the meaning or intention of any portion of the Specifications and Drawings where the same may be found obscure or in dispute and the Owner shall have the right to correct any errors or omissions therein.
- B. All Work that may be called for in the Specifications and not shown on the Drawings or shown on the Drawings and not called for in the Specifications shall be executed and furnished by the Contractor as if described in both. Should any incidental Work or materials be required which is not denoted either on the Drawings or in the Specifications, either directly or indirectly, but which is necessary for the carrying out of the intent of the Specifications or Drawings, the Contractor agrees to perform all such Work and furnish and install all such materials as if the same were fully indicated or specified. The Contractor shall carry out all Work and furnish all materials necessary to complete the project as intended and implied by the Drawings and Specifications.

- C. References to "Contractor" in these Specifications shall apply to the specific Contractor or Contractors for all sections of the project included in their Scope of Work unless specifically noted. Other references to "Contractor" in the remainder of these Specifications shall apply to all of the individual Contractors.

1:03 ERRORS AND DISCREPANCIES ON THE DRAWINGS OR IN THE SPECIFICATIONS

If the Contractor, in the course of the Work, finds any discrepancy between the Drawings or Specifications and the physical condition of the locality, or any errors on the Drawings, in the Specifications, or in the layout, it shall be his duty to immediately inform the Engineer and Owner in writing; the Engineer will promptly clarify the discrepancy and notify the Contractor in writing. Any Work undertaken after the discrepancy has been discovered and prior to clarification by the Owner and the Engineer will be done at the Contractor's risk without compensation.

1:04 TRAFFIC CONTROL AND OTHER SAFETY CONCERNS

Contractor(s) shall provide, coordinate and conduct all traffic controls (i.e. road closures, flagging, detour traffic control and multiple mobilizations, etc.) as required and necessary during the performance of the Contract Work.

All work zone traffic controls shall be in accordance with the latest edition of PennDOT Publication 212 and 213, as amended and as applicable. Contractor(s) shall post roads at least forty eight (48) hours prior to start of Work on said roads.

Contractor(s) shall be responsible to notify the local fire and police departments and school district of all proposed Work and changes in traffic patterns and/or detours prior to start of Work.

Closure of municipal roads, streets or alleys will be permitted where necessary to perform required Work; however, Contractor(s) shall submit their proposed road closure and detour plan in accordance with PennDOT Pub. 212 and 213 to the Owner/Engineer for review and approval at least (5) days prior to the actual closing.

If a road is to be closed, Contractor(s) shall be responsible to properly notify all affected residents and businesses, in addition to the local fire and police departments and school district(s). The timing of the road closures and detours must be approved by the Owner prior to implementing the closure or detour. The road closure and detour plan must also be coordinated with the school district if the Work is performed during the school year.

Fire alarm boxes and fire hydrants adjacent to the Work shall at all times be readily accessible to fire apparatus and equipment, and no material or other obstruction shall be placed within 15 feet of any hydrant.

Contractor(s) shall coordinate all Work with the Owner and provide a minimum one (1) week advance notice before proceeding with Work.

There will be a pre-construction meeting scheduled prior to the start of Work to clarify the responsibilities and timing of Work to be performed by the Contractor(s), and work to be performed by the Owner, if any.

1:05 DATUM FOR ELEVATIONS (AS APPLICABLE)

The project site datum and all elevations shown on any Contract Drawings are in feet. All measurements will be made in United States standard feet.

1:06 MISCELLANEOUS RESTORATION WORK

All property survey pins and/or monuments disturbed or removed during any Work performed for the completion of this Contract shall be replaced to the satisfaction of the property owner by a professional property survey conducted at the expense of the Contractor.

All fences, sheds, bushes, trees, mailboxes and all other obstructions or landscaped areas and/or structures encountered, disturbed and/or removed due to Work performed by the Contractor as part of or incidental to these Specifications, shall be relocated, replaced or disposed of properly to the satisfaction of the property owner, Engineer and Owner at no additional cost.

The Contractor shall backfill along the edge of cartway/parking lot with compacted gravel or topsoil, in kind per existing conditions, to provide a smooth transition to existing grade. Topsoiled areas shall be permanently seeded and lined with erosion control blanket unless specifically waived by the Owner/Engineer. The cost of the cartway edge /parking lot restoration is incidental to the paving Work.

1:07 WORKING AREA

The Owner will provide the Contractor the right to enter upon the roads for the prosecution of the Work. If additional area is required for the storage of material or equipment, the Contractor shall provide such space at his own expense. The Work on rights-of-ways shall be limited to widths of the rights-of-way, unless easements have been provided. The Contractor shall not cut down or trim any trees or shrubbery until all trees or shrubbery intended for removal are flagged and approved by the Owner/Engineer.

1:08 PENNSYLVANIA PREVAILING WAGE ACT

Pursuant to the Pennsylvania Prevailing Wage Act of August 15, 1961, Act No. 442, the workmen employed in the performance of the Contract shall be paid not less than the minimum wage as established by the Bureau of Labor Law Compliance, and proper payroll records shall be kept and maintained by the Contractor and each of his Subcontractors in accordance with the Act, which shall be available at all reasonable hours to the inspection of the Owner and to the Bureau. The Contractor shall familiarize himself with all provisions of the Act and shall comply with all rules and regulations thereof.

The full Prevailing Wages Act can be found at 43 P.S. Sections 165-1 through 165-17.

1:09 PENNSYLVANIA STATUTES AND REGULATIONS

The Clean Streams Law, Act of June 22, 1937, P.L. 1937, as amended 35 P.S., 691 et seq. And Chapter 73, 91, 93, 95, 97, 101, and 104 Department of Environmental Protection regulations promulgated thereunder.

1:10 VERBAL INSTRUCTIONS

Although the Contractor may request from the Engineer, or Engineer may give verbal instructions to Contractor concerning the manner in which the Work is carried out, such verbal instructions shall in no event be binding upon the Owner. Upon request by the Contractor, a written confirmation of such verbal instructions is to be given and confirmation requested. Any Work performed or omitted by Contractor in accordance with verbal instruction of Engineer and not confirmed in writing as above provided, shall be at the sole risk of the Contractor and shall not obligate the Owner in any manner whatsoever.

1:11 QUALITY OF WORK

It is understood that the Work shall be done in a first class manner and best new materials used. If the Specifications or Drawings admit of a doubt as to meaning, the interpretation which calls for the best Work shall be followed.

1:12 BRAND NAMES

Brand names are given only for the purpose of establishing standard type and quality for estimating purposes. Similar approved material will be acceptable provided samples (or other appropriate information) are submitted to the Engineer for approval as equal to that listed, in accordance with the Instructions to Bidders Article 11; and General Conditions, paragraph 7.04, as applicable.

1:13 MATERIAL ACCEPTABILITY

All materials used for the Work shall be subject to the review of the Engineer, who shall be the sole judge of their quality and efficiency. He shall be notified in advance whenever the preparation or manufacture of any material for the Work is to be commenced at any place.

No material shall be shipped to the Work before it has been reviewed and accepted, unless review has been authorized by the Engineer to be made at the site or has been waived.

1:14 REMOVAL AND REPLACEMENT OF REJECTED MATERIAL OR WORK

If any material selected or brought on the site for use in the project is condemned by the Engineer as unsuitable or not in conformity with the Specifications, the Contractor shall forthwith remove such material from the project site.

All material or Work of whatever kind which shall become damaged from any cause or be rejected by the Engineer, shall be removed from the premises within 48 hours, and replaced by good materials or Work at the Contractor's expense.

1:15 REMOVAL AND SALVAGE

The Contractor is responsible to remove all existing related items of construction necessary to provide the Work under this Contract. He is to protect all surfaces and items of material and construction that are to remain and become part of the finished project. All materials and items so removed shall become the property of the Owner. It is expected that any benefit expected or realized from the sale of any items of demolition will reflect as a credit to the Owner in the proposal cost items submitted to the Owner. Any materials removed that the Owner decides to salvage shall become the property of the Owner. The Contractor shall deliver such materials to a place as determined by the Owner.

The Contractor shall legally dispose of any and all materials, refuse, debris, and other unwanted material from the site.

1:16 OBSERVANCE OF LAWS

The Contractor at all times shall observe and comply with all Federal, State and local laws, by-laws, ordinances, codes and regulations, in any manner affecting the conduct of the Work or applying to any employees on the project, as well as all orders or decrees which have been promulgated or enacted, or which may be promulgated or enacted during the progress of the Work, by any legal bodies or tribunals having authority or jurisdiction over the Work, materials, employees, or the Contract. By executing the Contract, the Contractor agrees to indemnify and save harmless the Owner and all its officers, employees and agents, from all suits, actions, or claims of any character or description brought forth, made on account of, or arising from the violation of any such law, by-law, ordinance, regulation, order or decree.

1:17 PUBLIC SAFETY

- A. All fire hydrants adjacent to the Work shall be kept readily accessible at all times to fire apparatus, and no materials or obstructions shall be placed within fifteen (15) feet of any fire hydrant. Local fire companies serving the area shall be notified in advance, in writing, of the path of construction and/or road closures and detours. A copy of said notice shall be submitted to the Engineer.
- B. The Contractor shall erect and maintain such barricades or railings and display on the Work such lights, signals, or warnings as may be necessary to safeguard the public and those employed about the Work. At all times during the progress of the Work, the Engineer may order increasing, moving, or replacing of barricades for the safety of the public.

1:18 PROTECTION OF PROPERTY AND STRUCTURES

- A. The Contractor shall, at his own expense, sustain in their places, and protect from direct or indirect injury, all pipes, tracks, walls, buildings, and other structures or property in the vicinity of his Work, whether above or below the ground. He shall at all time have a sufficient quantity of timber and plank, chains, ropes, etc., on the ground and shall use

them as necessary for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened.

- B. The Contractor shall take all risks attending the presence or proximity of pipes, poles, tracks, walls, buildings, and other structures and property, of every kind and description, in or over his Work, or in the vicinity of his Work, whether above or below the surface of the ground; and he shall be responsible for all damages and assume all expenses for direct or indirect injury, caused by his Work, to any of them, or to any person or property by reason of injury to them, whether such structures are or are not shown on the Drawings.
- C. The Contractor shall be responsible for the replacement of any property pins or monuments that are moved, removed, damaged or otherwise altered during the course of the Work.
- D. The accuracy of the replacement of any property pins or monuments that are moved, removed, damaged or otherwise altered during the course of the Work shall be certified by a registered surveyor of the state of Pennsylvania.

Any and all costs associated with the above shall be the responsibility of the Contractor and shall be included in his Total Bid Price.

- E. The Contractor shall be responsible for all Work until completion and final acceptance thereof. No payments will be allowed for damage to the Contractor's materials or equipment. Except as herein provided, damage to all Work, utilities, materials, equipment, and other properties, etc. shall be repaired to the satisfaction of the Owner at the Contractor's expense. The Contractor shall, at his own expense, restore to a condition similar to the condition that existed prior to the damage, any direct or indirect damage to public or private property caused by the Work or in consequence of any act or omission on the part of the Contractor, his employees, agents, or Subcontractors. Should any property require repair, replacement or rebuilding by the Owner as a result of damage due to fault or neglect on the part of the Contractor, the cost thereof will be deducted from any money due or to become due to the Contractor under this Contract; or the Owner may deduct from any money due the Contractor a sum sufficient to reimburse the owner of the property so damaged. When applicable, the Unit or Lump Sum Price set forth in the Contract shall be used.
- F. Any cause for damage to private property outside of the existing Owner's right-of-way/easement shall be borne by the Contractor.

1:19 PROTECTION AND SAFEGUARDS

- A. Contractor shall protect all trees, shrubs, lawns and landscaping from damage and shall provide such guards and covering as is necessary. Contractor shall take proper and necessary precautions to protect all public and private roads, and walks, in and near the area of the project. All damaged items shall be repaired or replaced at the Contractor's expense.

- B. It will be the responsibility of the Contractor at all times to protect all excavation, trenches, installations, structures, and all Work performed under his Contract from water damage of every kind, including damage by rainwater, or surface water, and the backing up of drains, rain conductors or sewers and to repair any such damage immediately and at his own expense.
- C. The Contractor shall at all times protect, maintain and support, in an entirely safe condition, for the usual service all surface, subsurface and overhead structures and their appurtenances which might be affected by the prosecution of his Work. Blasting is not allowed without written permission of the Owner/Engineer.
- D. Contractor shall provide for dust control as may be required for the proper protection and prosecution of the Work under the Contract.
- E. Contractor shall furnish, erect and maintain such barricades, fencing, railings, enclosures, guard lights, danger signals and warnings, and take such precautions in and around the area of the Work, as are necessary to insure the safety of the public prevent trespassing and to avoid damage or injury to all persons and property.
- F. All underground utilities, service lines, and other facilities uncovered or exposed by the operations under this Contract shall be protected by the Contractor. Services and utilities in and to existing buildings must not be interrupted without first obtaining the consent and approval of respective owners. General locations of utilities that are known to exist are indicated on the drawings. However, it is the responsibility of the Contractor to make his own investigation of utilities in the project area to ascertain their correct location and extent to which they will interfere with his Work. He shall protect and maintain existing active services in accordance with standard procedures or instructions from the owner of the utility. Should relocation of active utilities not shown on the drawings or included in the Specifications be necessary, the Contractor shall proceed in accordance with the regulations and wishes of the owner of the utility to be relocated.

1:20 CONTRACTOR TO PREPARE SITE

The Contractor shall do everything necessary to prepare the site for construction operations, including the demolition and removal of any portions of structures and obstacles located thereon at or below the elevation of the grade.

1:21 USE OF PRIVATE LAND

- A. The Owner will provide the right of the Contractor to enter upon the right-of-way for the prosecution of the Work. If additional area is required for storage of materials or equipment, the Contractor shall provide such space at his own expense.
- B. The Contractor shall confine his operations to the area within the existing Owner's right-of-way and easements of the roads and/or construction site as indicated on the Drawings. All additional land required for the erection of temporary construction facilities, storage of material, dumping of excavated material, together with the right of access thereto, shall be provided by the Contractor. No use of any private land will be

permitted until written permission from the owner of the land is furnished to the Engineer.

1:22 MAINTAINING PROJECT AREA/STORAGE YARD

The Contractor is required to maintain the Project area and his field office and storage yard in a neat and orderly fashion, and provide for the protection of the general public by a fence or other protective device. The Contractor shall remove from the site all surplus and discarded materials. At the conclusion of Work, all field office, temporary parking and storage yard areas shall be restored to the satisfaction of the Owner/Engineer and/or property owner, as applicable, to their pre-construction conditions, unless specified otherwise in the Contract Documents or authorized by the property owner.

1:23 CONSTRUCTION SIGNS

Subject to local regulations, the Contractor and his Subcontractors may erect temporary signs for purposes of identification and controlling traffic. The Contractor shall furnish, erect, and maintain such signs as may be required by safety regulations and as necessary to safeguard life and property.

1:24 OTHERS TO WORK ON SITE

The Contractor shall give every facility to the Owner or other corporations to lay and relay or repair any pipes or conduits within the area before backfilling. The Contractor shall arrange with the proper authorities for the relocation, and/or replacement, lowering, or raising of any underground pipes, conduits, manholes, manhole covers, access covers, etc., in the line of the Work. The cost of any such relocation, and/or replacement, lowering or raising of any underground pipes, conduits, manholes, manhole covers, access covers, etc. in the line of the Work shall be paid for by the Contractor.

1:25 CONSTRUCTION

The Work of construction shall be started at such points as may be directed or approved by the Engineer.

1:26 UTILITIES: LOCATION AND COORDINATION

It shall be the responsibility of the Contractor to exactly locate, as necessary, all existing utilities on the project site and to avoid all unnecessary conflicts therewith.

The Contractor shall cooperate with all utility companies involved in this project, and shall, within one (1) week after Notice to Proceed, provide each utility company with a copy of the approved project schedule. The Contractor shall be required to notify the affected utility company not less than three (3) nor more than ten (10) business days in advance of beginning excavation or demolition Work in any area of conflict.

The Contractor will be held responsible for all damage to utility facilities and/or drainage structures, caused by the Contractor, and such damage will be repaired at the expense of the Contractor in accordance with applicable utility specifications.

1:27 PROTECTION OF UTILITIES – PENNSYLVANIA ACT 287

It shall be the responsibility of the Contractor to comply with all requirements of the Pennsylvania One Call System (POCS), PA Act 287 of 1974, as amended by PA Act 121 of 2008.

1:28 INTERRUPTION OF EXISTING STORM SEWER FACILITIES

All existing pipe or culvert storm sewers, inlets, storm laterals, rainwater conductors, drainage structures, or storm water connections that are interrupted or disturbed during progress of the Work shall be adequately restored by the Contractor to the satisfaction of the Engineer and shall be part of the Total Bid Price.

The existence and location of said underground storm water facilities shall be investigated and verified in the field by the Contractor before starting Work.

1:29 INTERRUPTION OF EXISTING UTILITIES AND FACILITIES

All existing utilities and facilities that are interrupted or disturbed during progress of the Work shall be adequately restored by the Contractor to the satisfaction of the Engineer and shall be part of the Unit Price Bid per foot of pipe in place.

The existence and location of said underground utilities and facilities shall be investigated and verified in the field by the Contractor before starting Work.

1:30 UNSUITABLE MATERIAL

Defined as: Any earthen material containing vegetable or organic silt, topsoil, frozen materials, trees, stumps, certain manmade deposits or industrial waste, sludge or landfill, excess moisture or other undesirable materials.

Remove unsuitable material to its entire depth, unless directed otherwise by the Owner/Engineer, from all areas to be filled or excavated as well as those areas which are to receive pavements, and other surface improvements and remove from premises. The repair method will be determined by the Engineer. PA Class 4A geotextile fabric as minimum may be required.

1:31 RESTORATION OF EXISTING SURFACES AND FEATURES

A. The Contractor shall restore all surfaces and other features removed and/or damaged during the course of Work to original or better conditions as described in the Specifications, Appendices and/or shown on the Contract Drawings. Surfaces and features to be restored include, but shall not be limited to the following:

1. Topsoiling and seeding
2. Bituminous paving

3. Curbing, sidewalks, driveway aprons, handicap ramps and driveways
4. Fencing
5. Guide rail, railings
6. Signs

1:32 START OF WORK NOTIFICATION

Unless specifically directed otherwise, the Contractor shall notify the Owner and Engineer in writing a minimum of one (1) week prior to the start of Work.

1:33 CLEANING UP AFTER WORK

The Contractor shall be responsible for a clean job throughout the construction. Roads, service and parking areas shall be maintained on a daily basis. Cleaning up along the path of the Work shall be a continuous process throughout the entire construction period. The Contractor shall clean all storm inlets and manholes of aggregate, paving material, sediment, grits, trash and debris as directed by the Owner/Engineer, including construction material deposited in storm sewer pipes and culverts, to the satisfaction of the Owner/Engineer. The cost for daily cleanup of the project area and final cleaning of the storm sewer system shall be included in the Total Bid Price.

1:34 DAMAGE CLAIMS BY CONTRACTOR

Contractor agrees that if, by failure to perform his Work hereunder with due diligence, he shall delay another contractor having a contract on the project directly with the Owner, who shall suffer additional expense or damage resulting from such delay, the Owner shall not be a party to disputes or actions between contractors concerning such additional expenses or damages, and such disputes shall not be subject to arbitration.

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 – GENERAL

1:01 DESCRIPTION

- A. Contractor shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the work or to:
 - 1. Make the parts fit together properly.
 - 2. Uncover portions of the work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of contract documents.
 - 5. Provide routine penetrations of nonstructural surfaces for installation of electrical conduit.

1:02 RELATED REQUIREMENTS

- A. Summary of Work. Section 01010.
- B. Submittals. Section 01300.
- C. Earthwork. Division 2.

1:03 SUBMITTALS

- A. Submit a written request to Engineer well in advance of executing any cutting or alteration which affects:
 - 1. The work of the Owner or any separate Contractor.
 - 2. The structural value or integrity of any element of the project.
 - 3. The integrity of effectiveness of weather-exposed or moisture-resistant elements or systems.
 - 4. The efficiency, operational life, maintenance or safety of operational elements.

5. The visual qualities of sight-exposed elements.
- B. The request shall include:
1. Identification of the project.
 2. The reason for cutting, alteration or excavation.
 3. The effect of the work on the Owner or any separate Contractor, or on the structural or weatherproof integrity of the project.
 4. Written permission of any separate Contractor whose work will be affected.
 5. Description of the proposed work.
 - a. The scope of cutting, patching, alteration or excavation.
 - b. The trades who will execute the work.
 - c. Products proposed to be used.
 - d. The extent of refinishing to be done.
 6. Alternatives to cutting and patching.
 7. Cost proposal, when applicable.
- C. Should conditions of the work or the schedule indicate a change of products from the original installation, Contractor shall submit a request for substitution as specified in Section 01600, Material and Equipment.
- D. Submit a written notice to Engineer designating the date and the time the work will be uncovered.

PART 2 – PRODUCTS

Comply with specifications and standards for each specific product involved.

PART 3 – EXECUTION

3:01 INSPECTION

- A. Inspect existing conditions of the project, including elements subject to damage or to movement during cutting and patching.

- B. After uncovering work, inspect the conditions affecting the installation of products or performance of the work.
- C. Report unsatisfactory or questionable conditions in writing; do not proceed with the work until the Engineer has provided further instructions.

3:02 PREPARATION

- A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the work.
- B. Provide devices and methods to protect other portions of the project from damage.
- C. Provide protection from the elements for that portion of the project which may be exposed by cutting and patching work and maintain excavations free from water.

3:03 PERFORMANCE

- A. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surfaces to receive installation of repairs.
- B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- C. Employ the original installer or fabricator to perform cutting and patching for:
 - 1. Weather-exposed or moisture-resistant elements.
 - 2. Sight-exposed finished surfaces.
- D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- E. Restore work which has been cut or removed; install new products to provide completed work in accord with requirements of contract documents.
- F. Fit work airtight to conduit and other penetrations through surfaces.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 – GENERAL

1:01 SECTION INCLUDES

- A. Submittal procedures.
- B. Action on submittals.
- C. Construction progress schedules.
- D. Shop Drawings.
- E. Product data.
- F. Samples.
- G. Manufacturers' instructions.
- H. Manufacturers' certificates.
- I. Construction photographs.

1:02 RELATED REQUIREMENTS

- A. Schedule of Values. Section 01370.
- B. Material and Equipment. Section 01600.
- C. Close-out Submittals. Section 01700.

1:03 SUBMITTAL PROCEDURES

- A. Number each submittal. Number shall consist of the following parts, each separated by a dash:
 - 1. Five-digit Specification Section number, if applicable.
 - 2. Two-digit sequence number starting for each Specification Section with 01 and continuing with 02, 03, etc., for subsequent submittals with the same Specification Section number.

3. Use the fourth part of the number only for resubmittals. For the first resubmittal of a previous submittal, add -R1 to the previous number. For the second resubmittal, change to -R2, and so on.

As an example of the numbering process for Contract 1, the third submittal under Section 03300 would be numbered 1-03300-03 and the second resubmittal of this same submittal would be numbered 1-03300-03-R2.

- B. Identify Project, Contractor, Subcontractor, or supplier. Identify pertinent Drawing sheet and detail number(s) and letter(s), and Specification Section and Subsection numbers, as appropriate.
- C. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, all are in full accordance with the requirements of the Work and Contract Documents. Stamp shall have the following format:

Approved for Contract Requirements

The Contractor's signature below indicates that he has checked this Submittal with the Drawings, Specifications, and site conditions and found it to meet all requirements of same including dimensions.

RE: Project _____

Submittal Number _____

Drawing Sheet Number _____ Detail Number _____

Deviations from Contract Documents? No. _____ Yes _____
(letter(s) attached)

By _____
Signature (Contractor)

Contractor's Name _____

- D. Schedule submittals to expedite the Project, and deliver to Engineer at business address. Coordinate submission of related items.
- E. Submit letter which clearly and specifically identifies deviations from Contract Documents. Identify product or system limitations which may be detrimental to successful performance of the completed Work.

- F. Where deviations from Contract Documents may affect the Work of another Contractor, the Contractor making the submittal shall attach a letter from the other Contractor(s) stating that the deviation will either:
 - 1. Have no effect on his Work; or
 - 2. Have an effect on his Work and that the Contractor making the submittal has agreed to pay all extra costs associated with the deviation.
- G. Provide space for Contractor and Engineer review stamps.
- H. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- I. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- J. All submittals shall be completely legible.
- K. All submittals shall be entirely printed or in ink, not pencil.
- L. Neither facsimiles, nor copies from facsimiles, shall be submitted.

1:04 ACTION ON SUBMITTALS

- A. Engineer's Action: Where action and return is required or requested, Engineer will review each submittal, mark with the action taken, and return. Where submittal must be held for coordination, Contractor may be so advised by Engineer.
- B. Submittals returned with "APPROVED" action indicates that the information submitted was found to be in conformance with the design concept and in compliance with the requirements of the Contract Documents. The Contractor remains responsible for work-related errors, deviations, and discrepancies in the submittal, but may proceed with performance of the work covered by the submittal.
- C. Submittals returned with "APPROVED AS NOTED" action indicates that the information submitted was found to be in conformance with the design concept and in compliance with the requirements of the Contract Documents, provided the noted clarifications or corrections are incorporated in the submitted information for Record Document purposes. The Contractor remains responsible for work-related errors, deviations, and discrepancies in the submittal, but may proceed with performance of the work covered by the submittal. Resubmission of information is not required.

- D. Submittals returned with “RETURNED FOR CORRECTION” action indicate that: (1) information submitted is at least partially not in conformance with the design concept, (2) information submitted is at least partially not in compliance with the requirements of the Contract Documents, (3) submittal is incomplete and does not include all items required by the individual Specification Sections, or (4) certifications or computations required by the individual Specification Sections have not been included with the Shop Drawings and product data. Engineer will note the deficiencies or corrections required, and return the submittal to the Contractor. Performance of the work covered by the submittal shall not proceed until corrected information is submitted and approved
- E. Submittals returned with “NOT AS SPECIFIED” action indicates that the Engineer interprets the information submitted to be not in conformance with the design concept or not in compliance with the Contract Documents. This action may also indicate non-compliance with the Contractor’s responsibility to review information and submit notification of deviations and discrepancies for the Engineer’s review. Performance of the work shall not proceed until new information is submitted and approved.
- F. Review Action does not establish submitted information as a Contract Document, a Change Order, or authorization to deviate from the Contract Documents.

1:05 CONSTRUCTION SCHEDULES

- A. Submit initial construction schedule in PDF within 10 days after date of “NOTICE TO PROCEED”. Revise and resubmit as required.
- B. Submit revised schedules as required by Engineer, identifying changes since previous version.
- C. Submit a horizontal bar chart with separate line for each section of work, identifying first work day of each week.
- D. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities.
- E. Submit a narrative report with each updated construction schedule; highlight significant activities planned for the next month and, if the project is behind schedule, list the actions which are planned to return the work to the schedule.
- F. Indicate estimated percentage of completion for each item of work at each submission.

1:06 PROPOSED PRODUCT LIST

- A. Within 10 days after date of Notice to Proceed, submit in triplicate complete list of major products proposed for use, with name of manufacturer, trade name and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1:07 SHOP DRAWINGS

- A. Submit the number of opaque reproductions which Contractor requires, plus three (3) copies which will be retained by Engineer. Electronic submittals in PDF shall be acceptable if approved by Engineer.
- B. Submittals describing structural and mechanical items shall be drawn to scale.
- C. Data shall be explicit with regard to details of the products being furnished and complete enough to enable the Engineer to readily determine that the products submitted conform to the requirements of the Specifications. If a submittal indicates more than one (1) style, size, capacity, etc., of a product on a sheet, the Contractor shall clearly indicate by specifically marking exactly which product type is being submitted for approval. Failure to indicate exactly which product is being submitted shall be cause for rejection of the submittal. Catalog data shall bear the name of manufacturer of the product.
- D. All Shop Drawings (and product data) covering related items of equipment or material or integrated systems of equipment or material shall be submitted at the same time in order that their integrated use can be adequately reviewed. No partial submissions will be considered.

1:08 PRODUCT DATA

- A. Submit the number of copies which the Contractor requires, plus three (3) copies which will be retained by the Engineer.
- B. Mark each copy to identify applicable products, models, options and other data. Delete inapplicable portions or use arrows to indicate applicable portions. Supplement manufacturers' standard data to provide information applicable to this project.
- C. All product data (and shop drawings) covering related items of equipment or material or integrated systems of equipment or material shall be submitted at the same time in order that their integrated use can be adequately reviewed. No partial submissions will be considered.

1:09 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures and patterns for Engineer's or Owner's selection.
- C. Include identification on each sample, with full product information.
- D. Large, bulky samples may be submitted to the Resident Project Representative at the project site. Whenever a sample is submitted at the project site, immediately notify the Engineer of this submittal in writing.

1:10 MANUFACTURER'S INSTRUCTIONS

- A. Submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing, and operations and maintenance in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and contract documents.

1:11 MANUFACTURER'S CERTIFICATES

- A. When specified in individual Specification Sections, submit manufacturers' certificates in quantities specified for Product Data, to Engineer.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.
- D. When Supplementary Conditions specify certain regulatory restrictions concerning origin of materials (for example, that any steel used on the Project must be a product of the United States), submit a certificate from equipment or material manufacturer that products supplied to the Contractor are in conformity with the regulatory requirements.

PART 2 - PRODUCTS

NOT APPLICABLE TO THIS SECTION

PART 3 – EXECUTION

3:01 SUBMITTAL SCHEDULE

- A. Within 10 days of the effective date of Notice to Proceed, submit a schedule showing the date by which each submittal will be made. Allow at least 15 days for review and approval of each submittal. Schedule submittals so that approved submittals will be in the Contractor's hands before the work is scheduled to be done.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 – GENERAL

1:01 INTENT

Within 15 days after award of the Contract, the Contractor shall prepare and submit to the Engineer a proposed construction schedule for the work, with subschedules of related activities which are essential to its progress.

1:02 RELATED REQUIREMENTS

- A. Summary of the Work. Section 01010.
- B. Submittals. Section 01300.
- C. Shop Drawings, Product Data and Samples. Section 01340.

1:03 FORM OF SCHEDULES

- A. Prepare schedule in the form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation.
 - 2. Horizontal Time Scale. Identify first work day of each week
 - 3. Scale and Spacing. To allow space for notations and future revisions.

1:04 CONTENT OF SCHEDULES

- A. Construction Schedule.
 - 1. Show complete sequence of construction by activity.
 - 2. Show dates of beginning and completion of each major element of construction. Specifically list:
 - 3. Show projected percentages of completion for each item, as of the first day of each month.

4. Indicate the critical path for completion of the entire project.
- B. Schedule for Submittals of Shop Drawings, Product Data and Samples. Show:
1. The dates for Contractor's submittals.
 2. The dates submittals will be required for Owner-furnished products.
 3. The dates reviewed submittals will be required back from the Engineer.
- C. Products Delivery Schedule. Show delivery dates for:
1. Products furnished by Owner, Section 01010.
- D. Provide subschedules to define critical portions of prime schedules.

1:05 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule.
1. Major changes in scope.
 2. Activities modified since previous submission.
 3. Revised projections in progress and completion.
 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
1. Problem areas, anticipated delays and the impact on schedule.
 2. Corrective action that will be taken by the Contractor to get the project back on schedule. This item is required whenever the progress of the job is behind the original progress schedule.
 3. The effect of changes on schedules or on other prime contractors.

1:06 SUBMISSIONS

- A. Submit initial schedules within 15 days after award of contract.
1. Engineer will review schedules and return review copy within 10 days after receipt.

2. If required, resubmit within 7 days after return of review copy.
- B. Submit revised progress schedules with each application for payment.
- C. If size is greater than 11 x 17 inches, submit one reproducible transparency and two opaque reproductions; otherwise, submit two copies.

1:07 DISTRIBUTION

- A. Distribute copies of reviewed documents to concerned parties.
- B. Instruct recipients to report promptly to Contractor, in writing, any problems anticipated by the projections shown in the schedules.

PART - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01370

SCHEDULE OF VALUES AND APPLICATIONS FOR PAYMENT

PART 1 – GENERAL

1:01 SECTION INCLUDES

- A. Schedule of Values.
- B. Application for Payment.
- C. Payment for Tests and Inspections.

1:02 SCHEDULE OF VALUES

- A. Paragraph 14.01 of the General Conditions requires submission of a Schedule of Values for lump sum contracts. Prepare this Schedule as follows:
 - 1. Use format that can later be used as Application for Payment.
 - 2. Set up the following as separate line items:
 - a) Contract bonds and insurance.
 - b) Maintenance and final preparation of Record Documents.
 - 3. Use Table of Contents for Divisions 2 through 28 to establish line items for Schedule of Values. Provide values for, at least, every Section in Divisions 2 through 28.
 - 4. When a Section covers several different but related items, provide a value for each separate item. For example, if a pump section covers several different sizes of the same type pump, provide a value for each size pump.
 - 5. Set up each unit price item as a separate line item at the extended price amount shown on the Bid Form.
 - 6. Include within each line item a directly proportional amount of Contractor's overhead and profit. Total of all items on Schedule of Values shall equal the Contract Price.

7. Schedule shall be balanced, and will not be used until it is accepted by the Engineer.

1:03 APPLICATIONS FOR PAYMENT

- A. Submit three (3) copies of Application for Payment at times specified in Paragraph 14.02 of the General Conditions.
- B. Submit Application for Payment on form which has been used for the Schedule of Values and accepted by the Engineer.

1:04 PAYMENT FOR TESTS AND INSPECTIONS

- A. Include the costs of shop tests and shop inspections in the price of the manufactured Products, and no separate or extra payment will be made for such tests and inspections.
- B. Contractor shall employ and pay for the services of an independent firm(s) to perform laboratory and field testing and inspection as required in the various Specification Sections. Obtain acceptance of the proposed testing and inspection forms from Engineer. Cost of such tests and inspections shall be included in the Bid prices and separate or extra payment will be made.

PART 2 – PRODUCTS

NOT APPLICABLE TO THIS SECTION

PART 3 – EXECUTION

NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 – GENERAL

1:01 RELATED REQUIREMENTS

- A. Inspections and Tests Required by Regulatory Agencies. The responsibility for compliance lies with the Contractor. See General Conditions.
- B. Specific Product Testing. Tests to be performed by an independent testing laboratory are described in the various specification sections.

1:02 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Exercise quality control over suppliers, manufacturers, products, services, site conditions and workmanship to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with contract documents, request clarification from Engineer before proceeding.
- C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
- D. Perform Work by persons qualified to produce workmanship of specified quality.
- E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1:03 REFERENCE STANDARDS

- A. Conform to reference standard by date of issue current on date of Contract Documents.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. The contractual relationship of the parties to the contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

- D. Abbreviations for the various reference standard organizations, which may be cited in these Specifications, are as follows:

<u>Abbreviation</u>	<u>Organization</u>
AA	Aluminum Association
AASHTO	American Assoc. of State Highway and Transportation Officials
ACI	American Concrete Institute
ACS	American Chemical Society
AFBMA	Anti-Friction Bearing Manufacturers Association
AGA	American Gas Association
AGC	Associated General Contractors of America
AGMA	American Gear Manufacturers Association
AHDGA	American Hot Dip Galvanizers Association
AI	Asphalt Institute
AIA	American Institute of Architects
AICE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
ISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
APA	American Plywood Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
BIA	Brick Institute of America
CBRA	Copper and Brass Research Association
CLFMI	Chain Link Fence Manufacturer's Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard (U.S. Dept. of Commerce)
DEP	Pennsylvania Department of Environmental Protection
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EEI	Edison Electric Institute
EJCDC	Engineers' Joint Contract Documents Committee
EPA	U.S. Environmental Protection Agency
FM	Factory Mutual System
FTI	Facing Tile Institute
FS	Federal Specifications
IEEE	Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association

<u>Abbreviation</u>	<u>Organization</u>
MBE	Minority Business Enterprise
MBMA	Metal Building Manufacturers Association
MIL	Military Specification
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
NAAMM	National Association of Architectural Metal Manufacturers
NBFU	National Bureau of Fire Underwriters
NBS	National Bureau of Standards
NCPI	National Clay Pipe Institute
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OFCCP	Office of Federal Contracts Compliance Program
OSHA	Occupational Safety and Health Act of 1970
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PennDOT	Pennsylvania Department of Transportation
SAE	Society of Automotive Engineers
SCPI	Structural Clay Products Institute
SDI	Steel Deck Institute
SFPA	Southern Forest Products Association
SIGMA	Sealed Insulating Glass Manufacturer Association
SJI	Steel Joist Institute
SPIB	Southern Pine Inspection Bureau
SMACNA	Sheet Metal and Air Conditioning National Association
SMSA	Standard Metropolitan Statistical Area
SSPC	Steel Structures Painting Council
TCA	Tile Council of America, Inc.
TEMA	Tabular Exchanger Manufacturers Association
UL	Underwriters' Laboratories, Inc.
USGS	United States Geological Survey

1:04 FIELD SAMPLES

- A. Install field samples at the site as required by individual specifications sections for review.
- B. Acceptable samples represent a quality level for the Work.

- C. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Engineer.

1:05 TESTING LABORATORY SERVICES

- A. Contractor shall retain the services of an independent qualified firm(s), approved by the Engineer, to perform inspection and testing. Each such firm shall have a documented favorable record for skill and experience in the type of Work it proposes to do for this project.
- B. The independent firm will perform inspections, tests and other services specified in individual specification sections and as required by the Engineer.
- C. Reports will be submitted by the independent firm to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or noncompliance with contract documents. Reports will be submitted to Engineer within 48 hours after completion of test.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
 - 1. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. All specified testing shall be at the Contractor's expense.
- F. Retesting required because of nonconformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor.

1:06 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions; conditions of surfaces and installation; quality of workmanship; start-up of equipment; testing, adjusting and balancing of equipment; and installation as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions. Submit report in duplicate within 10 days of observation.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1:01 INTENT

Where applicable, the facilities and controls specified in this section are considered minimum for the project. The Contractor may provide additional facilities and controls which he considers necessary for the proper execution of the work and to meet his responsibilities for protection of persons and property.

1:02 REGULATORY REQUIREMENTS

- A. Comply with applicable laws and regulations of authorities having jurisdiction, including but not limited to building codes, health and safety regulations, utility company regulations, and environmental protection regulations.
- B. Provide electrical equipment which is UL listed.

1:03 RESPONSIBILITIES UNDER SEPARATE CONTRACTS

- A. Construction Coordinator (General and Electrical Contractor) shall, as specified in the Supplementary Conditions, be responsible for all Construction Facilities and Temporary Controls.
- B. The Contractor shall be responsible to provide the electric service required to complete the Work at their own expense.

1:04 UTILITIES

- A. Underground Utilities. At least 3 days prior to commencing any underground excavation, notify the One Call Notification Center (OCNC), (800) 242-1776. Utility companies will be notified by the OCNC and will mark the location of underground utilities on the site. The time of notification and the serial number assigned by the OCNC shall become part of the project records.

1:05 CONTROLS

A. Water Control

1. At all times during the construction of Work of this Project, maintain the flow of storm water, naturally occurring water, and wastewater in existing facilities and channels affected by the Work.
2. Contractor assumes risk from flood damages done to the Work in progress or to Work completed. Make repairs and replacements to the satisfaction of the Engineer.
3. Contractor assumes responsibility for damages to property caused by flooding due to blocking or restriction of storm water passages, natural waterways, wastewater facilities.
4. Do not at any time permit wastewater to flow into nearby waterways or to flow on surface areas.
5. See other water control requirements under "Erosion and Sediment Control".

1:06 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris and rubbish on a daily basis and place such materials in a suitable container. Maintain site in a clean and orderly condition.
- B. Remove waste materials, debris and rubbish from site weekly and dispose of same off-site in a manner consistent with state and local laws and ordinances.

1:07 EXTERIOR MUD AND DUST, ETC.

Clean mud, dust, and construction debris from any public roads and streets used by Contractor's vehicles and construction equipment. Such cleaning will be required on at least a daily basis.

1:08 SAFETY EQUIPMENT

- A. First Aid Supplies: Comply with governing regulations.
- B. Fire Extinguishers

1. Provide truck/equipment-mounted fire extinguishers on-site.
2. Comply with NFPA 10 latest edition and 241 latest edition for classification, extinguishing agent, and size required by location and class of fire exposure.

1:09 PARKING

If parking is not permitted on the adjacent streets, provide adequate stable, mud-free off-street parking for the maximum number of anticipated employees on the site at any given time, including additional spaces for Engineer, Owner, suppliers, etc.

1:10 SECURITY

Provide security and facilities to protect the Work from unauthorized entry, vandalism or theft.

1:11 BARRIERS

- A. Provide barriers to prevent unauthorized entry to the construction area and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide protection of vegetation designated to remain undisturbed. Replace damaged vegetation.
- C. Protect vehicular traffic, stored products, structures and other site features from damage.

1:12 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual Specification sections.
- B. Provide temporary and removable protection of installed Work. Control activity in immediate work area to minimize damage.

1:13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.

- C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1:14 ADDITIONAL REQUIREMENTS

- A. Traffic Control. Any traffic control that may be required will be provided by the Contractor in accordance with PennDOT Publication 213M. All traffic control measures will be incidental to the project.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 01505

MOBILIZATION/DEMOBILIZATION

PART 1 – GENERAL

1:01 RELATED DOCUMENTS

All Drawings and bid documents apply to this Section.

1:02 SUMMARY

This Work shall consist of the assembling/disassembling and setting up/tearing down for the Project, the Contractor's necessary general plant, including field office, shops, plants, storage areas, project sign, sanitary and any other facilities, as required by the specifications and special requirements of the Contract, as well as by local or State laws and regulations. The determination of the adequacy of the Contractor's facilities, except as noted above, shall be made by the Contractor. The cost of photo documentation, the required insurance and bonds and/or other initial expenses required for the start of Work shall be included in this item.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

1:01 The Contractor shall furnish all materials and furnishings required for this item. These materials and furnishings will not be considered as a part of the various items of the completed Contract.

The Contractor shall provide all tools, equipment, materials, labor and work for the construction and furnishings of the required facilities and services. All Work under this item shall be performed in a safe and workmanlike manner.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1:01 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

1:02 RELATED SECTIONS

- A. Instructions to Bidders: Article 11, Substitute and “Or Equal” Items
- B. Summary of Work - Section 01010.
- C. Submittals - Section 01300.
- D. Cleaning and Adjusting - Section 01710.

1:03 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. Provide interchangeable components of the same manufacturer, for similar components.

1:04 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.

- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1:05 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate-controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Provide mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1:06 PRODUCTION OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for "Approved Equal": Submit a request for substitution for any manufacturer not named.

1:07 SUBSTITUTIONS

- A. Contractor shall follow provisions of General Condition Paragraph 6.05 as amended by Supplementary Condition Paragraph SC-6.05 for any and all desired substitutions. Contractor shall use the "Substitution Request Form" provided at the end of this Section for any and all requests.
- B. Contractor's Representation. A request for a substitution constitutes a representation that Contractor:
1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.
 2. Will provide the same warranties or bonds for the substitution as for the product specified.
 3. Will coordinate the installation of an accepted substitution into the work, and make such other changes as may be required to make the work complete in all respects.
 4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SUBSTITUTION REQUEST

TO: _____

PROJECT: _____

SPECIFIED ITEM:

Section	Page	Paragraph	Description

The undersigned request consideration of the following:

PROPOSED

SUBSTITUTION: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

Fill in blanks below:

A. Does the substitution affect dimensions shown on Drawings? _____ Yes _____ No

B. Will the undersigned pay for changes to the building design, including engineering and investigation and redesign which may be necessitated by the requested substitution? _____ Yes _____ No

C. What effect does substitution have on other trades and on construction schedule?

D. Differences between proposed substitution and specified item?

E. Manufacturer's guarantees of the proposed and specified items are:

_____ Same _____ Different (explain on attachment)

F. Use subject to any license fee or royalty? Yes No

G. Adjustment in the contract sum due to substitution: \$ _____

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Signature: _____

For use by the A/E

Firm: _____

☐ Approved☐ Approved as noted

Address _____

☐ Not Approved☐ Received too late

By _____

Date _____

Date _____

Telephone _____

Remarks _____

Attachments

SECTION 01650

STARTING OF SYSTEMS

PART 1 – GENERAL

1:01 SECTION INCLUDES

- A. Starting systems.
- B. Demonstration and instructions.
- C. Testing, adjusting, and balancing.

1:02 RELATED SECTIONS

- A. Quality Control - Section 01400
- B. Contract Closeout - Section 01700

1:03 STARTING SYSTEMS

- A. Contractor shall coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer seven (7) days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative, and Contractors' personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

- H. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

1:04 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel at least two weeks prior to date of Substantial Completion.
- B. Demonstrate Project equipment at the project site by a qualified manufacturers' representative who is knowledgeable about the Project and equipment.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at equipment location.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

1:05 TESTING, ADJUSTING, AND BALANCING

- A. Contractor will conduct and pay for services of an independent firm to perform testing, adjusting and balancing.
- B. Reports will be submitted by the Contractor to the Engineer indicating observations and results of tests and indicating compliance or non-compliance with specified requirements and with the requirements of the Contract Documents.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 – GENERAL

1:01 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Operation and maintenance data.
- F. Warranties.
- G. Spare parts and maintenance materials.

1:02 RELATED SECTIONS

- A. General and Supplementary Conditions.
- B. Starting of Systems - Section 01650.

1:03 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- D. Owner will occupy all portions of the building as specified.

1:04 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
- C. Clean equipment and fixtures.
- D. Replace filters of operating equipment.
- E. Clean debris from work area, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1:05 ADJUSTING

Adjust operating Products and equipment to ensure smooth and unhindered operation.

