

MONTGOMERY COUNTY MARYLAND
Invitation for Bids
#1086041

PROJECT MANUAL



UNDERGROUND PARKING AIR QUALITY SYSTEM TESTING/CALIBRATION/ REPAIRS AND REFURBISHMENT OF FANS, PLENUMS AND CONTROL PACKAGES

IFB NO. 1086041

OWNER: MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
DIVISION OF PARKING MANAGEMENT
ROCKVILLE, MARYLAND

April 5, 2019

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Notice to Bidders

Invitation for Bids

#1086041

For

Underground Parking Air Quality System Testing/Calibration/Repairs and Refurbishment of Fans, Plenums and Control Packages Montgomery County, Department of Transportation Division of Parking Management

This solicitation may be subject to the County's Wage Requirements law for service contracts. If this solicitation is subject to this law, then Item #27, under Section A, "Services Contract", on page 4, and "Wage Requirements Certification", under "Mandatory Submissions: (a) Bid Submissions," on page B, will be marked. And, in this event, the "Requirements for Services Contract Addendum" should be attached.

If this solicitation is subject to the Wage Requirements law, then the "Wage Requirements Certification" and, if applicable, the "501(c)(3) Non-profit Organization's Employee's Wage and Health Insurance Form" (see forms near the end of this document), must be completed and submitted with your bid. If you fail to submit and complete the required material information on the form(s), your bid may be unacceptable under County law and may be rejected for nonresponsiveness.

As noted in Attachment "C" (Section A on Page C2, Wage Requirements Compliance), a contractor required to comply with the Wage Requirements Law must quarterly (January, April, July, and October for the prior quarter) submit certified payroll records for all employees and all subcontractor's employees governed by the Wage Requirements Law, for each payroll period, to the Office of Business Relations and Compliance, Attn: Wage Program Manager. These payroll records must include the following for each employee and each subcontractor's employee: name; address; position/title; daily straight time hours worked; daily overtime hours worked; straight time hourly pay rate; overtime hourly pay rate; any deduction for health insurance; total gross wages paid for each period; and total net wages paid after any additions and deductions for each pay period.

Please note, the information pertaining to the Wage Requirements law that is contained in Attachment C. Note that for services contracts, you can find the current mandatory per-hour wage rate payable to employees under Section 11B-33A of the County Code, by going to the website (www.montgomerycountymd.gov/WRL).

MONTGOMERY COUNTY, MARYLAND
INVITATION FOR BIDS
GENERAL INFORMATION

NOTE TO POTENTIAL BIDDERS:

Your bid is to be returned in a sealed envelope that should be at least 9-1/2" x 12-1/2" in size, and is to be clearly marked with the IFB number, the Opening Date, and the Opening Time. The County will not be responsible for premature or late opening of a bid that is improperly addressed or identified. Bids must be received at the Office of Procurement, Rockville Center, 255 Rockville Pike, Suite 180, Rockville, MD 20850-4166 prior to the date and time specified in the attached solicitation.

The County will not accept bids it receives by fax or email. All faxed or emailed bids will be returned to the bidder.

Please note:

- The **Name and Signature Requirements** sections located on the Solicitation, Bid, and Award Sheet.
Failure to sign your bid as required may be cause for your bid to be deemed nonresponsive.
- The **Mandatory Bid Submissions** on Page B. The checked items must be submitted with your bid.
Failure to submit the mandatory bid submissions may be cause for your bid to be deemed nonresponsive.
- The **Method of Award** stated in this solicitation on Page A and Page 1, in Section A, Item #3.

MONTGOMERY COUNTY OFFICE OF PROCUREMENT
ROCKVILLE CENTER, 255 ROCKVILLE PIKE, SUITE 180
ROCKVILLE, MARYLAND 20850-4166

20	<input checked="" type="checkbox"/>	FAILURE TO PERFORM/DELIVER
21		HEAVY DUTY
22	<input checked="" type="checkbox"/>	INVOICES (Sample Invoice Attachment G)
23		LABOR COSTS
24		MANUALS
25	<input checked="" type="checkbox"/>	MATERIAL AND WORKMANSHIP
26	<input checked="" type="checkbox"/>	MATERIALS
27		METHOD OF ORDERING
28		MULTIPLE AWARDS
29		NET PRICES
30	<input checked="" type="checkbox"/>	NEW MATERIALS
31		OPTION TO INCREASE QUANTITIES
32	<input checked="" type="checkbox"/>	ORDERING TERMS
33		PARTS/SERVICE
34	<input checked="" type="checkbox"/>	PAYMENTS
35	<input checked="" type="checkbox"/>	PERFORMANCE BOND: In the amount of \$250,000.00 is required.
36		(this provision has been intentionally left blank)
37	<input checked="" type="checkbox"/>	PROTECTION OF EXISTING FACILITIES
38		PURCHASE OF GOODS BY NON-PROFIT ORGANIZATIONS
39		PURCHASE ORDERS/JOB RELEASES
40		QUANTITIES
41	<input checked="" type="checkbox"/>	SAFETY STANDARDS
42		SERVICE
43	<input checked="" type="checkbox"/>	SITE INSPECTION
44		TRAVEL TIME
45	<input checked="" type="checkbox"/>	WARRANTY
46	<input type="checkbox"/>	LABOR AND MATERIAL PAYMENT BOND
47	<input checked="" type="checkbox"/>	PROFESSIONAL SERVICES
48	<input checked="" type="checkbox"/>	LIQUIDATED DAMAGE
49	<input checked="" type="checkbox"/>	CERTIFICATIONS OF PAYMENT TO SUBCONTRACTOR AND SUPPLIERS

Section 012900	PAYMENT PROCEDURES
Section 013000	SUBMITTALS
Section 014000	QUALITY CONTROL
Section 015000	TEMPORARY FACILITIES
Section 016000	MATERIALS AND EQUIPMENT
Section 016060	GENERAL ELECTRICAL REQUIREMENTS
Section 016310	PRODUCT SUBSTITUTIONS
Section 017000	PROJECT CLOSEOUT
Section 017200	PROJECT RECORD DOCUMENTS
Section 017400	WARRANTIES AND BONDS
Section 017823	OPERATION AND MAINTENANCE DATA
	DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
Section 230923	DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC
Section 230993	SEQUENCE OF OPERATIONS FOR HVAC
Section 233300	AIR DUCT ACCESSORIES
	DIVISION 26 – ELECTRICAL
Section 260010	BASIC ELECTRICAL REQUIREMENTS
Section 260519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
Section 260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
Section 260529	HANGARS AND SUPPORTS FOR ELECTRICAL SYSTEMS
Section 260533	RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
Section 260553	IDENTIFICATION FOR ELECTRICAL SYSTEMS
Section 262913.03	MANUAL AND MAGNETIC MOTOR CONTROLLERS

SECTION D – DRAWING AND SPECIFICATIONS

The following sections are all applicable to any contract awarded as a result of this solicitation.

Section 010000	UNIT QUANTITY WORK ITEMS
Section 010100	SUMMARY OF WORK
Section 010350	MODIFICATION PROCEDURES
Section 010400	PROJECT COORDINATION
Section 010450	CUTTING AND PATCHING
Section 010500	FIELD ENGINEERING
Section 010950	DEFINITIONS
Section 012000	PROJECT MEETINGS

MANDATORY SUBMISSIONS:**a. BID SUBMISSIONS:**

The following checked (XX) items (each of which is described in detail in Section A, B, C, or D) and any related attachments to this solicitation must be submitted with your bid reply:

- ____ "SOLICITATION, BID AND AWARD SHEET" (