1:06 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
 - 1. Contract Drawings: As a condition of final payment, each Contractor, during construction shall maintain one record set of contract drawings and shall record on this set, in red pencil or crayon, all construction deviations from the original. Record final installed locations of conduit, equipment sizes, locations of underground lines by depth from finished grades and offset distances in feet and inches to surface improvements such as building, curbs, edge of walks and other pertinent details. At the completion of the work, each Contractor shall forward these marked prints to the Engineer. Compliance with this requirement is a prerequisite for approval of final payment to the Contractor.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.

5. Reviewed shop drawings, product data, and samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and Modifications.
- E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 1. Measured depths of foundations in relation to finish main floor datum.
 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 4. Field changes of dimension and detail.
 5. Details not on original Contract Drawings.
- F. Delete Engineer title block and seal from all documents.
- G. Submit documents to Engineer with claim for final Application for Payment.

1:07 OPERATION AND MAINTENANCE DATA

- A. Submit five sets prior to final inspection, bound in 8-1/2 x 11 inch text pages, 3-ring binders with durable plastic covers.
- B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below, with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents:
 - 1. Prepare a Table of Contents for each volume, with each Product or system description identified, typed on 24-pound white paper.
 - 2. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - 3. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
 - 4. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.
- E. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with Engineer comments. Revise content of documents as required prior to final submittal.
- F. Submit final volumes revised, within ten days after final inspection.

1:08 WARRANTIES

- A. Provide duplicate notarized copies.
- B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in 3-ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1:09 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 01710

CLEANING AND ADJUSTING

PART 1 – GENERAL

1:01 RESPONSIBILITY

- A. Each Contractor is responsible for cleaning and adjusting their own work. If the Contractor(s) fail to clean and adjust the work, the Owner may do so and charge the resulting costs to the appropriate Contractor.
- B. Detailed cleaning and adjusting requirements for specific work are specified in sections pertaining to that work.

1:02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Fire Protection. Store volatile waste in covered metal containers and remove from premises daily.
- B. Pollution Control. Conduct cleaning and disposal operations in compliance with local ordinances and antipollution laws.
 - 1. Burning or burying of rubbish and materials on the project site is not permitted.
 - 2. Disposal of volatile fluid wastes and other chemical wastes in storm or sanitary sewer systems or into streams or waterways is not permitted.
- C. Safety Standards. Maintain the project in accordance with insurance and safety standards.

PART 2 – PRODUCTS

2:01 MATERIALS

Use only cleaning materials approved by the manufacturer of the surface to be cleaned. Employ cleaning materials in the manner recommended by the cleaning material manufacturer.

PART 3 – EXECUTION

3:01 DURING CONSTRUCTION

- A. Oversee cleaning and ensure that the premises are maintained free from accumulations of waste material and rubbish. Do not allow waste materials, rubbish and debris to accumulate and become unsightly or create a hazard. Provide containers and locate on site for collection of waste material, rubbish and debris.
- B. At reasonable intervals during progress of the work, collect and disposal of waste material, rubbish and debris. Handle waste in a controlled manner; do not drop or throw materials from heights.
- C. Remove waste materials, rubbish and debris from the site and legally dispose at public or private dumping areas off the project site.

3:02 FINAL CLEANING AND ADJUSTING

- A. Use experienced workmen or professional cleaners for final cleaning.
- B. Remove grease, dust, dirt, stains, paint, oil, labels, fingerprints and other foreign materials from interior and exterior surfaces. Repair, patch and touch-up marred surfaces to match adjacent finishes.
- C. Broom clean paved surfaces; rake clean other surfaces of grounds.
- D. If installed features of the work fail to operate or operate improperly, make the necessary adjustments to prevent damage and ensure proper operation. Remove and repair or replace adjusted items if necessary for proper adjustment.
- E. Remove all waste material and rubbish from the project area, as well as all tools, construction equipment, machinery, surplus materials and temporary facilities.
- F. Immediately prior to acceptance, conduct a final inspection of exposed interior and exterior surfaces to verify that the work is properly cleaned. Maintain cleaning until the premises are occupied by the Owner.

3:03 ADJACENT AREAS

To the Engineer's satisfaction, clean or repair adjacent areas affected by the construction. Remove dust and debris in the adjacent area. Repair, patch and touch-up marred surfaces to match adjacent finishes.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

Prepare and maintain record documents for the project to reflect accurately the construction as built. Documents must be submitted at work completion as a condition of final acceptance.

1:01 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintain at the job site, one copy of the following as Project Record Documents:
 - 1. Contract drawings.
 - 2. Project Manual.
 - 3. Addenda.
 - 4. Reviewed shop drawings.
 - 5. Approved samples.
 - 6. Change orders and field orders.
 - 7. Field test records.
 - 8. Correspondence.
- B. Store record documents in an approved location apart from documents used for construction. Do not use record documents for construction purposes. Provide files and racks for orderly storage. Maintain documents in clean, dry, legible condition. Make documents and samples available at all times for inspection by the Engineer.

1:02 MARKING DEVICES

Mark all changes legibly in a contrasting color.

1:03 RECORDING

- A. Keep record documents current. Do not permanently conceal any work until required information has been recorded.

- B. Label each document "PROJECT RECORD" in neat, large, printed letter. Legibly mark contract drawings to record actual construction, showing:
1. Depths of various elements of foundation in relation to finished floor.
 2. Horizontal and vertical location of underground and underslab utilities and appurtenances referenced to permanent surface improvements.
 3. Location of internal utilities and appurtenances referenced to permanent surface improvements.
 4. Field changes of dimension and detail.
 5. Changes made by change order or field order.
 6. Details not on original contract drawings.
- C. Legibly mark specifications and addenda to record:
1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
 2. Changes made by change order or field order.
 3. Other matters not originally specified.
- D. Legibly annotate the following shop drawings to record changes made after review:
1. Project Record Copy
 2. Engineers/Owners Copy
- E. Delete Engineer's seals from record documents.

1:04 SUBMITTAL

- A. At project completion, submit record documents as required in Section 01300. Place all letter-sized material in a 3-ring binder, neatly indexed. Bind contract drawings and shop drawings in rolls of convenient size for each of handling.
- B. Accompany the submittal with a transmittal letter in duplicate, containing:
1. Date.

2. Project title and number.
3. Contractor's name and address.
4. Title and number of each record document.
5. Certification that each document as submitted is complete and accurate.
6. Signature of Contractor.

PART 2 – PRODUCTS

NOT USED.

PART 3 – EXECUTION

NOT USED.

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 – GENERAL

1:01 RELATED REQUIREMENTS

- A. General Warranty of Construction. Conditions of the Contract.
- B. Contract Closeout. Section 01700.
- C. Warranties and Bonds and Duration Required for Specific Products in Sections. Project Checklist in Section 01300.

1:02 SUBMITTALS

- A. Requirements
 - 1. Assemble two original signed copies of all warranties, bonds, and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors.
 - 2. Provide complete information for each item, including, but not limited to, the following information:
 - a. Product or work item.
 - b. Firm, with name of principal, address and telephone number.
 - c. Scope.
 - d. Date of beginning and duration of warranty, bond, or service and maintenance contract.
 - e. Proper procedure for Owner's personnel in case of failure.
 - f. Instances which might affect validity of warranty or bond.
 - 3. Provide a table of contents, neatly typed, in orderly sequence.
 - 4. Place a copy of the equipment warranties in the Operations and Maintenance Manual for the equipment.

B. Form

1. Prepare submittals in duplicate packets bound in 3-ring binders of commercial quality with cleanable plastic covers.
2. All materials should be 8-1/2" x 11" (larger sheets shall be folded to fit binders), punches to fit the 3-ring binders.
3. Include a cover sheet identifying each packet with the title: "WARRANTIES AND BOND". Also list the project title and name of Contractor.

C. Time of Submittals.

1. For equipment or component parts of equipment put into service during progress of construction, submit documents within 10 days after inspection and acceptance.
2. Make submittals within 10 days after date of substantial completion, and prior to final request for payment. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within 10 days after acceptance, listing the date of acceptance as the start of the warranty period.

D. Required Submittals. Submit warranties, bonds, service and maintenance contracts as specified.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.

- B. Related Requirements:

- 1. Division 01 Section "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner as directed.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. Loose furniture and equipment.
 - b. Administrative supplies and materials
 - c. Stored materials.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or preconstruction videotapes.
 - 1. Comply with requirements specified in Division 01 Section "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Division 01 Section "Construction Waste Management and Disposal."

B. Removed and Salvaged Items:

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 designated by Owner.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Foundations.
 - 2. Slabs-on-grade.
 - 3. Retaining walls
 - 4. Stairs
- B. Related Sections:
 - 1. Division 31 Section "Earth Moving" for drainage fill under slabs-on-grade.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Architect.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, testing agency.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Waterstops.
 - 6. Curing compounds.
 - 7. Floor and slab treatments.
 - 8. Bonding agents.
 - 9. Adhesives.
 - 10. Vapor retarders.
 - 11. Semirigid joint filler.
 - 12. Joint-filler strips.
 - 13. Repair materials.
- D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
 - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5 and Section 7, "Lightweight Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
 3. Furnish ties with integral water-barrier plates to walls indicated to receive damp-proofing or waterproofing.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I, Type II, Type I/II, Type III, Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
 - 2. Blended Hydraulic Cement: ASTM C 595, Type IS, portland blast-furnace slag cement.
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 - 1. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those

permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 3. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
- C. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals - Building Systems; Rheocrete 222+.
 - b. Cortec Corporation; MCI- 2000.
 - c. Grace Construction Products, W. R. Grace & Co.; DCI-S.
 - d. Sika Corporation; FerroGard 901.
 - e. Sika Corporation; Sika Fiber MS.

2.6 VAPOR RETARDERS

- A. Sheet Vapor Retarder with maximum perm rating of .01 perms. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Raven Industries Inc.; VaporBlock 15.
 - b. Reef Industries, Inc.; Griffolyn Type-65.
 - c. Stego Industries, LLC; Stego Wrap, 15 mil Class A.
 - d. ISI Building Products; Viper Vaporcheck II 15-mil Class A Vapor Barrier.

2.7 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 5700 psi (39 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlay: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.8 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash: 25 percent.
 2. Combined Fly Ash and Pozzolan: 25 percent.
 3. Ground Granulated Blast-Furnace Slag: 50 percent.
 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
 5. Silica Fume: 10 percent.
 6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
 7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to [0.06] percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing or high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Foundation Walls: Proportion normal-weight concrete mixture as follows:
 1. Minimum Compressive Strength: 4000 psi (20.7 MPa) at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.40.
3. Slump Limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm) nominal maximum aggregate size.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
2. Minimum Cementitious Materials Content: 470 lb/cu. yd. (279 kg/cu. m).
3. Slump Limit: 4 inches (100 mm, plus or minus 1 inch (25 mm).
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm) nominal maximum aggregate size.
6. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.10 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
 2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.

- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be

damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

- A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and reshoring.
1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.6 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Hot-Weather Placement: Comply with ACI 301 and as follows:
 1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water

equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 1. Apply a trowel finish to surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
 - b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
 - c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
 - d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.
 3. Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm).

3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.11 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least six month(s). Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.
 - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 - 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 - 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - 6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original

concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
 - F. Repair materials and installation not specified above may be used, subject to Architect's approval.

END OF SECTION 033000

SECTION 033050 – BOLLARDS

PART 1 – GENERAL

1.01 Description

- A. This work is to provide all labor and materials for the furnishing, installation, priming and painting of a 6" O.D. Steel pipe Bollard filled with concrete and painted exterior of post with 2 coats of enamel as detailed on the Plans.

PART 2 - PRODUCTS

2.01 Materials

- A. Steel Pipe. ASTM A-53, standard weight (Schedule 40), unless otherwise indicated.
- B. Gray-Iron Castings. ASTM A-48, Class 30.
- C. Malleable-Iron Castings. ASTM A-47, Grade 32510 (ASTM A-47M, Grade 22010).
- D. Welding Rods and Bare Electrodes: Select according to AWS Specifications for the metal alloy to be welded.
- E. Galvanizing Repair Paint. High-zinc to dust content paint for regalvanizing weld in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight and complying with DOD-P-21035 or SSPC-Paint 20.
- F. Paint for Zinc Coated Metal. Provide block fillers, primers, undercoats and finish coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience. Provide manufacturer's best quality paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable. Provide the following finish over exterior zinc-coated (galvanized) metal surfaces:
 - 1. One coat galvanized metal primer, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils. Two finish coats low luster, exterior, urethane paint applied at the spreading rate.
 - 2. Paint color to be yellow, 2 coats of enamel.
- G. Fasteners. Provide plated fasteners complying with ASTM B-633, Class Fe/Zn 25 for electro deposited zinc coating, for exterior use. Select fasteners for the type, grade and class required.
- H. Grout. Non-shrink, non-metallic grout, factory packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- I. Concrete, Class AA.

PART 3 - EXECUTION

3.01 Submittals

- A. Product Data: Submit for the bollard specified, including details of construction relative to materials, dimensions of individual components, profiles, paint color sample and finishes.
- B. Shop Drawings:
 - 1. Show fabrication and erection of bollards. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, layout, reinforcement, accessories, and installation details.

3.02 Installation

- A. Fabricate bollards from Schedule 40 steel pipe unless otherwise noted. The top of the bollard shall have concrete rounded over.
 - 1. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
 - 2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
 - 3. Shear and punch metals cleanly and accurately. Remove burrs. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated.
 - 4. Weld seams continuously to comply with the following:
 - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - b. Obtain fusion without undercut or overlap.
 - c. Remove welding flux immediately.
 - d. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
 - 5. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners whenever possible.
 - 6. Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Use connections that maintain structural value of joined pieces.
 - 7. Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Use connections that maintain structural value of joined pieces.
 - 8. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

- B. Set sleeves in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entry.
- C. Set bollards accurately in location, alignment and elevation; with edges and surfaces level, plumb, true and free of rack.
- D. After bollards have been inserted into sleeves, fill annular space between pole and solidly with non-shrink grout, mixed and placed to comply with grout manufacturer's directions.
- E. Clean, prime and paint bollard prior to acceptance.

END OF SECTION 033050

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Mortar and grout.
 - 3. Masonry joint reinforcement.
 - 4. Ties and anchors.
 - 5. Miscellaneous masonry accessories.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - 2. Cementitious materials. Include brand, type, and name of manufacturer.
 - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 4. Grout mixes. Include description of type and proportions of ingredients.
 - 5. Joint reinforcement.
 - 6. Anchors, ties, and metal accessories.
- B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1.5 QUALITY ASSURANCE

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.

2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide bullnose units for outside corners unless otherwise indicated.
- B. Interior CMUs: ASTM C 90.
 1. Density Classification: Light weight unless otherwise indicated.
 2. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
 3. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
 - a. Premium grade face for all exposed and painted CMU locations. Block filler will be required to fill any voids or pot marks found in exposed CMU prior to Paint application. Contactor shall notify Architect prior to painting for wall inspections.

2.3 CONCRETE AND MASONRY LINTELS

- A. General: Provide one of the following:
- B. Concrete Lintels: ASTM C 1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than CMUs.

- C. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
- E. Aggregate for Grout: ASTM C 404.
- F. Water: Potable.

2.5 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
 - 2. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.
 - 3. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
 - 4. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
 - 1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.109-inch- (2.78-mm-) thick, stainless-steel sheet.
 - a. 0.108-inch- (2.74-mm-) thick, galvanized sheet may be used at interior walls unless otherwise indicated.

2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch (25 mm) of masonry face, made from 0.25-inch- (6.35-mm-)diameter, stainless-steel wire. Mill-galvanized wire may be used at interior walls unless otherwise indicated.
3. Corrugated Metal Ties: Metal strips not less than 7/8 inch (22 mm) wide with corrugations having a wavelength of 0.3 to 0.5 inch (7.6 to 12.7 mm) and an amplitude of 0.06 to 0.10 inch (1.5 to 2.5 mm) made from 0.109-inch- (2.78-mm-) thick, stainless-steel sheet with dovetail tabs for inserting into dovetail slots in concrete and sized to extend to within 1 inch (25 mm) of masonry face.
 - a. 01.08-inch- (2.74-mm-) thick, galvanized sheet may be used at interior walls unless otherwise indicated.
- C. Rigid Anchors: Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated bent to configuration indicated.
 1. Corrosion Protection: Epoxy coating 0.020 inch (0.51 mm) thick

2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

2.7 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 1. Do not use calcium chloride in mortar or grout.
 2. Use portland cement-lime mortar unless otherwise indicated.
 3. For exterior masonry, use portland cement-lime mortar.
 4. For reinforced masonry, use portland cement-lime mortar.
 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
1. For masonry below grade or in contact with earth, use Type M
 2. For reinforced masonry, use Type S
 3. For mortar parge coats, use Type S or Type N.
 4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type S.
 5. For interior non-load-bearing partitions, Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
 3. Provide grout with a slump of 8 to 11 inches (203 to 279 mm) as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp,

un-chipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond pattern indicated on Drawings; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4-inches (100-mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
- H. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
 - 1. Install compressible filler in joint between top of partition and underside of structure above.
 - 2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch (13-mm) clearance between end of anchor rod and end of tube. Space anchors 48 inches (1200 mm) o.c. unless otherwise indicated.
 - 3. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
 - 4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 07 Section "Fire-Resistive Joint Systems."

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.6 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
 - 1. Space reinforcement not more than 16 inches (406 mm) o.c.
 - 2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:
 - 1. Provide an open space not less than 1 inch (25 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.8 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.

3.9 LINTELS

- A. Provide concrete or masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.
- B. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

3.10 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 2. Limit height of vertical grout pours to not more than 60 inches (1520 mm)

3.11 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent

construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel un-cleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.12 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Division 31 Section "Earth Moving."
 - 3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042200

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 1. Wood blocking, cants and nailers.
 2. Wood furring and grounds.
 3. Plywood backing panels.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 2. NLGA: National Lumber Grades Authority.
 3. SPIB: The Southern Pine Inspection Bureau.
 4. WCLIB: West Coast Lumber Inspection Bureau.
 5. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all rough carpentry unless otherwise indicated.
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 - 4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
 - 5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 - 1. Use treatment that does not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to

ASTM D 6841. For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.

- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
 - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by testing agency.
- E. Application: Treat all rough carpentry unless otherwise indicated.
 - 1. Framing for raised platforms.
 - 2. Framing for stages.
 - 3. Concealed blocking.
 - 4. Roof construction.
 - 5. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Cants.
 - 4. Furring.
 - 5. Grounds.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Western woods; WCLIB or WWPA.
 - 4. Eastern softwoods; NeLMA.
- C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:
 - 1. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
 - 2. Eastern softwoods; No. 2 Common grade; NeLMA.

- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.7 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- F. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- (38-mm actual-) thickness.
 - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
 - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.
- G. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 1. NES NER-272 for power-driven fasteners.
 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - J. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD GROUND, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preserved-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 064116 - PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Plastic-laminate-faced architectural cabinetry.
- 2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.

B. Related Requirements:

- 1. Section 061000 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets and concealed within other construction before cabinet installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, including panel products, high-pressure decorative laminate and cabinet hardware and accessories.

- 1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

- 1. Show details full size.
- 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
- 3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural plastic-laminate cabinets.

C. Samples for Initial Selection:

- 1. Plastic laminates.
- 2. PVC edge material.
- 3. Thermoset decorative panels.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, fabricator.
- B. Product Certificates: For the following:
 - 1. Composite wood and agrifiber products.
 - 2. Thermoset decorative panels.
 - 3. High-pressure decorative laminate.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 43 and 70 percent during the remainder of the construction period.
- C. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.
- B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Section 087111 "Door Hardware (Descriptive Specification)" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET FABRICATORS

- A. Fabricators: Subject to compliance with requirements, provide products by one of the following:
 1. TMI Systems Design Corporation- 50 South Third Avenue West Dickinson, NJ 58601-5595 <http://tmisystems.com/>
 2. Mastercraft Woodworking Company, Inc., 681 Mohrsville Road, Shoemakersville, PA 19555. Ph: 610-926-1500.
 3. AmeriCase, Division of American Millwork & Cabinetry, Inc., 840 Broad Street, Emmaus, PA 18049. Ph: 610-965-0440.
 4. Wood-Metal Industries, Division of Wood-Made Inc., 100 East Sherman Street, Selinsgrove, PA 17870. Ph: 570-374-1176.
 5. Stevens Industries, Inc., 704 West Main Street, Teutopolis, Ill, 62467. Ph: 217-540-3100.
 6. Case Systems, Inc., Midland, MI 48642. Ph: 989-496-9510.
 7. Advanced Cabinet Systems, 1629 Joquin Drive, Marion IN 46953. Ph. 765-677-8000.
 8. Cabinets By Design, LLC, 2883 Pleasant Hill Road, Duluth, GA 30096; www.cabinetsbydesigninc.com
 9. Champion Millwork, 140 Hiawatha Place, Syracuse, NY 13208. Ph. 315-463-0711.

2.2 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
 1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

- B. Grade: Premium.
- C. Type of Construction: Frameless.
- D. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- E. Reveal Dimension: 1/2 inch (13 mm) .
- F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Wilsonart International; Div. of Premark International, Inc.
 - b. Lamin-Art, Inc.
 - c. Formica Corporation.
- G. Laminate Cladding for Exposed Surfaces:
 - 1. Horizontal Surfaces: Grade HGS.
 - 2. Postformed Surfaces: Grade HGP.
 - 3. Vertical Surfaces: Grade HGS.
 - 4. Edges: 3mm PVC tape, matching laminate in color, pattern, and finish.
 - 5. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.
 - 6. Open Interiors of Cubbies, Wall Cabinets without doors: Grade HGS to match exposed high-pressure decorative laminate finish.
- H. Materials for Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - a. Edges of Plastic-Laminate Shelves: PVC T-mold matching laminate in color, pattern, and finish.
 - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - 2. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.
 - 3. Drawer Bottoms: Thermoset decorative panels.
- I. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- J. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
- K. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.
- L. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
1. As indicated by laminate manufacturer's designations.
 2. Match Architect's sample.
 3. As selected by Architect from laminate manufacturer's full range.

2.3 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
1. Wood Moisture Content: 4 to 9 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
1. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.
 2. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.4 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087111 "Door Hardware (Descriptive Specification)."
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening, self-closing, fully adjustable for clockwise counter-clockwise, toe in and out door alignment. Heavy gauge metal construction, 200,000 open/close cycle tests, with hinge manufacturer's lifetime material replacement guarantee. Hinges shall match wire pulls standard satin chrome finish.
- C. Wire Pulls: Back mounted, solid metal, 4 inches (100 mm) long, 5/16 inch (8 mm) in diameter, Matte Nickel Finish by Hafele model number 116.07.621 or equal.
- D. Adjustable Shelving and Supports: Provide machine pre-drilled holes every 1 inch on center, vertically at interior of cabinets to allow for shelf height adjustment. Provide steel anti-slip shelf clips, with Matte Nickel finish by Hafele model number 282.23.725 Ex-Cellent H or equal.
- E. Drawer Slides: BHMA A156.9.
1. Grade 1 and Grade 2: Side mounted and extending under bottom edge of drawer; full-extension type; epoxy-coated steel with polymer rollers.

2. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-extension type; zinc-plated-steel ball-bearing slides.
 3. For drawers not more than 3 inches (75 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1.
 4. For drawers more than 3 inches (75 mm) high but not more than 6 inches (150 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1.
 5. For drawers more than 6 inches (150 mm) high or more than 24 inches (600 mm) wide, provide Grade 1HD-100.
 6. For computer keyboard shelves, provide Grade 1.
 7. For trash bins not more than 20 inches (500 mm) high and 16 inches (400 mm) wide, provide Grade 1HD-100.
- F. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
- G. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Adhesive for Bonding Plastic Laminate: Water Based Un-pigmented contact cement.
1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.6 FABRICATION

- A. Fabricate cabinets to dimensions, profiles, and details indicated.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check

measurements of assemblies against field measurements before disassembling for shipment.

- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
- B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required.

3.2 INSTALLATION

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - 1. Use filler matching finish of items being installed.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semi-exposed surfaces.

END OF SECTION 064116

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.
4. Acoustical joint sealants.

- B. Related Sections:

1. Division 04 Section "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
2. Division 07 Section "Fire-Resistive Joint Systems" for sealing joints in fire-resistance-rated construction.
3. Division 08 Section "Glazing" for glazing sealants.
4. Division 32 Section "Concrete Paving Joint Sealants" for sealing joints in pavements, walkways, and curbing.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- B. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food provide products that comply with 21 CFR 177.2600.
- E. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range of available colors.

2.2 SILICONE JOINT SEALANTS

- A. Multicomponent, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type M, Grade NS, Class 50, for Use NT.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Tremco Incorporated; Spectrem 4TS.
- B. Multicomponent, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type M, Grade P, Class 100/50, for Use T.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; FC Parking Structure Sealant.
 - b. Sika Corporation, Inc.; Sikaflex - 2c SL.
 - c. Sonneborn, Division of ChemRex Inc.; SL 2.
- C. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Building Systems; Omniplus.
 - b. Dow Corning Corporation; 786 Mildew Resistant.
 - c. GE Advanced Materials - Silicones; Sanitary SCS1700.
 - d. Tremco Incorporated; Tremsil 200 Sanitary.

2.3 URETHANE JOINT SEALANTS

- A. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT.
 1. Products: Subject to compliance with requirements, provide one of the following:

- a. BASF Building Systems; “Sonolastic NP 2”.
 - b. Pecora Corporation; “Dynatrol II”.
 - c. Tremco Incorporated; “Dymeric”.
 - d. Bostik Construction Products Division; “Chem-Calk 500”.
 - e. Sherwin Williams, Loxon 2K NS
- B. Multicomponent, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Building Systems; “Sonolastic NP 2”.
 - b. Pecora Corporation; “Dynatred”.
 - c. Tremco Incorporated; “THC-901”.
 - d. Bostick Construction Products Division; “Chem-Calk 550”.
 - e. Sherwin Williams, Loxon 2K NS

2.4 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Building Systems; Sonolac.
 - b. Pecora Corporation; AC-20+.
 - c. Tremco Incorporated; Tremflex 834.
 - d. Sherwin Williams 950A Siliconized Acrylic Latex Caulk

2.5 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; AC-20 FTR.
 - b. USG Corporation; SHEETROCK Acoustical Sealant.
 - c. Sherwin Williams 950A Siliconized Acrylic Latex Caulk

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 - 3. Remove laitance and form-release agents from concrete.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
- F. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 FIELD QUALITY CONTROL

- A. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces
 - 1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Tile control and expansion joints.
 - c. Joints between different materials listed above.
 - 2. Silicone Joint Sealant: Multicomponent, pourable, traffic grade, neutral curing.
 - 3. Urethane Joint Sealant: Multicomponent, nonsag, traffic grade, Class 25.
 - 4. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.
 - 1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints in exterior insulation and finish systems.
 - d. Joints between metal panels.
 - e. Joints between different materials listed above.
 - f. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - g. Control and expansion joints in ceilings and other overhead surfaces.
 - 2. Silicone Joint Sealant: Multicomponent, nonsag, neutral curing.
 - 3. Urethane Joint Sealant: Multicomponent, nonsag, Class 25.
 - 4. Joint-Sealant Color: As selected by Architect from manufacturer's full range of available colors.

- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - 2. Silicone Joint Sealant: Multicomponent, pourable, traffic grade, neutral curing.
 - 3. Urethane Joint Sealant: Multicomponent, nonsag, traffic grade, Class 25.
 - 4. Joint-Sealant Color: As selected by Architect from manufacturer's full range of available colors.

- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.

- c. Tile control and expansion joints.
 - d. Vertical joints on exposed surfaces of interior unit masonry, concrete, walls, and partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
 - 2. Joint Sealant: Latex.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of available colors.
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.
- 1. Joint Sealant Location:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - 2. Joint Sealant: Single component, nonsag, mildew resistant, acid curing.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of available colors.
- F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal non-traffic surfaces.
- 1. Joint Location:
 - a. Acoustical joints where indicated.
 - b. Other joints as indicated.
 - 2. Joint Sealant: Acoustical.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of available colors.

END OF SECTION 079200

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceiling Type 1.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each acoustical panel ceiling, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

0.1 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

1. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 5.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 2. Smoke-Developed Index: 450 or less.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ACOUSTICAL PANELS, GENERAL

- A. Source Limitations:
 1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
 2. Suspension System: Obtain each type from single source from single manufacturer.
- B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.
- C. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- D. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.
- E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Armstrong World Industries, Inc.
 - a. Type 1 Fine Fissured 1830 (2x4)
 2. CertainTeed Corp.
 - a. Type 1 Fine Fissured PFF-197 (2x4)
 3. USG Interiors, Inc.; Subsidiary of USG Corporation.
 - a. Type 1 Radar Clima Plus – Firecode 2415 (2x4)
- B. Classification: Provide fire-resistance-rated panels complying with ASTM E 1264 for type, form, and pattern as follows:
1. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
 2. Type and Form: Type IV, mineral base with membrane-faced overlay; Form 2, water felted; with vinyl overlay on face.
 3. Type and Form: Type XII, glass-fiber base with membrane-faced overlay; Form 2, cloth.
 4. Pattern: (Type 1 Fine Fissured)
- C. Color: As selected from manufacturer's full range.
- D. LR: Not less than (Type 1 .85) (Type 3 .80).
- E. NRC: Not less than (Type 1 .55) (Type 3 NA).
- F. CAC: Not less than (Type 1 35) (Type 3 40 Type).
- G. Edge/Joint Detail: Types 1: Square
- H. Thickness: Type 1: 5/8 inch (15 mm).
- I. Modular Size: As indicated on Drawings.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
 - 1. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.
- B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
 - b. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchor.
 - c. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B 164 for UNS No. N04400 alloy.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304, nonmagnetic.
 - 3. Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.
 - 4. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.
- D. Suspension System: Prelude Fireguard XL 15/16" as manufactured by Armstrong World Industries, or DXLA by USG.
 - 1. Type: Wide-face, capped, double-web, steel suspension system.
 - 2. Finish: High humidity; hot-dipped galvanized with corrosion resistant painted finish.
 - 3. Cap Material and Finish: Aluminum sheet with white painted finish.
 - 4. Structural Classification: Heavy-duty system.
 - 5. Color and Texture: White to match ceiling panels; manufacturer's standard smooth texture.

2.5 METAL SUSPENSION SYSTEM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. USG Interiors, Inc.; Subsidiary of USG Corporation.
 - 3. Cap Finish: Painted in color as selected by architect from manufacturer's full range.
- B. Wide-Face, Capped, Double-Web, Fire-Rated, Hot-Dip Galvanized, G60 (Z180), Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; hot-dip galvanized according to ASTM A 653/A 653M, G60 (Z180) coating designation; with prefinished, cold-rolled, 15/16-inch- (24-mm-) wide aluminum caps on flanges.
 - 1. Structural Classification: Heavy-duty system.
 - 2. Face Design: Flat, flush.
 - 3. Face Finish: Painted in color as selected by architect from manufacture's full range.

2.6 Sheet-Metal Edge Moldings and Trim

- A. Type and profile indicated, or if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.
 - 1. For lay-in panels with reveal edge details, provide stepped-edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 - 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
 - 3. For edge trim at outside, bullnose corners, provide manufacturer's prefabricated bullnosed corner trim to match radius of bullnose to allow for hairline joint between wall and edge trim.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
 - 1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, counters playing, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - 6. Do not attach hangers to steel deck tabs.
 - 7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 8. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
 - 9. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system

to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.

2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 2. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 3. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
 4. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
 5. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
- B. Related Sections:
 - 1. Section 096519 "Resilient Tile Flooring" for resilient floor tile.
 - 2. Section 096813 "Carpet Tile" for carpet tile.

1.3 SUBMITTALS

- A. Product data for each type of product specified.
- B. Samples for initial selection purposes of manufacturer's standard sample sets in form of pieces cut from each type of product specified showing full range of colors and patterns available.
- A. Samples for verification purposes in manufacturer's standard sizes, but not less than 12 inches (300 mm) long, of each different color and pattern of product specified

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

- A. Resilient Base:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johnsonite.
 - b. Roppe Corporation, USA.
- B. Resilient Base Standard: ASTM F 1861.
 - 1. Material Requirement: Type TS (rubber, vulcanized thermoset).
 - 2. Manufacturing Method: Group I (solid, homogeneous).
 - 3. Style: Cove (base with toe).
- C. Minimum Thickness: 0.125 inch (3.2 mm).
- D. Height: 4 inches.
- E. Lengths: Cut lengths 48 inches (1219 mm) long or coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Finish: As selected by Architect from manufacturer's full range.
- I. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING - LVT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Luxury vinyl tile (LVT).

- B. Related Sections:

- 1. Section 096513 "Resilient Base and Accessories" for resilient base, reducer strips, and other accessories installed with resilient floor coverings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of floor tile indicated.
- C. Product Schedule: For floor tile.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MATERIALS MAINTENANCE SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Installer Qualifications: Installer who has been trained in the installation of resilient sheet flooring.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.8 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F in spaces to receive floor tile during the following time periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. Materials and adhesive must be acclimated to the installation area for a minimum of 48 hours prior to installation.
- C. Store tiles in dry conditions on a flat surface and squarely on top of one another.
- D. Store away from vents and direct sunlight.
- E. When palletizing, first place a 5/8" or thicker sheet of plywood on the pallet. Stack 2 rows high side by side with no airspace between. Then quarter turn for 2 rows side by side. Do not exceed 12 boxes high. If you are stacking pallets, use a 1" thick sheet of plywood in between pallets.
- F. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F.
- G. Close spaces to traffic during floor tile installation.
- H. Close spaces to traffic for 48 hours after floor tile installation.
- I. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT SOLID VINYL TILE FLOORING

- A. Products: Subject to compliance with requirements, provide the following:
 1. Mohawk Matuto Plus – To Match Existing - No Substitutions

- B. Thickness: 2.5mm (0.1")
- C. Wear Layer Thickness: 20 mil. (0.5 mm)
- D. Edge Treatment: Square (SE)
- E. Size: 12 by 24 inches.
- F. Wearing Surface Emboss: To Match Existing – To be confirmed with Architect when color selected.
- G. Warranty: Manufacturer's standard Commercial Warranty.
- H. Adhesives and Primers: Manufacturer recommended adhesives and primers.
- I. Installation Method: Infill to match existing pattern.
- J. Finish: LVT – To Match Existing.
- K. Colors and Patterns (50% / 30% / 20% Random Mix):
 - 1. 915A Frostbite
 - 2. 927A Sonic Silver
 - 3. 556A Mega Blue

2.2 TESTING REQUIREMENTS

- A. Static Load Limit ASTM F970: 1500 psi
- B. Residual Indentation F1914: passes , 8%
- C. Flexibility ASTM F137: Passes
- D. Resistance to Heat ASTM F1514: Passes
- E. Resistance to Light ASTM F1515: Passes
- F. Resistance to Chemicals ASTM F925: Passes
- G. Radiant Flux ASTM E648: / 0.45 W/sq. cm., Class I
- H. Smoke Density ASTM E662: Passes, <450

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated. Do not install resilient flooring over gypsum-based patching and / or leveling compounds.

- B. Adhesives: Water resistant type as recommended by manufacturer to meet site conditions for specified product.
- C. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile including dust, wax, solvents, paint, grease, oils, old adhesive residue, curing and hardening compounds and sealers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.
- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.

B. Luxury Vinyl Tile Flooring:

1. Install with adhesive specified for the site conditions and follow adhesive label for proper use.
2. Follow manufacturer's recommendations.
3. Install using conventional tile and plank installation techniques. Plank products should have a minimum of 6 to 8" seam stagger.
4. Center rooms and hallways so borders are not less than half of a tile or plank.
5. Work out of multiple boxes at the same time.
6. In hallways and small spaces, work lengthwise from one end.
7. Ensure cut edges are always against the wall.
8. To cut products, score the top side of the material with a utility knife. Bend the product and finish the cut through the back side. It may be necessary to use a heat gun to cut around vertical obstructions. Allow the heated product to return to room temperature before installation.
9. If you cut the product into a fine point, it may delaminate. Use an ethyl cyanoacrylate-based super glue to fuse the points together. Clean all glue from the top surface immediately. Alcohol-based super glues may cause the vinyl to swell.
10. Roll the plank or tile with a 3-section 100 lb. roller. Re-roll the floor within the working time of the adhesive. Continue to roll the floor throughout the working day to ensure a proper bond.
11. Use floor protection after installation. DO NOT use a plastic adhesive-based protection system.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 1. Remove adhesive and other blemishes from exposed surfaces.
 2. Sweep, vacuum or dust mop to remove dirt and grit.
 3. If needed, add neutral cleaner to cool water following the manufacturer's instructions.
 4. Scrub with a low-rpm machine or auto scrubber. Use a red pad or brush.
 5. Never use brown or black pads (too aggressive and can damage the product)
 6. Remove the cleaning solution with a wet-dry vacuum or auto scrubber until the floor is dry.
 7. Rinse the floor with clean water. Repeat the rinse process if necessary to remove all haze.
- C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096723 - RESINOUS FLOORING AND COATINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Urethane Concrete Flooring.
 - 1. Slurry-applied urethane cement composition flooring with decorative quartz broadcast aggregate. (Dex-O-Tex Tek-Crete SLCQ with Tek-Crete SL-F Basecoat)

1.3 RELATED SECTIONS

- A. Section 033000 - Cast-in-Place Concrete.
- B. Section 035415 – Hydraulic Underlayment.

1.4 REFERENCES

- A. American Standard Test Method International (ASTM):
 - 1. ASTM C307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.
 - 2. ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 - 3. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 - 4. ASTM C580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 - 5. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheet.
 - 6. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
 - 7. ASTM D2240 - Standard Test Method for Rubber Property-Durometer Hardness.
 - 8. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
 - 9. ASDTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
 - 10. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - 11. ASTM F1679 - Standard Test Method for Using a Variable Incidence Tribometer (VIT).
 - 12. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
 - 13. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

14. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. American Concrete Institute (ACI):
 1. ACI 503.1 - Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive.
- C. American National Standards Institute (ANSI):
 1. ANSI A1264 - American National Standard for the Provision of Slip Resistance on Walking/Working Surfaces..
- D. International Concrete Repair Institute (ICRI):
 1. ICRI - 310.25 Selecting and Specifying Concrete Surface Preparation.
- E. National fire Protection Association (NFPA):
 1. NFPA 56A - Standard for the Use of Inhalation Anesthetics.
- F. Society of Protective Coatings (SSPC):
 1. SSPC - Monitoring and Controlling Ambient Condition During Coating operations.
 2. SSPC TU-10 - Procedures For Applying Thick Film Coatings and Surfacing Over Concrete Floors.
 3. SSPC TR-5 - Design, Installation, and Maintenance of Protective Polymer Flooring Systems for Concrete.
 4. SSPC TECHNOLOGY GUIDE NO. 10 - Guide to Specifying Coatings Conforming to Volatile Organic Compound (VOC) Content Requirements.
 5. SSPC-SP 13/NACE No. 6 - Surface Preparation of Concrete.
- G. United States Defense Standard (MIL):
 1. MIL-D-3134 - Deck Covering Materials.
 2. MIL-PRF-3135 - Performance Specification: Deck Covering Underlay Materials.

1.5 SUBMITTALS

- A. Submit under provisions of Section 013000 - Submittals.
- B. Product Data:
 1. Manufacturer's data sheets on each product to be used.
 2. Preparation instructions and recommendations.
 3. Storage and handling requirements and recommendations.
- C. Verification Samples: For products specified, two samples, 6 inches (150 mm) square representing actual product, color, texture ranges and patterns.
 1. For each type of exposed finish required, include a full set of surface profile samples demonstrating finished system with options for non-slip level.

NOTE: For Color Only. For Final Finish and texture, refer to Section 1.5 – D.

- D. Shop Drawings: Details of materials, construction and finish. Include relationship with adjacent construction.
- E. Contractor Certification: Manufacturer letter certifying installer is properly trained in

application of materials being installed and is acceptable to materials manufacturer.

- F. Guarantee Certification: Letter from the primary materials manufacture certifying that the manufacturer will issue a joint Installer/Manufacturer warranty with the installing contractor.
- G. Certification: CA Department of Public Health 01350 Method for Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers.
- H. Closeout Submittals:
 - 1. Care and Maintenance Data

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with ISO certification, or in the process of said certification, and a minimum of 10 years documented experience.
- B. Installer Qualifications:
 - 1. Firm specializing in work of this section with a minimum 5 years experience.
 - 2. Written approval by the flooring manufacturer.
- C. Regulatory Requirements:
 - 1. Dynamic coefficient of friction: Minimum 0.60, tested to ANSI A326.3
- D. Source Limitations: Sole Source Responsibility:
 - 1. Obtain materials; including primers, resins, hardening agents, and finish or sealing coats, from a single manufacturer. Private Label materials will not be accepted
 - 2. Provide secondary materials, including patching and fill materials, joint sealant, accessory items, etc.. from a source recommended by the manufacturer of the primary materials.
 - 3. Private label materials will not be accepted.
- E. Mock-Up: Mock-Up: Construct a 10' x 10' mock up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
 - 1. Intent of the mock-up is to demonstrate quality of workmanship, visual appearance and final finish and texture.
 - 2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 - 3. Retain mock-up during construction as standard for comparison with completed work.
 - 4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.7 PRE-INSTALLATION CONFERENCE

- A. Pre-installation Meetings: Coordinate work of this Section, with related work.
 - 1. Attendance: Subcontractor performing work and manufacturers and fabricators involved, or affected by, installation. Coordinate installations that precede or follow.
 - 2. Agenda: Review progress of construction activities and preparations for the particular activity under consideration. Agenda shall include schedule, drain and floor sink interface, detailing, door thresholds, responsibilities, critical path items, and approvals.
 - 3. Record, agreements, and disagreements, and corrective measures and actions.
 - 4. Reporting: Distribute minutes to each party present and others requiring information.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers with unbroken seals and bearing manufacturer's labels with date of manufacture and production lot number. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- B. Protect from damage due to weather, excessive temperature, and construction operations.
- C. When practical stage materials in area of Work 72 hours prior to beginning of Work.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, surface temperature, material temperature and ventilation) within limits recommended by manufacturer during installation and cure. Do not install under conditions outside manufacturer's recommended limits.
- B. Restrict access to Work area except installing contractor and site supervision during preparation, installation and cure period.
- C. Lighting: Permanent lighting shall be in place prior to flooring installation.

1.10 WARRANTY

- A. Manufacturer's Warranty: Provide Sole Source Responsibility, ten (10) year total system warranty from manufacturer for application and materials. Warranty shall also include moisture mitigation system and manufacturer's underlayment. Contractor shall comply with manufacturer's requirements for warranty including but not limited to MVER, rh and ph testing as prescribed by manufacturer as well as providing required documentation associated with testing, registration forms, site report forms, etc..

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers, Subject to specification requirements:
 - 1. Address: Crossfield Products Corporation, which is located at: 140 Valley Road; Roselle Park, NJ 07204; ASD Phone: 908-245-2800; Fax: 908-245-0659; Email: info@dextex.com; Web: www.dextex.com.
 - 2. Seamless Flooring Solutions – Life Science Products, Chestertown, MD.
 - 3. Approved Equal.
- B. Requests for substitutions must be submitted two weeks prior to bid date. Substitution request received after will not be considered. Request will be considered per Section 016000 - Product Requirements.

2.2 URETHANE CONCRETE FLOORING

- A. Slurry-Applied Urethane Cement Composition Flooring with Decorative Quartz Aggregate Broadcast:
 - 1. Basis of Design: Dex-O-Tex Tek-Crete SLCQ by Crossfield Products.
 - 2. Physical Properties:
 - a. Compressive Strength (ASTM C579): 6,100 psi (42.0 MPa).
 - b. Thermal Distortion (250 degrees F Emersion): Passes.
 - c. Tensile Strength (ASTM C307): 1,000 psi (6.89 MPa).
 - d. Flexural Strength (ASTM C580): 2,000 psi (13.8 MPa).
 - e. Thermal Co-Efficient of Thermal Expansion (ASTM C531): 1.4×10^{-5} .
 - f. Density (ASTM C905): 130 pcf (20.4 kN/cu.m).
 - g. Water Absorption (MIL-PRF-3134): 0.64 percent.
 - h. Surface Hardness (ASTM D2240) 85-90 Durometer "D".
 - i. Abrasion Resistance (ASTM D1044): 33mg.
 - j. Adhesion (ASTM D4541): 400 psi (2.76 MPa), 100 percent failure in concrete.
 - k. Flammability-Critical Radiant Flux (ASTM E648): 1.07 watts/sq.cm.
 - l. Resistance to Fungal Growth (ASTM G21): Passes, Rating 1.
 - 3. Underlayment – Trowelable mortar recommended AND manufactured by the Flooring Manufacturer, (Dex-O-Tex A-81 or High Strength Mortar)
 - 4. Membrane – Dex-O-Tex Cheminert SC Membrane applied in 2 coats with a sand broadcast per manufacturer's written recommendations.
 - 5. Body Coat: 1/8", (Tek-Crete SL-F), with a decorative quartz aggregate broadcast to rejection.
 - 6. Second Broadcast: Apply second broadcast into clear resin, (Polyaspartic or Epoxy).
 - 7. Colors: TBD – Reference Dex-O-Tex Color Charts for proper color/blends. Color to be selected by Architect from manufacturer's full range of colors.
 - a. Color 1: Kitchen Area
 - b. Color 2: Gang Toilet Rooms
 - c. Color 3: Single Occupant Toilet Rooms
 - 8. Top Coat: Quik-Glaze Clear Gloss. UV and abrasion resistant High Build Polyaspartic Topcoat, typically applied in two, (2), coats.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin preparation and installation until substrates are properly constructed and inspected complying with ACI 311.4R-05 Guide for Concrete Inspection. The General Contractor is to correct non-conformities if defects are discovered. Repair per ACI 546.R-04. Turn over work in broom clean condition free of debris and foreign matter.
- B. If substrate preparation is responsibility of another contractor, inspect per ACI 311.4R-05 Guide for Concrete Inspection by a certified SSPC CCI inspector. If preparation is not satisfactory or if surface is contaminated, notify Architect in writing. Do not proceed with the installation before the deficiencies have been satisfactorily corrected.
- C. Perform moisture testing per ASTM F1869 and F2170. Document results per this specification. If MVER or RH exceeds manufactures recommend level for specified product. Apply vapor control primer before proceeding.

NOTE: Contractor shall include in their bid the cost to provide Vapor Control Primer 1P at all locations regardless of testing results.

- D. Verify the substrate has proper levelness and flatness, or slope for drainage. If proper levelness and flatness, or slope for drainage is not in the substrate notify the Architect and General Contractor immediately. Do not proceed with flooring installation until the conditions are corrected.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to commencement of the preparation and installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under project conditions.
- C. Concrete Surfaces: Shot-blast, or diamond grind per SSPC SP-13/NACE 6. Remove material to provide a sound surface free of laitance, glaze, efflorescence, bond inhibiting curing compounds or form release agents. Remove grease, oil, and other penetrating contaminants. Repair damaged and deteriorated concrete to acceptable condition per ACI 546.R-04. Produce a surface profile equal to ICRI 310.25 CPS 2, CPS 3, or CPS 4. Leave surface free of dust, dirt, laitance, and efflorescence.
- D. Underlayment for Slope and Drainage – Provide a trowel-grade underlayment as recommended and manufactured by the flooring manufacturer, (Dex-O-Tex A-81 or High Strength Mortar).
- E. Cut 1/8" X 1/2" keyways around the perimeter, around drains, clean outs, access panels or other flooring interruption, and at expansion or isolation joints.

NOTE: Keyways are cut when basecoat is applied direct to concrete substrate. If a membrane is required, proceed as listed below:

- F. Apply Membrane in a 40 mil "neat" coat and allow to cure overnight. Apply a second 10 mil coat and broadcast with sand to rejection. Allow to cure.
- G. Sweep off the surface and apply the Urethane Cement basecoat directly to the broadcast surface.
- H. Verify proper surface profile per ICRI 310.25 CSP coupons. Perform water break test and tape dust cleanliness test per ISO 8502-3 to determine surface is acceptable to proceed.

3.3 INSTALLATION

- A. Apply Flooring System components according to manufacturer's written instructions. Produce a uniform, monolithic wearing surface of thickness, color and texture indicated.
 1. Coordinate application of components. Provide optimum adhesion of coatings to substrate, and optimum intercoat adhesion.
 2. Cure coatings per manufacturer's written instructions. Prevent contamination during application and curing processes.
 3. Expansion, Isolation and Control Joint Treatment: At substrate expansion, isolation and control joints, comply with resinous flooring manufacturer's written instructions.
 4. Contractor shall keep daily logs recording the work performed and environmental conditions as required by the materials manufacturer.

- B. Install 4" integral cove base with 5/8" radius at all vertical horizontal transitions.

NOTE: The Cove Base is Applied using epoxy as the basecoat.

- C. Self-Leveling Body Coats: Apply in thickness indicated for flooring system.
1. Aggregates: Broadcast aggregates at rate recommended by manufacturer. After resin cures, remove excess aggregates.
 2. 2nd broadcast for color consistency: Apply a clear Polyaspartic or Epoxy coating to the broadcast surface and broadcast at a rate recommended by manufacturer. After resin cures, remove excess aggregates. Provide surface texture indicated.
- D. Top Coat: Quik-Glaze Clear Gloss. Apply in number indicated for flooring system and at spreading rates recommended by manufacturer to produce wearing surface indicated.

3.4 CLEANING AND PROTECTION

- A. Clean products after 96 hours cure in accordance with the manufacturer's recommendations.
- B. Prohibit foot and wheel traffic over flooring for 24 hours. Light foot traffic is acceptable after 24 hours. Normal traffic after 48 hours.
- C. Do not expose to harsh chemicals until full 7 days cure.
- D. Touch-up, repair or replace damaged products before Substantial Completion
- E. Provide floor protection acceptable to the materials manufacturer.

END OF SECTION

SECTION 096813- CARPET TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes carpet tile with adhesive backing and accessories.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 2 Section "Selective Demolition" for removing existing floor.
 - 2. Division 9 Section "Resilient Wall Base and Accessories" for materials and installation.

1.3 SUBMITTALS

- A. Product Data for each type of carpet material and installation accessory specified. Submit manufacturer's printed data on physical characteristics, durability, fade resistance, and fire-test-response characteristics. Submit methods of installation for each type of substrate. Submit third party certification of recycled content requirement.
- B. Shop Drawings showing columns, doorways, enclosing walls or partitions built-in cabinets, and locations where cutouts are required in carpet. Indicate the following:
 - 1. Carpet type, color, and dye lot.
 - 2. Locations where dye lot changes occur.
 - 3. Seam locations, types, and methods.
 - 4. Type of subfloor.
 - 5. Type of installation.
 - 6. Pattern of installation.
 - 7. Pile direction.
 - 8. Type, color, and location of edge, transition, and other accessory strips.
 - 9. Transition details to other flooring materials.
- C. Samples for initial selection in the form of manufacturer's color charts or Samples of materials showing the full range of colors, textures, and patterns available for each type of carpet indicated.
- D. Samples for verification of the following products, in manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected. Prepare Samples from the same material to be used for the Work. Label each sample with manufacturer's name, material type, color, pattern, and designation indicated on Drawings and carpet schedule. Submit the followings:
 - 1. 24-inch square Samples of each type of carpet material required.

- 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch long Samples.
- E. Manufacturer's Product Warranty.
- F. Manufacturer's Installation Instructions.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data for carpet to include in the operation and maintenance manual specified in Division 1. Include the following:
 - 1. Methods for maintaining carpet, including manufacturer's recommended frequency for maintaining carpet.
 - 2. Precautions for cleaning materials and methods that could be detrimental to finishes and performance. Include cleaning and stain-removal products and procedures.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who is certified by the Floor Covering Installation Board (FCIB) or who can demonstrate compliance with FCIB certification program requirements.
 - 1. Flooring contractor must be certified by the manufacturer prior to bid.
 - 2. Flooring contractor to be a specialty contractor normally engaged in this type of work and shall have prior experience in the installation of these types of materials.
 - 3. Flooring contractor will be responsible for proper product installation, including floor testing and preparation as specified by the manufacturer and JOB CONDITIONS herein.
- B. Manufacturer Qualifications:
 - 1. Single-Source Responsibility: Obtain each type of carpet from one source and by a single manufacturer.
- C. Carpet Fire-Test-Response Characteristics: Provide carpet with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify carpet with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface Flammability: Passes CPSC 16 CFR, Part 1630.
 - 2. Flame Spread: 25 or less per ASTM E 84.
 - 3. Smoke Developed: 450 or less per ASTM E 84.

- D. Fire Performance: Provide carpet materials capable of meeting the following requirements when tested in accordance with methods indicated, by UL (Underwriters Laboratories, Inc.) or other independent testing agency acceptable to authorities having jurisdiction.
 - 1. Methenamine Pill Test (ASTM D 2859): Passes.
 - 2. Average Critical Radiant Flux (ASTM E 648 / NFPA 253): Minimum 0.45 watt per square centimeter.
 - 3. Smoke Density with Flame (ASTM E 662): Less than 450.
- E. Physical Properties: Provide carpet materials capable of meeting the following requirements when tested in accordance with methods indicated.
 - 1. Static Electricity Generation (AATCC 134): 1.1 kilovolts or lower.
 - 2. Microbial Resistance: As follows:
 - a. Bacterial Reduction (AATCC 100): Minimum 90 percent.
 - b. Fungal Growth (AATCC 30): Maximum 30 percent.
 - c. Diffusion in Moisture (AATCC 147): Develops no zone of inhibition.
- F. Recycled Content: Manufacturer shall have a carpet collection / recovery system and a currently operational, commercial scale, recycling process to recycle vinyl backed carpet. Carpet recycled in the process is used to produce recycled content carpet. Manufacturers products, when recovered shall be 100% recyclable in this process. Recycled content shall be certified by a third party testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI's "CRI Carpet Installation Standard."
- B. Deliver materials to Project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.
- C. Store materials on-site in original undamaged packages, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity per Manufacturer's recommendations. Lay flat, with continuous blocking off ground.
- D. Base, Carpet Edge, and Transition Strips: As specified in applicable sections.

1.8 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6, "Site Conditions".
- B. Space Enclosure and Environmental Limitations: Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.
- C. Subfloor Moisture Conditions: Moisture emission rate of not more than 3 lb/1000 sq. ft./24 hours (14.6 kg/1000 sq. m/24 hours) when tested by calcium chloride moisture test in compliance with CRI 104, 6.2.1, with subfloor temperatures not less than 44 degrees F (12.7 degrees C).

- D. Subfloor Alkalinity Conditions: a pH range of 5 to 9 when subfloor is wetted with potable water and pHHydrion paper is applied.
- E. Sub-floor preparation is to include all required work to prepare the existing floor for installation of the product as specified in this document and Manufacturer's installation instructions.
- F. Please see Installation & Floor Preparation Instructions for specific requirements for moisture vapor emission rate, ambient conditions, and other requirements.
- G. All material used in sub-floor preparation and repair shall be recommended by the carpet manufacturer and shall be chemically and physically compatible with the carpet system being bid.
- H. Maintain minimum 65 degrees F ambient temperature and 65% Relative Humidity for 72 hours prior to, during, and 48 hours after installation.

1.9 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Carpet Warranty: Submit a written warranty executed by carpet manufacturer and Installer agreeing to repair or replace carpet that does not meet requirements or that fails in materials or workmanship within the specified warranty period. Failures are defined to include faulty workmanship or materials, including, but not limited to, more than 15 percent loss of face fiber, edge raveling, snags, runs, and delamination.
- C. Warranty Period: The non-prorated lifetime limited warranty shall cover against and specifically define the following:
 - 1. Excessive Surface Wear: More than 15% loss of pile fiber weight.
 - 2. Excessive Static Electricity: More than 3.0 kV per AATCC 134.
 - 3. Resiliency Loss of the Backing: More than 10% loss of backing resiliency.
 - 4. Delamination.
 - 5. Edge Ravel.
 - 6. Zippering.
- D. Tuft Bind warranty in lieu of edge ravel and zippering is not acceptable.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Tandus-Centiva Flooring – “Stack 9” (Basis of Design).
 - 2. Patcraft – Infrastructure, Style Formwork with EcoLogix Cushion Backing.

3. Mohawk – Sense of Space, Classic Form MD011
 4. Or approved equal.
- B. Face Construction:
- a. Construction: Patterned Loop.
 - b. Width: 24"x24" tile.
 - c. Gauge: 5/64.
 - d. Pile Units Per Inch: 10.0/in (39.4/10cm).
 - e. Pile Height Average: 0.187 inches, (4.7 mm)
 - f. Pile Thickness: 0.078 inches (2.5 mm) (ASTM 418, Section 10).
 - g. Fiber System: Dynex SD Nylon (Permanent Stain Resistance)
 - h. Dye Method: 100%Solution Dyed
- C. Flex-Aire Cushion Modular Backing System:
- a. Primary Tufting Substrate: Synthetic.
 - b. Fushion Coat (Pre-Coat): Sealant Vinyl.
 - c. Backing:
 - 1) Flex-Aire Closed Cell Vinyl Cushion.
 - 2) Weight: 35.5 oz/sq yd, (ASTM D 1667).
 - 3) Density: 18.5 lbs/cu ft, (ASTM D 1667).
 - 4) Thickness: 0.156 inches, (ASTM D 1667).
 - 5) Compression Set: Max 10%, (ASTM D 1667).
 - 6) Compression Deflection: Min 5 lbs/sq in @ 25%, (ASTM D 1667).
 - d. Adhesive System: Microencapsulated Tackifier applied to 100% of material at time of manufacturing.
 - e. Total Product Weight: 81.0 oz/sq yd +/-5%.
- D. Product Testing:
- a. Flammability
 - 1) Federal Flammability: Passes, (CPSC FF 170).
 - 2) Flooring Radiant Panel:
 - a) Class 1, (ASTM E-648).
 - b) Mean Average CRF-0.45 watts/sq cm or higher.
 - b. Electrostatic Propensity
 - 1) 3.0 K.V. or lower, (AATCC 134).
- E. Color and Pattern: As selected by Architect from the manufacturer's full range of colors and patterns produced for carpet specified. (As specified with product designation below.)
- a. Installation Pattern: Installation pattern shall be either "monolithic" or "ashlar pattern". Installation pattern shall be confirmed with Architect prior to start of installation.

2.2 INSTALLATION ACCESSORIES

- A. Concrete-Slab Primer: Non-staining type as recommended by carpet manufacturer.
- B. Subfloor Filler: White factory-mixed latex type as recommended by carpet manufacturer.
- C. Seaming: Sealer and Cleaner as recommended by carpet manufacturer for taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.
- D. Base, Carpet Edge, and Transition Strips: As specified in applicable sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine subfloors and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting performance of carpet. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Verify that subfloors and conditions are satisfactory for carpet installation and comply with requirements specified in this Section and those of carpet manufacturer.
- C. Start of installation constitutes acceptance of substrate conditions and full responsibility for the completed Work.

3.2 PREPARATION

- A. General: Comply with carpet manufacturer's installation recommendations to prepare substrates indicated to receive carpet installation.
- B. Level subfloor within 1/8 inch in 10 feet, noncumulative, in all directions. Sand or grind protrusions, bumps, and ridges. Patch and repair cracks and rough areas. Fill depressions.
 - 1. Use leveling and patching compounds to fill cracks, holes, and depressions in subfloor as recommended by carpet manufacturer.
 - 2. Prohibit traffic until patching compounds have cured.
- C. Remove subfloor coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone.
- D. Broom or vacuum clean subfloors to be covered with carpet. Following cleaning, examine subfloors for moisture, alkaline salts, carbonation, or dust.
- E. Concrete-Subfloor Preparation: Apply concrete-slab primer, according to manufacturer's directions, where recommended by carpet manufacturer. Apply concrete sealer where required to prevent formation of dust.

3.3 INSTALLATION

- A. Comply with carpet manufacturer's recommendations for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under door in closed position. Do not bridge building expansion joints with continuous carpet.
- B. Where demountable partitions or other items are indicated for installation on top of finished carpet floor, install carpet before installation of these items.
- C. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.

- D. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. Install pattern parallel to walls and borders.
- F. Verify product match before cutting to ensure minimal variation between dye lots.
- G. Install edge guards at exposed carpet edges unless indicated otherwise; provide secure attachment to substrate. Comply with requirements of "Resilient Wall Base and Accessories" Section.

3.4 CLEANING

- A. Remove carpet remnants which are not usable; comply with Owner's instructions for final disposition of usable remnants.
- B. Perform the following operations immediately after completing installation.
 - 1. Remove visible adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
 - 2. Remove protruding yarns from carpet surface.
 - 3. Vacuum carpet using commercial machine with face-beater element.
- C. Eliminate stains; replace and pay for carpet from which stains cannot be eliminated using carpet manufacturer's recommended products and methods.
- D. Do not wet-clean any glued-down carpet within 60 days of installation.

3.5 PROTECTION

- A. Protect installed carpet tile to comply with CRI's "Carpet Installation Standard," Section 20, "Protecting Indoor Installations."
 - A. Protect installation with non-staining building paper. Do not use a moisture barrier such as plastic film.
 - B. Do not permit foot traffic or place furniture on glued-down carpet for a minimum of 48 hours after installation.
 - C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensure carpet is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 096813

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Concrete.
2. Clay masonry.
3. Concrete masonry units (CMU).
4. Steel.
5. Galvanized metal.
6. Aluminum (not anodized or otherwise coated).
7. Wood.
8. Exterior portland cement plaster (stucco).

- B. Related Requirements:

1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
2. Division 06 Sections for shop priming carpentry with primers specified in this Section.
3. Division 08 Sections for factory priming windows and doors with primers specified in this Section.
4. Division 09 painting Sections for special-use coatings.
5. Division 09 Section "Interior Painting" for surface preparation and the application of paint systems on interior substrates.
6. Division 09 Section "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on exterior wood substrates.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

- D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.
 - 2. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Co.
 - 2. PPG Paints
 - 3. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- C. Colors: Match Architect's samples

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry CMU: 12 percent.
 - 3. Wood: 15 percent.
 - 4. Portland Cement Plaster: 12 percent.
- C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

- F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
 - 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
 - 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.
- J. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 - 2. Sand surfaces that will be exposed to view and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 - 4. Paint entire exposed surface of window frames and sashes.
 - 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view:
 - a. Equipment, including panelboards
 - b. Un-insulated metal piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 - e. Tanks that do not have factory-applied final finishes.
 - f. Motors and mechanical equipment

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

BM	Primer:	Ultra Spec Masonry Interior/Exterior Latex Sealer 608
	1st coat:	Regal Select Exterior MoorLife Flat W105
	2nd coat:	Regal Select Exterior MoorLife Flat W105
PPG	Primer:	Seal-Grip 17-921XI
	1st coat:	SPEEDHIDE® Exterior Latex Flat 6-650XI
	2nd coat:	SPEEDHIDE® Exterior Latex Flat 6-650XI
SW	Primer:	A-100 Latex Primer
	1st coat:	A-100 Latex Flat
	2nd coat:	A-100 Latex Flat

B. Clay-Masonry Substrates:

BM	Primer:	Ultra Spec Masonry Interior/Exterior Latex Sealer 608
	1st coat:	Regal Select Exterior MoorLife Flat W105
	2nd coat:	Regal Select Exterior MoorLife Flat W105
PPG	Primer:	Speedhide 6-15XI
	1st coat:	SPEEDHIDE® Exterior Latex Flat 6-650XI
	2nd coat:	SPEEDHIDE® Exterior Latex Flat 6-650XI
SW	Primer:	Loxon Concrete and Masonry Primer
	1st coat:	A-100 Latex Flat
	2nd coat:	A-100 Latex Flat

C. CMU Substrates:

BM	Primer:	Ultra Spec Masonry Interior/exterior High Build Block Filler 571
	1st coat:	Regal Select Exterior MoorLife Flat W105
	2nd coat:	Regal Select Exterior MoorLife Flat W105
PPG	Primer:	Speedhide 6-15XI
	1st coat:	SPEEDHIDE® Exterior Latex Flat 6-650XI
	2nd coat:	SPEEDHIDE® Exterior Latex Flat 6-650XI
SW	Primer:	PrepRite Block Filler
	1st coat:	A-100 Latex Flat
	2nd coat:	A-100 Latex Flat

D. Steel Substrates:

1. Alkyd, gloss.

BM	Primer:	Super Spec HP Alkyd Metal Primer P06
	1st coat:	Super Spec HP Urethane Alkyd Enamel Gloss P22
	2nd coat:	Super Spec HP Urethane Alkyd Enamel Gloss P22
PPG	Primer:	Speed Hide Rust Inhibitive Primer 6-208
	1st coat:	Industrial Gloss Alkyd Enamel 7-282 Series
	2nd coat:	Industrial Gloss Alkyd Enamel 7-282 Series
SW	Primer:	Kem Bond Universal Metal Primer
	1st coat:	Industrial Enamel, B54 series
	2nd coat:	Industrial Enamel, B54 series

E. Galvanized-Metal Substrates:

1. Alkyd, gloss.

BM	Primer:	Ultra Spec HP Acrylic Primer P04
	1st coat:	Super Spec HP Urethane Alkyd Enamel Gloss P22
	2nd coat:	Super Spec HP Urethane Alkyd Enamel Gloss P22
PPG	Primer:	Pitt-Tech Hight Performance Primer 90-712
	1st coat:	Industrial Gloss Alkyd Enamel 7-282 Series
	2nd coat:	Industrial Gloss Alkyd Enamel 7-282 Series
SW	Primer:	Pro-Cryl Universal Primer
	1st coat:	Industrial Enamel, B54 series
	2nd coat:	Industrial Enamel, B54 series

F. Aluminum Substrates:

1. Alkyd, gloss.

BM	Primer:	Ultra Spec HP Acrylic Primer P04
	1st coat:	Super Spec HP Urethane Alkyd Enamel Gloss P22
	2nd coat:	Super Spec HP Urethane Alkyd Enamel Gloss P22
PPG	Primer:	Pitt-Tech Hight Performance Primer 90-712
	1st coat:	Industrial Gloss Alkyd Enamel 7-282 Series
	2nd coat:	Industrial Gloss Alkyd Enamel 7-282 Series
SW	Primer:	Pro-Cryl Universal Primer
	1st coat:	Industrial Enamel, B54 series
	2nd coat:	Industrial Enamel, B54 series

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Concrete.
 - 2. Clay masonry.
 - 3. Concrete masonry units (CMU).
 - 4. Steel.
 - 5. Cast iron.
 - 6. Galvanized metal.
 - 7. Aluminum (not anodized or otherwise coated).
 - 8. Wood.
 - 9. Gypsum board.
 - 10. Plaster.
- B. This specification relates to the technical requirements for furnishing all labor, materials, equipment and related items necessary to complete all painting work as indicated on the drawings and described in this specification. Paint all existing painted surfaces and new construction. The Work of this section includes but is not limited to the following (for rooms listed below):
 - 1. Preparing all surfaces, new and existing called for to be painted.
 - 2. Painting all exposed surfaces not noted to receive another finish unless otherwise indicated on the drawings.
 - 3. Painting metal trim.
 - 4. Painting miscellaneous metals.
 - 5. Painting existing concrete block walls and partitions.
 - 6. Painting existing and new drywall, new and existing plaster.
 - 7. Furnishing of all scaffolds, drop cloths, and similar appurtenances to perform work.
 - 8. Touching up and cleaning.

Rooms to be Painted – As noted on Drawings:

This Section includes surface preparation and field painting of the following:

1. Exposed exterior and interior items and surfaces.
 2. Field painting exposed electrical items.
 3. Field painting exposed mechanical items.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels, unless otherwise indicated.
1. Primers listed in the paint schedule are in addition to shop applied primers specified in other Sections.
- D. Related Requirements:
1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
 2. Division 06 Sections for shop priming carpentry with primers specified in this Section.
 3. Division 09 painting Sections for high-performance and special-use coatings.
 4. Division 09 Section "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
- E. HVAC, Plumbing and Fire Protection items to be painted under the General Construction Contract include, but are not limited to, the following:
1. Piping, pipe hangers, and supports.
 2. Ductwork.
 3. Insulation.
 4. Motors and mechanical equipment.
 5. Accessory items.
- F. Electrical items to be painted under the General Construction Contract include, but are not limited to, the following:
1. Conduit and fittings.
 2. Panel enclosures.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.
- H. DFM (Dry Film Mils): Thickness, measured in mils, of a coat of paint in a cured state.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.
 - 2. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

- D. Provide adequate ventilation, including mechanical ventilation, to remove paint odors and fumes from areas of the building where odors might migrate to occupied spaces. If required, provide continuous ventilation and sufficient heating facilities to maintain temperatures above 50 degrees Fahrenheit for 24 hours before, during, and 48 hours after the application of finishes.
- E. Provide temporary lighting to achieve a well-lit surface with a level of at least 80 foot candles measured mid-height.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Sherwin-Williams Company (The)
 2. PPG Paints
 3. Benjamin Moore & Co.

2.2 PAINT, GENERAL

- A. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Colors: Match Architect's samples

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 2. Testing agency will perform tests for compliance with product requirements.
 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

- B. Applicator Qualifications: Engage an experienced applicator with at least 5 years of experience and who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
 - 1. Maintain throughout duration of the Work a crew of painters who are fully qualified to satisfy requirements of the Specifications.
- C. Materials: Provide all coating materials required by this Section as produced by a single manufacturer, unless otherwise required or approved.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Report in writing to the Architect prior to the start of painting, any condition that may affect proper application.
 - 3. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 2. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.
 - 2. Test shop applied primers for compatibility with subsequent cover materials.
 - 3. Where materials are applied over previously painted surfaces, apply samples and perform in-place test to check for compatibility, adhesion and film integrity of the new materials to existing painted surfaces. Report in writing and condition that may affect application, appearance or performance of the paint.
- C. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Gypsum Board: 12 percent.
 - 5. Plaster: 12 percent.
- D. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- E. Plaster Substrates: Verify that plaster is fully cured.
- F. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.

- G. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- H. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
 - 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
 - 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

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

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

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

E. The General Trades Contractor shall be responsible for painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in equipment rooms:
 - a. Un-insulated metal piping.
 - b. Pipe hangers and supports.
 - c. Metal conduit.
 - d. Tanks that do not have factory-applied final finishes.
2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
- E. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.6 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces, Acrylic Semi-gloss:

BM	Primer:	Ultra Spec Masonry Interior/Exterior Latex Sealer 608
	1st coat:	Ultra Spec 500 Interior Semi-Gloss N539
	2nd coat:	Ultra Spec 500 Interior Semi-Gloss N539
SW	Primer:	Loxon Concrete and Masonry Primer
	1st coat:	ProMar 200 Zero VOC Latex Semi-Gloss
	2nd coat:	ProMar 200 Zero VOC Latex Semi-Gloss
PPG	Primer:	Speedhide Block Filler 6-15XI
	1 st coat:	6-4510XI Series Speedhide Zero Interior Latex Semi-Gloss.
	2 nd coat:	6-4510XI Series Speedhide Zero Interior Latex Semi-Gloss.

B. Concrete Substrates, Traffic Surfaces:

1. Polyamide Epoxy with non-skid additive. Total dry film thickness 6.0 mils minimum

BM	Primer: 1 coat Benjamin Moore Corotech 100% Solids Epoxy Pre-Primer V155 1 st Coat: Corotech Polyamide Epoxy V400 2 nd Coat: Corotech Polyamide Epoxy V400
SW	Primer: ArmorSeal WB epoxy 8100 Finish: ArmorSeal WB epoxy 8100
PPG	Primer: Aquapon WB EP 98E-1 Finish: Aquapon WB EP 98E-1

***Note: Perform adhesion test on previously coated floors prior to painting.

C. CMU Substrates:

1. Water-base epoxy, gloss. (Apply at all Corridors, Toilet Room, Locker Rooms, Kitchen, & Janitors Closets if CMU forms the finished surface).

BM	Primer: Ultra Spec Masonry Interior/Exterior Hi-Build Block Filler 571 1st coat: Corotech Pre-Catalyzed Waterborne Epoxy Semi-gloss V341 2nd coat: Corotech Pre-Catalyzed Waterborne Epoxy Semi-gloss V341
SW	Primer: ProIndustrial Heavy Duty Block Filler B42 series 1st coat: ProIndustrial Pre-Catalyzed WaterBased Epoxy 2nd coat: ProIndustrial Pre-Catalyzed WaterBased Epoxy
PPG	Primer: Speed Hide Block filler 6-15XI 1st coat: Aquapon WB EP 98E-1 2nd coat: Aquapon WB EP 98E-1

2. Acrylic Latex SemiGloss:

BM	Filler: Ultra Spec Masonry Interior/Exterior Hi-Build Block Filler 571 1st coat: Ultra Spec 500 Interior Semi-Gloss N539 2nd coat: Ultra Spec 500 Interior Semi-Gloss N539
SW	Filler: ProIndustrial Heavy Duty Block Filler B42 series 1st coat: ProMar 200 Zero VOC Latex Semi-Gloss 2nd coat: ProMar 200 Zero VOC Latex Semi-Gloss
PPG	Filler: SPEEDHIDE® Pro-EV Zero Interior Latex Primer 12-900XI 1st coat: Speedhide Zero Interior Latex Semi-Gloss. 6-4510XI Series 2nd coat: Speedhide Zero Interior Latex Semi-Gloss. 6-4510XI Series

Steel Substrates:

SW Primer: ProCryl Universal Metal Primer
 1st coat: ProIndustrial DTM Acrylic finish, semi-gloss
 2nd coat: ProIndustrial DTM Acrylic finish, semi-gloss
 Replace DTM with ProIndustrial WB Alykd Urethane Enamel, B3 at handrails and guardrails

PPG Primer: DTM Primer 907-12*
 1st coat: DTM Finish 907-12*
 2nd coat: DTM Finish 907-12*

- * PPG Pitthane Ultra Gloss 95-8000 for primer and finish coats at handrails and guardrails.

D. Galvanized-Metal Substrates:

SW Primer: ProCryl Universal Metal Primer
 1st coat: ProIndustrial DTM Acrylic finish
 2nd coat: ProIndustrial DTM Acrylic finish

PPG Primer: DTM Primer 907-12*
 1st coat: DTM Finish 907-12*
 2nd coat: DTM Finish 907-12*

- * PPG Pitthane Ultra Gloss 95-8000 for primer and finish coats at handrails and guardrails.

E. Aluminum (Not Anodized or Otherwise Coated) Substrates:

SW Primer: ProCryl Universal Metal Primer
 1st coat: ProIndustrial DTM Acrylic finish
 2nd coat: Proindustrial DTM Acrylic finish

PPG Primer: DTM Primer 907-12*
 1st coat: DTM Finish 907-12*
 2nd coat: DTM Finish 907-12*

- * PPG Pitthane Ultra Gloss 95-8000 for primer and finish coats at handrails and guardrails.

F. Wood Substrates, Non-Traffic Surfaces, Stained finish:

Polyurethane finish, satin gloss (filled and stained wood).

BM stain: Interior Penetrating Satin
 1st coat: Benwood Stays Clear Acrylic Polyurethane
 Low Lustre Finish N423
 2nd coat: Benwood Stays Clear Acrylic Polyurethane
 Low Lustre Finish N423

SW	stain:	Wood Classics 250 stain
	1st coat:	Wood Classics Polyurethane
	2nd coat:	Wood Classics Polyurethane
PPG	stain:	Deft Stain DFT400
	1st coat:	Deft Satin DFT129
	2nd coat:	Deft Satin DFT129

H. Wood, Non-Traffic, pigmented finish

Acrylic Latex, semi gloss.

BM	Primer:	Ultra Spec 500 Interior Latex Primer N534
	1st coat:	Ultra Spec 500 Interior Latex Semi-Gloss N539
	2nd coat:	Ultra Spec 500 Interior Latex Semi-Gloss N539
S/W	Primer:	Mulit Purpose Primer
	1st coat:	ProMar 200 Zero VOC Latex Semi-Gloss
	2nd coat:	ProMar 200 Zero VOC Latex Semi-Gloss
PPG	Primer:	SPEEDHIDE® Pro-EV Zero Interior Latex Primer 12-900XI
	1st coat:	Speedhide Zero Interior Latex Semi-Gloss. 6-4510XI Series
	2nd coat:	Speedhide Zero Interior Latex Semi-Gloss. 6-4510XI Series

I. Gypsum Board and or Plaster Substrates:

Water-base epoxy, semi-gloss. (Apply at all Corridors, Toilet Rooms, Kitchen, Locker Rooms , & Janitor Closets if Gypsum Wall board forms the finished surface).

BM	Primer:	Ultra Spec 500 Interior Latex Primer N534
	1st coat:	Corotech Pre-Catalyzed Waterborne Epoxy Semi-gloss V341
	2nd coat:	Corotech Pre-Catalyzed Waterborne Epoxy Semi-gloss V341
SW	Primer:	ProMar 200 zero VOC primer
	1st coat:	ProIndustrial Pre-Catalyzed WasterBased Epoxy
	2nd coat:	ProIndustrial Pre-Catalyzed WasterBased Epoxy
PPG	Primer:	Seal Grip 17-921XI
	1st coat:	Aquapon WB EP 98E-1
	2nd coat:	Aquapon WB EP 98E-1

2. Acrylic Latex Semi-Gloss

BM	Primer:	Ultra Spec 500 Interior Latex Primer N534
	1st coat:	Ultra Spec 500 Interior Latex Semi-Gloss N539
	2nd coat:	Ultra Spec 500 Interior Latex Semi-Gloss N539
SW	Primer:	ProMar 200 Zero VOC Primer
	1st coat:	ProMar 200 zero VOC Latex Semi-gloss
	2nd coat:	ProMar 200 zero VOC LatexSemi-Gloss

PPG	Primer:	SPEEDHIDE® Pro-EV Zero Interior Latex Primer 12-900XI
	1st coat:	Speedhide Zero Interior Latex Semi-Gloss. 6-4510XI Series
	2nd coat:	Speedhide Zero Interior Latex Semi-Gloss. 6-4510XI Series

END OF SECTION 099123

SECTION 102220 – CHANGING ROOMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Supplementary and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Site-assembled demountable partition changing rooms.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at the project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For demountable partitions.
 - 1. Include plans, elevations, sections, and attachment details at floors, columns, permanent partitions, and ceilings; and method of erection and disassembly.
- C. Samples: For each exposed product and for each color and texture specified, 6 inches (150 mm) square in size.
- D. Samples for Initial Selection: For each type of exposed finish.
 - 1. Include Samples of hardware and accessories involving color or finish selection.
- E. Samples for Verification: For each type of the following products:
 - 1. Face-Panel Finish: Manufacturer's standard-size unit, but not less than 6 inches (150 mm) square.
 - 2. Linear Trim: 12-inch- (300-mm-) long Samples.
 - 3. Door Finish: Manufacturer's standard-size unit, but not less than 3 inches (75 mm) square.
 - 4. Hardware and Accessories: One lockset.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from the installers of the items involved:
 - 1. Suspended-ceiling components and dimensioned ceiling-grid layout.
 - 2. Locations of fixed door and window mullions.
 - 3. Overhead bracing, seismic restraints, and related structural members.
 - 4. Ductwork above ceiling.
- B. Qualification Data: For Installer.
- C. Product Certificates: For each type of demountable partition.
- D. Product Test Reports: For each type of demountable-partition assembly, for tests performed by manufacturer and witnessed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For demountable partitions to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Partition Components: Furnish a quantity of each type of full-size unit with installation tools and materials equal to two percent of the amount installed, but no fewer than 2 units.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.9 FIELD CONDITIONS

- A. Finished Spaces: Do not deliver or install demountable partitions until finishes in spaces to receive them are complete, including suspended ceilings, floor finishes, and painting.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Basis of Design: WALL&FORMS, Inc., 15000 Grand River Road, Suite 111, Fort Worth, TX 76155 Phone: 972-745-0800, website: www.wallforms.com
 2. No Substitutions.

2.2 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 450 or less.

2.3 SITE-ASSEMBLED DEMOUNTABLE PARTITIONS

- A. General: Site-assembled, demountable-partition assembly and components that are the standard products of manufacturer.
- B. Face Panels: Manufacturer's standard particleboard substrate.
 1. Thickness: 3/4 inch (19 mm).
 2. Panel Widths: Modular and custom panel sizes, as required to achieve room configurations indicated on Drawings, and required filler panels.
 3. Facing (Both sides): Plastic laminate.
 - a. Color, Texture, and Pattern: As selected by Architect from manufacturer's full range.
- C. Trim: Continuous, factory-finished, snap-on type; adjustable for variations in floor level.
 1. Trim Material: Aluminum.
 2. Panel Joints: Butt joints with Closure trim.
 3. Outside Corner Trim: Square.
 4. Base Profile: Flush.
 5. Cornice Trim: Continuous over tops of partial-height units for maximum stability.
 6. Trim Color: As selected by Architect from manufacturer's full range.
- D. Doors: Manufacturer's standard 1-3/8 inch thick, full height, wood hollow core door construction.
 1. Door Operation: Sliding and Swinging – See drawings for locations of each.
 2. Door Finish: Match face panels of partition.

- a. Color, Texture, and Pattern: As selected by Architect from manufacturer's full range.
- E. Door Frames: Manufacturer's standard aluminum frames for 1-3/4-inch (45-mm) doors, factory mortised to receive hardware.
 - 1. Frame Finish: Color Anodized Factory Finish.
 - 2. Frame Color: As selected by Architect from manufacturer's full range.
- F. Door Hardware:
 - 1. Standard Changing Rooms: Privacy Lockset with push button locking and occupancy indicator. Lockset openable from exterior with special key.
 - 2. Handicap Accessible Stall: Privacy Lockable Latching Hardware for Sliding Door including occupancy indicator. Lockset openable from exterior with special key.
- G. Accessories:
 - 1. Steel corner brackets and thresholds for door opening panels.
 - 2. Overhead door track, door wheels and guide brackets for sliding panel doors.
- H. Bench:
 - 1. Standard Changing Rooms: Provide manufacturer's standard bench in each changing room with finish to match changing rooms.
 - 2. Handicap Accessible Changing Rooms: Provide manufacturer's accessible bench in each accessible changing room with finish to match changing room.
- I. Shelf:
 - 1. Provide manufacturer's standard shelf in each changing room.

2.4 OTHER MATERIALS

- A. Plastic Laminate: High-pressure decorative laminate according to NEMA LD 3.
 - 1. Winsonart Thermally Fused Laminate Panels.

2.5 FABRICATION

- A. General: Fabricate demountable walls for installation with concealed fastening devices and pressure-fit members that will not damage ceiling or floor coverings. Fabricate systems for installation with continuous seals at floor, ceiling, and other locations where partitions abut fixed construction.
- B. Panels for Site-Assembled Demountable Partitions: Face panels fabricated and finished in modular widths indicated.
 - 1. Transom Panels: Fabricated in material and finish to match wall panels unless otherwise indicated.
- C. Finish Facings: Factory apply finish-facing materials with appropriate backings, using mildew-resistant nonstaining adhesive as recommended by finish-material manufacturer's written instructions.

1. Apply facing to panel in one piece, seamless and with no gaps or overlaps; free of air bubbles, wrinkles, blisters, or other defects.
2. Tightly secure and conceal raw and selvage edges of facing for finished appearance.
3. Where facings with directional or repeating patterns, mark facing top and attach facing in same direction.
4. Match facing pattern 72 inches (1830 mm) above finished floor.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

- A. Color Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker over a nonspecular as fabricated mechanical finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine components before installation. Reject components that are wet, moisture damaged, mold damaged, broken, cracked, chipped, deformed, or unmatched.
- C. Examine roughing-in for electrical power to verify actual locations of power connections before partition installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install demountable partitions after other finishing operations have been completed.
 1. Install partitions rigid, level, plumb, and aligned. Install seals at connections with floors, ceilings, fixed walls, and abutting surfaces to prevent light and sound transmission.
 2. Except for filler panels scribed to fixed walls or columns, do not modify manufacturer's standard components.
- B. Doors and Frames: Install door-and-frame assemblies securely anchored to partitions and with doors aligned and fitted. Install and adjust door hardware for proper operation.

3.3 ERECTION TOLERANCES

- A. Install each demountable partition so surfaces vary not more than 1/8 inch (3 mm) from the plane formed by the faces of adjacent partitions.

3.4 ADJUSTING

- A. Inspect installation, correct misalignments, and tighten loose connections.
- B. Doors: Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly, and lubricate as recommended by manufacturer. Verify that latches and locks engage accurately and securely without forcing or binding.
- C. Remove and replace defaced or damaged components that cannot be satisfactorily repaired.

END OF SECTION 102220

SECTION 105113 - METAL LOCKERS HEALTH OCCUPATIONS CLASSROOM**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Installation of Heavy-duty metal lockers. Lockers supplied by Owner.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Owner will deliver lockers to the work area in coordination with the General Contractor.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.5 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

PART 2 - EXECUTION**2.1 EXAMINATION**

- A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

2.2 INSTALLATION

- A. General: Install level, plumb, and true; shim as required, using concealed shims.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
 2. Anchor single rows of metal lockers to walls near top and bottom of lockers.
 3. Anchor back-to-back metal lockers to floor.
- B. All-Welded Metal Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.
- C. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
1. Attach hooks with at least two fasteners.
 2. Attach door locks on doors using security-type fasteners.
 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
 - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
 - b. Attach plates to upper shelf of each open-front metal locker, centered, with a least two aluminum rivets.
 4. Attach recess trim to recessed metal lockers with concealed clips.
 5. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
 6. Attach sloping-top units to metal lockers, with closures at exposed ends.
 7. Attach boxed end panels with concealed fasteners to conceal exposed ends of nonrecessed metal lockers.

2.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.
- B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.
- C. Touch up marred finishes or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 105113 - METAL LOCKERS WELDING BUILDING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Installation of Heavy-duty metal lockers.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. General Contractor to be remove, protect and relocate existing lockers in accordance with Contract Documents.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.5 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

PART 2 - EXECUTION**2.1 EXAMINATION**

- A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

2.2 INSTALLATION

- A. General: Install level, plumb, and true; shim as required, using concealed shims.
 - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
 - 2. Anchor single rows of metal lockers to walls near top and bottom of lockers.
 - 3. Anchor back-to-back metal lockers to floor.
- B. All-Welded Metal Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.
- C. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
 - 1. Attach hooks with at least two fasteners.
 - 2. Attach door locks on doors using security-type fasteners.
 - 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
 - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
 - b. Attach plates to upper shelf of each open-front metal locker, centered, with a least two aluminum rivets.
 - 4. Attach recess trim to recessed metal lockers with concealed clips.
 - 5. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
 - 6. Attach sloping-top units to metal lockers, with closures at exposed ends.
 - 7. Attach boxed end panels with concealed fasteners to conceal exposed ends of nonrecessed metal lockers.

2.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.
- B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.
- C. Touch up marred finishes or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

SCHEDULE 1 - SUMMARY

- A. Section includes plastic-laminate countertops.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product, including high-pressure decorative laminate, adhesive for bonding plastic laminate.
 - 1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, electrical switches and outlets, and other items installed in plastic-laminate countertops.
 - 2. Apply WI Certified Compliance Program label to Shop Drawings.
- C. Samples for Initial Selection:
 - 1. Plastic laminates.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, fabricator.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.
- B. Installer Qualifications: Certified participant in AWI's Quality Certification Program.

- C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver countertops until painting and similar operations that could damage countertops have been completed in installation areas. If countertops must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 43 and 70 percent during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.
 - 1. Provide labels and certificates from AWI certification program indicating that countertops, including installation, comply with requirements of grades specified.
 - 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
- B. Grade: Premium.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Wilsonart International; Div. of Premark International, Inc.
 - b. Lamin-Art, Inc.
 - c. Panolam Industries International, Inc.
 - d. Formica
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 1. As indicated by manufacturer's designations.
 2. As selected by Architect from manufacturer's full range of available colors and patterns.
 3. Grain Direction: Parallel to cabinet fronts.
- E. Edge Treatment: 3-mm PVC edging.
- F. Core Material: Particleboard or medium-density fiber board , Exterior-grade plywood.
- G. Core Material at Sinks: Particleboard made with exterior glue, medium-density fiberboard made with exterior glue or exterior-grade plywood.
- H. Core Thickness: 1-1/8 inch (29 mm).
 1. Build up countertop thickness to 1-1/2 inches (38 mm) at front, back, and ends with additional layers of core material laminated to top.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
 1. Wood Moisture Content: 4 to 9 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 1. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
 2. Softwood Plywood: DOC PS 1.

2.3 ACCESSORIES

- A. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, color As selected by Architect from manufacturer's full range, molded-plastic grommets and matching plastic caps with slot for wire passage.
 1. Product: Subject to compliance with requirements, provide Products by one of the following:

- a. TG series by Doug Mockett & Company, Inc.
- b. BY-BE00612-A by CableOrganizer.com, Inc.

2.4 MISCELLANEOUS MATERIALS

- A. Adhesive for Bonding Plastic Laminate: Hybrid PVA type III water resistant adhesive.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.5 FABRICATION

- A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets. Ease edges to radius indicated for the following:
 - 1. Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
- B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.
- B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing and back priming.

3.2 INSTALLATION

- A. Grade: Install countertops to comply with same grade as item to be installed.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, wall protrusions, and similar items.
 - 2. Seal edges of cutouts by saturating with varnish.
- C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
 - 1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
 - 3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean countertops on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 123623.13

SECTION 226313

GAS PIPING FOR WELDING FACILITIES

PART 1 – GENERAL

1:01 RELATED DOCUMENTS

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

1:02 SUMMARY

- A. Section Includes:
 - 1. Acetylene piping.
 - 2. Oxygen piping.
 - 3. Argon piping.
 - 4. Carbon Dioxide/Argon blend piping.
 - 5. Undesignated (IG-3) inert gas piping.
- B. Owner-Furnished Material:
 - 1. Bulk welding gas storage cylinders.

1:03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include diagrams for power, signal, and control wiring.

1:04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Seismic Qualification Certificates: For gas manifold, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

- 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Certification from installer that all welding gas piping complies with NFPA 51 - Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes.
- D. Brazing certificates.
- E. Field quality-control reports.

1:05 CLOSEOUT SUBMITTALS

Operation and Maintenance Data: For gas piping specialties to include in emergency, operation, and maintenance manuals.

1:06 QUALITY ASSURANCE

- A. Comply with NFPA 51 - Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes.
- B. Brazing: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications"; or AWS B2.2, "Standard for Brazing Procedure and Performance Qualification."

PART 2 – PRODUCTS

2:01 SYSTEM DESCRIPTION

- A. Acetylene: operating pressure 0 to 15 psig.
- B. Oxygen: operating pressure 0 to 55 psig.
- C. Argon: operating pressure 0 to 30 psig.
- D. Carbon Dioxide/Argon Blend: operating pressure 0 to 30 psig.
- E. Inert Gas-3: operating pressure 0 to 30 psig.

2:02 PERFORMANCE REQUIREMENTS

Seismic Performance: Gas manifolds and piping shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2:03 PIPES, TUBES AND FITTINGS

- A. Comply with NFPA 51 for welding gas piping materials.
- B. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.
 - 1. Cast-Copper Solder-Joint Fittings: ASME B16.18, pressure fittings.
 - 2. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
 - 3. Cast-Copper-Alloy Flanges: ASME B16.24, Class 150, with solder-joint ends.
 - 4. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
- C. Steel Pipe: ASTM B31.3, black steel with plain ends; welded and seamless, Schedule 40 wall thickness.
 - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150.
 - 2. Malleable-Iron Unions: ASME B16.39; Classes 150
 - 3. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.5, Classes 150; raised ground face, and bolt holes spot faced.

2:04 JOINING MATERIALS

- A. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys.
- B. Threaded-Joint Tape: Compatible with gas to be handled.
- C. Gasket Material: Thickness, material, and type suitable for gas to be handled and working temperatures and pressures.

2:05 DIELECTRIC FITTINGS

General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

2:06 VALVES

- A. Comply with NFPA 51 for high-pressure gas cylinder manifold headers.
- B. Valves are indicated by part number on the Drawings.

2:07 GAS MANIFOLDS

- A. Comply with NFPA 51 for high-pressure gas cylinder manifold headers.
- B. Manifolds and Headers are indicated by part number on the drawings.

2:08 BULK MEDICAL GAS STORAGE TANKS

- A. Comply with NFPA 51 for high-pressure gas cylinders.
- B. Gas Storage Cylinders are by the Owner.

2:09 GAS CYLINDER STORAGE RACKS

- A. Wall Storage Racks: Provide manufactured wall mounted cylinder racks with chain restraints for upright cylinders as indicated.
- B. Freestanding Storage Racks: Provide manufactured storage racks as indicated.

PART 3 – EXECUTION

3:01 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of gas piping. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Comply with NFPA 51 for installation of welding gas piping.
- C. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install distribution mains and branch piping tight to or within 8 inches of the underside of the roof structural steel.
- F. Install piping adjacent to equipment and specialties to allow service and maintenance.
- G. Install nipples, unions, special fittings, and valves with pressure ratings same as or higher than system pressure rating.
- H. Install piping to permit valve servicing.

- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and for branch connections.
- K. Piping Restraint Installation: Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- L. Connect gas piping to gas sources and to gas outlets and equipment requiring gas service.
- M. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- N. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3:02 JOINT CONSTRUCTION

- A. Remove scale, slag, dirt, and debris from outside of cleaned tubing and fittings before assembly.
- B. Threaded Joints: Apply appropriate tape to external pipe threads.
- C. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Braze Joints" chapter. Continuously purge joint with oil-free, dry nitrogen during brazing.

3:03 GAS SERVICE COMPONENT INSTALLATION

- A. Install gas manifolds anchored to substrate.
- B. Install gas cylinders and connect to manifold piping.
- C. Install gas manifolds with seismic restraints.

3:04 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment" for seismic-restraint devices.
- B. Comply with requirements in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support devices.
- C. Vertical Piping: MSS Type 8 or Type 42, clamps.

- D. Individual, Straight, Horizontal Piping Runs:
 - 1. 100 Feet and Less: MSS Type 1, adjustable, steel, clevis hangers.
 - 2. Longer than 100 Feet: MSS Type 43, adjustable, roller hangers.
- E. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze. Comply with requirements in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment" for trapeze hangers.
- F. Support horizontal piping within 12 inches of each fitting and coupling.
- G. Install hangers for drawn-temper copper piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS $\frac{3}{4}$ and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS $1\frac{1}{4}$: 72 inches with 3/8-inch rod.
 - 3. NPS $1\frac{1}{2}$ and NPS 2: 96 inches with 3/8-inch rod.
- H. Install supports for vertical drawn-temper copper piping every 10 feet.
- I. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS $1\frac{1}{4}$ and Smaller: 84 inches with 3/8-inch rod.
 - 2. NPS $1\frac{1}{2}$: 108 inches with 3/8-inch rod.
 - 3. NPS 2: 10 feet with 3/8-inch rod.
- J. Install supports for vertical steel piping every 15 feet (4.5 m).

3:05 IDENTIFICATION

- A. Install identifying labels and devices for specialty gas piping, valves, and specialties. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment."
- B. Install identifying labels and devices for welding gas piping systems according to NFPA 51.

3:06 FIELD QUALITY CONTROL WELDING GAS INSTALLATION

- A. Tests:

1. Welding Gas Piping Testing Coordination: Perform tests according to requirements in NFPA 51:
 - a. Initial pressure test.
 - b. Standing pressure test for positive-pressure welding gas piping.
 - c. Operational pressure test.
 - d. Valve test.
 - e. Verify correct labeling of equipment and components.
 - f. Repair leaks and retest until no leaks exist.
 2. Testing Certification: Certify that specified tests, inspections, and procedures have been performed and certify report results. Include the following:
 - a. Inspections performed.
 - b. Procedures, materials, and gases used.
 - c. Test methods used.
 - d. Results of tests.
- B. Remove and replace components that do not pass tests and retest as specified above.
- C. Prepare test and inspection reports.

3:07 PROTECTION

Protect finished and testing installations from damage.

3:08 PIPING SCHEDULE

- A. Connect new tubing to existing tubing with memory-metal couplings.
- B. Acetylene Piping: All sizes: Schedule 40, Grade B, Type 96 steel pipe; Class 150, malleable-iron fittings; cast-iron flanges and flange fittings; and threaded joints.
- C. Oxygen Piping: All sizes: Type L, copper tube; wrought-copper fittings; and brazed joints.
- D. Argon Piping: All Sizes: Type L, copper tube; wrought-copper fittings; and brazed joints.
- E. Carbon Dioxide/Argon Blend Piping: All sizes: Schedule 40, Grade B, Type 96 steel pipe; Class 150, malleable-iron fittings; cast-iron flanges and flange fittings; and threaded joints.

- F. Inert Gas-3 Piping: All sizes: Schedule 40, Grade B, Type 96 steel pipe; Class 150, malleable-iron fittings; cast-iron flanges and flange fittings; and threaded joints.

END OF SECTION

DIVISION 26 - ELECTRICAL

260519	Low-Voltage Electrical Power Conductors and Cables
260526	Grounding and Bonding for Electrical Systems
260529	Hangers and Supports for Electrical Systems
260533	Raceways and Boxes for Electrical Systems
260544	Sleeves and Sleeve Seals for Electrical Raceways and Cabling
260548	Vibration and Seismic Controls for Electrical Systems
260553	Identification for Electrical Systems
260923	Lighting Control Devices
262726	Wiring Devices
265119	LED Interior Lighting

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
 - 1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Alcan Products Corporation; Alcan Cable Division.
 - 2. American Insulated Wire Corp.; a Leviton Company.
 - 3. General Cable Corporation.
 - 4. Senator Wire & Cable Company.
 - 5. Southwire Company.
- B. Copper Conductors: Comply with NEMA WC 70.
- C. Conductor Insulation: Comply with NEMA WC 70 for Types THW and THHN-THWN.
- D. Multiconductor Cable: Comply with NEMA WC 70 for metal-clad cable, Type MC with ground wire.

2.2 CONNECTORS AND SPLICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Hubbell Power Systems, Inc.
 - 3. O-Z/Gedney; EGS Electrical Group LLC.
 - 4. 3M; Electrical Products Division.
 - 5. Tyco Electronics Corp.
- C. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR 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 THW, THHN-THWN, or XHHW single conductors in raceway.
- B. Exposed Feeders: Type THW or THHN-THWN single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THW or THHN-THWN single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THW or THHN-THWN single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THW or THHN-THWN single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway or Metal-clad cable, Type MC.
 - 1. Metallic cable may be used on this project only as follows:
 - a. From junction box to light fixture (8 feet maximum length);
 - b. For lighting circuits from light fixture to light fixture above accessible ceilings (10 feet maximum length);
 - c. Connection to motors (2 feet maximum);
 - d. Branch circuits in stud walls.
 - 2. All other wiring shall be installed in EMT or rigid metal conduit unless approved otherwise by the Engineer prior to installation. All feeder wiring shall be run in conduit. All branch circuit wiring shall be run in conduit from the panel to the room/area served by the branch circuit.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THW or THHN-THWN single conductors in raceway.
- H. Cord Drops and Portable Appliance Connections: Type SJO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- I. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- J. Class 2 Control Circuits: Type THHN-THWN, in raceway or Power-limited cable, concealed in building finishes.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."
- F. Identify and color-code conductors and cables according to Section 260553 "Identification 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 and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 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."

3.6 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Perform tests and inspections and prepare test reports.
- C. Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- D. Test Reports: Prepare a written report to record the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.

3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- E. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Grounding systems and equipment.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - 1. Instructions for periodic testing and inspection of grounding features at ground rings based on NFPA 70B.
 - a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
 - b. Include recommended testing intervals.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- 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 UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 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:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 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. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad; 3/4 inch by 10 feet in diameter.
- B. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts.
 - 1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches long.
 - 2. Backfill Material: Electrode manufacturer's recommended material.

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. Underground Grounding Conductors: Install bare or tinned-copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 30 inches below grade.
- C. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Exothermic welded connectors.
 - 3. Connections to Structural Steel: Welded connectors.

3.2 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.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Flexible raceway runs.
 - 6. Armored and metal-clad cable runs.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- D. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
 - 1. For communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 - 2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch grounding bus.
 - 3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. 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.
- D. Ground Counterpoise: Install a grounding conductor, electrically connected to each ground rod and to main ground bus bar.
 - 1. Install tinned-copper conductor not less than No. 2/0 AWG for ground counterpoise.
 - 2. Bury ground ring not less than 30 inches from building's foundation.
 - 3. Install three (3) ground rods equi-spaced at least 10 feet apart from each other.

3.4 LABELING

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems" for instruction signs. The label or its text shall be green.
- B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.
 - 1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.

C. 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.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

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

E. Prepare test and inspection reports.

F. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohms.
5. Pad-Mounted Equipment: 5 ohms.

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

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.
- B. Related Sections include the following:
 - 1. Section 260548 "Vibration and Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - g. Wesanco, Inc.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. 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.

- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Hilti Inc.
 - 2. ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3. MKT Fastening, LLC.
 - 4. Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
 - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated or stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2. Empire Tool and Manufacturing Co., Inc.
 - 3. Hilti Inc.
 - 4. ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5. MKT Fastening, LLC.
 - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
 - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 - 6. Toggle Bolts: All-steel springhead type.
 - 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other 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.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. 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.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.

5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, or Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 7. To Light Steel: Sheet metal screws.
 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Boxes, enclosures, and cabinets.

1.3 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel conduit.
- C. IMC: Intermediate metal conduit.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Allied Tube & Conduit; a Tyco International Ltd. Co.
 - 3. Anamet Electrical, Inc.
 - 4. Electri-Flex Company.
 - 5. O-Z/Gedney; a brand of EGS Electrical Group.
 - 6. Picoma Industries, a subsidiary of Mueller Water Products, Inc.
 - 7. Republic Conduit.
 - 8. Robroy Industries.
 - 9. Southwire Company.
 - 10. Thomas & Betts Corporation.
 - 11. Wheatland Tube Company; a division of John Maneely Company.

- B. 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.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. ARC: Comply with ANSI C80.5 and UL 6A.
- E. IMC: Comply with ANSI C80.6 and UL 1242.
- F. PVC-Coated Steel Conduit: PVC-coated IMC.
 - 1. Comply with NEMA RN 1.
 - 2. Coating Thickness: 0.040 inch, minimum.
- G. EMT: Comply with ANSI C80.3 and UL 797.
- H. FMC: Comply with UL 1; zinc-coated steel or aluminum.
- I. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- J. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 - 2. Fittings for EMT:
 - a. Material: Steel or die cast.
 - b. Type: Setscrew or compression.
 - 3. 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.
 - 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- K. Joint Compound for IMC, GRC, or ARC: 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, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Anamet Electrical, Inc.
 - 3. Arnco Corporation.
 - 4. CANTEX Inc.
 - 5. CertainTeed Corp.
 - 6. Condux International, Inc.
 - 7. Electri-Flex Company.
 - 8. Kraloy.

9. Lamson & Sessions; Carlon Electrical Products.
 10. Niedax-Kleinhuis USA, Inc.
 11. RACO; a Hubbell company.
 12. Thomas & Betts Corporation.
- B. Listing and Labeling: Nonmetallic 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.
 - C. ENT: Comply with NEMA TC 13 and UL 1653.
 - D. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
 - E. LFNC: Comply with UL 1660.
 - F. Rigid HDPE: Comply with UL 651A.
 - G. Continuous HDPE: Comply with UL 651B.
 - H. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
 - I. RTRC: Comply with UL 1684A and NEMA TC 14.
 - J. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
 - K. Fittings for LFNC: Comply with UL 514B.
 - L. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - M. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Cooper B-Line, Inc.
 2. Hoffman; a Pentair company.
 3. Mono-Systems, Inc.
 4. Square D; a brand of Schneider Electric.
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.
 1. Metal wireways installed outdoors shall be NEMA 3R 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.
- D. Wireway Covers: NEMA 1 - Screw-cover type; NEMA 3R - Flanged-and-gasketed type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Cooper Technologies Company; Cooper Crouse-Hinds.
 - 2. EGS/Appleton Electric.
 - 3. Erickson Electrical Equipment Company.
 - 4. FSR Inc.
 - 5. Hoffman; a Pentair company.
 - 6. Hubbell Incorporated; Killark Division.
 - 7. Milbank Manufacturing Co.
 - 8. Mono-Systems, Inc.
 - 9. O-Z/Gedney; a brand of EGS Electrical Group.
 - 10. RACO; a Hubbell Company.
 - 11. Robroy Industries.
 - 12. Spring City Electrical Manufacturing Company.
 - 13. Thomas & Betts Corporation.
 - 14. 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, cast aluminum or 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: 2-gang - 4 inches square by 2-1/8 inches deep; single gang - 4 inches by 2-1/8 inches by 2-1/8 inches deep.
- I. Gangable boxes are allowed beyond 2-gang boxes.

- J. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- K. Cabinets:
 - 1. NEMA 250, Type 1 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.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC, PVC-coated IMC, or ARC.
 - 2. Concealed Conduit, Aboveground: IMC.
 - 3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried or concrete encased.
 - 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, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: IMC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations, and for connection to mechanical equipment in mechanical rooms.
 - 6. Damp or Wet Locations: GRC.
 - 7. 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. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 - 3. EMT: Use setscrew or compression, steel or cast-metal fittings. Comply with NEMA FB 2.10.
 - 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.
- H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

- A. 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.
- B. 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.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Raceways are NOT permitted in floor slabs on grade or elevated floor slabs, only below slabs on grade.

- J. Raceways below slabs on grade:
 - 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. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 4. Change from ENT to GRC or IMC before rising above floor.
- K. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- L. 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.
- M. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- N. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- O. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- P. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- Q. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- R. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- S. 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.
- T. 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. Install raceway sealing fittings according to NFPA 70.

- U. 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. Where otherwise required by NFPA 70.
- V. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- W. 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. Install in each run of aboveground RMC conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 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.
 - d. Attics: 135 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 deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal 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.
- X. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed 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.
- Y. 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.

- Z. 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 box and cover plate or supported equipment and box.
- AA. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- BB. Locate boxes so that cover or plate will not span different building finishes.
- CC. 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.
- DD. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified in Section 312000 "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured rigid steel conduit elbows (large sweep) for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
5. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- 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, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Install handholes with bottom below frost line, 30" below grade.
- 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 conduits 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.

3.5 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."

3.6 FIRESTOPPING

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

3.7 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

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.
 - 5. Silicone sealants.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
 - 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:
 - 1. Material: Galvanized sheet steel.
 - 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 SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 2. Pressure Plates: Carbon steel.
 - 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.3 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.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 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.
 - 2. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- 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.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- 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-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 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

SECTION 260548 - VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Isolation pads.
2. Spring isolators.
3. Restrained spring isolators.
4. Channel support systems.
5. Restraint cables.
6. Hanger rod stiffeners.
7. Anchorage bushings and washers.

- B. Related Sections include the following:

1. Section 260529 "Hangers and Supports for Electrical Systems" for commonly used electrical supports and installation requirements.

1.3 DEFINITIONS

- A. The IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic-Restraint Loading:

1. Site Class as Defined in the IBC.
2. Assigned Seismic Use Group or Building Category as Defined in the IBC.
 - a. Component Importance Factor: 1.0.
 - b. Component Response Modification Factor: 1.5.
 - c. Component Amplification Factor: 1.0.

1.5 ACTION SUBMITTALS

- A. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators and seismic restraints.
 - a. Coordinate design calculations with wind-load calculations required for equipment mounted outdoors. Comply with requirements in other electrical Sections for equipment mounted outdoors.
 - 2. Indicate materials and dimensions and identify hardware, including attachment and anchorage devices.
 - 3. Field-fabricated supports.
 - 4. Seismic-Restraint Details:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
 - c. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints.
- B. Qualification Data: For testing agency.
- C. Welding certificates.
- D. Field quality-control test reports.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
- B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- E. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ace Mountings Co., Inc.
 - 2. Amber/Booth Company, Inc.
 - 3. California Dynamics Corporation.
 - 4. Isolation Technology, Inc.
 - 5. Kinetics Noise Control.
 - 6. Mason Industries.
 - 7. Vibration Eliminator Co., Inc.
 - 8. Vibration Isolation.
 - 9. Vibration Mountings & Controls, Inc.
- B. Pads: Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
 - 1. Resilient Material: Oil- and water-resistant neoprene.
- C. Spring Isolators: Freestanding, laterally stable, open-spring isolators.
 - 1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 - 2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 - 3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 - 4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 - 5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4-inch- thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig.
 - 6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

- D. Restrained Spring Isolators : Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.
1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
 2. Restraint: Seismic or limit-stop as required for equipment and authorities having jurisdiction.
 3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.2 SEISMIC-RESTRAINT DEVICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Amber/Booth Company, Inc.
 2. California Dynamics Corporation.
 3. Cooper B-Line, Inc.; a division of Cooper Industries.
 4. Hilti Inc.
 5. Loos & Co.; Seismic Earthquake Division.
 6. Mason Industries.
 7. TOLCO Incorporated; a brand of NIBCO INC.
 8. Unistrut; Tyco International, Ltd.
- B. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- D. Restraint Cables: ASTM A 603 galvanized or ASTM A 492 stainless-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.
- E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or reinforcing steel angle clamped to hanger rod. Do not weld stiffeners to rods.

- F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchors and studs.
- G. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices.
- H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- I. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- J. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.3 FACTORY FINISHES

- A. Finish: Manufacturer's standard prime-coat finish ready for field painting.
- B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
 - 1. Powder coating on springs and housings.
 - 2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
 - 3. Baked enamel or powder coat for metal components on isolators for interior use.
 - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Equipment and Hanger Restraints:
 - 1. Install restrained isolators on electrical equipment.
 - 2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
 - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.
- B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- D. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 - 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Perform tests and inspections.
- C. Tests and Inspections:
 - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 - 2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.
 - 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 - 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
 - 5. Test to 90 percent of rated proof load of device.
 - 6. Measure isolator restraint clearance.
 - 7. Measure isolator deflection.
 - 8. Verify snubber minimum clearances.
 - 9. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Adjust isolators after isolated equipment is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- C. Adjust active height of spring isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 260548

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special, and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

1.3 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.4 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.

- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on a white field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- G. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.2 METAL-CLAD CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Colors for Raceways Carrying Circuits at 600 V and Less:
 - 1. Black letters on a white field.
 - 2. Legend: Indicate voltage and system or service type.

- C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- D. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.
- E. Snap-Around Labels: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Snap-Around, Color-Coding Bands: Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Snap-Around Labels: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

- D. Snap-Around, Color-Coding Bands: Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- F. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.5 FLOOR MARKING TAPE

- A. 2-inch- wide, yellow semi-gloss paint, with stripes in clear zone area.

2.6 UNDERGROUND-LINE WARNING TAPE

- A. Tape:
 - 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.
- B. Color and Printing:
 - 1. Comply with ANSI Z535.1 through ANSI Z535.5.
 - 2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
 - 3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.
- C. Tag:
 - 1. Reinforced, detectable three-layer laminate, consisting of a printed pigmented woven scrim, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
 - 2. Overall Thickness: 8 mils.
 - 3. Foil Core Thickness: 0.35 mil.
 - 4. Weight: 34 lb/1000 sq. ft.
 - 5. 3-Inch Tensile According to ASTM D 882: 300 lbf, and 12,500 psi.

2.7 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Baked-Enamel Warning Signs:
 - 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - 2. 1/4-inch grommets in corners for mounting.
 - 3. Nominal size, 7 by 10 inches.
- D. Metal-Backed, Butyrate Warning Signs:
 - 1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
 - 2. 1/4-inch grommets in corners for mounting.
 - 3. Nominal size, 10 by 14 inches.
- E. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES" (for 208V systems) "48 INCHES" (for 480V systems).

2.8 EQUIPMENT IDENTIFICATION LABELS

- A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.
- B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.
- C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.9 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
 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.
 4. Color: Black except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.
1. Minimum Width: 3/16 inch.
 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.
 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
1. Minimum Width: 3/16 inch.
 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.

2.10 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select 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 identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in

contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

- G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line 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.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label or self-adhesive vinyl tape applied in bands. Install labels at 10-foot maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. Emergency Power.
 - 2. Power.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1. Phase A: Black.
 - 2. Phase B: Red.
 - 3. Phase C: Blue.
 - c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.
- F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
 - 1. Limit use of underground-line warning tape to direct-buried cables.
 - 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- H. Workspace Indication: Paint floor markings to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- I. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. 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.
 - b. Controls with external control power connections.
- J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- 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 and load shedding.
- L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power,

lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

- a. Switchboards and Panelboards: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
- b. Individual Circuit Breakers in Switchboards: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
- c. Indoor Equipment: Adhesive film label or Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
- d. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
- e. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
- f. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Directory shall list what the breaker serves and the actual room numbers/areas, not architectural room numbers. Panelboard identification shall be self-adhesive, engraved, laminated acrylic or melamine label. Update existing directories to reflect work performed.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.
- d. Switchboards and the individual circuit breakers contained within it.
- e. Emergency system boxes and enclosures.
- f. Enclosed switches.
- g. Enclosed circuit breakers.
- h. Enclosed controllers.
- i. Push-button stations.
- j. Contactors.

END OF SECTION 260553

SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Photoelectric switches.
2. Indoor occupancy sensors.
3. Emergency shunt relays.

- B. Related Requirements:

1. Section 262726 "Wiring Devices" for wall-box dimmers, and manual light switches.

1.3 ACTION SUBMITTALS

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

- B. Shop Drawings: Show installation details for occupancy and light-level sensors.

1. Interconnection diagrams showing field-installed wiring.
2. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each type of lighting control device to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 OUTDOOR PHOTOELECTRIC SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Intermatic, Inc.
 - 2. NSi Industries LLC; TORK Products.
- B. Description: Solid state, with SPST dry contacts rated for 1000-VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Light-Level Monitoring Range: 1.5 to 10 fc (16.14 to 108 lux), with an adjustment for turn-on and turn-off levels within that range, and a directional lens in front of the photocell to prevent fixed light sources from causing turn-off.
 - 3. Time Delay: Fifteen second minimum, to prevent false operation.
 - 4. Surge Protection: Metal-oxide varistor.
 - 5. Mounting: Twist lock complies with NEMA C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.
 - 6. Voltage rating as required to connect into lighting control system.

2.2 INDOOR OCCUPANCY SENSORS (Line Voltage)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Acuity.
 - 2. Watt Stopper.
 - 3. Lutron.
 - 4. Sensorsworx.
 - 5. Current Controls.
- B. General Requirements for Sensors: Ceiling-mounted, solid-state indoor occupancy sensors with a separate power pack.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
 - 3. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack.
 - 4. Power Pack: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.

5. Mounting:
 - a. Sensor: Suitable for mounting in any position on a standard outlet box.
 - b. Relay: Externally mounted through a 1/2-inch (13-mm) knockout in a standard electrical enclosure.
 - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
 6. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
 7. Bypass Switch: Override the "on" function in case of sensor failure.
 8. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc (21.5 to 2152 lux); turn lights off when selected lighting level is present.
- C. PIR Type: Ceiling mounted; detect occupants in coverage area by their heat and movement.
1. Detector Sensitivity: Detect occurrences of 6-inch- (150-mm-) minimum movement of any portion of a human body that presents a target of not less than 36 sq. in. (232 sq. cm).
 2. Detection Coverage (Room): Detect occupancy anywhere in a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 3. Detection Coverage (Corridor): Detect occupancy within 90 feet (27.4 m) when mounted on a 10-foot- (3-m-) high ceiling.
- D. Ultrasonic Type: Ceiling mounted; detect occupants in coverage area through pattern changes of reflected ultrasonic energy.
1. Detector Sensitivity: Detect a person of average size and weight moving not less than 12 inches (305 mm) in either a horizontal or a vertical manner at an approximate speed of 12 inches/s (305 mm/s).
 2. Detection Coverage (Small Room): Detect occupancy anywhere within a circular area of 600 sq. ft. (56 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 4. Detection Coverage (Large Room): Detect occupancy anywhere within a circular area of 2000 sq. ft. (186 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 5. Detection Coverage (Corridor): Detect occupancy anywhere within 90 feet (27.4 m) when mounted on a 10-foot- (3-m-) high ceiling in a corridor not wider than 14 feet (4.3 m).
- E. Dual-Technology Type: Ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.
1. Sensitivity Adjustment: Separate for each sensing technology.
 2. Detector Sensitivity: Detect occurrences of 6-inch- (150-mm-) minimum movement of any portion of a human body that presents a target of not less than 36 sq. in. (232 sq. cm), and detect a person of average size and weight moving not less than 12 inches (305 mm) in either a horizontal or a vertical manner at an approximate speed of 12 inches/s (305 mm/s).
 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.

2.3 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Acuity #WSX-WH.
 - 2. Lutron LOS-SIR-HD-WH.
 - 3. Watt Stopper.
 - 4. Sensorworx.
- B. General Requirements for Sensors: Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application, and shall comply with California Title 24.
 - 2. Operating Ambient Conditions: Dry interior conditions, 14 to 85 deg F (-10 to 29 deg C).
 - 3. Switch Rating: Not less than 800-VA fluorescent at 120 V, 1200-VA fluorescent at 277 V, and 800-W incandescent.
- C. Wall-Switch Sensor:
 - 1. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage up to 20 feet for small motion.
 - 2. Sensing Technology: PIR.
 - 3. Switch Type: SP, field selectable automatic "on," or manual "on" automatic "off."
 - 4. Voltage: Dual voltage, 120 and 277 V.
 - 5. Concealed, field-adjustable, "off" time-delay selector at up to 20 minutes.
 - 6. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.

2.4 GENERATOR TRANSFER RELAY

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Philips/Bodine Generator Transfer Device
- B. Description: Device to bypass wall switch when emergency generator powers light fixture; complying with UL 924.
 - 1. Coil Rating: 120/277 V.

2.5 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Control Cable: Multi-conductor cable with stranded-copper conductors not smaller than recommended by lighting control system manufacturer.

PART 3 - EXECUTION

3.1 SENSOR INSTALLATION

- A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- B. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.2 WIRING INSTALLATION

- A. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 3/4 inch.
- B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and non-power-limited conductors according to conductor manufacturer's written instructions.
- C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."
 - 1. Identify controlled circuits in lighting contactors.
 - 2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.
- B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate lighting control devices and perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Lighting control devices will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
 - 1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
 - 2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.

3.6 DEMONSTRATION

- A. Coordinate demonstration of products specified in this Section with demonstration requirements for low-voltage, programmable lighting control systems specified in Section 260943 "Network Lighting Controls."
- B. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 260923

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Twist-locking receptacles.
 - 3. Tamper-resistant receptacles.
 - 4. Weather-resistant receptacles.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. UTP: Unshielded twisted pair.

1.4 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 if requested.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names:
 1. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 2. Leviton Mfg. Company Inc. (Leviton).
 3. Pass & Seymour/Legrand (Pass & Seymour).
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 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 application.
- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 2. Devices shall comply with the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

- A. Duplex Convenience Receptacles, 125V, 20A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498. Federal Spec Grade with decora-style nylon face (smooth), steel strap, brass contacts for side and back wiring, and nylon base.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell; Commercial Specification Grade or Extra Heavy Duty.
 - b. Leviton; Commercial Grade.
 - c. Pass & Seymour; Commercial Specification Grade.
 - d. Color shall be white.
 - e. Prewired pigtailed connectors that accommodate Fed Spec receptacles will be considered as equivalents. Pass & Seymour PT5362 series or Hubbell SNAPConnect™ equivalent.
- B. Tamper-Resistant Duplex Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement std, and FS W-C-596.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell; Commercial Specification Grade or Extra Heavy Duty.
 - b. Leviton; Commercial Grade.
 - c. Pass & Seymour; Commercial Specification Grade.

2.4 GFCI RECEPTACLES

A. General Description:

1. Straight blade, non-feed-through type.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. Tamper-Resistant GFCI Convenience Receptacles, 125 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell; GFR5362S.
 - b. Pass & Seymour; 2095TR.
 - c. Leviton T7899

2.5 TWIST-LOCKING RECEPTACLES

A. Single Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration L5-20R, and UL 498.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell; HBL2310.
 - b. Leviton; 2310.
 - c. Pass & Seymour; L520-R.

2.6 WALL PLATES

A. 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 Kitchens and Food Service Areas: 0.035-inch-thick, satin-finished 302 stainless.
4. Material for Unfinished Spaces: Galvanized steel.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

1. Pass & Seymour WIUC10 Series.
2. Hubbell.

3. Leviton.

2.7 FINISHES

- A. Wiring Device Color: **GRAY**
- B. Wall Plate: Stainless as specified herein.

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. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 2. 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.
 3. 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.
 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailling existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.

4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. 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.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Use durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
1. Test Instruments: Use instruments that comply with UL 1436.
 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. Tests for Convenience 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.

6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- 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 265119 - LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior solid-state luminaires that use LED technology.
 - 2. Emergency lighting units.
 - 3. Exit signs.
 - 4. Lighting fixture supports.

1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including driver, light engine, reflector, and housing.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Arrange in order of luminaire designation.
 - 2. Include data on features, accessories, and finishes.
 - 3. Include physical description and dimensions of luminaires.
 - 4. Include emergency lighting units, including batteries and chargers.
 - 5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
 - 6. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing and Calculation Guides, of each lighting fixture

type. The adjustment factors shall be for lamps and accessories identical to those indicated for the lighting fixture as applied in this Project.

- a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
- b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Installation instructions.

D. Lighting Fixture Schedule: Refer to drawings.

1.5 INFORMATIONAL SUBMITTALS

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

1. Lighting luminaires.
2. Suspended ceiling components.
3. Partitions and millwork that penetrate the ceiling or extend to within 12 inches of the plane of the luminaires.
4. Structural members to which suspension system and/or luminaires will be attached.
5. Initial access modules for acoustical tile, including size and locations.
6. Items penetrating finished ceiling, including the following:
 - a. Other luminaires.
 - b. Air outlets and inlets.
 - c. Sprinklers.
 - d. Smoke and Heat Detectors.
 - e. Access panels.
 - f. Occupancy Sensors.
7. Moldings.

B. Qualification Data: For testing laboratory providing photometric data for luminaires.

C. Product Certificates: For each type of luminaire.

D. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.
 - 1. Provide a list of all fixture types used on Project; use ANSI and manufacturers' codes.

1.7 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products, and complying with the applicable IES testing standards.
- B. Provide luminaires from a single manufacturer for each luminaire type.
- C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.9 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Two (2) years from date of Substantial Completion.
- C. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period for Emergency Lighting Unit Batteries: 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining nine years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.
 - 1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified and the luminaire will be fully operational during and after the seismic event."

2.3 LUMINAIRE 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. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
- D. Recessed Fixtures: Comply with NEMA LE 4.
- E. Bulb shape complying with ANSI C79.1.
- F. Lamp base complying with ANSI C81.61 or IEC 60061-1.
- G. CRI of minimum 85. CCT of 4000 K or as indicated on the drawings.
- H. Rated lamp life of 50,000 hours, minimum.
- I. Lamps dimmable from 100 percent to 0 percent of maximum light output, or as indicated on the drawings.
- J. Integral driver.
- K. Nominal Operating Voltage: As indicated on the drawings.

2.4 MATERIALS

- A. Metal Parts:
 - 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging.
- B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- C. Diffusers and Globes:

1. Acrylic Diffusers: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Glass: Annealed crystal glass unless otherwise indicated.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

D. Housings:

1. Extruded-aluminum or steel housing and heat sink.
2. Powder-coat or painted finish.

E. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Light engine / driver wattage.
 - c. CCT and CRI for all luminaires.

2.5 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they can be and are assembled or installed to minimize contrast.

2.6 EXIT SIGNS

- A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:

1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.

2.7 EMERGENCY LIGHTING UNITS

- A. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.

1. Battery: Sealed, maintenance-free, lead-acid type.
2. Charger: Fully automatic, solid-state type with sealed transfer relay.
3. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.

5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
6. Integral Time-Delay Relay: Holds unit on for fixed interval of 3 minutes when power is restored after an outage.
7. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.8 LUMINAIRE FIXTURE SUPPORT COMPONENTS

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, 1/2-inch (13-mm) steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).
- E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage (2.68 mm).
- F. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.
- G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before fixture installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

3.3 TEMPORARY LIGHTING

- A. If approved by the Engineer, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting.

3.4 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and relamping.
 - 3. Provide support for luminaire without causing deflection of ceiling or wall.
 - 4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.
- E. Flush-Mounted Luminaire Support:
 - 1. Secured to outlet box.
 - 2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
 - 3. Trim ring flush with finished surface.
- F. Wall-Mounted Luminaire Support:
 - 1. Use one of the following support types.
 - a. Attached to structural members in walls.
 - b. Attached to a minimum 20 gauge backing plate attached to wall structural members.
 - c. Attached using through bolts and backing plates on either side of wall.
 - 2. Do not attach luminaires directly to gypsum board.
- G. Ceiling-Mounted Luminaire Support:
 - 1. Ceiling mount with two (2) 5/32-inch- diameter aircraft cable supports adjustable to 120 inches in length.
- H. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
 - 3. Continuous Rows: Use tubing or stem or cable for wiring at one point and tubing or rod or aircraft cable for suspension for each unit length of fixture chassis, including one at each end.

4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

I. Ceiling-Grid-Mounted Luminaires:

1. Install ceiling support system rods or wires, independent of the ceiling suspension devices, for each fixture. Locate not more than 6 inches (150 mm) from lighting fixture corners. Install at least two (2) supports on opposite corners.
2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.

- J. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.6 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
- B. Verify that exit signs are installed according to their listing and the requirements in NFPA 101.
- C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 265119

SECTION 312141

DEWATERING AND DRAINAGE OF EXCAVATION

PART 1 – GENERAL

1:01 WORK INCLUDED

- A. This section provides for furnishing all labor, materials, equipment, power and incidentals, and for performing all operations necessary to dewater, drain and maintain excavations as described herein and as necessary for concrete work. Included are removal of standing water, surface drainage and seepage from excavation or other work, and repair of any resulting damage.
- B. The Contractor shall assume sole responsibility for dewatering systems and for all loss or damage resulting from partial or complete failure of protective measures, except as otherwise provided in the General and Supplementary Conditions of Contract Documents.

1:02 RELATED WORK

- A. Construction Facilities and Temporary Controls. Section 01500.

1:03 PHYSICAL DATA

- A. If applicable, see attached document for results of geotechnical investigations conducted at the project site. The report shall be used for guidance only with regard by estimates of groundwater. The Contractor is responsible for groundwater in any amounts.
- B. Additional hydrological data is available from the U.S. Geological Survey and the National Weather Service.

1:04 MEASUREMENT AND PAYMENT

No separate measurement will be made for any of the work specified in this section. Payment for all costs in connection with such work will be made at the lump sum price bid for the work.

The Contractor assumes all responsibility for costs of dewatering the site. Any estimates of groundwater are the sole responsibility of the Contractor. Groundwater Control shall not be considered an unforeseen condition. All costs of dewatering shall be included in the Bid Price.

PART 2 – PRODUCTS

Select equipment and material desired.

PART 3 – EXECUTION

3:01 DEWATERING EXCAVATIONS

- A. Furnish, install, operate and maintain all necessary pumping for dewatering the various parts of the work and for maintaining free of water the parts of the work as required for construction operations and as required for inspections and safety, or for any reason determined by the Engineer to be desirable.

3:02 REPAIR OF DAMAGE

Assume full responsibility for all loss and damage due to rainfall or seepage in any part of the work. Repair any damage to partially completed work from these or other causes, including the removal of slides, repair of constructed work and performance of any other work necessitated by failure or lack of adequate dewatering or drainage facilities.

END OF SECTION

SECTION 312222

EXCAVATION

PART 1 – GENERAL

1:01 SECTION INCLUDES

- A. Excavation for fence post foundations.

1:02 GENERAL

The work covered by this section includes the removal of earth, rock and other materials encountered necessary to installation foundations as indicated on the Contract Drawings; the complete and satisfactory disposal of all surplus material; backfilling or refilling to finish grade; draining, dewatering or pumping all collected ground or surface water necessary to maintain a dry excavation; protection from freezing; and all work required to comply with the Erosion & Sediment Control Plan (if applicable).

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3:01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Identify known underground, above ground, and aerial utilities. Stake and flag locations.
- C. Protect above and below grade utilities which are to remain.
- D. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.
- E. Protect bench marks, and existing structures, from excavation equipment and vehicular traffic.

3:02 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation work, including utilities and pipe chases.
- B. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- C. Hand trim excavation. Remove loose matter.
- D. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume.
- E. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- F. Correct unauthorized excavation at no extra cost to Owner.
- G. Correct areas over-excavated by error in accordance with Section 02223, Backfilling.
- H. Stockpile excavated material in area designated on site and remove excess material not being reused, from site.
- I. Boulders and/or bedrock outcrops that extend more than 4 inches above the specified elevation of the base of the excavation shall be removed.

3:03 FIELD QUALITY CONTROL

- A. Field inspection will be performed by Engineer and under provisions of Section 01400, Quality Control.
- B. Provide for visual inspection of bearing surfaces.

3:04 PROTECTION

- A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- B. The Contractor shall properly protect the excavated bottom to insure a satisfactory foundation. He shall be responsible for and shall bear any additional

cost resulting from the use of insufficient or improper construction procedures or methods.

- C. The Contractor shall keep the excavation properly and adequately protected at all times during the process of the work. The Contractor will be held responsible for any damage due to improper protection. All regulations of governing bodies applicable to this work relating to protection of life and property.
- D. The Contractor shall be responsible for the condition of all excavation made by him. All slides and cave-ins shall be removed without extra compensation, at whatever time under whatever circumstances that may occur.
- E. The Contractor shall, at his own expense, sustain in their places, and protect from or indirect injury, all pipes, walls, buildings, and other structures or property in the vicinity of his work, whether above or below the ground, or that may appear in the trench. He shall at all times have sufficient quantity of timber and plank, chains, ropes, etc., on the ground and shall use them as necessary for sheeting his excavation and for sustaining or supporting any structure that are uncovered, undermined, endangered, threatened, or weakened.
- F. The Contractor shall take risks attending the presence of proximity of pipes, poles, tracks, walls, buildings, and other structures and property of every kind and description, in or over his trenches, or in the vicinity of his work, whether above or below the surface of the ground; and he shall be responsible for all damages and assume all expenses for direct or indirect injury, caused by his work, to any of them, or to any person or property by reason of injury to them, whether such structures are or are not shown on the Drawings.
- G. Obstructions Shown on Drawings

Certain information regarding the reputed presence, size, character, and location of existing underground structures may be shown on the Contract Drawings. There is no certainty of the accuracy of this information and it shall be considered by the Contractor in this light. The location of underground structures shown may be inaccurate and other obstructions than those shown may be encountered. The Contractor hereby distinctly agrees that the Owner is not responsible for the correctness or sufficiency of the information given; that he shall have no claim for delay or extra compensation on account of incorrectness of information given, or on account of the insufficiency or absence of information regarding obstructions either revealed or not revealed by the Drawings; and that he shall have no claim for relief from any obligation or responsibility under the Contract, in case the location, size or character of any pipe or other underground structures is encountered that is not shown on the Drawings.

3:05 EXCAVATION DEWATERING

- A. Provide, operate and maintain pumps, equipment, piping etc. to remove groundwater or surface water from excavations to maintain an environment suitable for construction activities.
- B. The Contractor shall control the grading in the vicinity of structures so that ground surfaces are properly pitched to prevent water running into the excavated areas.
- C. No additional payment will be made to the Contractor for the cost of performing this work. Said costs to be included in the bid prices for completing the project.

END OF SECTION

SECTION 312223

BACKFILLING

PART 1 - GENERAL

1:01 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO).
 - 1. AASHTO M6 - Fine Aggregate for Portland Cement Concrete.
 - 2. AASHTO M43 - Standard Sizes of Coarse Aggregate for Highway Construction.
 - 3. AASHTO M147 - Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses.
 - 4. AASHTO M283 - Coarse Aggregate for Highway and Airport Construction
- B. American Society of Testing Materials (ASTM)
 - 1. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 2. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. PennDOT Pub. 408 Specifications, Section 703, latest edition.

1:02 TESTS

- A. Percent compaction refers to field density, determined by ASTM D1556, as a percentage of maximum lab density determined by ASTM D698.
- B. In order to determine reference density (maximum lab density) and optimum moisture content, direct acceptable independent testing firm to take soil samples and perform moisture/density tests in accordance with ASTM D698. Engineer shall determine number and location of samples.

- C. Direct acceptable independent testing firm to perform field moisture and density tests at locations determined by Engineer.

PART 2 – PRODUCTS

2:01 SOIL MATERIALS

- A. Topsoil from On-Site Excavations: Free of roots, rocks larger than one inch, subsoil, debris, and weeds. Ash or soil containing ash will not be accepted for use a topsoil.
- B. Imported Topsoil
 - 1. Friable loam.
 - 2. Free of subsoil, roots, grass, weeds, stone, and foreign matter.
 - 3. Acidity range (pH): 5.5 to 7.5.
 - 4. Organic Matter: Minimum of four percent, maximum of 25 percent.
- C. Suitable Subsoil (for use as Common Fill)

Common fill material is defined as excavated material that is free of organic matter, lumps larger than 6 inches, deleterious content and rock fragments over 3 inches in maximum dimension and which classifies as a Unified Soil Classification System CL, SM, SC, SP, SW, GM, GC, GP or GW soil type in accordance with ASTM D 2487 shall be used for fill/backfill except as specified hereinafter and/or indicated on the plans.

2:02 SELECT MATERIALS

- A. Coarse Aggregates: All coarse aggregates must meet the quality requirements for Type A coarse aggregate, as specified in PennDOT Pub. 408 Specifications, Section 703, latest edition.

B. Compactible Aggregates (coarse aggregates with fines)

1. PA OGS

- a. Material meeting the size and gradation requirements of PA OGS and Type A coarse aggregate quality requirements as specified in PennDOT Pub. 408 Specifications, Section 703, latest edition except for the following:

<u>Sieve Size</u>	<u>Percent Passing</u>
#4	24 minimum
#16	10 minimum

2. No. 2A

- a. Meet size and grading requirements for No. 2A as specified in PennDOT Pub. 408 Specifications, Section 703, latest edition.

C. Sand

1. PennDOT Type A Fine Aggregate (Sand)

- a. Meet grading and quality requirements of Type A fine aggregates as specified in PennDOT Pub. 408 Specifications, Section 703, latest edition.

PART 3 – EXECUTION

3:01 EXAMINATION

- A. Verify fill materials to be reused are acceptable.

3:02 BACKFILLING

- A. Earth filling/backfilling includes all refilling, the regrading of adjacent disturbed areas, the replacing of drains and other surface and subsurface structures, furnishing of suitable fill material if necessary, reseeding lawns and replacing trees and shrubbery damaged by the Contractor and all appurtenant work incidental thereto.
- B. Fill/backfill shall be placed in loose layers that are not over 6 inches thick where compaction is performed with power tampers or walk-behind rollers and in loose

layers that are not over 8 inches thick where compaction is performed with full-size equipment.

- C. Prior to backfilling, all dunnage, refuse, and form materials shall be removed from the area to be backfilled.
- D. Rocks larger than 4 inches in maximum dimension shall not be used as fill/backfill except in areas designated by the Engineer.
- E. No backfilling shall be made during freezing weather except by permission of the Engineer, and no fill shall be made when the material already in the trench is frozen, nor shall frozen materials be used in backfilling.
- F. If the opinion of the Engineer, the material used for refilling is of such character that satisfactory results cannot be obtained by tamping or ramming, the Contractor shall refill the excavated areas with suitable material in such manner and at such times as the Engineer may direct.
- G. As the excavated areas are filled in and the work completed, the Contractor shall, at his own cost and expense, remove and dispose of all surplus earth, stone, or other material from the Work, in such manner and at such point or points, as he may select or provide, subject to the approval of the Engineer; or he may deposit the same, either with or without rehandling, at any points on the line of the work covered by the Contract, if so directed by the Engineer, and shall leave all roads, sidewalks, and other places free, clear and in good order. In case the Contractor shall fail or neglect to do so, or to make satisfactory progress in doing so, within 24 hours after the receipt of a written notice from the Engineer, the Owner may remove such surplus material and clear the roadways, sidewalks and other places, and the cost of said work shall be charged to the Contractor and deducted from any monies due or to become due him under the Contract.
- H. Backfill areas to contours and elevations with unfrozen materials.
- I. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- J. Backfill against supported foundation walls. Do not backfill against unsupported foundation walls.
- K. Slope grade away from buildings at a minimum 6 inches in 10 feet, unless noted otherwise.
- L. Make grade changes gradual. Blend slope into level areas.

- M. Remove surplus backfill materials from site.
- N. Leave fill material stockpile areas completely free of excess fill materials.

3:03 FIELD QUALITY CONTROL

- A. Compaction testing of backfill shall be provided by the Contractor in accordance with these specifications.
- B. Tests and analysis of fill material will be performed in accordance with ASTM D1557 and with Section 01400, Quality Control.
- C. Compaction testing will be performed in accordance with ASTM D1556, ASTM D698 and with Section 01400, Quality Control.
- D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.
- E. Frequency of Tests: Frequency of inspection and tests by Engineer shall be unannounced.

3:05 PROTECTION OF FINISHED WORK

- A. Fill/backfill and existing subgrades that have been exposed to weather and vehicular traffic shall be recompact as specified.

END OF SECTION

SECTION 323113 – POLYMER COATED CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Polymer coated chain-link fences and sports backstops.
 - 2. Swing gates.

- B. Related Requirements:

- 1. Section 033000 "Cast-in-Place Concrete"

1.3 ACTION SUBMITTALS

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

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Fence and gate posts, rails, and fittings.
 - b. Chain-link fabric, reinforcements, and attachments.

- B. Shop Drawings: For each type of fence and gate assembly.

- 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Include accessories, hardware, gate operation, and operational clearances.

- C. Samples for Initial Selection: For each type of factory-applied finish.

- D. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples of size indicated below:

- 1. Polymer-Coated Components: In 6-inch (150-mm) lengths for components and on full-sized units for accessories.

- E. Delegated-Design Submittal: For structural performance of chain-link fence and gate frameworks greater than 10'-0" in height, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Product Certificates: For each type of chain-link fence and gate.
- C. Product Test Reports: For framework strength according to ASTM F 1043, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For gate operators to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing fence grounding; member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to comply with performance requirements.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Fifteen (15) years from date of Substantial Completion on all fence fabric and framing components and coatings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: The General Contractor shall engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design chain-link fence and gate frameworks.
- B. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.
 - 1. Design Wind Load: As indicated on Structural Drawings.
 - a. Minimum Post Size: Determine according to ASTM F 1043 for post spacing not to exceed 10 feet (3 m) for Material Group IA, ASTM F 1043, Schedule 40 steel pipe.
 - b. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.
- C. Lightning Protection System: Maximum resistance-to-ground value of 25 ohms at each grounding location along fence under normal dry conditions.

2.2 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:
 - 1. Fabric Height: As indicated on Drawings.
 - 2. Steel Wire for Fabric: Core Wire diameter of 0.192 inch (4.88 mm).
 - a. Mesh Size: 2 inches (50 mm).
 - b. Polymer-Coated Fabric: ASTM F 668, Class 2b over Zn-5-Al-MM-alloy-coated steel wire.
 - 1) Color: Black according to ASTM F 934.
 - c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
 - 3. Selvage: Knuckled at both selvages.

2.3 FENCE FRAMEWORK

- A. Posts and Rails: ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:

1. Fence Height: As indicated on Drawings.
2. Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40.
 - a. Line Post:
 - 1) 1.9 inches (48 mm) in diameter
 - 2) 2.375 inches (60 mm) in diameter
 - 3) 2.875 inches (73 mm) in diameter
 - 4) 4.0 inches (102 mm) in diameter
 - 5) 6.625 inches (168 mm) in diameter
 - b. End, Corner, and Pull Posts:
 - 1) 2.375 inches (60 mm) in diameter
 - 2) 2.875 inches (73 mm) in diameter
 - 3) 4.0 inches (102 mm) in diameter
 - 4) 6.625 inches (168 mm) in diameter
3. Horizontal Framework Members: Intermediate, top and bottom rails according to ASTM F 1043.
 - a. Rail: 1.66 inches (42 mm) in diameter.
4. Brace Rails: ASTM F 1043.
5. Metallic Coating for Steel Framework:
 - a. External, Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- (0.0076-mm-) thick, zinc-pigmented coating.
6. Polymer coating over metallic coating.
 - a. Color: Black, according to ASTM F 934.

2.4 TENSION WIRE

- A. Polymer-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter core wire thickness, tension wire according to ASTM F 1664, Class 2b over Zn-5-Al-MM-alloy-coated steel wire.
 1. Color: Black, according to ASTM F 934.

2.5 SWING GATES

- A. General: ASTM F 900 for gate posts and single and double swing gate types.
 1. Gate Leaf Width: As indicated.
 2. Framework Member Sizes and Strength: Based on gate fabric height of 72 inches (1830 mm) or less.

B. Pipe and Tubing:

1. Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework.
2. Gate Posts: Round tubular steel.
3. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: assembled with corner fittings.

D. Hardware:

1. Hinges: 360-degree inward and outward swing.
2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
3. Finishes to match fence framework.

2.6 FITTINGS

A. Provide fittings according to ASTM F 626.

B. Post Caps: Provide for each post.

1. Provide line post caps with loop to receive tension wire or top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches (152 mm) long.
2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails to posts.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel length not less than 2 inches (50 mm) shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.

H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:
 - a. Hot-Dip Galvanized Steel: 0.106-inch- (2.69-mm-) diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.

I. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. (366 g/sq. m) of zinc.
 - a. Polymer coating over metallic coating. Color: Black.

2.7 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

2.8 GROUNDING MATERIALS

- A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.
 1. Connectors for Below-Grade Use: Exothermic welded type.
 2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches (16 by 2440 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.
 2. Ensure property lines are legal boundaries are clearly established.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet (152 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.
 - 1. Install fencing on established boundary lines inside property line.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Concealed Concrete: Place top of concrete 2-1/2 inches below grade to allow covering with surface material.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more. For runs exceeding 500 feet (152 m), space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts uniformly at 10 feet (3 m) o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric 72 inches (1830 mm) or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Intermediate and Bottom Rails: Secure to posts with fittings.
- I. Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 1-inch (25-mm) bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches (380 mm) o.c.
- K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach

other end to chain-link fabric according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches (300 mm) o.c. and to braces at 24 inches (610 mm) o.c.
- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side.

3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.5 GROUNDING AND BONDING

- A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Fence and Gate Grounding:
 1. Ground for fence and fence posts shall be a separate system from ground for gate and gate posts.
 2. Install ground rods and connections at maximum intervals of 1500 feet (450 m).
 3. Fences within 100 Feet (30 m) of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet (225 m).
 4. Ground fence on each side of gates and other fence openings.
 - a. Bond metal gates to gate posts.
 - b. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches (457 mm) below finished grade.
- C. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a ground rod located a maximum distance of 150 feet (45 m) on each side of crossing.
- D. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches (152 mm) below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
 1. Make grounding connections to each barbed wire strand with wire-to-wire connectors designed for this purpose.
 2. Make grounding connections to each barbed tape coil with connectors designed for this purpose.

E. Connections:

1. Make connections with clean, bare metal at points of contact.
2. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
3. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
4. Make above-grade ground connections with mechanical fasteners.
5. Make below-grade ground connections with exothermic welds.
6. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.6 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION 323113

APPENDICES

APPENDIX “A”

“Affidavit of Release of Liens” and
“Final Waiver of Liens” Forms
and Sample Forms

AFFIDAVIT OF RELEASE OF LIENS

To All Whom It May Concern:

WHEREAS, the undersigned has been employed by _____

To furnish labor and material for _____

work, under a Contract _____

for the improvements of the property described as _____

in the _____ of _____

County of _____, State of _____

of which _____

_____ is the
Owner.

NOW, THEREFORE, this _____ day of _____, 20____.

The undersigned, as the Contractor for the above-named Contract pursuant to the conditions of the Contract hereby certifies that to the best of his/her knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all Suppliers of materials and equipment, and all performers of Work, labor or services, who have or may have liens against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

Exceptions: (If none, write "None". If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each exception.)

Attachments:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers.

(Affix Corporate Seal Here)

(SEAL)

Contractor (Name of Sole Ownership, Corporation or Partnership)

(SEAL)

(Signature of Authorized Representative)

TITLE: _____

AFFIDAVIT OF RELEASE OF LIENS

To All Whom It May Concern:

WHEREAS, the undersigned has been employed by the National Paper Company, Inc.

Delaware Corporation organized and existing in the city of Oshkosh, State of P.A.

To furnish labor and material for Construction of New Addition to the Neenah Plant in accordance
with Specification No. 316.

work, under Contract B

for the improvements of the property described as Administration Offices and Laboratory

in the Municipality of Neenah

County of Winnebago, State of Pennsylvania

of which The National Paper Company, Inc. of Oshkosh, Pennsylvania

_____ is the
Owner.

NOW, THEREFORE, this 10th day of January, 2011

The undersigned, as the Contractor for the above-named Contract pursuant to the conditions of the Contract hereby certifies that to the best of his/her knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all Suppliers of materials and equipment, and all performers of Work, labor or services, who have or may have liens against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

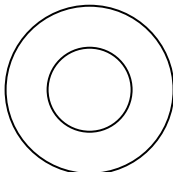
Exceptions: (If none, write "None". If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each exception.)

DATA USED IS FOR FICTICIOUS ILLUSTRATION ONLY

Attachments:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers.

(Affix Corporate Seal Here)



ABC Construction Company (SEAL)

Contractor (Name of sole ownership, corporation or partnership)

(Signature of Authorized Representative)
Bob Doe

TITLE: President

APPENDIX “B”

Consent of Surety to Final Payment

CONSENT OF SURETY TO FINAL PAYMENT

COUNTY OF _____

STATE OF _____

PROJECT: _____

OWNER: _____

CONTRACTOR: _____

CONTRACT DATE: _____

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the _____

_____, Surety Company, on bond of _____,

Contractor, hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety Company of any of its obligations to _____

_____, Owner, as set forth in the Surety Company's Payment Bond and/or Performance Bond.

IN WITNESS WHEREOF, _____

_____, the Surety Company has hereunto set its hand this _____ day of _____, 20____.

SURETY COMPANY

SIGNATURE OF AUTHORIZED REPRESENTATIVE

PRINT NAME AND TITLE

Attest: _____

(Seal)

APPENDIX “C”

Pennsylvania Prevailing Wage Rates

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project Name:	Health Occ Classroom and Welding Bldg Changing Rm Renovation
General Description:	Partial renovation to convert an existing classroom into a Health Occupation Classroom, and Renovations of existing locker rooms and office space into changing rooms and locker room spaces
Project Locality	1057 County Welfare Road, Lees
Awarding Agency:	Berks Career & Technology Center
Contract Award Date:	4/23/2026
Serial Number:	26-03063
Project Classification:	Building
Determination Date:	3/27/2026
Assigned Field Office:	Scranton
Field Office Phone Number:	(570)963-4577
Toll Free Phone Number:	(877)214-3962
Project County:	Berks County

BUREAU OF LABOR LAW COMPLIANCE PREVAILING WAGES PROJECT RATES

Project: 26-03063 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	6/30/2025		\$41.50	\$29.86	\$71.36
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2024		\$36.71	\$19.13	\$55.84
Boilermakers	1/1/2024		\$52.10	\$35.72	\$87.82
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/4/2025		\$41.68	\$19.17	\$60.85
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/3/2026		\$43.53	\$19.17	\$62.70
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2025		\$36.84	\$20.44	\$57.28
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2026		\$36.84	\$22.69	\$59.53
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2027		\$36.84	\$24.94	\$61.78
Cement Finishers & Plasterers	5/4/2025		\$32.23	\$22.27	\$54.50
Cement Finishers & Plasterers	5/3/2026		\$34.23	\$22.27	\$56.50
Cement Finishers & Plasterers	5/3/2027		\$33.49	\$25.01	\$58.50
Cement Masons	5/1/2024		\$34.85	\$20.90	\$55.75
Cement Masons	5/1/2025		\$35.85	\$20.90	\$56.75
Dockbuilder, Pile Drivers	5/1/2025		\$55.23	\$37.99	\$93.22
Dockbuilder, Pile Drivers	5/1/2026		\$56.98	\$37.99	\$94.97
Dockbuilder/Pile Driver Diver	5/1/2025		\$64.35	\$41.74	\$106.09
Dockbuilder/Pile Driver Diver	5/1/2026		\$66.54	\$41.74	\$108.28
Dockbuilder/pile driver tender	5/1/2025		\$55.23	\$37.99	\$93.22
Dockbuilder/pile driver tender	5/1/2026		\$56.98	\$37.99	\$94.97
Drywall Finisher	5/1/2025		\$31.83	\$23.26	\$55.09
Electricians	9/2/2024		\$44.52	\$26.83	\$71.35
Electricians	9/1/2025		\$46.02	\$28.39	\$74.41
Elevator Constructor	1/1/2025		\$61.41	\$44.95	\$106.36
Elevator Constructor	1/1/2026		\$64.06	\$46.01	\$110.07
Floor Coverer	5/1/2025		\$37.78	\$19.80	\$57.58
Floor Coverer	5/1/2026		\$38.59	\$20.61	\$59.20
Glazier	5/1/2024		\$39.48	\$23.81	\$63.29
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2025		\$38.76	\$33.38	\$72.14
Laborers (Class 01 - See notes)	5/1/2025		\$29.27	\$17.84	\$47.11
Laborers (Class 01 - See notes)	5/1/2026		\$30.12	\$18.49	\$48.61
Laborers (Class 02 - See notes)	5/1/2026		\$32.12	\$18.49	\$50.61
Laborers (Class 02 - see notes)	5/1/2025		\$31.27	\$17.84	\$49.11
Laborers (Class 03 - See notes)	4/27/2025		\$31.82	\$18.09	\$49.91
Laborers (Class 03 - See notes)	5/1/2026		\$32.82	\$18.74	\$51.56
Laborers (Class 04 - See notes)	4/27/2025		\$33.82	\$18.09	\$51.91
Laborers (Class 04 - See notes)	5/1/2026		\$34.32	\$18.74	\$53.06
Laborers (Class 05 - See notes)	5/1/2025		\$31.27	\$17.84	\$49.11
Laborers (Class 05 - See notes)	5/1/2026		\$32.12	\$18.49	\$50.61
Laborers (Class 06 - See notes)	5/1/2025		\$30.62	\$17.84	\$48.46
Laborers (Class 06 - See notes)	5/1/2026		\$31.47	\$18.49	\$49.96

BUREAU OF LABOR LAW COMPLIANCE PREVAILING WAGES PROJECT RATES

Project: 26-03063 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Marble Mason	5/1/2025		\$37.71	\$18.73	\$56.44
Marble Mason	5/1/2026		\$39.66	\$18.73	\$58.39
Millwright	6/1/2025		\$43.00	\$22.95	\$65.95
Millwright	6/1/2026		\$44.97	\$22.95	\$67.92
Operators (Building, Class 01 - See Notes)	5/1/2025		\$44.89	\$30.92	\$75.81
Operators (Building, Class 01 - See Notes)	5/1/2026		\$46.05	\$31.76	\$77.81
Operators (Building, Class 01A - See Notes)	5/1/2025		\$47.14	\$31.58	\$78.72
Operators (Building, Class 01A - See Notes)	5/1/2026		\$48.30	\$32.42	\$80.72
Operators (Building, Class 02 - See Notes)	5/1/2025		\$44.61	\$30.83	\$75.44
Operators (Building, Class 02 - See Notes)	5/1/2026		\$45.77	\$31.67	\$77.44
Operators (Building, Class 02A - See Notes)	5/1/2025		\$46.86	\$31.50	\$78.36
Operators (Building, Class 02A - See Notes)	5/1/2026		\$48.02	\$32.34	\$80.36
Operators (Building, Class 03 - See Notes)	5/1/2025		\$41.88	\$30.03	\$71.91
Operators (Building, Class 03 - See Notes)	5/1/2026		\$43.04	\$30.87	\$73.91
Operators (Building, Class 04 - See Notes)	5/1/2025		\$40.74	\$29.70	\$70.44
Operators (Building, Class 04 - See Notes)	5/1/2026		\$41.90	\$30.54	\$72.44
Operators (Building, Class 05 - See Notes)	5/1/2025		\$40.30	\$29.56	\$69.86
Operators (Building, Class 05 - See Notes)	5/1/2026		\$41.45	\$30.41	\$71.86
Operators (Building, Class 06 - See Notes)	5/1/2025		\$39.42	\$29.30	\$68.72
Operators (Building, Class 06 - See Notes)	5/1/2026		\$40.58	\$30.14	\$70.72
Operators (Building, Class 07A- See Notes)	5/1/2025		\$54.56	\$35.21	\$89.77
Operators (Building, Class 07A- See Notes)	5/1/2026		\$56.03	\$36.14	\$92.17
Operators (Building, Class 07B- See Notes)	5/1/2025		\$54.22	\$35.10	\$89.32
Operators (Building, Class 07B- See Notes)	5/1/2026		\$55.69	\$36.03	\$91.72
Painters Class 1 (see notes)	5/1/2024		\$31.81	\$23.77	\$55.58
Painters Class 1 (see notes)	5/1/2025		\$32.71	\$24.17	\$56.88
Painters - Line Stripping	12/1/2024		\$44.12	\$27.91	\$72.03
Painters - Line Stripping	12/1/2025		\$45.12	\$29.41	\$74.53
Painters Class 2 (see notes)	5/1/2023		\$30.09	\$23.19	\$53.28
Painters Class 2 (see notes)	5/1/2025		\$35.61	\$24.18	\$59.79
Painters Class 3 (see notes)	5/1/2025		\$41.71	\$24.18	\$65.89
Piledrivers	5/1/2021		\$43.73	\$37.99	\$81.72
Plasterers	5/1/2024		\$32.93	\$21.08	\$54.01
Plasterers	5/1/2025		\$34.68	\$21.23	\$55.91
plumber	5/1/2024		\$54.28	\$35.26	\$89.54
plumber	5/1/2025		\$56.28	\$36.01	\$92.29
Roofers (Composition)	5/1/2024		\$44.13	\$34.77	\$78.90
Roofers (Composition)	5/1/2025		\$46.03	\$34.77	\$80.80
Roofers (Shingle)	5/1/2024		\$34.35	\$22.20	\$56.55
Roofers (Slate & Tile)	5/1/2024		\$37.35	\$22.20	\$59.55
Sheet Metal Workers	6/1/2024		\$43.09	\$43.14	\$86.23
Sheet Metal Workers	6/1/2025		\$45.02	\$44.71	\$89.73
Sign Makers and Hangars	7/15/2024		\$32.32	\$25.82	\$58.14
Sign Makers and Hangars	7/15/2025		\$33.48	\$26.41	\$59.89

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 26-03063 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Sprinklerfitters	4/1/2024		\$46.45	\$28.62	\$75.07
Sprinklerfitters	4/1/2025		\$49.75	\$29.21	\$78.96
Steamfitters	5/1/2024		\$59.65	\$43.09	\$102.74
Steamfitters	5/1/2025		\$61.47	\$44.89	\$106.36
Terrazzo Finisher	5/1/2024		\$35.66	\$20.76	\$56.42
Terrazzo Finisher	5/1/2025		\$36.32	\$21.68	\$58.00
Terrazzo Grinder	5/1/2024		\$36.42	\$20.76	\$57.18
Terrazzo Grinder	5/1/2025		\$37.10	\$21.68	\$58.78
Terrazzo Mechanics	5/1/2024		\$36.44	\$22.51	\$58.95
Terrazzo Mechanics	5/1/2025		\$37.17	\$23.43	\$60.60
Tile & Marble Finisher	5/1/2025		\$35.31	\$16.99	\$52.30
Tile & Marble Finisher	5/1/2026		\$37.26	\$16.99	\$54.25
Tile Setter	5/1/2025		\$37.71	\$18.73	\$56.44
Tile Setter	5/1/2026		\$39.66	\$18.73	\$58.39
Truckdriver class 1(see notes)	5/1/2025		\$41.87	\$0.00	\$41.87
Truckdriver class 2 (see notes)	5/1/2025		\$41.94	\$0.00	\$41.94
Truckdriver class 3 (see notes)	5/1/2025		\$42.43	\$0.00	\$42.43
Window Film / Tint Installer	6/1/2024		\$26.37	\$14.83	\$41.20
Window Film / Tint Installer	6/1/2025		\$27.42	\$15.13	\$42.55

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 26-03063 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter - Chief of Party (Surveying & Layout)	5/1/2021		\$41.42	\$15.49	\$56.91
Carpenter - Instrument Person (Surveying & Layout)	5/1/2021		\$36.02	\$15.49	\$51.51
Carpenter - Rodman I (Survey & Layout)	5/1/2021		\$28.82	\$12.39	\$41.21
Carpenter	5/1/2025		\$36.87	\$20.49	\$57.36
Carpenter	5/1/2026		\$37.63	\$21.18	\$58.81
Carpenter Welder	5/1/2025		\$37.62	\$20.49	\$58.11
Carpenter Welder	5/1/2026		\$38.38	\$21.18	\$59.56
Carpenters - Piledriver/Welder	1/1/2025		\$37.62	\$20.49	\$58.11
Carpenters - Piledriver/Welder	1/1/2026		\$38.38	\$21.18	\$59.56
Cement Finishers	1/1/2017		\$27.70	\$20.20	\$47.90
Dockbuilder, Pile Drivers	5/1/2025		\$55.23	\$37.99	\$93.22
Dockbuilder, Pile Drivers	5/1/2026		\$56.98	\$37.99	\$94.97
Dockbuilder/Pile Driver Diver	5/1/2025		\$60.31	\$44.97	\$105.28
Dockbuilder/Pile Driver Diver	5/1/2026		\$61.88	\$45.47	\$107.35
Dockbuilder/pile driver tender	5/1/2025		\$55.23	\$37.99	\$93.22
Dockbuilder/pile driver tender	5/1/2026		\$56.98	\$37.99	\$94.97
Electric Lineman	6/3/2024		\$52.80	\$30.61	\$83.41
Electric Lineman	6/2/2025		\$55.42	\$31.04	\$86.46
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2024		\$37.26	\$32.63	\$69.89
Laborers (Class 01 - See notes)	5/1/2025		\$26.61	\$19.99	\$46.60
Laborers (Class 01 - See notes)	5/1/2026		\$27.61	\$20.44	\$48.05
Laborers (Class 02 - See notes)	5/1/2025		\$33.23	\$19.99	\$53.22
Laborers (Class 02 - See notes)	5/1/2026		\$34.23	\$20.44	\$54.67
Laborers (Class 03 - See notes)	5/1/2025		\$30.22	\$19.99	\$50.21
Laborers (Class 03 - See notes)	5/1/2026		\$31.22	\$20.44	\$51.66
Laborers (Class 04 - See notes)	5/1/2025		\$30.57	\$19.99	\$50.56
Laborers (Class 04 - See notes)	5/1/2026		\$31.57	\$20.44	\$52.01
Laborers (Class 05 - See notes)	5/1/2025		\$31.24	\$19.99	\$51.23
Laborers (Class 05 - See notes)	5/1/2026		\$32.24	\$20.44	\$52.68
Laborers (Class 06 - See notes)	5/1/2025		\$30.66	\$19.99	\$50.65
Laborers (Class 06 - See notes)	5/1/2026		\$31.66	\$20.44	\$52.10
Laborers (Class 07 - See notes)	5/1/2025		\$30.95	\$19.99	\$50.94
Laborers (Class 07 - See notes)	5/1/2026		\$31.95	\$20.44	\$52.39
Laborers (Class 08 - See notes)	5/1/2025		\$31.43	\$19.99	\$51.42
Laborers (Class 08 - See notes)	5/1/2026		\$32.43	\$20.44	\$52.87
Millwright	6/1/2025		\$45.46	\$23.33	\$68.79
Millwright	6/1/2026		\$47.52	\$23.33	\$70.85
Operators (Heavy, Class 01 - See Notes)	5/1/2025		\$43.46	\$30.50	\$73.96
Operators (Heavy, Class 01 - See Notes)	5/1/2026		\$44.61	\$31.35	\$75.96
Operators (Heavy, Class 01A - See Notes)	5/1/2025		\$45.71	\$31.16	\$76.87
Operators (Heavy, Class 01A - See Notes)	5/1/2026		\$46.86	\$32.01	\$78.87
Operators (Heavy, Class 02 - See Notes)	5/1/2025		\$43.18	\$30.41	\$73.59
Operators (Heavy, Class 02 - See Notes)	5/1/2026		\$44.34	\$31.25	\$75.59
Operators (Heavy, Class 02A - See Notes)	5/1/2025		\$45.43	\$31.08	\$76.51

BUREAU OF LABOR LAW COMPLIANCE PREVAILING WAGES PROJECT RATES

Project: 26-03063 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Heavy, Class 02A - See Notes)	5/1/2026		\$46.59	\$31.92	\$78.51
Operators (Heavy, Class 03 - See Notes)	5/1/2025		\$40.26	\$29.55	\$69.81
Operators (Heavy, Class 03 - See Notes)	5/1/2026		\$41.43	\$30.38	\$71.81
Operators (Heavy, Class 04 - See Notes)	5/1/2025		\$39.12	\$29.22	\$68.34
Operators (Heavy, Class 04 - See Notes)	5/1/2026		\$40.28	\$30.06	\$70.34
Operators (Heavy, Class 05 - See Notes)	5/1/2025		\$38.67	\$29.09	\$67.76
Operators (Heavy, Class 05 - See Notes)	5/1/2026		\$39.83	\$29.93	\$69.76
Operators (Heavy, Class 06 - See Notes)	5/1/2025		\$37.80	\$28.82	\$66.62
Operators (Heavy, Class 06 - See Notes)	5/1/2026		\$38.96	\$29.66	\$68.62
Operators (Heavy, Class 07A - See Notes)	5/1/2025		\$52.85	\$34.71	\$87.56
Operators (Heavy, Class 07A - See Notes)	5/1/2026		\$54.32	\$35.64	\$89.96
Operators (Heavy, Class 07B - See Notes)	5/1/2025		\$52.51	\$34.60	\$87.11
Operators (Heavy, Class 07B - See Notes)	5/1/2026		\$53.97	\$35.54	\$89.51
Operators (Highway, Class 01 - See Notes)	5/1/2025		\$42.56	\$30.24	\$72.80
Operators (Highway, Class 01 - See Notes)	5/1/2026		\$43.72	\$31.08	\$74.80
Operators (Highway, Class 01a - See Notes)	5/1/2025		\$44.81	\$30.92	\$75.73
Operators (Highway, Class 01a - See Notes)	5/1/2026		\$45.97	\$31.76	\$77.73
Operators (Highway, Class 02 - See Notes)	5/1/2025		\$41.39	\$29.89	\$71.28
Operators (Highway, Class 02 - See Notes)	5/1/2026		\$42.55	\$30.73	\$73.28
Operators (Highway, Class 03 - See Notes)	5/1/2025		\$40.70	\$29.68	\$70.38
Operators (Highway, Class 03 - See Notes)	5/1/2026		\$41.87	\$30.51	\$72.38
Operators (Highway, Class 04 - See Notes)	5/1/2025		\$40.26	\$29.54	\$69.80
Operators (Highway, Class 04 - See Notes)	5/1/2026		\$41.41	\$30.39	\$71.80
Operators (Highway, Class 05 - See Notes)	5/1/2025		\$39.73	\$29.41	\$69.14
Operators (Highway, Class 05 - See Notes)	5/1/2026		\$40.89	\$30.25	\$71.14
Operators (Highway, Class 06 - See Notes)	5/1/2025		\$42.80	\$30.30	\$73.10
Operators (Highway, Class 06 - See Notes)	5/1/2026		\$43.95	\$31.15	\$75.10
Operators (Highway, Class 06/A - See Notes)	5/1/2025		\$45.05	\$30.96	\$76.01
Operators (Highway, Class 06/A - See Notes)	5/1/2026		\$46.21	\$31.80	\$78.01
Operators (Highway, Class 07/A - See Notes)	5/1/2025		\$51.79	\$34.38	\$86.17
Operators (Highway, Class 07/A - See Notes)	5/1/2026		\$53.25	\$35.32	\$88.57
Operators (Highway, Class 07/B - See Notes)	5/1/2025		\$50.37	\$33.97	\$84.34
Operators (Highway, Class 07/B - See Notes)	5/1/2026		\$51.84	\$34.90	\$86.74
Painters - Line Stripping	12/1/2024		\$44.12	\$27.91	\$72.03
Painters - Line Stripping	12/1/2025		\$45.12	\$29.41	\$74.53
Painters Class 2 (see notes)	5/1/2025		\$35.61	\$24.18	\$59.79
Painters Class 3 (see notes)	5/1/2024		\$40.81	\$23.78	\$64.59
Painters Class 3 (see notes)	5/1/2025		\$41.71	\$24.18	\$65.89
Piledrivers	5/1/2025		\$36.87	\$20.49	\$57.36
Piledrivers	5/1/2026		\$37.63	\$21.18	\$58.81
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2025		\$54.39	\$44.73	\$99.12
Truckdriver class 1(see notes)	5/1/2025		\$41.87	\$0.00	\$41.87
Truckdriver class 2 (see notes)	5/1/2025		\$41.94	\$0.00	\$41.94
Truckdriver class 3 (see notes)	5/1/2025		\$42.43	\$0.00	\$42.43

Notes for 29 County Building Common Journeyperson Laborer

Adams, Berks, Bradford, Carbon, Columbia, Cumberland, Dauphin, Juniata, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, Monroe, Montour, Northampton, Northumberland, Perry, Pike, Schuylkill, Snyder, Sullivan, Susquehanna, Tioga, Union, Wayne, Wyoming & York

The following updates to the Bureau of Labor Law Compliance's Pennsylvania Building Journeyperson Laborer Notes are meant to provide a reference point for uniformity and clarity throughout the Commonwealth. The Notes may not be comprehensive, and should be read in conformity with the custom and usage of the construction industry in the geographic region in which they are utilized.

CLASS 1

COMMON JOURNEYPEPERSON

1. Cleaning, scrubbing, washing and polishing floors, furniture and windows (including through the use of bonding or flying cranes); For marble, granite, and terrazzo, cleaning, scrubbing, washing, and polishing after final acceptance.
2. Demolition of interiors and removal of all debris;
3. Grading stone and dirt by hand;
4. Form pinning
5. Pouring handling, and placing of all concrete and related materials and all cure applications;
6. Sheathing, lagging, and mining;
7. Cleaning up debris;
8. Stripping, dismantling, oiling and moving of concrete forms;
9. Loading, unloading and carrying of reinforced steel;
10. Handling and distributing lumber and all other building materials, including final strip, and including materials used or installed by mechanical trades (e.g., electrician, plumber, sheet metal worker, insulator);
11. Unloading, carrying, distributing and laying of pre-cast concrete slabs and planks;
12. Wrecking, moving and demolishing underpinning and shoring of all structures;
13. Using flags and other signaling devices;
14. Performing landscaping and nursery work;
15. Serving as a Toolroom Person, hanging tools, delivering tools;
16. Cleaning precipitators;
17. Watching for fires;
18. Operating conveyors;
19. Using vacuum cleaners of all types (ride or walk-along);
20. Digging and filling holes and trenches using hand tools;
21. Driving stakes;

22. Ripping out material which is to be discarded;
23. Cleaning roof removal materials on the ground. Performs roof removal work for demolition (Roof removal work for roof replacement is performed by roofers);
24. Operating a pressure washer;
25. Unloading, stockpiling and moving materials for carpenters.
26. Operating power buggies and pumps;
27. Operating walk along compacting and vibrating equipment;
28. Operating guniting machines (including potman);
29. Operating steam jennies;
30. Using pumps of 2" and under;
31. Operating burning torches or burners for demolition;
32. Blasting or assisting with blasting;
33. Grading and building scaffolds;
34. Using or assisting with air and hydraulic wagon drills, on or off tracks;
35. Using walk-along or walk behind lifts and similar machines;
36. Serving as a drill runner or drill runner's assistant;
37. Operating a chipping hammer or similar;
38. Mixing mortar or operating a mortar mixing machine (regardless of power used, including starting and stopping);
39. Feeding grout machines and operating grout pumps;
40. Operating concrete saws;
41. Operating air tracks or assisting;
42. Laying on nonmetallic (clay, ironstone, terra cotta, vitrified concrete and plastic) pipe and the making of joints for the same within five feet outside a building, or to the first joint beyond five feet from a building;
43. Operating jackhammers or concrete busters;
44. Operating concrete drills and cutting equipment for trenches, flatwork, and wall coring of multi-use (common) holes;
45. Operating walk behind rollers and similar machines
46. Using a cutting torch for demolition work on steel or other metal structures;
47. Operating salamanders, smudge pots, propane and kerosene burners and all other heating methods;
48. Operating drills and all other pneumatic and electric hand tools for demolition;
49. Using concrete mixers, vibrators and pumps;
50. Operating walk along tamping equipment;
51. Sandblasting (filling the pot, cleaning up of sand, use of the nozzle) pumps 2" or under for demolition;
52. Using welding torches;
53. Working on swing scaffold, sling and Bosun chairs.

CLASS 2

ASBESTOS REMOVAL

Asbestos Removal. Hazardous & Toxic Waste Removal. Lead & Lead-based paint removal. All work in connection with handling, control, removal, abatement, encapsulation or disposal of

asbestos &/or toxic waste &/or lead of lead-based paint removal with be assigned to the members of the Laborers' International Union of North America not to be limited to the erection, moving, servicing & dismantling of all tools & equipment normally used in the handling, control. Removal or encapsulation of hazardous material. This agreement covers work tasks associated with any & all safety requirements & final cleanup & disposal of such hazardous material.

CLASS 3

MASON TENDERS

Mason Tenders- Mixing of Mortar, mortar pumps, caisson work, blast furnaces. Coke ovens and all related work. Erection and dismantling of all scaffolding, including tubular frame, manual and powered. Climbing scaffold, swing scaffolds, slings, bosun chairs and all associated safety protection including barricades, nets and ropes, scaffold weather enclosures; shoring; mortar buggies; concrete pumps; walk-behind forklifts; electric welders, torches, compressors, generators & the repair and maintenance of same; jackhammers, tampers, cut-off saws and other power equipment required for demolition, rotary-hammer drills, electric and pneumatic hand tools, transits, levels and lasers, tempering mortar; stocking scaffolds with masonry materials including brick, block, mortar, terra cotta, architectural pre-cast concrete, natural stone, insulation and mastic, flashing, anchors and ties, rebar, grout, Mobile lifting platform scaffolding powered by any power, mode or method; clean-up of all masonry debris.

CLASS 4

FORKLIFT LABORER

Operation of rough terrain forklifts & skid-steering loaders.

CLASS 5

MASON TENDER CRANE OPERATOR

Pioneer 9000 truck crane and self erecting portable tower crane similar to the POTAIN HDT 80

CLASS 6

PLASTERER AND DRYVIT TENDERS

1. Mixing of plaster and dryvit.
2. Plaster pumps.
3. Plaster tenders.
4. Scaffold Builders.
5. Mobile lifting platform scaffolding, by any power, mode or method.

Mixing of plaster and dryvit. Plaster pumps. Plaster tenders. Caisson work. Erection and dismantling of all scaffolding, including tubular frame, manual and powered climbing scaffold, swing scaffolds, slings, bosun chairs and all associated safety protection including barricades, nets and ropes, scaffold weather enclosures; shoring, mortar buggies; concrete pumps; walk-behind forklifts; electric welders, torches, compressors, generators & the repair and maintenance of same; jackhammers, tampers; cut-off saws and other power equipment requires for demolition; rotary-hammer drills, electric and pneumatic hand-tools; transits, levels and lasers, and the clean up of all plaster debris.

Notes for Building, Heavy, Highway Truckdriver

Truckdriver Class 1

Single Axle

Truckdrivers Class 2

Tandem

Tri-Axle

Semi-Trailer (Combination)

Truckdrivers Class 3

Speciality Vehicles

Definitions for 29 County Heavy, Highway Construction Laborers'

Adams, Berks, Bradford, Carbon, Columbia, Cumberland, Dauphin, Juniata, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, Monroe, Montour, Northampton, Northumberland, Perry, Pike, Schuylkill, Snyder, Sullivan, Susquehanna, Tioga, Union, Wayne, Wyoming, & York

Laborers' Class I

Flagperson

Laborers' Class II

Hazardous/Toxic/Asbestos Waste Handler, Lead Paint handler

Laborers' Class III

Asphalt Tamper, Concrete Pitman & Puddler, Highway Guide Rail, Right of Way and Property Fence, Highway Slab Reinforcement Placer Laborer (Landscape, Planters, Seeders, Arborists), Magazine Tender, Rail Trackman & Signalmen, Laser Beam Men for Pipe Laying & Paving Machines, Pneumatic & Electric Tool Operators, Jack Hammers, Paving Breakers, Concrete Saws, Whacker Vibrator, Sheet Hammers, Chainsaws, Pipelayers, Asphalt Rake, Lute or Screed Men, Highway Concrete Block Layers, Walk Behind Rollers, Walk Behind Trencher

Laborers' Class IV

Caisson open Air Below 8', Cofferdam open Air Below 8' where excavating for Circular Caisson and Cofferdam 8' Below Natural elevation of Grade Adjacent to Starting Point, Form Setters Road, Certified Concrete Technician, Concrete Rubber, Wagon Drill, Diamond Point Drill, Guinite Nozzle Operator, Blaster

Laborers' Class V

Foreman, Form Setter, Road Foreman, Reinforced Steel Placer, Bonding Aligning and Securing, Burning and Welding in conjunction with Rebar, Concrete Surfacers

Laborers' Class VI

Outside Laborers in conjunction with Tunnels and Rock Shafts

Laborers' Class VII

Chuck Tenders, Muckers, Nippers, Miners Helpers, Inside Laborers

Laborers' Class VIII

Miners, Drillers, Blasters, Pneumatic Shield Operators, Lining, Spotting and Timber Workers, Rebar Steel Placer, Bonding Aligning and Securing, Welders and Concrete Surfacers

Definitions for 29 County Highway Construction Operators

Tioga, Bradford, Lycoming, Sullivan, Union, Montour, Columbia, Snyder, Northumberland, Juniata, Perry, Dauphin, Cumberland, Lebanon, York, Lancaster, Adams, Schuylkill, Berks, Lehigh, Northampton, Carbon, Susquehanna, Wayne, Wyoming, Lackawanna, Pike, Luzerne, & Monroe

Operators Class 1

All Types of Cranes *	Bulldozers & Tractors
All Type of Backhoes	Log Skidder
Drag Line	Motor Patrols
Keystones	Chipper With Boom
All Types of Shovels	Mechanic Welders
Derricks	Hydro Ax
Trench Shovels	Side Boom
Trenching Machines	Tree Spade
All Pavers (Blacktop & Concrete)	Bob Cat Type (With Attachments)
Gradalls	Boring Machines Including Directional Boring Machines
All Front End Loaders Tandem Scrapers	All Autograde & Concrete Finishing Machines (Excluding Trowel Machines)
Pippin Type Backhoes	Concrete Breaking Machines
Boat Captains	High Rail/Burro Crane
Batch Plant With Mixer	Rail Loader (Winch Boom Type)
Drill Self-Contained (Drillmaster Type)	Production Switch Tamper
Milling Machine	Ballast Regulators
Vermeer Saw	Tie Replacer
Conveyor Loader (Euclid Type)	Rail/Road Loader

Power Jack Liner

Concrete Pumps

* On all machines with booms, jibs, masts and leads 100 feet and over, twenty-five (\$0.25) cents per hour additional will be paid for each increment of 25 feet over 100 feet. On machines with booms (including jibs, masts and leads, etc.), 200 feet and over, two operating engineers shall be required.

Machines Similar to above including remote control equipment

Operators Class 1a

Crawler Backhoes Over One Cubic Yard
(Factory Rating)

Cherry Picker Type Machinery and
Equipment 15 Tone and Over

Hydraulic Backhoes Over One Cubic Yard
(Factory Rating)

Single Person Operation Truck Cranes 15 Ton
and Over (Factory Rating)

All Types of Cranes 15 Ton and Over
(Factory Rating)

Equipment in this wage group that does not
require an oiler

Machines Similar to above including remote control equipment

Operators Class 2

Spreaders

Stump Grinder

Asphalt Plant Engineers

Grease Truck

Rollers (High Grade Finishing)

Fork Lifts (20 Feet & Over)

Machines Similar to above including remote control equipment

Operators Class 3

Welding Machines

Rollers

Well Points

Miscellaneous Equipment Operator

Compressors

Seaman Pulverizing Mixer

Pumps

Tireman (For Power Equipment)

Heaters	Power Broom Conveyor Landers Other Than Euclid Type
Farm Tractors	
Form Line Graders	Seeding Spreader
Ditch Witch Type Trencher	Conveyors
Road Finishing Machines	Driller Second Class
Concrete Breaking Machines (Guillotine Type)	Fork Lifts (Under 20 Feet)

Machines Similar to above including remote control equipment

Operators Class 4

Fireman

Machines Similar to above including remote control equipment

Operators Class 5

Oilers & Deck Hands (Personnel Boats)

Machines Similar to above including remote control equipment

Operators Class 6

On All machines with Booms (Including Jibs, Masts Leads, Etc.) 100 Feet

Machines Similar to above including remote control equipment

Operators Class 6a

On all machines with Booms (Including Jibs, Masts Leads, Etc.) 100 Feet 15 Ton and Over (Factory Rating)

Equipment in this wage group that does not require an oiler

Machines Similar to above including remote control equipment

Operators Class 7a (Toxic/Hazardous Waste Removal)

Pile Drivers or Engineers - Working with
Dock Builder & Pile Drivers

All Types of Cranes

All Types of Backhoes

Drag Line

Keystones

All Types of Shovels

Derricks

Trench Shovels

Trenching Machines

All Pavers (Blacktop & Concrete)

Gradalls

All Front End Loaders

Tandem Scrapers

Pippin Type Backhoes

Boat Captains

Batch Plant With Mixer

Drill Self-Contained (Drillmaster Type)

CMI Autograde

Vermeer Saw

Scrapers & Tournapulls

Chipper With Boom

Boring Machines Including

Directional Boring Machine

Conveyor Loader (Euclid Type)

Bulldozers & Tractors

Hydro Ax

Concrete pumps

Tree Spade

Motor Patrols

All Autograde & Concrete Machines
(Excluding Trowel Machines)

Mechanic Welders

Log Skidder

Concrete Breaking Machines

Side Boom

Bob Cat Type (With Attachments)

Ballast Regulators

Tie Replacer

Rail/Road Loader

Power Jack Liner

Machines Similar to above including remote control equipment

Definition for 22 County Building Construction Operators

Tioga, Bradford, Lycoming, Sullivan, Union, Montour, Columbia, Snyder, Northumberland, Juniata, Perry, Dauphin, Cumberland, Lebanon, York, Lancaster, Adams, Schuylkill, Berks, Lehigh, Northampton, Carbon

Operators Class 1

Machines Doing Hook Work	Cableways
Any Machine Handling Machinery	Drag Lines
Cable Spinning Machines	Derricks
Helicopter	All types of Overhead Cranes
All Types of Cranes *	High Rail/Burro Crane
Rail Loader (Winch Boom Type)	

Machines Similar to above including remote control equipment

* On all machines with booms, jibs, masts and leads 100 feet from ground up, fifty (\$0.50) cents per hour additional will be paid for each increment of 25 feet over 100 feet. On cranes with booms (including jibs, masts and leads, etc.), 200 feet and over, two (2) operators shall be required, no oilers will be required, with seventy-five (\$0.75) cents in increments of 25 feet.

Tower cranes calculated from ground up and out for purpose of boom pay.

Operators Class 1a

Machines Doing Hook Work	High Rail/Burro Crane 15 Ton and Over (Factory Rating)
Machines Handling Machinery	Rail Loader, Winch Boom Type, 15 Ton and Over (Factory Rating)
All Types of Cranes 15 Ton and Over (Factory Rating)	Equipment in this wage group that does not require an oiler

Machines Similar to above including remote control equipment

Operators Class 2

Keystones	Bundle Puller Extractors (Tubular Type)
All Types of Shovels	Scrapers & Tournapulls
All Types of Backhoes	Spreaders
Trench Shovels	Tree Spade
Trenching Machines	Bulldozers & Tractors
Hoists With Two Towers	Vermeer Saw
All Pavers (Blacktop & Concrete)	Side Boom
Building Hoists (Double Drum)	Rollers (High Grade Finishing)
All Front-End Loaders	Mechanic-Welders
Tandem Scrapers	Chipper With Boom
Pippin Type Backhoes	Motor Patrols
Hydro Ax	Concrete Breaking Machines
Boat Captains	Concrete Pumps
Milling Machines	Fine Grade Machines
Batch Plant Operators (Concrete)	Grease Trucks
Bobcat Type (All Attachments)	Directional Boring Machines
All Autograde & Concrete Finishing Machines (Excluding Trowel Machines)	Production Switch Tamper
Drills, Self-Contained Rotary Drills	Ballast Regulators
Fork Lifts (20 Feet & Over)	Tie Replacer
Gradalls	Rail/Road Loader
Mucking Machines in Tunnel	Power Jack Liner

Machines Similar to above including remote control equipment

Operators Class 2a

Crawler Backhoes Over One Cubic Yard	Equipment 15 Ton and Over

Crawler Gradalls Over One Cubic Yard	Concrete Pumps 92 feet of Boom Length (150 yd. pour or less)
Hydraulic Backhoes Over One Cubic Yard	Equipment in this wage group that does not require an oiler

Machines Similar to above including remote control equipment

Operators Class 3

Conveyors	Second Class Drill, Self-Contained Rotary Drills
Building Hoists (Single Drum)	Fork Lift Trucks (Under 20 Feet Lift)
High or Low Pressure Boilers	Stump Grinder
Well Drillers	Miscellaneous Equipment Operator
Asphalt Plant Engineers	Tireman (For Power Equipment)
Ditch Witch Type Trenchers	
Core Drill Operator	

Machines Similar to above including remote control equipment

Operators Class 4

Welding Machines	Concrete Breaking Machines (Guillotine)
Well Points	Rollers
Compressors	Seaman Pulverizing Mixer
Pumps	Grout Pump
Heaters	Power Broom
Farm Tractors	Forced Air Propane Heater
Form Line Graders	Seeding Spreader
Road Finishing Machines	

Machines Similar to above including remote control equipment

Operators Class 5

Fireman

Machines Similar to above including remote control equipment

Operators Class 6

Oilers & Deck Hands (personnel Boats)

Core Drill 2nd Class

Machines Similar to above including remote control equipment

Operators Class 7 (A) (Toxic/Hazardous Waste Removal)

Machines Doing Hook Work

Derricks

Any Machine Handling Machinery

All Types of Overhead Cranes

Cable Spinning Machines

High Rail/Burro Crane

Helicopters

Rail Loader (Winch Boom Type)

All Types of Cranes

Cableways

Drag Lines

Machines Similar to above including remote control equipment

Operators Class 7 (B) (Toxic/Hazardous Waste Removal)

Keystones

Bundle Puller Extractors (Tubular Type)

All Types of Shovels

Scrapers & Tournapulls

All Types of Backhoes

Spreaders

Trench Shovels

Tree Spade

Trenching Machines

Bulldozers & Tractors

Hoists With Two Towers

Side Boom

All Pavers (Blacktop & Concrete)

Rollers (High Grade Finishing)

Building Hoists (double Drum)

Gradalls

Mucking Machines in Tunnel

All Front-End Loaders

Tandem Scrapers

Directional Boring Machines

Pippin Type Backhoes

Hydro Ax

Boat Captains

Finishing Machines (Excluding Trowel Machines)

Power Jack Liner

Tie Replacer

Batch plant Operators (Concrete)

Drills, Self-Contained Rotary Drills

Fork Lifts (20 Feet & Over)

Vermeer Saw

Mechanic – Welders

Chipper With Boom

Motor Patrols

Concrete Breaking Machines

Milling Machines

Fine Grade Machines

Concrete Pumps

Grease Trucks

Bobcat Type (All Attachments)

Rail/Road Loader

Production Switch Tamper

Ballast Regulators

Machines Similar to above including remote control equipment

Painters Notes for Building, Heavy, Highway Painters

Cameron, Crawford, Forest, Potter & Warren Counties

Painters Class 1 - Industrial Rates (Heavy/Highway)

Painters Class 2 - Commercial Rates (Building)

Allegheny, Fayette, Greene & Washington Counties

Painters Class 1 - Industrial Brush & Roll (Heavy/Highway)

Painters Class 2 - Industrial Sandblast & Spray (Heavy/Highway)

Painters Class 3 - Bridge, Hot Stack, & Transmission Towers (Heavy/Highway)

Painters Class 4 - Painter Tender I (Heavy/Highway)

Painters Class 5 - Painter Tender II (Heavy/Highway)

Painters Class 6 - Commercial Painting & Paperhanging (Building)

Armstrong, Beaver, Bedford, Blair, Butler, Cambria, Centre, Clarion, Clearfield, Elk, Fulton, Huntingdon, Indiana, Jefferson, Juniata, Lawrence, Mercer, Mifflin, Somerset, Venango & Westmoreland Counties

Painters Class 1 - Industrial Brush & Roll (Heavy/Highway)

Painters Class 2 - Industrial Sandblast & Spray (Heavy/Highway)

Painters Class 3 - Bridge, Hot Stack, & Transmission Towers (Heavy/Highway)

Painters Class 4 - Painter Tender I (Heavy/Highway)

Painters Class 5 - Painter Tender II (Heavy/Highway)

Painters Class 6 - Commercial Painting & Paperhanging (Building)

Bucks, Chester, Delaware, Montgomery & Philadelphia Counties

Painters Class 1 - Brush, Roller & Spray

Painters Class 2 - Bridge

Painters Class 3 - Wallcoverer

Adams, Berks, Bradford, Carbon, Clinton, Columbia, Cumberland, Dauphin, Franklin, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, Monroe, Montour, Northampton, Northumberland, Perry, Pike, Schuylkill, Snyder, Sullivan, Susquehanna, Tioga, Union, Wayne, Wyoming & York Counties

Painters Class 1 - Commercial*

Painters Class 2 - Industrial (includes Structural Steel, Industrial Spray & Sandblasting)*

Painters Class 3 - Bridge*

\$1.00per hour above the rate for all classifications for work done in the following

* manner: Steel, Spray, Epoxy, HIPAC Coatings, Catalyzed Epoxy, Urethanes, Removers, Swing, Basket, and Sandblasting

Clinton County

Painters Class 1 - Spray

Painters Class 2 - Brush & Roller

ASBESTOS REMOVAL -- ASBESTOS WORKER/LABORER

AMENDED FOR 11/21/97

The removal of asbestos containing materials should be handled as follows:

1. The removal of all insulation materials, whether they contain asbestos or not, from mechanical systems (pipes, boilers, ducts, flues, breachings, etc.) will be recognized as work to be classified as Asbestos Worker.
2. On all mechanical systems (pipes, boilers, ducts, flues, breachings, etc.) that are going to be scrapped, the removal of all insulating material, whether they contain asbestos or not, will be classified as Laborers.
3. The removal of all asbestos containing materials from walls, ceilings, floors, columns and all other non-mechanical structures and surfaces, etc., will be held to the classification of Laborers (with the exception of roofing materials).
4. The term "removal" shall not include sealing, labeling and dropping of scrap material into appropriate containers. After the drop, the final disposal will be classified as Laborers.
5. The loading at the designated area of all materials that have been removed, bagged and tagged, as well as clean-up and all unloading, burying and other work required at the disposal site should be classified as Laborers.

Notes for Electric Lineman

Updated September 19, 2018

Assembling, installation, erection, operation, maintenance, repair, control, inspections of all apparatus devices, wires, cables, supports, insulators, conductors, ducts, raceways, conduits including temporary, permanent, maintaining or restoring electrical service when part of outdoor lighting and wiring when fed from the street and controlled from the street.

All work consisting of wood poles, concrete or metal (or substitutes therefore) poles or towers, including wires, cables or other apparatus supported therefrom. Installing and maintaining the catenary and trolley work on railroad property and bonding of rails.

All outdoor substations, electrical connections and grounding including the setting of transformers and connecting the buses thereto, windmills and solar installations.

Installation and maintenance of roadway lighting and traffic signals systems electronic signs, and intelligent transportation systems.

APPENDIX “D”

Nondiscrimination/Sexual Harassment Clause

Commonwealth of PA – Contract Compliance

NONDISCRIMINATION/SEXUAL HARASSMENT CLAUSE

During the term of the Contract, the Contractor (known herein as “Grantee”) agrees as follows:

1. In the hiring of any employee(s) for the manufacture of supplies, performance of work, or any other activity required under the grant agreement or any subgrant agreement, contract, or subcontract, the Grantee, a subgrantee, a contractor, a subcontractor, or any person acting on behalf of the Grantee shall not discriminate in violation of the *Pennsylvania Human Relations Act* (PHRA) and applicable federal laws against any citizen of this Commonwealth who is qualified and available to perform the work to which the employment relates.
2. The Grantee, any subgrantee, contractor or any subcontractor or any person on their behalf shall not in any manner discriminate in violation of the PHRA and applicable federal laws against or intimidate any of its employees.
3. The Grantee, any subgrantee, contractor or any subcontractor shall establish and maintain a written nondiscrimination and sexual harassment policy and shall inform their employees of the policy. The policy must contain a provision that sexual harassment will not be tolerated and employees who practice it will be disciplined. Posting this Nondiscrimination/Sexual Harassment Clause conspicuously in easily-accessible and well-lighted places customarily frequented by employees and at or near where the grant services are performed shall satisfy this requirement.
4. The Grantee, any subgrantee, contractor or any subcontractor shall not discriminate in violation of the PHRA and applicable federal laws against any subgrantee, contractor, subcontractor or supplier who is qualified to perform the work to which the grant relates.
5. The Grantee and each subgrantee, contractor and subcontractor represents that it is presently in compliance with and will maintain compliance with all applicable federal, state, and local laws and regulations relating to nondiscrimination and sexual harassment. The Grantee and each subgrantee, contractor and subcontractor further represents that it has filed a Standard Form 100 Employer Information Report (“EEO-1”) with the U.S. Equal Employment Opportunity Commission (“EEOC”) and shall file an annual EEO-1 report with the EEOC as required for employers subject to *Title VII of the Civil Rights Act of 1964*, as amended, that have 100 or more employees and employers that have federal government contracts or first-tier subcontracts and have 50 or more employees. The Grantee, any subgrantee, any contractor or any subcontractor shall, upon request and within the time periods requested by the Commonwealth, furnish all necessary employment documents and records, including EEO-1 reports, and permit access to their books, records, and accounts by the granting agency and the Bureau of Small Business Opportunities (BSBO), for the purpose of ascertaining compliance with the provisions of this Nondiscrimination/Sexual Harassment Clause.

6. The Grantee, any subgrantee, contractor or any subcontractor shall include the provisions of this Nondiscrimination/Sexual Harassment Clause in every subgrant agreement, contract or subcontract so that those provisions applicable to subgrantees, contractors or subcontractors will be binding upon each subgrantee, contractor or subcontractor.
7. The Grantee's and each subgrantee's, contractor's and subcontractor's obligations pursuant to these provisions are ongoing from and after the effective date of the grant agreement through the termination date thereof. Accordingly, the Grantee and each subgrantee, contractor and subcontractor shall have an obligation to inform the Commonwealth if, at any time during the term of the grant agreement, it becomes aware of any actions or occurrences that would result in violation of these provisions.
8. The Commonwealth may cancel or terminate the grant agreement and all money due or to become due under the grant agreement may be forfeited for a violation of the terms and conditions of this Nondiscrimination/Sexual Harassment Clause. In addition, the granting agency may proceed with debarment or suspension and may place the Grantee, subgrantee, contractor, or subcontractor in the Contractor Responsibility File.

Company Name _____

Printed Name _____

Title _____

Signature _____

Date _____

Grantee _____

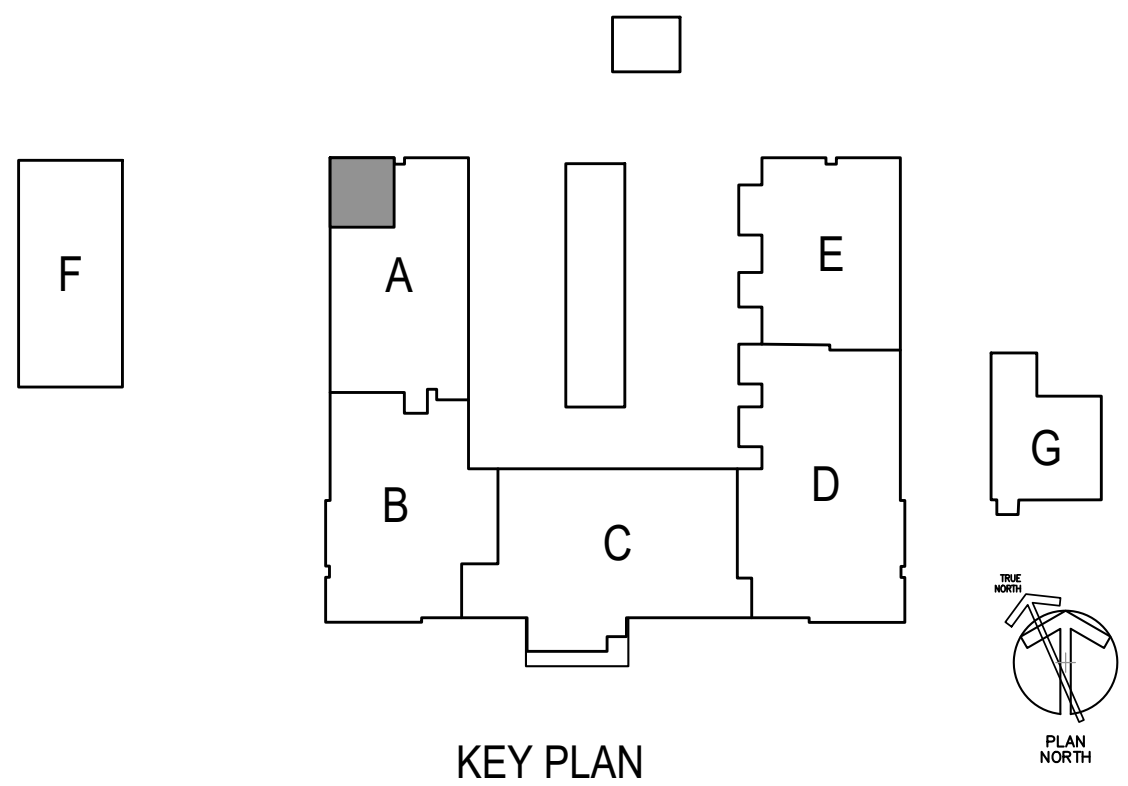
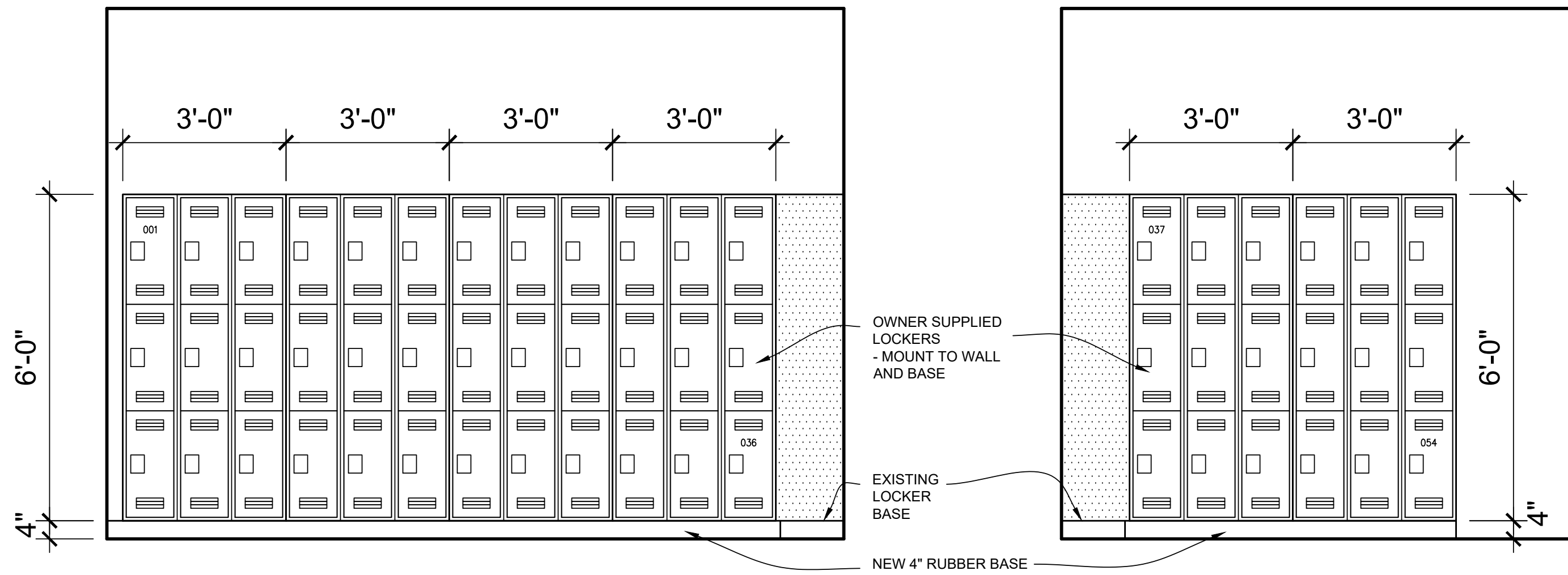
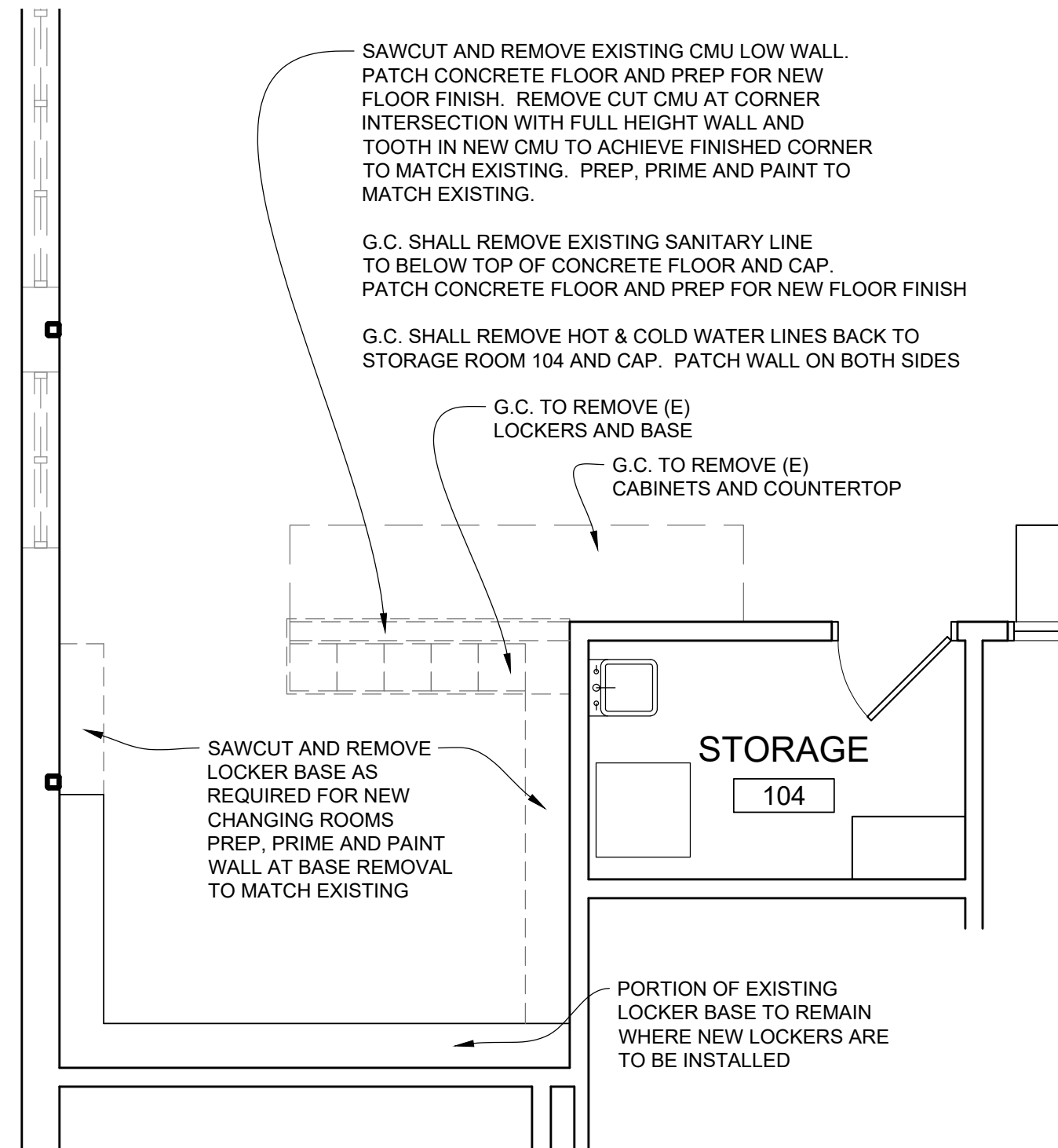
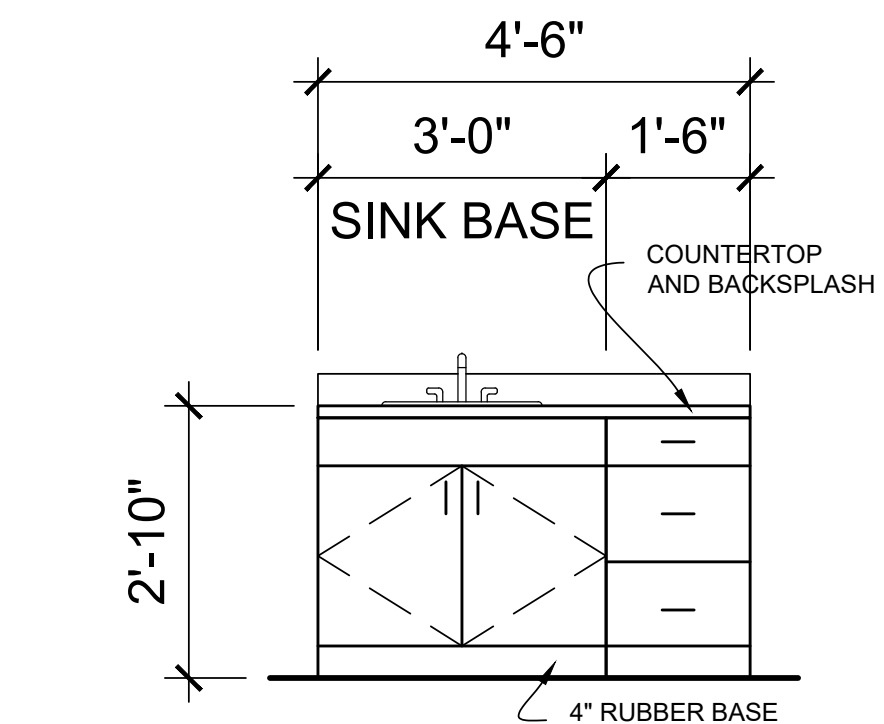
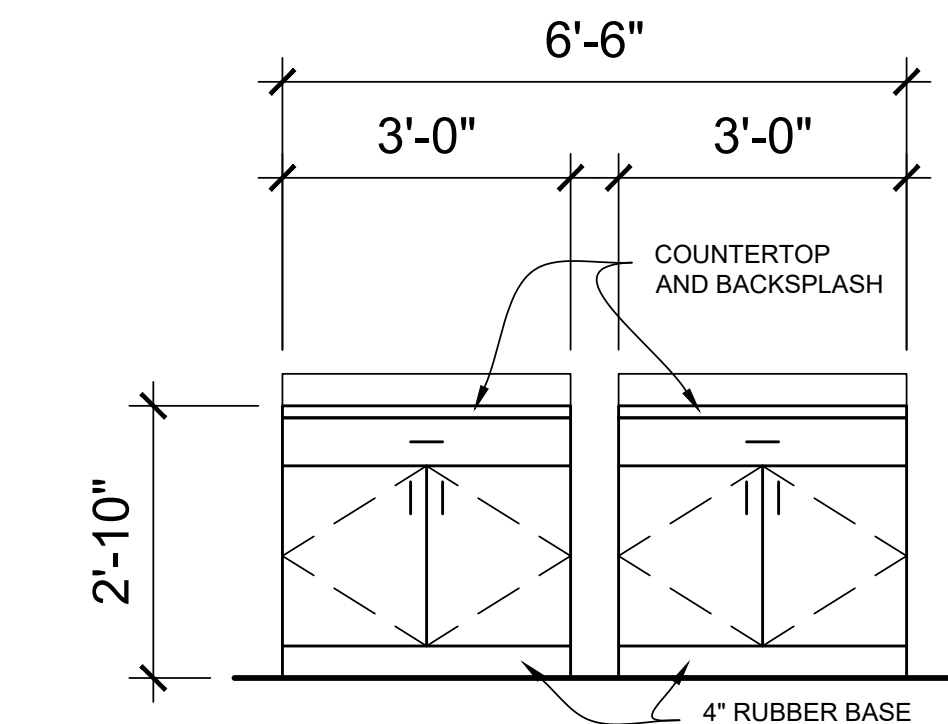
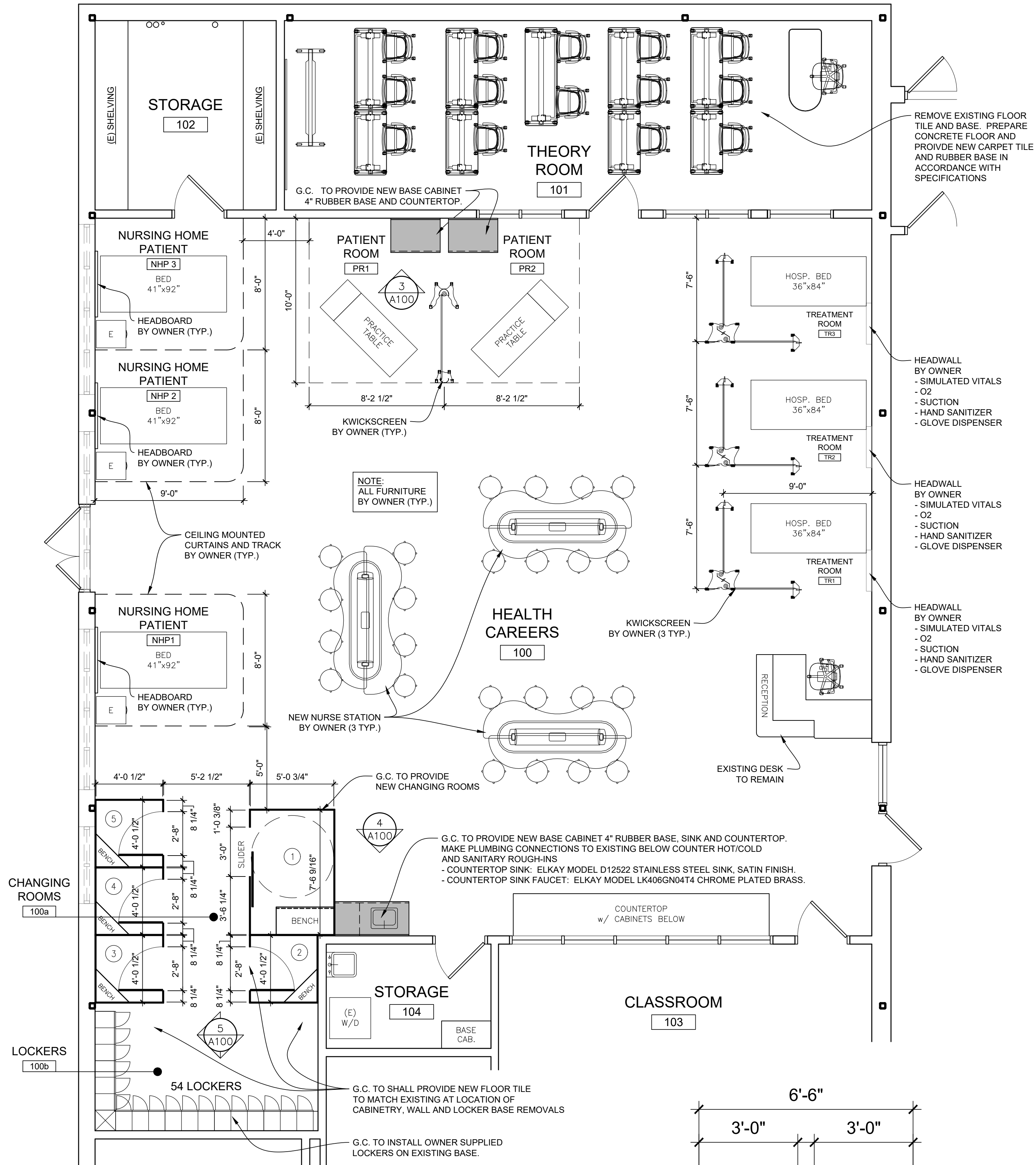
Printed Name _____

Title _____

Signature _____

Date _____

©COPYRIGHT 2024, Systems Design Engineering, Inc., LVA Coding/tech/2025/2511600 - Berks Career Tech Center - West Health Careers Architecture/2511600/100.dwg - February 26, 2024, 3:59 pm by DavidCasper



PETER M. MEDICA MEMBER OF THE AMERICAN INSTITUTE OF ARCHITECTS		RA016195	
BMA BONNETT MEDICA ASSOCIATES INCORPORATED ARCHITECTS • PLANNERS ENGINEERS • PROJECT MANAGERS		1242 WEST CHESTER PIKE • SUITE 11 WEST CHESTER, PA 19382 TELEPHONE 610 • 368 • 6678	
1032 JAMES DR., LEESPORT, PA 19533 PHONE: 610.916.8500 FAX: 610.916.8501		BOYERTOWN, PA 610.369.1319 SCHUYLKILL HAVEN, PA 570.385.5549	
PROPOSED FLOOR PLAN CLASSROOM RENOVATIONS - WEST CAMPUS HEALTH CAREERS BERKS CAREER & TECHNOLOGY CENTER 1057 COUNTY WELFARE ROAD LEESPORT, PA 19533 SITUAIE IN BERKS COUNTY, PA			
DRAWN BY dmc	CHECKED PMM	APPROVED .	CADD FILE NAME 25116.00a100.dwg
DATE 01/30/2026	SCALE AS NOTED	DRAWING NUMBER A100	

ELECTRICAL LEGEND

NOTE: THIS LEGEND IS A STANDARD AND SOME ITEMS MAY NOT APPLY

PHOTOELECTRIC SMOKE DETECTOR

IT IS THE INTENT OF THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS THAT THE CONTRACTOR SHALL, UNLESS OTHERWISE NOTED THEREIN, FURNISH ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT INCLUDING SCAFFOLDING TO COMPLETE THE INSTALLATION OF THE ENTIRE ELECTRICAL SYSTEM AS SPECIFIED HEREIN. CONTRACTOR SHALL PROPERLY INSTALL, BOND, ADJUST, AND PUT INTO PROPER OPERATION, THE RESPECTIVE PORTIONS OF THE INSTALLATION SPECIFIED, AND SO INTERCONNECT THE VARIOUS ITEMS OR SECTIONS OF THE WORK IN ORDER TO FORM A COMPLETE AND PROPERLY OPERATING WHOLE.

2. THE WORK SHALL INCLUDE ALL MATERIAL AND LABOR REQUIRED TO PROVIDE THE ELECTRICAL WORK SPECIFIED AND SHOWN ON DRAWINGS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ACCESSORIES, PARTS, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM.

3. THE WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

- MISCELLANEOUS DEVICES
- BRANCH CIRCUITS
- GROUNDING
- BONDS
- BOXES
- DEPLETION
- TESTING

4. THE WORK SHALL INCLUDE OBTAINING ALL PERMITS, PAYING ALL PERMIT FEES, SCHEDULING ALL REQUIRED INSPECTIONS, AND PAYING ALL UTILITY AND NEIGHBORHOOD FEES.

5. ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES, AND REGULATIONS ADOPTED BY MUNICIPAL, COUNTY, STATE, AND FEDERAL AUTHORITIES INCLUDING THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) AND WITH THE REQUIREMENTS/AMENDMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION (A/L).

6. CONTRACT DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO CONVEY SCOP, DESIGN INTENT, AND GENERAL ARRANGEMENTS. CONTRACTOR IS RESPONSIBLE FOR CORRELATING THE WORK OF ALL TRADES INCLUDING RESOLUTION OF FIELD CONFLICTS THAT MAY ARISE.

7. ALL OF THE ELECTRICAL INSTALLATION SHALL BE PERFORMED IN A NEAT, WORKMANLIKE MANNER AND IN ACCORDANCE WITH NEHY STANDARDS.

8. EACH FEEDER AND BRANCH CIRCUIT SHALL INCLUDE AN INSULATED EQUIPMENT GROUND CONDUCTOR PER NEC, ARTICLE 250. BOND ALL ELECTRICAL EQUIPMENT, OUTLET BOXES, GROUNDING TYPE RECEPTACLES, ETC. IN ACCORDANCE WITH NEHY ARTICLE 250.

9. MULTI-RAE BRANCH CIRCUITS ARE NOT BE PERMITTED. EACH 120V BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUNDING AND INSULATED GROUND CONDUCTORS.

10. GROUPING OF BRANCH CIRCUITS AND FEEDERS SHALL BE PERMITTED, PROVIDED THAT THE NEC, RULES PERTAINING TO MAXIMUM ALLOWABLE PERCENT FILL OF RACINAYS, AND AMPACITY ADJUSTMENT FACTORS FOR MORE THAN 3% OR 4% CURRENT CARRYING CAPACITY IN A RACEWAY ARE STRICTLY ADHERED TO. CONTRACTOR SHALL EXERCISE CAUTION IN PROVIDING AN EQUAL NUMBER OF A, B, AND C PHASE CONDUCTORS IN RACEWAYS WHEN GROUPING CIRCUITS.

11. TROUBLE, LUNION BOXES, AND PULL BOXES ARE NOT NECESSARILY INDICATED, BUT SHALL BE PROVIDED WHEN REQUIRED BY THE NEC, AND AS REQUIRED FOR FAST OF INSTALLATION. BOXES SHALL BE SIZED, AT A MINIMUM, IN ACCORDANCE WITH NEC, ARTICLE 34. TROUBLE SHALL BE SIZED PER NEC, ARTICLE 366.

12. ALL BRANCH CIRCUITS AND FEEDERS PROVIDED UNDER THIS CONTRACT ARE TO BE NEW UNLESS OTHERWISE NOTED.

- EXPOSED INTERIOR WIRING IN DRY LOCATIONS SHALL BE INSTALLED IN ELECTRICAL METALLIC TUBING (EMT) OR RIGID GALVANIZED STEEL CONDUIT, 3/4" MINIMUM SIZE, FLEXIBLE METAL CONDUIT, OR FLEXIBLE METAL CONDUIT. SHALL BE USED FOR ALLOWED BY CODE AND SPECIFICATIONS. IN LENGTHS NOT EXCEEDING 6'.
- WIRING IN INTERIOR, DRY SPACES, CONCEALED IN STRUCTURE, OR ABOVE ACCESSIBLE CEILING MAY BE INSTALLED IN EMT, OR METAL DRY TYPE RIGID METAL CONDUIT AS ALLOWED BY CODE AND SPECIFICATIONS. FOR EXPOSED DAMP OR WET LOCATIONS THESE WIRING IS SUBJECT TO DAMP, GALVANIZED RIGID STEEL CONDUIT SHALL BE USED.
- FOR INTERIOR AND EXTERIOR FEEDERS, UTILITY SCHEDULE 40 PVC CONDUIT, EXCEPT THAT IN AREAS SUBJECT TO VIBRANT TRAFFIC SCHEDULE 80 PVC CONDUIT SHALL BE USED.

13. ALL 600 VOLT OVER-CURRENT PROTECTIVE DEVICES SHALL HAVE INTERRUPTING RATINGS (AIC OR AIR) IN RMS AMPERES SYMMETRICAL. ALL DEVICES SHALL BE FULLY RATED FOR AVAILABLE FAULT CURRENT. ALL ELECTRICAL SWITCHGEAR, DISTRIBUTION BOXES, DEVICES ETC. SHALL BE FULLY RATED. SERIES RATED EQUIPMENT IS NOT ALLOWED.

14. ALL BUILDING WIRE SHALL BE TYPE THW/THHN (DUAL LISTED) COPPER CONDUCTORS, WITH 40° CELSIUS RATED INSULATION, 82 MINIMUM SIZE. UTILITY WIRE FOR ANY 120V, 15 OR 20A CIRCUIT THAT EXCEEDS 100 FEET TO LAST DEVICE OR OUTLET.

15. DO NOT UTILITY FEED THROUGH GFCI RECEPTACLES FOR DOWNSTREAM DEVICE PROTECTION. ALL DEVICES LISTED AS GF SHALL BE FEED-THRU ONLY.

16. CONTRACTOR SHALL PROVIDE AND INSTALL AN APPROVED, UL LISTED FIRE STOP SEALANT TO ALL PENETRATIONS ALTHOUGH ALL PENETRATIONS THROUGH WALLS, CEILING, FLOORS, ROOFS, ETC. ALL FLUOR PENETRATIONS SHALL BE CORE DILLED, SLOTTED, AND SEALED WITH AN APPROVED, FIRE RATED SEALANT. ALL EXISTING PENETRATIONS IN WALLS AND FLOORS MUST BE SEALED TO MAINTAIN FIRE RATING.

17. BRANCH CIRCUIT FOR FAC2 SHALL MEET THE REQUIREMENT OF SECTION 4.01 OF NFPA 72. CONTRACTOR INSTALLING FIRE ALARM SYSTEM SHALL BE NOTICED IF CERTIFIED.

18. EGRESS AND EMERGENCY LIGHTING SHALL BE CONNECTED AND INSTALLED TO MEET THE REQUIREMENTS OF NFPA 70, ARTICLE 780. CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS AND EQUIPMENT. THE LATEST ADOPTED EDITION OF THE INTERNATIONAL BUILDING CODE FOR EXACT LOCATIONS. THE DESIGNER DOES NOT TAKE RESPONSIBILITY FOR LOCATIONS. FINAL LOCATIONS SHALL BE APPROVED BY THE LOCAL A/L.

19. THE CONTRACTOR SHALL PERFORM THE WORK AS INDICATED ON THE DRAWINGS. ANY DEVIATION FROM THE DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OR ARCHITECT FOR REVIEW AND APPROVAL IN WRITING. IF CHANGES ARE MADE WITHOUT WRITTEN CONSENT, THE CONTRACTOR SHALL BE LIABLE FOR ANY SIZES THAT ARISE DUE TO THE CHANGES.

20. UNLESS NOTED OTHERWISE, ALL WIRE SHALL BE BASED ON THE FOLLOWING: TABLE 30.0, 60° CULM FOR 14 THROUGH 18, TABLE 30.1, 75° CULM FOR 19 AND GREATER, AND OTHER ALLOWANCES OF 100%.

21. UNLESS OTHERWISE NOTED, FEEDER TAPS AND TRANSFORMER SECONDARY CONDUCTOR TAPS ARE DESIGNED BASED ON THE 75° TABLE 30.1 (200/250 AND 250/300).

22. UNLESS OTHERWISE NOTED, ALL CONDUIT SIZES ARE BASED ON EMT, RIGID, OR RING PVC SCHEDULE 40.

23. ALL ELECTRICAL MATERIALS, DEVICES, APPLIANCES, AND EQUIPMENT SHALL BE NEW, LABELED AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY OR AGENCY (E.G. UL), UNLESS OTHERWISE NOTED.

24. ELECTRICAL CONTRACTOR SHALL FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS FOR ALL EQUIPMENT IF NOT INDICATED ON DRAWINGS. IF THERE IS A DISCREPANCY, MANUFACTURERS INSTRUCTIONS TAKE PRECEDENCE.

25. THE E.G. SHALL FURNISH ALL EQUIPMENT, LABOR, SERVICES, AND MATERIALS REQUIRED FOR COMPLETE AND FUNCTIONAL INSTALLATION OF THE WORK INDICATED. UNLESS OTHERWISE NOTED, ALL MATERIALS SHALL BE NEW.

26. PROVIDED ACCESS PARTS AS REQUIRED FOR CONFORM TO EQUIPMENT.

27. ALL WIRING, EQUIPMENT, STARTERS AND CONTROLS SHALL INFLUENCE TO THE NATIONAL ELECTRICAL CODE AND TO THE REQUIREMENTS OF THE LOCAL UTILITY COMPANY.

28. NEW LIGHTING CONTROLS SHALL COMPLY WITH THE APPLICABLE EDITION OF THE INTERNATIONAL ELECTRIC CODE (IECC) OR ASHRAE 90.1.

29. ALL WIRING METHODS SHALL BE NEC, COMPLIANT AND MEET THE REQUIREMENTS OF THE SPACE, OCCUPANCY AND CONDITION OF USE.

30. THESE PLANS HAVE BEEN DRAWN AND CALCULATED HAVE BEEN BASED ON THE EXISTING DOCUMENTS AND/OR INFORMATION PROVIDED BY THE CLIENT AND/OR OTHERS. THE ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THESE DRAWINGS. THE CONTRACTOR RESPONSIBLE FOR THE INSTALLATION OF THE ITEMS SHOWN ON THESE DRAWINGS AND/OR THE OWNER OF THE FACILITY SHALL FIELD VERIFY EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER FOR CORRECTION, EDITING, RE-CALCULATION, ETC. AS REQUIRED.

31. DO NOT SCALE DRAWINGS. CONTRACTOR SHALL VERIFY AND CONFIRM ALL DIMENSIONS IN THE FIELD AND NOTIFY THE ENGINEER OF ANY AND ALL DISCREPANCIES ON THE DRAWINGS. COPIES OF THESE DRAWINGS AND/OR INFORMATION PROVIDED BY THE CLIENT AND/OR OTHERS SHALL NOT BE CONSIDERED VALID, AND ARE FOR THE CONVENIENCE OF THE USER AT THEIR OWN RISK.

WALL MOUNTED FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE (OR AS SHOWN ON ARCHITECTURAL DETAILS)	1" BELOW FINISHED CEILING
TV MONITOR OUTLETS AND SERVICE RECEPTACLES FOR SHELF MOUNTED TV	8'-0" ABOVE FINISHED FLOOR
WARNING AND SIGNALING LUMINAIRES / SIGNS	CENTERED ABOVE DOOR OR WINDOW OPENING
FIRE ALARM VISUAL NOTIFICATION APPLIANCE MOUNTED AT 6'-8" MEASURED FROM THE FINISHED FLOOR TO THE BOTTOM OF THE DEVICE OR 8' BELOW FINISHED CEILING MEASURED FROM THE FINISHED CEILING TO THE TOP OF THE DEVICE, WHICHEVER IS LOWER.	6'-8" ABOVE FINISHED FLOOR
TOP OF FLUSH AND SURFACE MOUNTED LIGHTING CONTROL PANELS OR POWER PANELBOARDS AND TELEPHONE CABINETS.	6'-6" ABOVE FINISHED FLOOR
TOP OF HIGHEST ELECTRICAL SAFETY DISCONNECT SWITCHES	4'-0" ABOVE FINISHED FLOOR
WALL MOUNTED TELEPHONE AND WALL MOUNTED INTERCOMS	4'-0" ABOVE FINISHED FLOOR
WALL MOUNTED ELECTRICAL DEVICES, SUCH AS LIGHTING SWITCHES, MANUAL MOTOR STARTERS, THERMOSTATS, AND FIRE ALARM PULL STATIONS. 66" OUTLETS IN TOILET ROOMS ALL FLOOR EQUIPMENT IN LABS AND EQUIPMENT ROOMS	3'-6" ABOVE FINISHED FLOOR
ELECTRICAL RECEPTACLES INCLUDING THOSE USED WITHIN MECHANICAL SPACES AND ELEVATOR ROOMS, TELEPHONE, DATA, AND COMMUNICATION OUTLETS CATV AND ANY JUNCTION BOXES	1'-6" ABOVE FINISHED FLOOR
WALL CLOCK AT 8'-0" OR CENTER BETWEEN DOOR FRAME AND CEILING	8'-0" ABOVE FINISHED FLOOR

THE ABOVE MOUNTING HEIGHTS SHALL BE ADHERED TO UNLESS SPECIFICALLY NOTED OR DETAILED OTHERWISE ON THE ARCHITECTURAL DRAWINGS OR SPECIFICATIONS.

PETER M. MEDICA
RAOI6195

MEMBER OF THE AMERICAN
INSTITUTE OF ARCHITECTS

BMA

BONNETT
MEDICA
ASSOCIATES
INCORPORATED

ARCHITECTS • PLANNERS
ENGINEERS • PROJECT MANAGERS

1242 WEST CHESTER PIKE • SUITE 11
WEST CHESTER, PA 19382
TELEPHONE 610 • 368 • 6678



1032 JAMES DR., LEESPORT, PA 19533
PHONE: 610.916.8500 FAX: 610.916.8501

**SYSTEMS DESIGN
ENGINEERING, INC**

BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549

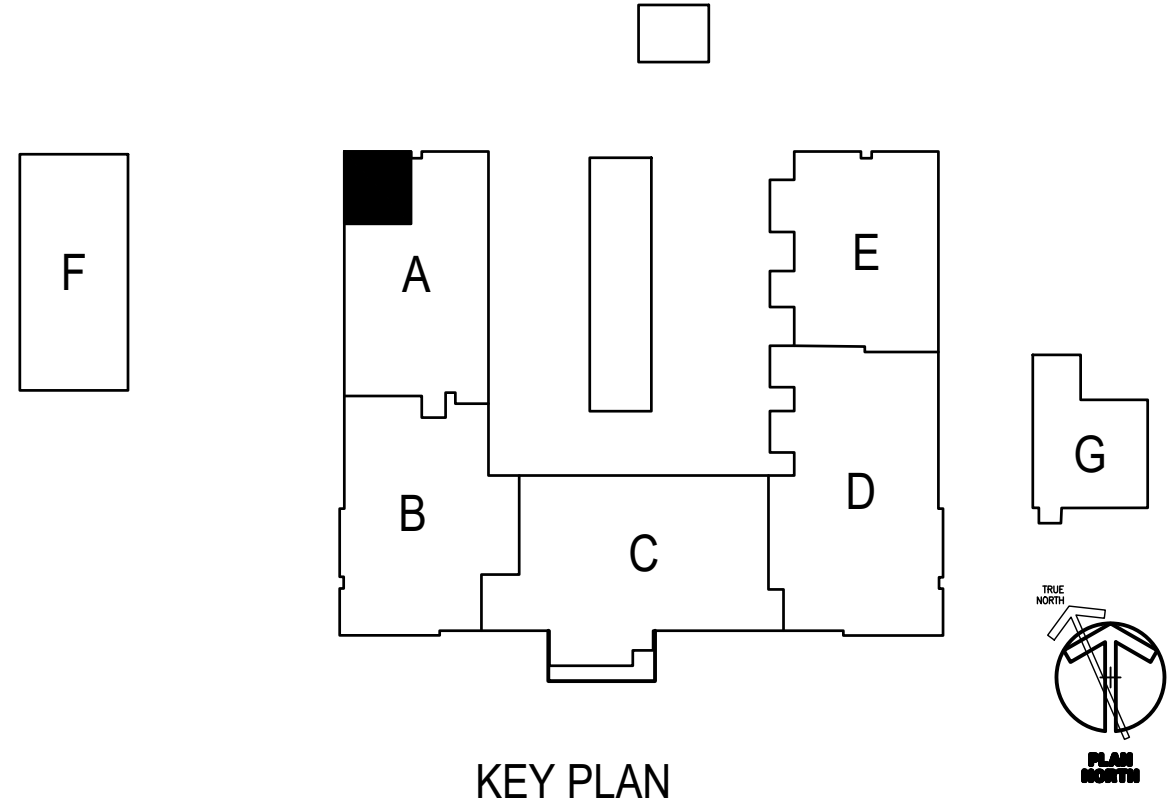
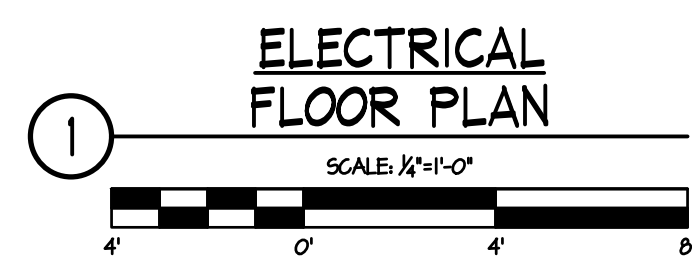
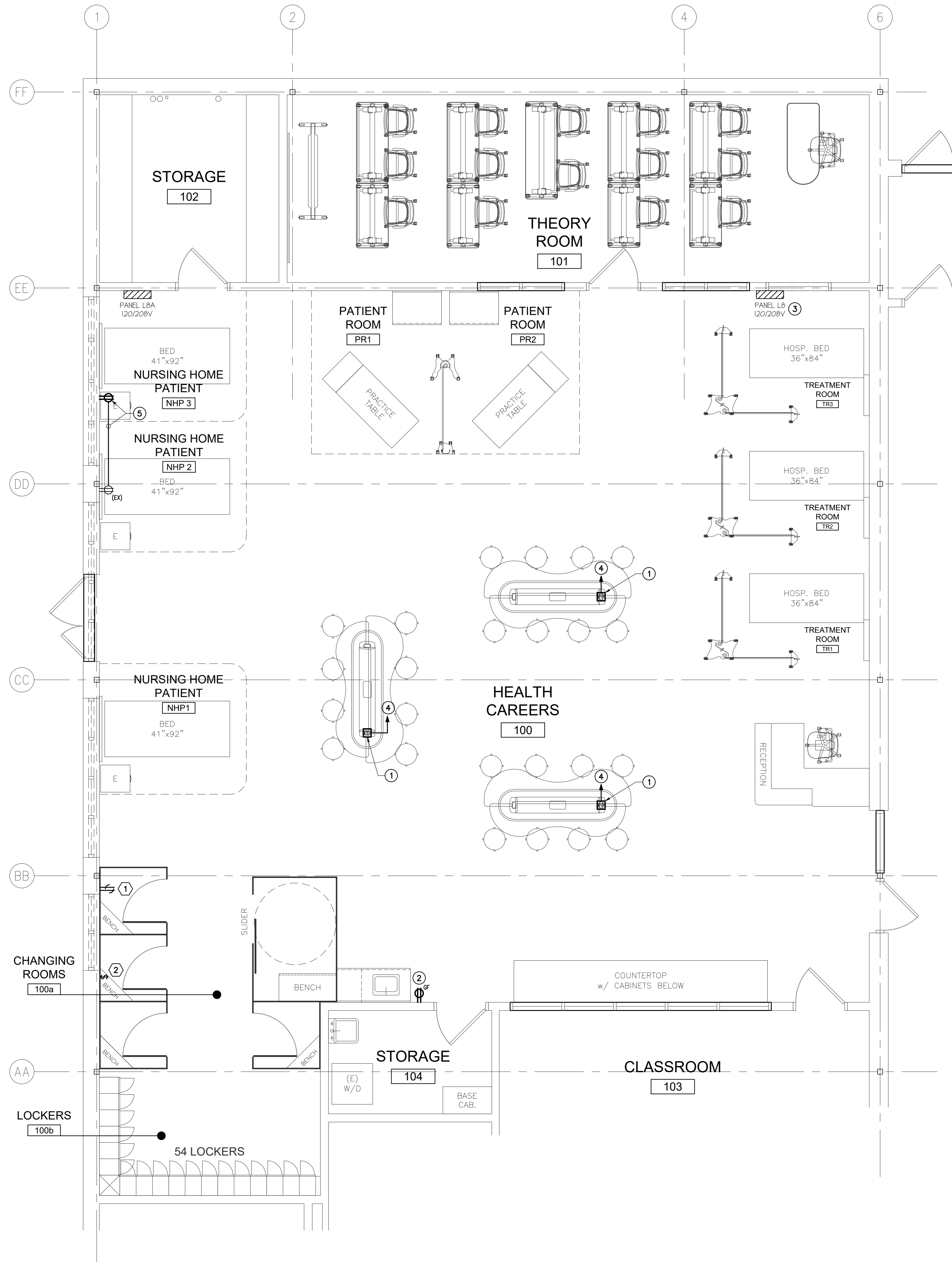
LEGEND & ABBREVIATIONS

CLASSROOM RENOVATIONS - WEST CAMPUS HEALTH CAREERS
BERKS CAREER & TECHNOLOGY CENTER

1057 COUNTY WELFARE ROAD
LEESPORT, PA 19533

SITUATE IN
BERKS COUNTY, PA

DRAWING CAR	CHECKED SG	APPROVED SG	CADD FILE NAME E101.dwg
DATE 03/10/2026	SCALE AS NOTED	DRAWING NUMBER D-25-0485-0040-E001	



KEYED DEMOLITION NOTES

- 1 DISCONNECT AND REMOVE EXISTING RECEPTACLE, REMOVE OUTLET BOX, CONDUIT AND WIRING BACK TO NEXT OUTLET. COVER OPENING IN OUTLET BOX.
- 2 DISCONNECT AND REMOVE SWITCH, REMOVE OUTLET BOX AND CONDUIT. REMOVE WIRING TO LIGHT FIXTURE, RECONNECT LIGHT FIXTURES TO BE CONTROLLED WITH MAIN ROOM LIGHT FIXTURES.

KEYED NEW WORK NOTES

- 1 POWER POLE FURNISHED AND INSTALLED BY GC WITH NURSE STATION. EC SHALL WIRE THROUGH POWER POLE WITH MC CABLE TO RECEPTACLES. EC SHALL FURNISH AND INSTALL SIX (6) DECORA STYLE RECEPTACLES IN EACH NURSE STATION.
- 2 REPLACE EXISTING RECEPTACLE WITH NEW GFCI RECEPTACLE. PROVIDE NEW COVERPLATE.
- 3 FURNISH AND INSTALL THREE (3) NEW 20A, 1P CIRCUIT BREAKERS IN EXISTING PANEL L8 (CUTLER-HAMMER PRL3g TYPE).
- 4 2 #12 & 1 #126, 3/4" TO PANEL L8 AND CONNECT TO 20A, 1P CIRCUIT BREAKER. REVISE PANEL DIRECTORY TO REFLECT WORK.
- 5 FURNISH AND INSTALL DOUBLE DUPLEX RECEPTACLE IN SURFACE CAST BOX WITH COVER PLATE, AND 2 #12 & 1 #126, 3/4" TO EXISTING RECEPTACLE AND CONNECT TO EXISTING CIRCUIT.

PETER M. MEDICA RA016195
MEMBER OF THE AMERICAN INSTITUTE OF ARCHITECTS
BMA
BONNETT MEDICA ASSOCIATES INCORPORATED
ARCHITECTS • PLANNERS
ENGINEERS • PROJECT MANAGERS
1242 WEST CHESTER PIKE • SUITE 11
WEST CHESTER, PA 19382
TELEPHONE 610 • 368 • 6678

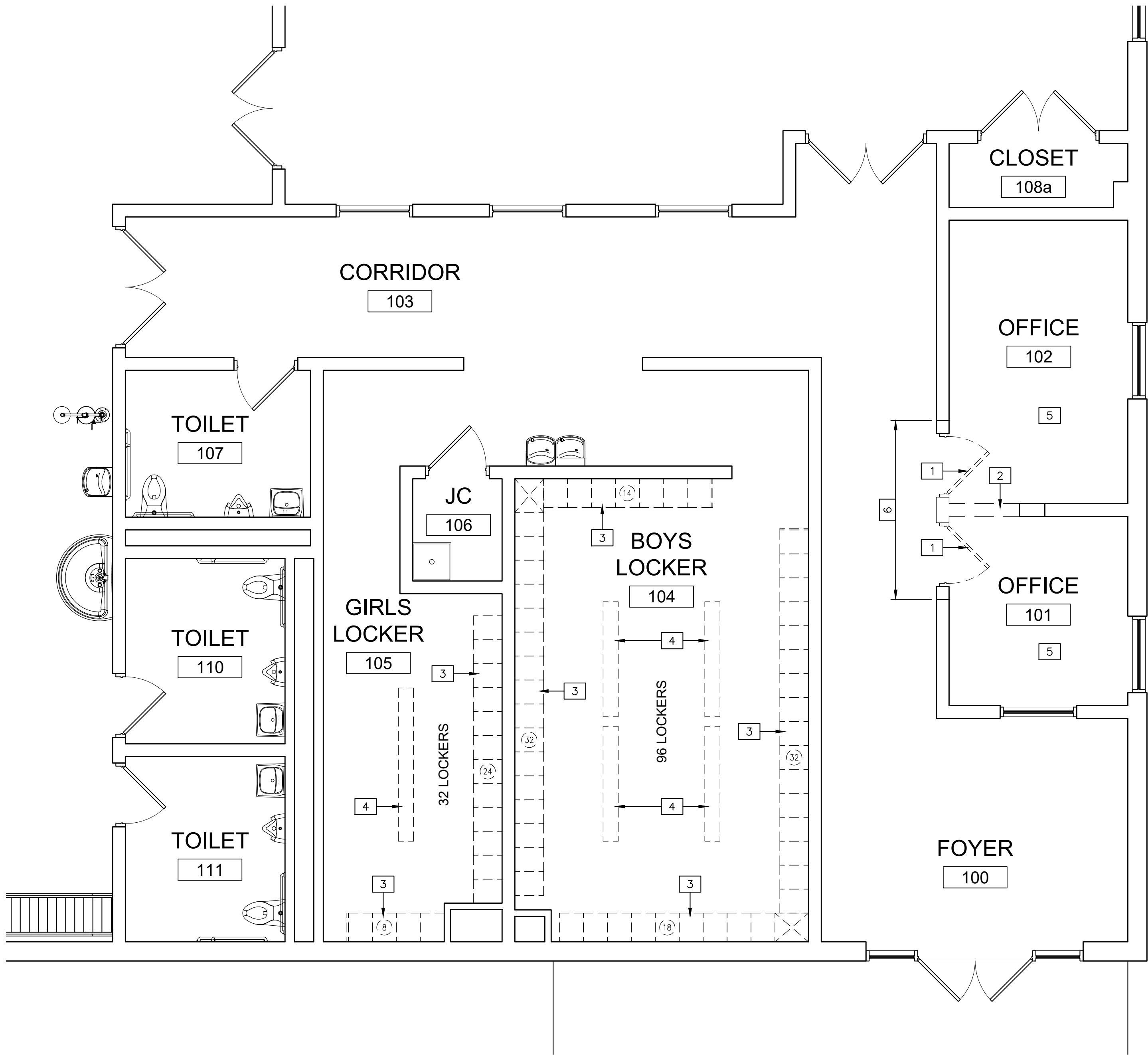
NO.	DATE	REVISION	BY

SYSTEMS DESIGN ENGINEERING, INC
1032 JAMES DR., LEESPORT, PA 19533
PHONE: 610.916.8500 FAX: 610.916.8501
BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549

ELECTRICAL FLOOR PLAN
CLASSROOM RENOVATIONS - WEST CAMPUS HEALTH CAREERS
BERKS CAREER & TECHNOLOGY CENTER
1057 COUNTY WELFARE ROAD
LEESPORT, PA 19533
SITUATE IN BERKS COUNTY, PA

DRAWN BY	CHECKED	APPROVED	CADD FILE NAME
CAR	SG	SG	E101.dwg

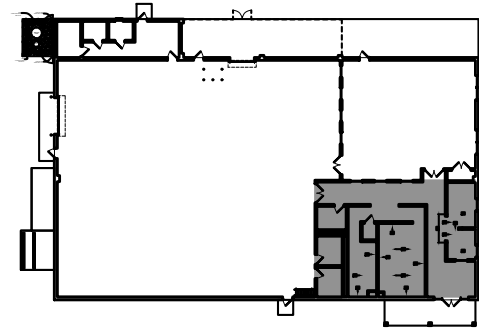
DATE	SCALE	DRAWING NUMBER
03/10/2026	AS NOTED	D-25-0485-0040-E101



1
A100 DEMOLITION FLOOR PLAN
WELDING SHOP 1/4" = 1'-0"

DEMOLITION KEYNOTES:

- 1 REMOVE DOOR & DOOR FRAME. PROTECT ADJACENT SURFACES AND PATCH WHERE REQUIRED WITH MATERIALS EXACTLY MATCHING THOSE MARRED BY THE REMOVAL.
- 2 SAW CUT AND REMOVE PORTION OF INTERIOR CMU PARTITION INCLUDING BELOW SLAB PORTION AND AS REQUIRED TO TOOTH-IN NEW CMU.
- 3 REMOVE AND RELOCATE EXISTING METAL LOCKERS AS SHOWN ON PLAN. PROVIDE WALL ANCHORS AND CLOSURE PANELS FOR NEW CONFIGURATION. COLOR OF CLOSURE PANELS SHALL MATCH EXISTING. REMOVE ALL EXISTING LOCKER WALL ANCHORS AND ACCESSORIES. PATCH HOLES, PREP AND PAINT WALLS.
- 4 REMOVE EXISTING BENCH AND SUPPORT LEGS. PATCH HOLES IN FLOOR.
- 5 REMOVE ALL EXISTING ACOUSTIC CEILING TILES AND SUSPENDED CEILING GRIDS WHERE NEW CEILINGS ARE SHOWN ON THE REFLECTED CEILING PLAN DRAWINGS. PROTECT ALL ADJACENT SURFACES WHICH ARE TO REMAIN.
- 6 SAW CUT AND REMOVE PORTION OF INTERIOR PARTITION ABOVE DOOR OPENING INCLUDING AS REQUIRED TO TOOTH-IN NEW CMU.



KEY PLAN

N.T.S.

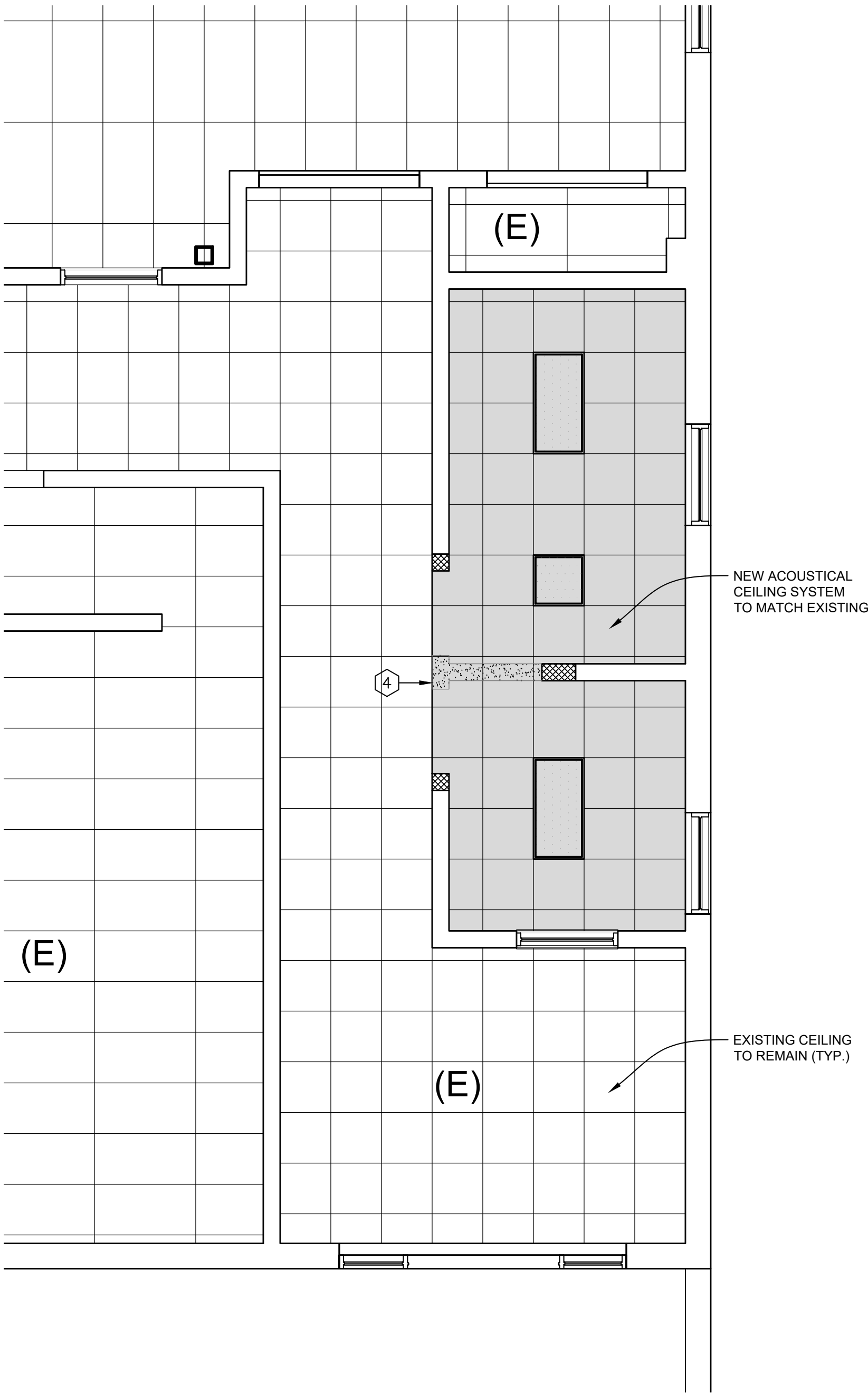
NO.	DATE	REVISION	BY	

PETER M. MEDICA RA016195
MEMBER OF THE AMERICAN INSTITUTE OF ARCHITECTS
BMA
BONNETT MEDICA ASSOCIATES INCORPORATED
ARCHITECTS • PLANNERS
ENGINEERS • PROJECT MANAGERS
1242 WEST CHESTER PIKE • SUITE 11
WEST CHESTER, PA 19382
TELEPHONE 610 • 368 • 6678

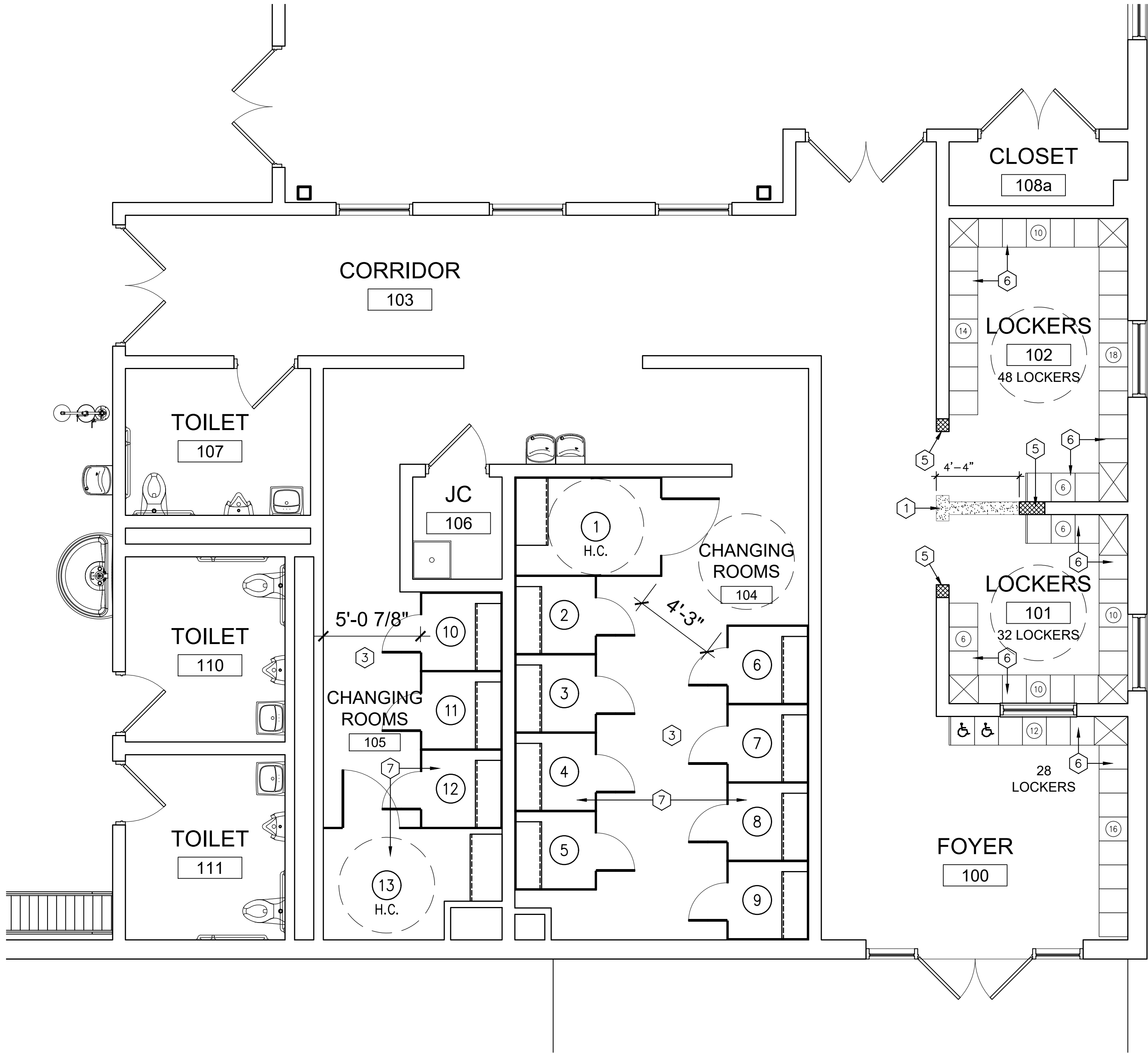
SYSTEMS DESIGN ENGINEERING, INC
1032 JAMES DR. LEESPORT, PA 19533
PHONE: 610.916.8500 FAX: 610.916.8501
BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549
DEMOLITION FLOOR PLAN
LOCKER ROOM ALTERATIONS - WEST CAMPUS WELDING SHOP
BERKS CAREER & TECHNOLOGY CENTER
1057 COUNTY WELFARE ROAD
LEESPORT, PA 19533
SITUATE IN
BERKS COUNTY, PA
DRAWN BY: dmc CHECKED: PMM APPROVED: .
CADD FILE NAME: 25115.00ad100.dwg
DATE: 01/06/2026 SCALE: AS NOTED DRAWING NUMBER: AD100

NEW CONSTRUCTION KEYNOTES:

- 1 PATCH CONCRETE FLOOR AT VOID FROM CMU REMOVAL WITH CONCRETE FINISHED FLUSH WITH ADJACENT CONCRETE. MATCH EXISTING CONCRETE TEXTURE.
- 2 EPOXY FLOOR AND BASE: PREPARE EXISTING CONCRETE FLOORS AND PROVIDE NEW EPOXY FLOORING AND INTEGRAL 4 INCH COVE BASE IN THE FOLLOWING ROOMS IN ACCORDANCE WITH CONTRACT DOCUMENTS:
 - CORRIDOR 103
 - TOILET 107
 - CHANGING ROOM 105
 - CHANGING ROOM 104
 - LOCKERS 102
 - LOCKERS 101
 - FOYER 100
- 3 PREP AND PAINT CMU WALLS.
- 4 TIE-IN NEW ACOUSTICAL CEILING TILES AND GRID INTO EXISTING CORRIDOR ACOUSTICAL TILE SYSTEM. REPLACE DAMAGED TILES AND GRID AS REQUIRED.
- 5 TOOTH IN CMU AT LOCATIONS OR WALL AND HMF REMOVAL. PREP AND PAINT NEW CMU TO MATCH EXISTING.
- 6 NEW LOCATION OF RELOCATED METAL LOCKERS. COORDINATE IDENTIFICATION NUMBERING WITH OWNER. NEW PROVIDE CLOSURE PANELS, COLOR TO MATCH EXISTING.
- 7 PROVIDE CHANGING ROOMS IN ACCORDANCE WITH SPECIFICATIONS.

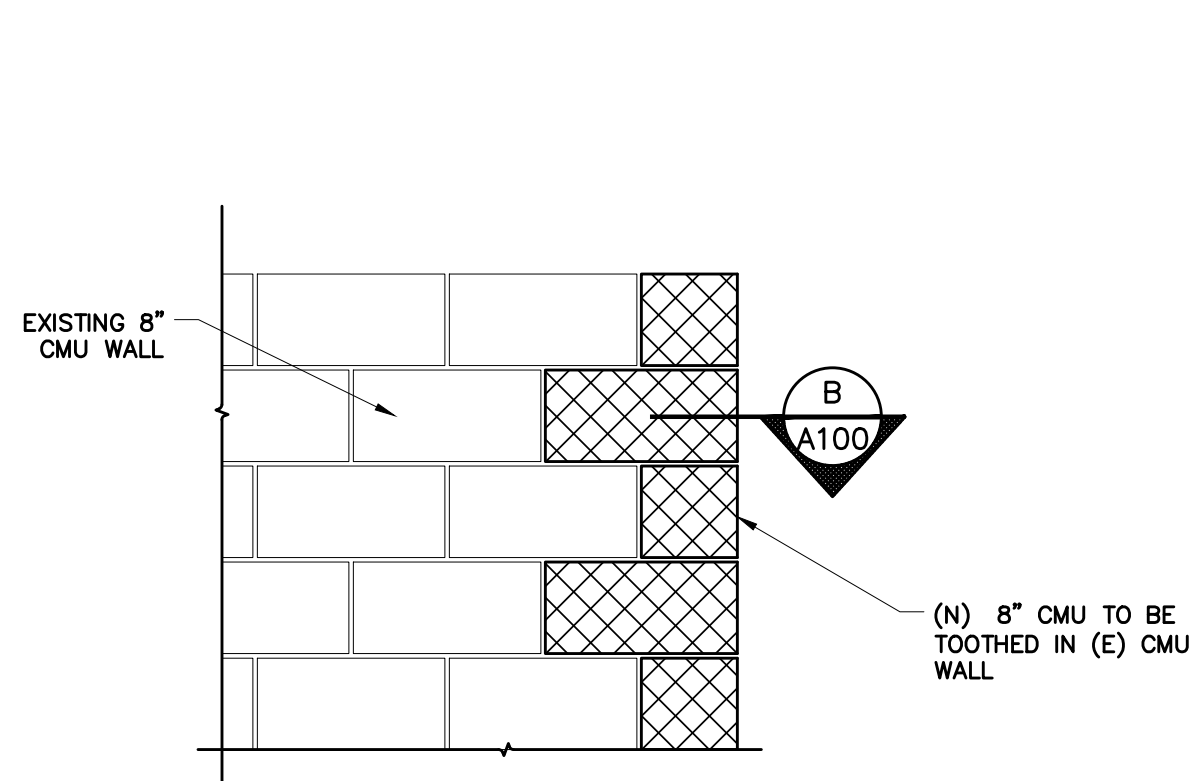


2 PARTIAL REFLECTED CEILING PLAN
A100 WELDING SHOP
1/4" = 1'-0"

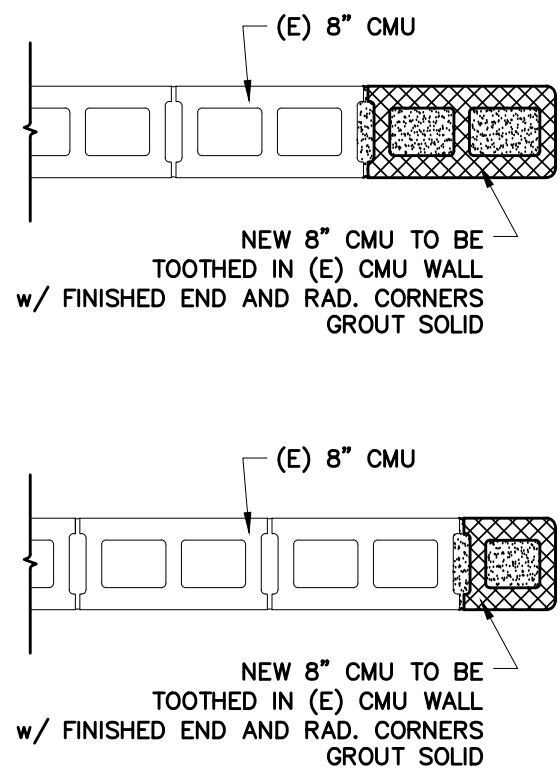


1 PROPOSED FLOOR PLAN
A100 WELDING SHOP
1/4" = 1'-0"

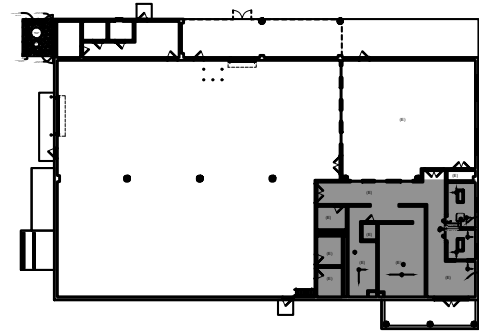
13 CHANGING ROOMS
108 LOCKERS



CMU WALL ELEV.
SCALE: 3/4"=1'-0"
A100



PLAN DETAIL
SCALE: 3/4"=1'-0"
B100



KEY PLAN
N.T.S.

PETER M. MEDICA RA016195
MEMBER OF THE AMERICAN INSTITUTE OF ARCHITECTS
BMA
BONNETT MEDICA ASSOCIATES INCORPORATED
ARCHITECTS • PLANNERS
ENGINEERS • PROJECT MANAGERS
1242 WEST CHESTER PIKE • SUITE 11
WEST CHESTER, PA 19382
TELEPHONE 610 • 368 • 6678

NO.	DATE	REVISION	BY

SYSTEMS DESIGN ENGINEERING, INC
1032 JAMES DR., LEESPORT, PA 19533
PHONE: 610.916.8500 FAX: 610.916.8501
BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549

PROPOSED NEW FLOOR PLAN
LOCKER ROOM ALTERATIONS - WEST CAMPUS WELDING SHOP
BERKS CAREER & TECHNOLOGY CENTER
1057 COUNTY WELFARE ROAD
LEESPORT, PA 19533
SITUAIE IN
BERKS COUNTY, PA

DRAWN BY	CHECKED	APPROVED	CADD FILE NAME
dmc	PM		25115.00g100.dwg

DATE	SCALE	DRAWING NUMBER
01/06/2026	AS NOTED	A100

Technical drawing of a gate assembly, showing side and end views with dimensions and labels.

Labels:

- 4" CORNER POST
- POST CAP
- RAIL END
- 2 1/2" LINE POST
- TOP RAIL
- HORIZ. BRACE
- TENSION BAR
- DIAG. BRACE ROD
- TENSION WIRE OR BOTTOM RAIL
- TURN BUCKLE
- CORNER POST
- LINE POST
- EXPANSION SLEEVE
- 4" TERMINAL POST
- GATE HINGE
- GATE POST

Dimensions:

- 6'-0" (Overall height)
- 48" MIN. (Post height)
- 4" (Post diameter)
- 12" (Post width)
- 10'-0" MAX (Gate width)
- 42" MIN. (Gate height)
- 4" (Gate thickness)
- 10" (Gate width)
- 48" MIN. (Post height)
- 4" (Post diameter)
- 12" (Post width)

Diagram illustrating the cross-section of a concrete slab repair at an existing building. The diagram shows the following components and dimensions:

- EXISTING BUILDING** (Left edge)
- 1/2" JOINT SEALANT AT BUILDING** (At the interface with the existing building)
- #5 CONT. w/ CORNER BARS** (Reinforcement bars at the building edge)
- 10'-6" SLAB** (Overall width of the slab)
- 6" A.E. CONCRETE SLAB w/ 6X6 W2.9XW2.9 WWF** (Top layer of concrete with wire mesh)
- 6" CRUSHED STONE** (Base layer of the repair)
- PATCH ASPHALT DRIVEWAY AFTER CONCRETE SLAB INSTALLATION** (Area to the right of the concrete slab)
- 3'-0" MIN.** (Minimum width of the patch area)
- #5 CONT. w/ CORNER BARS** (Reinforcement bars at the right edge)
- 12"** and **16"** (Dimensions for the repair area width)

6" DIA. SCHEDULE 40
STEEL POST, CONCRETE
FILLED & FIELD PAINTED
HIGHWAY YELLOW

1/2" JOINT SEALANT

CONCRETE SLAB

6" CRUSHED STONE
SUB-BASE COMPACTED
PER ASTM C33

4'-0"

3,000 PSI
CONCRETE
FOOTING

1 OF 6 3/8"
DIAMETER x 4"
HEADED STUDS
WELDED TO STEEL
PIPE COL.

6"

3'-6"

5" 5"
1'-4"

Diagram illustrating the layout of the new tanks area, showing a dashed circle highlighting a specific section.

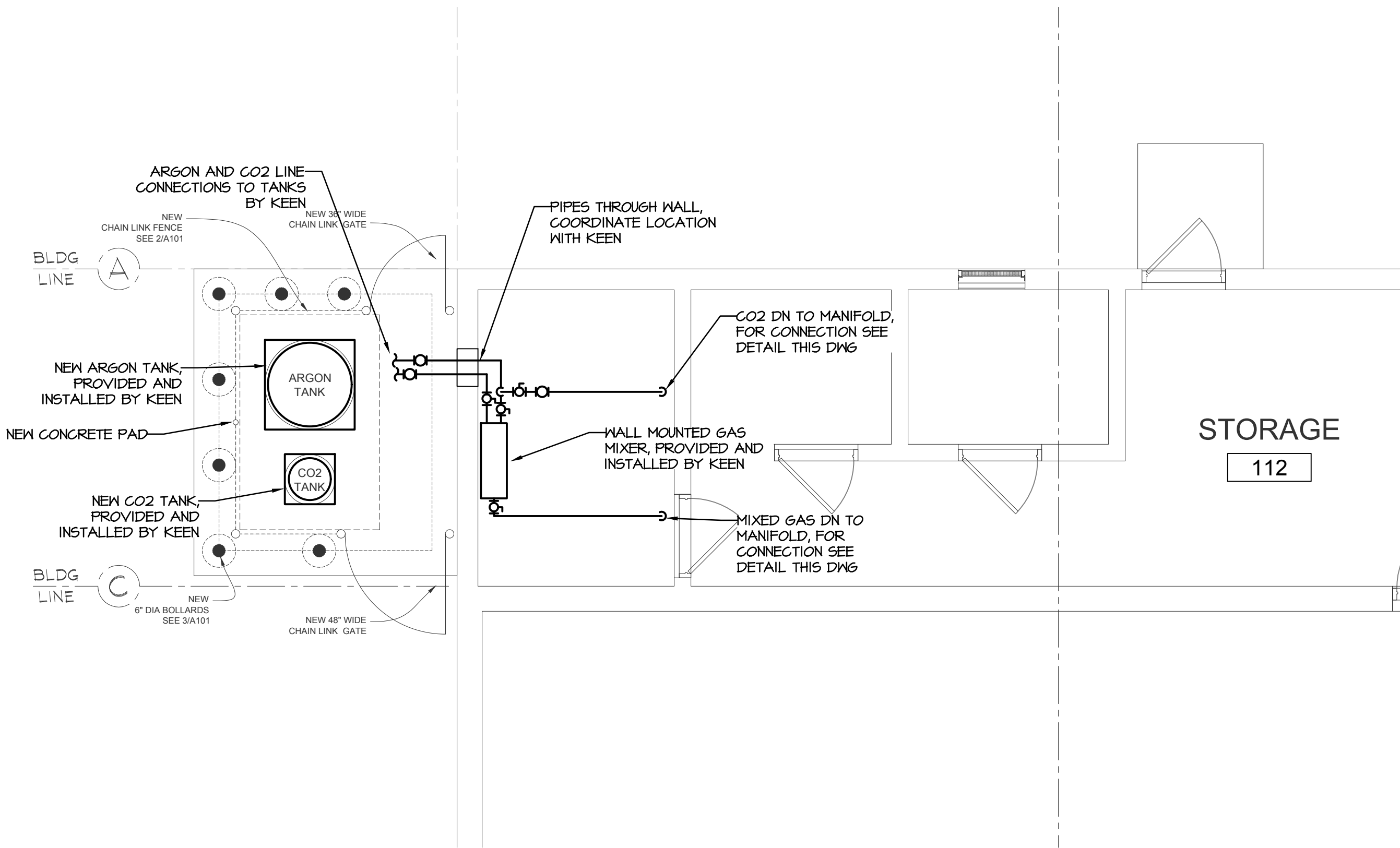
NO.	DATE	REVISION	BY

 **SYSTEMS DESIGN**
ENGINEERING, INC
1032 JAMES DR., LEESPORT, PA 19533
PHONE: 610.916.8500 FAX: 610.916.8501
BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549

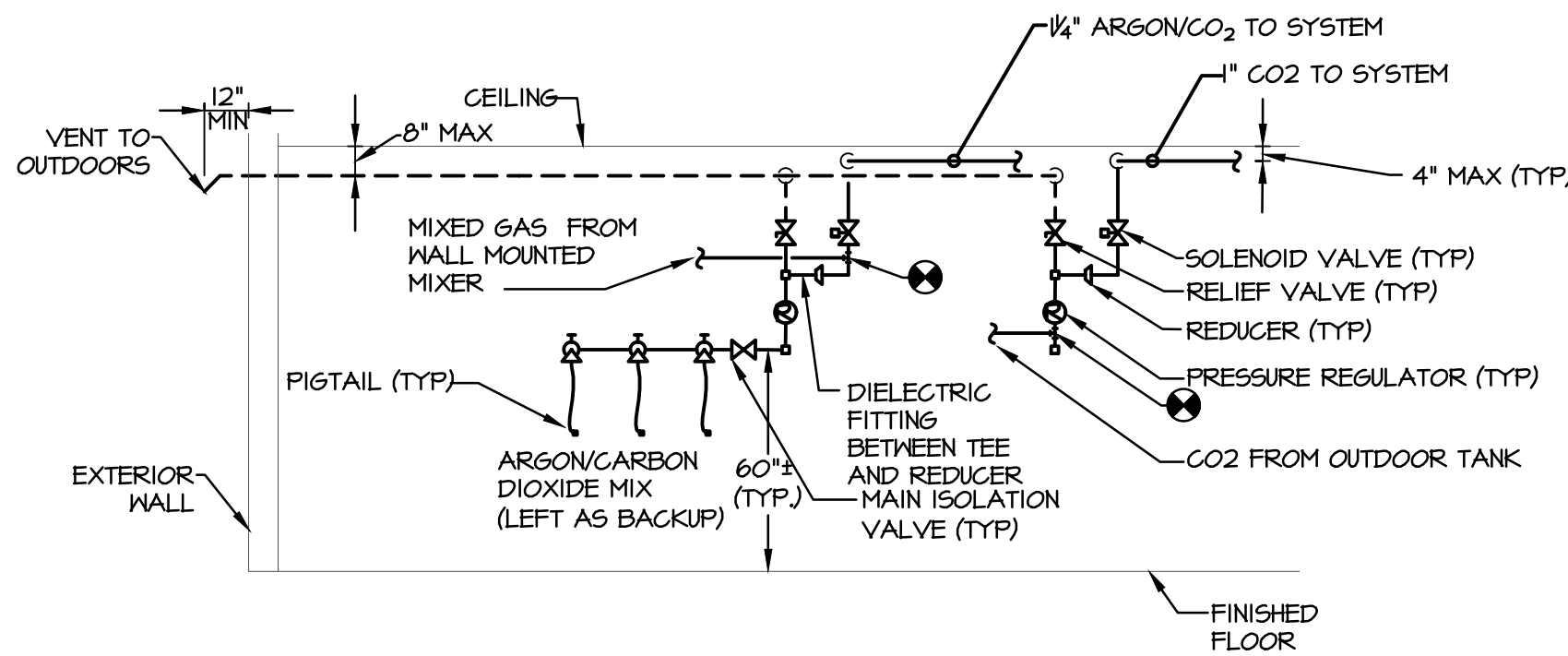
NEW OUTSIDE TANK ENCLOSURE
LOCKER ROOM ALTERATIONS - WEST CAMPUS WELDING SHOP
BERKS CAREER & TECHNOLOGY CENTER
1057 COUNTY WELFARE ROAD
LEESPORT, PA 19533

DRAWN BY dmc			CHECKED PMM	APPROVED .	CADD FILE NAME 25115.00a101.dwg
DATE 01/06/2026		SCALE AS NOTED		DRAWING NUMBER A101	

©COPYRIGHT 2024, Systems Design Engineering, Inc. - Q:\Project\Berk Career Technology Center\25-0485-0039 Welding Gas Changing Area\01 - Design Phase\Drawings\Plumbing\9-101.dwg - March 27, 2024, 3:33 pm by 'baiken'



WELDING BUILDING
GAS PLAN
SCALE: 1/4"=1'-0"



GAS MANIFOLD
CONNECTION DETAIL
NO SCALE

GENERAL SHEET NOTES

- CONTRACTOR SHALL INSTALL ALL PIPING INSIDE OF BUILDING AS 1/2" OD TYPE-K COPPER CLEANED PIPING.
- ALL PIPING SHALL BE SUPPORTED FROM CEILING BEAMS WITH BEAM CLAMPS, ALL THREAD, AND PIPE HANGERS.
- ALL MIXED GAS ENTERING THE SYSTEM WILL BE REGULATED AT THE MIXER.

GENERAL PLUMBING NOTES

GENERAL PLUMBING NOTES:

- CONTRACTOR TO PROVIDE ALL LABOR AND MATERIALS NEEDED FOR A COMPLETE AND PROPERLY OPERATING PLUMBING SYSTEM.
- THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INDICATIVE OF WORK TO BE PERFORMED. THE DRAWINGS ARE NOT INTENDED TO SHOW EXACT LOCATIONS OR TO SHOW EVERY PIPE, FITTING, VALVE, OR APPURTENANCE REQUIRED FOR A COMPLETE INSTALLATION. DO NOT SCALE LOCATION DIMENSIONS FROM THESE DRAWINGS.
- THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL EXISTING CONDITIONS AND DIMENSIONS, AND FOR COORDINATION OF HIS WORK WITH THAT OF OTHER TRADES. PERFORM WORK IN AN ORDERLY MANNER AND WITH THE LEAST POSSIBLE INTERFERENCE.
- WORK SHALL CONFORM TO OR MEET THE REQUIREMENTS OF THE MOST CURRENT ADOPTED EDITION OF:
A. INTERNATIONAL BUILDING CODE
B. INTERNATIONAL PLUMBING CODE
C. NEC (NFPA 70)
D. ALL FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES.
- ALL MATERIALS, EQUIPMENT, AND DEVICES SHALL, AS A MINIMUM, MEET THE REQUIREMENTS OF UL WHERE UL REQUIREMENTS ARE ESTABLISHED FOR THOSE ITEMS. ALL ITEMS SHALL BE CLASSIFIED BY UL AS SUITABLE FOR THE PURPOSE USED.
- WHERE PIPES OR CONDUIT PENETRATE FIRE RATED OR SMOKE RATED BARRIERS (WALLS, FLOORS, AND CEILINGS), SEAL PENETRATIONS IN ACCORDANCE WITH NFPA 90A WITH UL LISTED FIRE STOPPING SYSTEM.
- ALL EQUIPMENT AND MATERIALS INCORPORATED IN THIS WORK SHALL BE NEW UNLESS NOTED OTHERWISE AND SHALL BE CURRENT PRODUCTS BY MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH PRODUCTS.
- ALL FACTORY APPLIED COATINGS AND FINISHES SHALL BE PROVIDED WITHOUT RUST, SCRATCHES, OR DENTS.
- PROVIDE OWNER WITH CERTIFICATES OF FINAL INSPECTIONS AND ACCEPTANCE FROM THE AUTHORITY HAVING JURISDICTION.

COORDINATION REQUIREMENTS:

- COORDINATE LOCATION AND INSTALLATION OF PLUMBING WORK WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. MODIFICATIONS DUE TO FIELD CONDITIONS SHALL BE COMPLETELY RESOLVED BY CONTRACTOR IN ACCORDANCE WITH RECOMMENDATIONS OF THE CONSTRUCTION MANAGER/OWNER.
- PROVIDE TO THE CONSTRUCTION MANAGER DIMENSIONED LOCATIONS AND SIZES OF ALL REQUIRED FLOOR, WALL, AND ROOF OPENINGS. PROVIDE FOR INSTALLATION OF SLEEVES AND FRAMING AS REQUIRED.

PLUMBING INSTALLATION REQUIREMENTS:

- INSTALL ALL EQUIPMENT AND MATERIAL IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS. MAINTAIN CLEARANCES FOR CLEARANCE ACCESS TO MAINTAIN AND SERVICE EQUIPMENT, VALVES, AND CONTROLS.
- ALL INSTALLATION AND WORK SHALL BE PERFORMED IN A NEAT, WORKMANLIKE MANNER SO AS NOT TO DAMAGE ANY SURFACES, EQUIPMENT, OR MATERIALS.
- PIPE SIZES ARE IN INCHES UNLESS NOTED OTHERWISE.
- RUNOUTS TO EQUIPMENT SHALL BE SIZED AS INDICATED AND INCREASED OR REDUCED AT POINT OF FINAL CONNECTION TO EQUIPMENT.
- ALL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION IN ACCORDANCE WITH APPLICABLE CODE OR REGULATION.
- SEAL ALL PIPE PENETRATIONS THROUGH WALLS, FLOORS, AND ROOFS TO BE WATERTIGHT.

PLUMBING LEGEND

	SHUTOFF VALVE
	BALL VALVE
	BUTTERFLY VALVE
	GATE VALVE
	PRESSURE REDUCING VALVE
	CHECK VALVE
	REDUCED PRESSURE BACKFLOW PREVENTER
	STRAINER W/ BLOWDOWN
	RELIEF VALVE
	CALIBRATED BALANCING VALVE
	UNION
	REDUCER
	PIPING UP
	PIPING DOWN
	TEE DOWN
	TEE UP
	45 - ELBOW
	CONTINUATION
	FLOW ARROW
	GAS COCK
	VENT PIPING
	REGULATOR

NO.	DATE	REVISION			BY



SDE

SYSTEMS DESIGN

ENGINEERING, INC

1032 JAMES DR., LEESPORT, PA 19533
PHONE: 610.916.8500 FAX: 610.916.8501

BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549

WELDING GAS NEW WORK

LOCKER ROOM ALTERNATIONS - WEST CAMPUS WELDING SHOP

BERKS CAREER & TECHNOLOGY CENTER

1057 COUNTY WELFARE ROAD

LEESPORT, PA 19533

SITUATE IN
BERKS COUNTY, PA

DRAWN BY LS	CHECKED SG	APPROVED SG	CADD FILE NAME P-101.dwg
DATE 03/27/2026	SCALE AS NOTED	DRAWING NUMBER D-25-0485-0040-P101	

ABBREVIATIONS

AF	AMPERE FRAME
AFIF	ABOVE FINISHED FLOOR
AFIF	ABOVE BASED FLOOR
AG	AMPS INTERRUPTING CURRENT
AL	ALUMINUM
AS	AMP SENSITIVE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AC	AIR CONDITIONING
AFG	ABOVE FINISHED GRADE
CB	CIRCUIT BREAKER
CAT	CIRCUIT
CL	CURRENT LIMITING
CLF	CURRENT LIMITING FUSE
CLB	CEILING
CONTR	CONTRACTOR
EC	CURRENT TRANSFORMER
CAB	CABINET
CND	CONDUIT
CU	COPPER
COND.	CONDENSING UNIT BY OTHERS
DISC	DISCONNECT
DIST	DISTRIBUTION
DRAIN	DRAIN OUT
DMS	ELECTRIC BASEBOARD HEAT
EDH	ELECTRIC DISTRIBUTION
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELC	ELECTRICAL
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EMT	EXISTING TO BE DEMOLISHED
E	EXISTING TO REMAIN
ER	EXISTING TO BE RELOCATED
EC	ELECTRIC WATER COOLER
EDH	ELECTRIC WATER HEATER
EL	FIRE ALARM
FOR	FEEDER
FXT	FIXTURE
RJ	RJ45
GRND	GROUND
GF	GROUND FAULT INTERRUPTER
HOA	HAND - OFF - AUTOMATIC SWITCH
HP	HORSEPOWER
HZ	HERTZ
IDF	INTERMEDIATE DISTRIBUTION FRAME
IS	ISOLATED GROUND
JB	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT-AMPERES
KM	KILOMETER
LED	LIGHT EMITTING DIODE
LSC	LONG-SHORT INSTANTANEOUS AND GROUND
FAULT TRIP	FUNCTIONS
LTS	LIGHTING
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MDF	MAIN DISTRIBUTION FRAME
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MT	MOUNTING HEIGHT
MT	MAIN LUGS ONLY
MT	MOUNT
N	NEUTRAL
NC	NORMALLY CLOSED
NC	NOT IN CONTRACT
NL	NEAR LIGHT
NL	NUMBER
NTS	NOT TO SCALE
OPE	OWNER FURNISHED EQUIPMENT
PH	PHONE
PNL	PANEL
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
PR	POWER
RECEPT	RECEPTACLE
REC	RECESSED
RF	RETURN FAN
RL	EXISTING SHOWN RELOCATED
RM	ROOM
SCHED	SCHEDULE
SEC	SECONDARY
SF	SUPPLY FAN
SOL	SOLID STATE KEY RELEASE UNIT
SN	SOLID NEUTRAL
SNR	SWITCHBOARD
SNR	SWITCHGEAR
TDR	TIME DELAY RELAY
TEL	TELEPHONE
TF	TRANSFER FAN
TP	TYPICAL
UH	UNIT HEATER
UN	UNLESS OTHERWISE NOTED
V	VOLT
M	MATT
MP	MEATHERPROOF
TRFR	TRANSFER

ELECTRICAL LEGEND

NOTE: THIS LEGEND IS A STANDARD AND SOME ITEMS MAY NOT APPLY.

	NEW LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARD
	EXISTING LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARD
	DISTRIBUTION PANEL
	DISCONNECT SWITCH, 600V, HEAVY DUTY, QUICK MAKE, QUICK BREAK, SIZE AND NUMBER OF POLES AS INDICATED ON PLANS, FUSIBLE OR NON-FUSIBLE AS INDICATED ON PLANS.
	ENCLOSED CIRCUIT BREAKER, SIZE AND NUMBER OF POLES AS INDICATED ON PLANS.
	MAGNETIC MOTOR STARTER
	COMBINATION MAGNETIC MOTOR STARTER AND DISCONNECT SWITCH, NEMA SIZE AS INDICATED ON PLANS
	VARIABLE FREQUENCY DRIVE
	MOTOR - HORSEPOWER AS INDICATED OR "F" FOR FRACTIONAL
	JUNCTION BOX
	EMERGENCY POWER OFF STATION
	EMERGENCY POWER OFF STATION WITH KEY RESET
	HOME RUN TO PANELBOARD
	INDICATES CONDUIT TURNING DOWN
	INDICATES TURNING UP
	WIRING CONNECTED TO SAME CIRCUIT, CONTROLLED SEPARATELY
	DUPLEX RECEPTACLE OUTLET, * INDICATES SPECIAL MODIFIER, COMMERCIAL SPECIFICATION GRADE, NEMA 5-20R, 125 VOLTS, HUBBELL #B20, OR EQUIVALENT BY LEVITON, PASS 4 SETMOUR, OR ARRON HART, FINISH SELECTED BY THE ARCHITECT.
	TP - DENOTES TAMPER RESISTANT RECEPTACLE, HUBBELL #B20*TR, FINISH SELECTED BY THE ARCHITECT.
	MP - DENOTES WEATHER PROOF, HUBBELL #B20*MP, INSTALLED IN WEATHER TIGHT WHILE IN USE, FINISH SELECTED BY THE ARCHITECT.
	C - DENOTES MOUNTED ABOVE COUNTER TOP OR CABINET
	QUADPLEX RECEPTACLE (TWO DUPLEX RECEPTABLES UNDER COMMON COVER PLATE)
	SIMPLEX (SINGLE) RECEPTACLE, HUBBELL #B15S61.
	SPECIAL PURPOSE RECEPTACLE, NEMA CONFIGURATION AS INDICATED ON PLANS
	CORD REEL WITH DROP CORD, HUBBELL #B15H2525, PROVIDE NEMA 15-15 FE-MALE CONNECTOR AT END OF CORD, PROVIDE RECEPTACLE AT CEILING FOR CORD REEL CONNECTION.
	MOTOR RATED SWITCH, 30 AMP, 2 POLE, ALUMINUM COVER AND BASE, LOCKABLE IN THE OFF POSITION, MOUNT ON OR ADJACENT TO EQUIPMENT, HUBBELL #B15L120, OR EQUIVALENT BY SQUARE D, EATON, OR SIEMENS.
	FRACTIONAL HORSEPOWER MANUAL STARTER WITH MELTING ALLOY THERMAL OVERLOAD RELAY, 15 VOLTS, 10 AMP CONTINUOUS CURRENT RATINGS, TOGGLE OPERATOR, LOCKABLE IN THE OFF POSITION, MOUNT ON OR ADJACENT TO EQUIPMENT, SQUARE D #F61 OR EQUIVALENT BY EATON OR SIEMENS.
	PHONE OUTLET, "M" INDICATES WALL PHONE
	DATA OUTLET, NUMBER INDICATES TOTAL NUMBER OF PORTS IN WALL PLATE, PROVIDE FLUSH MOUNTED, TWO-GANG, DEEP WALL BOX WITH SINGLE-GANG PLASTER RING AND 1" CONDUIT TO ACCESSIBLE CEILING SPACE TERMINATE WITH PLASTIC BUSHING.
	CABLE TV OUTLET - PROVIDE FLUSH MOUNTED, SINGLE GANG, DEEP WALL BOX, AND 1" CONDUIT TO ACCESSIBLE CEILING SPACE TERMINATE WITH PLASTIC BUSHING.
	FLUSH POKE-THROUGH ASSEMBLY WITH QUAD RECEPTACLE, VOICE AND DATA, NIREMOLD #RCATG, FINISHES SELECTED BY THE ARCHITECT.
	FLUSH POKE THROUGH ASSEMBLY WITH CONDUIT FEED THROUGH PROVISIONS FOR DIRECT CONNECTION OF POWER AND DATA, NIREMOLD #RFFATG, FINISHES SELECTED BY THE ARCHITECT.
	FLUSH POKE THROUGH ASSEMBLY WITH ONE 2" CONDUIT FEED THROUGH FOR VOICE DATA (V/D) OR AUDIO VIDEO (A/V), NIREMOLD #RCATG, FINISHES SELECTED BY THE ARCHITECT.
	PEDESTAL STYLE POKE THROUGH ASSEMBLY WITH RECEPTACLE AS SHOWN ON PLANS AND EQUIPMENT SCHEDULE, NIREMOLD #RTT WITH 200-HSTG HEAD, AND FIFF FACEPLATES, FINISHES SELECTED BY THE ARCHITECT.
	FLOOR BOX WITH QUAD RECEPTACLE, VOICE, AND DATA, NIREMOLD #RFB4 (RFB4-GH FOR SLAB ON GRADE), FINISHES SELECTED BY THE ARCHITECT.
	SINGLE POLE SWITCH, COMMERCIAL SPECIFICATION GRADE, HUBBELL #C8320, OR EQUIVALENT BY LEVITON, PASS 4 SETMOUR, OR ARRON HART.
	SINGLE POLE SWITCH, COMMERCIAL SPECIFICATION GRADE, HUBBELL #C83420, OR EQUIVALENT BY LEVITON, PASS 4 SETMOUR, OR ARRON HART.
	WALL SWITCH TYPE OCCUPANCY SENSOR, LEVITON #OSD-ID, OR EQUIVALENT BY MATT STOPPER, SENSORSNITCH, OR HUBBELL, FINISH SELECTED BY THE ARCHITECT.
	DUAL RELAY WALL SWITCH TYPE OCCUPANCY SENSOR, SENSORSNITCH #NRA-2P FAN-HH, OR EQUIVALENT BY MATT STOPPER OR HUBBELL.
	PHOTO CONTROL SWITCH (WEATHER PROOF FOR OUTDOOR INSTALLATION)
	POWER / RELAY PACK FOR OCCUPANCY SENSOR
	CEILING MOUNTED OCCUPANCY SENSOR P = PASSIVE INFRARED U = ULTRASONIC D = DUAL TECHNOLOGY
	DAYLIGHT SENSOR
	DIMMING CONTROLLER - 0-10 VOLT UNLESS OTHERWISE NOTED
	LOW VOLTAGE SWITCH CONNECTED TO NETWORKED LIGHTING CONTROL SYSTEM
	RECESSED TROFFER OR FLAT PANEL LUMINAIRE, LETTER INDICATES TYPE, REFER TO LUMINAIRE SCHEDULE.
	RECESSED TROFFER OR FLAT PANEL LUMINAIRE, LETTER INDICATES TYPE, REFER TO LUMINAIRE SCHEDULE.
	RECESSED DOWNLIGHT OR PENDANT LUMINAIRE, LETTER INDICATES TYPE, REFER TO LUMINAIRE SCHEDULE.
	WALL MOUNTED EXIT SIGN, FILLED SEGMENT INDICATES ILLUMINATED FACE, LETTER INDICATES TYPE, PROVIDE DIRECTIONAL ARROWS AS INDICATED ON PLAN
	CEILING MOUNTED EXIT SIGN, FILLED SEGMENT INDICATES ILLUMINATED FACE, LETTER INDICATES TYPE, PROVIDE DIRECTIONAL ARROWS AS INDICATED ON PLAN
	WALL MOUNTED COMBINATION EXIT SIGN, EMERGENCY LIGHTING BATTERY UNIT, FILLED SEGMENT INDICATES ILLUMINATED FACE, LETTER INDICATES TYPE, PROVIDE DIRECTIONAL ARROWS AS INDICATED ON PLAN
	EMERGENCY LIGHTING BATTERY UNIT, LETTER INDICATES TYPE, REFER TO LUMINAIRE SCHEDULE
	TWIN EMERGENCY LIGHTING REMOTE HEAD, LETTER INDICATES TYPE, REFER TO LUMINAIRE SCHEDULE
	POLE MOUNTED AREA LIGHTING LUMINAIRE, LETTER INDICATES TYPE, REFER TO LUMINAIRE SCHEDULE

ELECTRICAL SPECIFICATIONS

- IT IS THE INTENT OF THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS THAT THE CONTRACTOR SHALL, UNLESS OTHERWISE SPECIFIED HEREIN, FURNISH ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT INCLUDING SCAFFOLDING TO COMPLETE THE INSTALLATION OF THE ENTIRE ELECTRICAL SYSTEM AS SPECIFIED HEREIN. CONTRACTOR SHALL PROPERLY INSTALL, EQUIP, ADJUST, AND PUT INTO PERFECT OPERATION, THE RESPECTIVE PORTIONS OF THE INSTALLATION SPECIFIED, AND SO INTERCONNECT THE VARIOUS ITEMS OR SECTIONS OF THE WORK IN ORDER TO FORM A COMPLETE AND PROPERLY OPERATING WHOLE.
- THE WORK SHALL INCLUDE ALL MATERIAL AND LABOR REQUIRED TO PROVIDE THE ELECTRICAL WORK SPECIFIED AND SHOWN ON DRAWINGS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ACCESSORIES, PARTS, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM.
- THE WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
 - INTERIOR LIGHTING SYSTEM
 - BRANCH CIRCUITS
 - CONNECTIONS TO EQUIPMENT PROVIDED BY OTHERS
 - GROUNDING
 - BOXES
 - CUTTING AND PATCHING
 - DEMOLITION
 - TESTING
- THE WORK SHALL INCLUDE OBTAINING ALL PERMITS, PAYING ALL PERMIT FEES, SCHEDULING ALL REQUIRED INSPECTIONS AND PAYING ALL UTILITY AND INSPECTION FEES.
- ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES, AND REGULATIONS ADOPTED BY MUNICIPAL, COUNTY, STATE, AND FEDERAL AUTHORITIES, INCLUDING THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) AND WITH THE REQUIREMENTS/AMENDMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION (AHL).
- CONTRACT DRAWINGS ARE DIAGNOSTIC IN NATURE AND ARE INTENDED TO CONVEY SCOPE, DESIGN INTENT, AND GENERAL ARRANGEMENT ONLY. CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES INCLUDING RESOLUTION OF FIELD CONFLICTS THAT MAY ARISE.
- ALL OF THE ELECTRICAL INSTALLATIONS SHALL BE PERFORMED IN A NEAT, WORKSMANLIKE MANNER AND IN ACCORDANCE WITH INDUSTRY STANDARDS.
- EACH FEEDER AND BRANCH CIRCUIT SHALL INCLUDE AN INSULATED ELECTRICAL GROUND CONDUCTOR PER NEC, ARTICLE 250, BOND ALL ELECTRICAL EQUIPMENT, OUTLET BOXES, GROUNDING TYPE RECEPTABLES, ETC. IN ACCORDANCE WITH NEC, ARTICLE 250.
- MULTI-WIRE BRANCH CIRCUITS ARE NOT BE PERMITTED. EACH 120V BRANCH CIRCUIT SHALL INCLUDE DEDICATED NEUTRAL AND INSULATED GROUND CONDUCTORS.
- GROUPING OF BRANCH CIRCUITS AND FEEDERS SHALL BE PERMITTED, PROVIDED THAT THE NEC RULES PERTAINING TO MAXIMUM ALLOWABLE PERCENT FULL OF RACEWAYS, AND ANFACITY ADJUSTMENT FACTORS FOR MORE THAN THREE (3) CURRENT CARRYING CONDUCTORS IN A RACEWAY ARE STRICTLY ADHERED TO. THE CONTRACTOR SHALL EXERCISE CAUTION IN PROVIDING AN EQUAL NUMBER OF A, B, AND C PHASE CONDUCTORS IN RACEWAYS WHEN GROUPING CIRCUITS.
- TROUBLES, JUNCTION BOXES, AND PULL BOXES ARE NOT NECESSARILY INDICATED, BUT SHALL BE PROVIDED WHERE REQUIRED BY THE NEC, AND AS REQUIRED FOR EASE OF INSTALLATION. BOXES SHALL BE SIZED, AT A MINIMUM, IN ACCORDANCE WITH NEC, ARTICLE 314. BOXES SHALL BE SIZED PER NEC, ARTICLE 306.
- ALL BRANCH CIRCUITS AND FEEDERS PROVIDED UNDER THIS CONTRACT ARE TO BE NEW UNLESS OTHERWISE NOTED.
 - EXPOSED INTERIOR WIRING IN DRY LOCATIONS, SHALL BE INSTALLED IN ELECTRICAL METALLIC TUBING (EMT) OR RIGID GALVANIZED STEEL CONDUIT, 3/4" MINIMUM SIZE. FLEXIBLE METAL CONDUIT, OR LIQUID-TIGHT FLEXIBLE METAL CONDUIT, SHALL BE USED FOR CONNECTIONS TO VIBRATION PRODUCING EQUIPMENT, IN LENGTHS NOT EXCEEDING 6'.
 - WIRING IN INTERIOR, DRY SPACES, CONCEALED IN STRUCTURE, OR ABOVE ACCESSIBLE CEILING MAY BE INSTALLED IN EMT, OR METAL GLAD (TYPE MC) CONDUIT, AS ALLOWED BY CODE AND SPECIFICATIONS.
 - FOR EXPOSED DAMP OR WET LOCATIONS WHERE WIRING IS SUBJECT TO DAMAGE, GALVANIZED RIGID STEEL CONDUIT SHALL BE USED.
 - FOR UNDERGROUND CIRCUITS AND FEEDERS, UTILIZE SCHEDULE 40 PVC CONDUIT, EXCEPT THAT IN AREAS SUBJECT TO VEHICULAR TRAFFIC SCHEDULE 80 PVC CONDUIT SHALL BE USED.
- ALL 600 VOLT OVER-CURRENT PROTECTIVE DEVICES SHALL HAVE INTERRUPTING RATINGS (AIC OR ARI) IN RMS AMPERES SYMMETRICAL. ALL DEVICES SHALL BE FULLY RATED FOR AVAILABLE FAULT CURRENT. ALL PANELBOARDS, SWITCHBOARDS, DISTRIBUTION BOARDS, DEVICES ETC. SHALL BE FULLY RATED. SERIES RATED EQUIPMENT IS NOT ALLOWED.
- ALL BUILDING WIRE SHALL BE TYPE THHN/THM (DUAL LISTED) COPPER CONDUCTORS, WITH 90° CELSIUS RATED INSULATION, #2 MINIMUM SIZE. UTILIZE 140 WIRE FOR ANY 120V, 15 OR 20A CIRCUIT THAT EXCEEDS 100 FEET TO LAST DEVICE OR OUTLET.
- DO NOT UTILIZE FEED-THROUGH (FTG) RECEPTABLES FOR DOWNSTREAM DEVICE PROTECTION. ALL DEVICES LISTED AS GF SHALL BE STAND ALONE.
- CONTRACTOR SHALL PROVIDE AND INSTALL AN APPROVED, UL LISTED, FIRE STOP SEALANT TOTALLY ENCLOSED ALL PENETRATIONS THROUGH WALLS, CEILING, FLOORS, ROOFS, ETC. ALL FLOOR PENETRATIONS SHALL BE CORE DRILLED, SLEEVED, AND SEALED WITH AN APPROVED, FIRE RATED SEALANT. ALL EXISTING PENETRATIONS IN WALLS AND FLOORS MUST BE SEALED TO MAINTAIN FIRE RATING.
- BRANCH CIRCUIT FOR FACT SHALL MEET THE REQUIREMENT OF SECTION 4.4.1 OF NFPA 72. CONTRACTOR INSTALLING FIRE ALARM SYSTEM SHALL BE NOTICED & CERTIFIED.
- EMERGENCY AND EMERGENCY LIGHTING SHALL BE CONNECTED AND INSTALLED TO MEET THE REQUIREMENTS OF NEC, 700.12(B) AND 700.16, CONSULT THE ARCHITECT, BUILDING INSPECTOR, OR THE LATEST ADOPTED EDITION OF THE INTERNATIONAL BUILDING CODE FOR EXACT LOCATIONS. THE DESIGNER DOES NOT TAKE RESPONSIBILITY FOR LOCATIONS. FINAL LOCATIONS SHALL BE APPROVED BY THE LOCAL AHL.
- THE CONTRACTOR SHALL PERFORM THE WORK AS INDICATED ON THE DRAWINGS, ANY DEVIATION FROM THE DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OR ARCHITECT FOR REVIEW AND APPROVAL. IN WRITING, ANY CHANGES ARE MADE WITHOUT WRITTEN CONSENT, THE CONTRACTOR SHALL BE LIABLE FOR ANY ISSUES THAT ARISE DUE TO THE CHANGES.
- UNLESS NOTED OTHERWISE, ALL WIRE SIZES SHALL BE BASED ON THE FOLLOWING: TABLE 310.15, 60° COLUMN FOR #14 THROUGH #1, TABLE 310.15, 75° COLUMN FOR #10 AND GREATER, AND OTHER ALLOWANCES OF 1014(C).
- UNLESS OTHERWISE NOTED, FEEDER TAPS AND TRANSFORMER SECONDARY CONDUCTOR TAPS ARE DESIGNED BASED ON THE 10' RULE OF 240.2(B)(1) AND 240.2(C)(2).
- UNLESS OTHERWISE NOTED, ALL CONDUIT SIZES ARE BASED ON EMT, RVC, OR RVC (PVC SCHEDULE 40).
- ALL ELECTRICAL MATERIALS, DEVICES, APPLIANCES, AND EQUIPMENT SHALL BE NEW, LABELED AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY OR AGENCY (E.G. UL), UNLESS OTHERWISE NOTED.
- ELECTRICAL CONTRACTOR SHALL FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS FOR ALL EQUIPMENT IF NOT INDICATED ON DRAWINGS. IF THERE IS A DISCREPANCY, MANUFACTURERS INSTRUCTIONS TAKE PRECEDENCE.
- THE E.G. SHALL FURNISH ALL EQUIPMENT, LABOR, SERVICES, AND MATERIALS REQUIRED FOR COMPLETE AND FUNCTIONAL INSTALLATION OF THE WORK INDICATED. UNLESS OTHERWISE NOTED, ALL MATERIALS SHALL BE NEW.
- PROVIDED ACCESS PANELS AS REQUIRED FOR ACCESS TO EQUIPMENT.
- ALL WIRING, EQUIPMENT, STARTERS, AND CONTROLS SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE AND TO THE REQUIREMENTS OF THE LOCAL UTILITY COMPANY.
- NEW LIGHTING CONTROLS SHALL COMPLY WITH THE APPLICABLE EDITION OF THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) OR ASHRAE 90.1
- ALL WIRING METHODS SHALL BE NEC COMPLIANT AND MEET THE REQUIREMENTS OF THE SPACE, OCCUPANCY, AND CONDITION OF USE.
- THESE PLANS HAVE BEEN DRAWN AND CALCULATIONS MADE BASED ON THE EXISTING DOCUMENTS AND/OR INFORMATION FURNISHED BY THE CLIENT AND/OR OTHERS. THE ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THESE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF THE ITEMS SHOWN ON THESE DRAWINGS AND FOR THE OTHER OF THE FACILITY SHALL FIELD VERIFY EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER FOR CORRECTION, EDITING, RE-CALCULATION, ETC. AS REQUIRED.
- DO NOT SCALE DRAWINGS. CONTRACTOR SHALL VERIFY AND CONFIRM ALL DIMENSIONS IN THE FIELD AND NOTIFY THE ENGINEER OF ANY AND ALL DISCREPANCIES. COPIES OF THESE DRAWINGS WITHOUT A PROFESSIONAL ENGINEERS SEAL AND ORIGINAL SIGNATURE SHALL NOT BE CONSIDERED VALID, AND ARE FOR THE CONVENIENCE OF THE USER AT THEIR OWN RISK.

ELECTRICAL EQUIPMENT MOUNTING HEIGHTS

WALL MOUNTED FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE (OR AS SHOWN ON ARCHITECTURAL DETAILS)	4' BELOW FINISHED CEILING
TV MONITOR OUTLETS AND SERVICE RECEPTABLES FOR SHELF MOUNTED TV	8'-0" ABOVE FINISHED FLOOR
WARNING AND SIGNALING LUMINAIRES / SIGNS	CENTERED ABOVE DOOR OR WINDOW OPENINGS
FIRE ALARM VISUAL NOTIFICATION APPLIANCE MOUNTED AT 6'-8" MEASURED FROM THE BOTTOM OF THE DEVICE OR 6' BELOW FINISHED CEILING MEASURED FROM THE FINISHED CEILING TO THE TOP OF THE DEVICE, WHICHEVER IS LOWER	6'-8" ABOVE FINISHED FLOOR
TOP OF FLUSH AND SURFACE MOUNTED LIGHTING CONTROL PANELS OR POWER PANELBOARDS AND TELEPHONE CABINETS.	6'-6" ABOVE FINISHED FLOOR
TOP OF HIGHEST ELECTRICAL SAFETY DISCONNECT SWITCHES	4'-0" ABOVE FINISHED FLOOR
WALL MOUNTED TELEPHONE AND WALL MOUNTED INTERCOMS	4'-0" ABOVE FINISHED FLOOR
WALL MOUNTED ELECTRICAL DEVICES, SUCH AS LIGHTING SWITCHES, MANUAL MOTOR STARTERS, THERMOSTATS, AND FIRE ALARM PULL STATIONS, GP OUTLETS IN TOILET ROOMS ALL FLOOR EQUIPMENT IN LABS AND EQUIPMENT ROOMS	3'-6" ABOVE FINISHED FLOOR
ELECTRICAL RECEPTABLES INCLUDING THOSE USED WITHIN MECHANICAL SPACES AND ELEVATOR ROOMS, TELEPHONE, DATA, AND COMMUNICATION OUTLETS CATV AND ANY JUNCTION BOXES	1'-6" ABOVE FINISHED FLOOR
WALL CLOCK AT 8'-0" OR CENTER BETWEEN DOOR FRAME AND CEILING	8'-0" ABOVE FINISHED FLOOR

MOUNTING HEIGHTS ARE TO CENTER OF OUTLETS UNLESS SPECIFICALLY NOTED OTHERWISE. IN MASONRY CONSTRUCTION, THE ABOVE HEIGHTS SHALL BE USED FOR REFERENCE TO NEAREST BLOCK OR BRICK COURSE. THE ABOVE MOUNTING HEIGHTS SHALL BE ADHERED TO UNLESS SPECIFICALLY NOTED OR DETAILED OTHERWISE ON THE ARCHITECTURAL DRAWINGS OR SPECIFICATIONS.

NO.	DATE		REVISION		BY

PETER M. MEDICA
MEMBER OF THE AMERICAN
INSTITUTE OF ARCHITECTS

BMA
BONNETT
MEDICA
ASSOCIATES
INCORPORATED

ARCHITECTS • PLANNERS
ENGINEERS • PROJECT MANAGERS

1242 WEST CHESTER PIKE • SUITE 11
WEST CHESTER, PA 19384
TELEPHONE 610 • 368 • 6678

R0016195

**SYSTEMS DESIGN
ENGINEERING, INC**

1032 JAMES DR. LEESPORT, PA 19333
PHONE: 610.916.8500 FAX: 610.916.8501

BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549

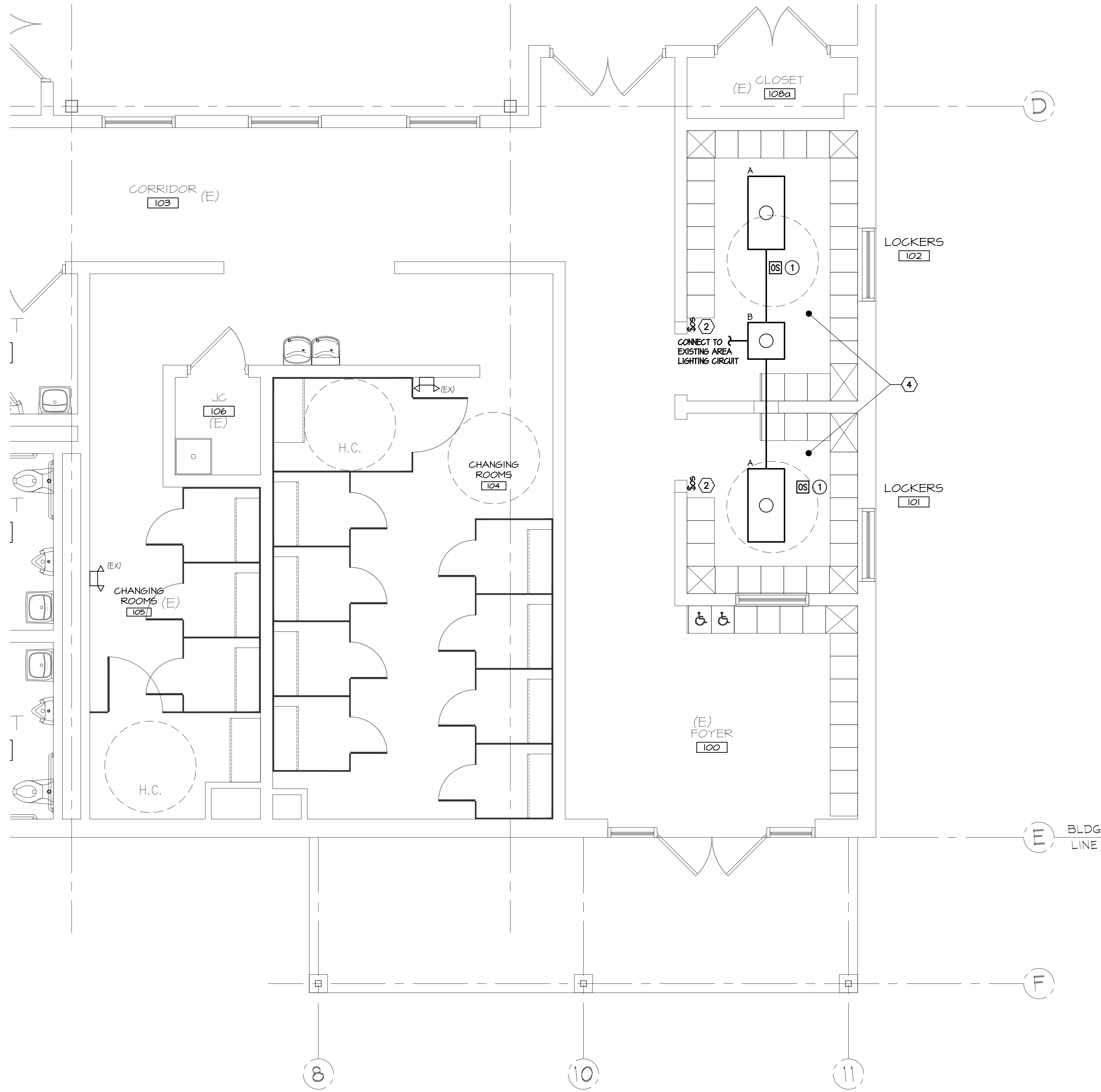
LEGEND & ABBREVIATIONS

LOCKER ROOM ALTERNATIONS - WEST CAMPUS WELDING SHOP
BERKS CAREER & TECHNOLOGY CENTER
1057 COUNTY WELFARE ROAD
LEESPORT, PA 19533

SITUATE IN
BERKS COUNTY, PA

DRAWN BY CAR	CHECKED SG	APPROVED SG	CADD FILE NAME E101.dwg
DATE 03/30/2026	SCALE AS NOTED	DRAWING NUMBER D-25-0485-0040-E001	

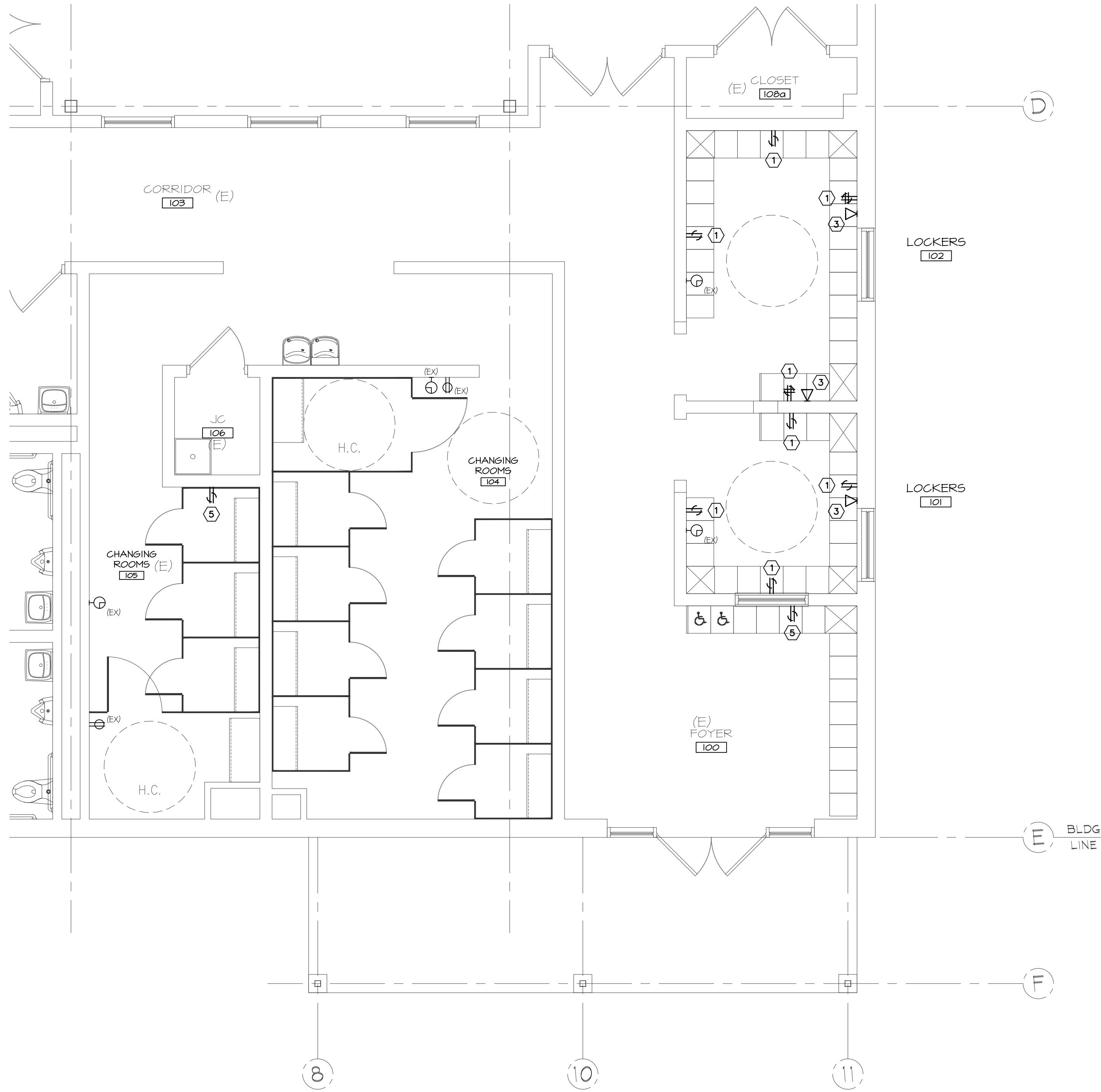
© Copyright 2024, Systems Design Engineering, Inc. - Q:\Project\Berk Career Technology Center\25-0485-0039 Welding Shop Changing Area\01 - Design\Drawings\Electrical\E101.dwg - March 30, 2024, 3:38 pm by ChrisR



**PARTIAL FLOOR PLAN
LIGHTING**
SCALE: 1/4"=1'-0"
4' 0' 4' 0'

LUMINAIRE SCHEDULE								
SYMBOL	TYPE	DESCRIPTION	MANUFACTURER (DESIGN BASE)	CATALOG NO.	LAMPS	BALLAST / DRIVER	VOLTS	MTG
	A	2'x4" BACK-LIT FLAT PANEL	COLUMBIA	CBT24-A-LSCS-EDD	80+ CRI, 3500K, 3457 LUMEN, 25 WATT L.E.D. LIGHT ENGINE	MFR'S. STANDARD 10%, 0-10V DIMMING DRIVER	120-277	CR
	B	2'x2" BACK-LIT FLAT PANEL	COLUMBIA	CBT22-A-LSCS-EDD	80+ CRI, 3500K, 3437 LUMEN, 27 WATT L.E.D. LIGHT ENGINE	MFR'S. STANDARD 10%, 0-10V DIMMING DRIVER	120-277	CR

MOUNTING LEGEND
C= CEILING
W= WALL
S= SURFACE
R= RECESSED
P= PENDANT
T= TRACK



**PARTIAL FLOOR PLAN
POWER**
SCALE: 1/4"=1'-0"
4' 0' 4' 0'

KEYED DEMOLITION NOTES

- DISCONNECT AND REMOVE EXISTING RECEPTACLE. REMOVE ASSOCIATED WIRING BACK TO PANEL OR NEXT RETAINED DEVICE. FURNISH AND INSTALL BLANK COVER PLATE ON OUTLET BOX.
- DISCONNECT AND REMOVE WALL SWITCH. REMOVE ASSOCIATED WIRING TO LIGHT FIXTURES. FURNISH AND INSTALL BLANK COVER PLATE ON OUTLET BOX.
- DISCONNECT AND REMOVE DATA OUTLETS. REMOVE ASSOCIATED DATA CABLES BACK TO DATA RACK ON MEZZANINE.
- DISCONNECT AND REMOVE (2) 2'x4" LIGHT FIXTURES, RETAIN CIRCUIT FOR CONNECTION TO NEW LIGHT FIXTURES.
- DISCONNECT AND REMOVE RECEPTACLE. REMOVE ASSOCIATED WIRING BACK TO NEXT RETAINED DEVICE, MAINTAINING CIRCUIT INTEGRITY.

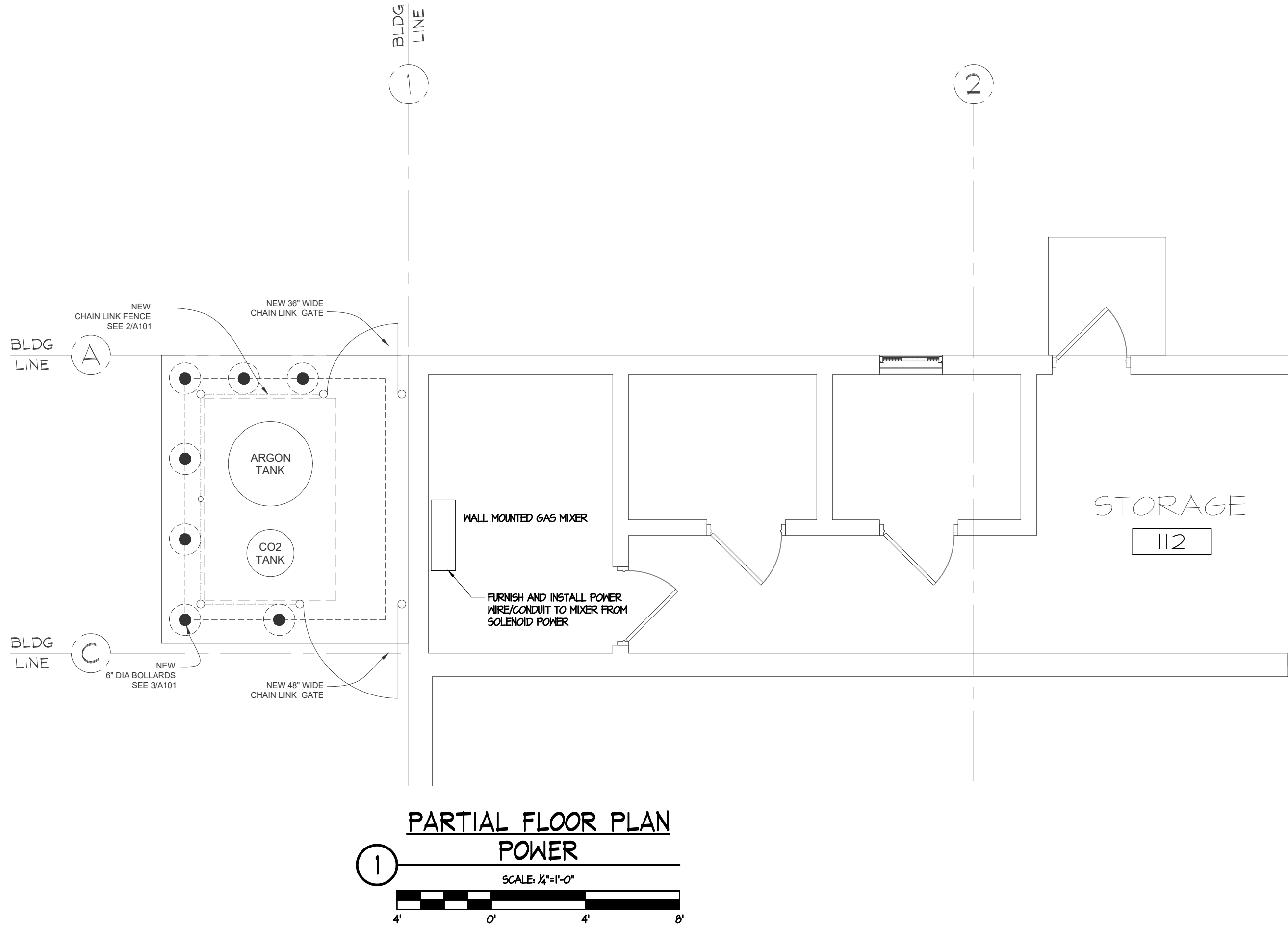
KEYED NEW WORK NOTES

- ACUITY CONTROLS NCM PDT 9 RJB CEILING OCCUPANCY SENSOR WITH RECESSED MOUNTING BRACKET.

PETER M. MEDICA RA016195
MEMBER OF THE AMERICAN
INSTITUTE OF ARCHITECTS
BMA
BONNETT
MEDICA
ASSOCIATES
INCORPORATED
ARCHITECTS • PLANNERS
ENGINEERS • PROJECT MANAGERS
1242 WEST CHESTER PIKE • SUITE 11
WEST CHESTER, PA 19382
TELEPHONE 610 • 368 • 6678

NO.	DATE	REVISION	BY
SYSTEMS DESIGN ENGINEERING, INC 1032 JAMES DR., LEESPORT, PA 19533 PHONE: 610.916.8500 FAX: 610.916.8501 BOYERTOWN, PA 610.369.1319 SCHUYLKILL HAVEN, PA 570.385.5549			
PARTIAL FLOOR PLANS LOCKER ROOM ALTERNATIONS - WEST CAMPUS WELDING SHOP BERKS CAREER & TECHNOLOGY CENTER 1057 COUNTY WELFARE ROAD LEESPORT, PA 19533 SITUATE IN BERKS COUNTY, PA			
DRAWN BY CAR	CHECKED SG	APPROVED SG	CADD FILE NAME E101.dwg
DATE 03/30/2026	SCALE AS NOTED	DRAWING NUMBER D-25-0485-0040-E101	

© Copyright 2024, Systems Design Engineering, Inc. - Q:\Project\Berk Career Technology Center\250485-0039 Welding Shop Changing Area\01 - Design\Drawings\Electrical\E101.dwg - March 30, 2024 3:38 pm by Chou8



PETER M. MEDICA
MEMBER OF THE AMERICAN
INSTITUTE OF ARCHITECTS
BMA
BONNETT
MEDICA
ASSOCIATES
INCORPORATED
ARCHITECTS • PLANNERS
ENGINEERS • PROJECT MANAGERS
1242 WEST CHESTER PIKE • SUITE 11
WEST CHESTER, PA 19382
TELEPHONE 610 • 368 • 6678

RA016195

SDE SYSTEMS DESIGN
ENGINEERING, INC
1032 JAMES DR., LEESPORT, PA 19533
PHONE: 610.916.8500 FAX: 610.916.8501
BOYERTOWN, PA 610.369.1319
SCHUYLKILL HAVEN, PA 570.385.5549

PARTIAL FLOOR PLAN
LOCKER ROOM ALTERNATIONS - WEST CAMPUS WELDING SHOP
BERKS CAREER & TECHNOLOGY CENTER
1057 COUNTY WELFARE ROAD
LEESPORT, PA 19533
SITUATE IN
BERKS COUNTY, PA.

DRAWN BY CAR	CHECKED SG	APPROVED SG	CADD FILE NAME E101.dwg
DATE 03/30/2026	SCALE AS NOTED	DRAWING NUMBER D-25-0485-0040-E102	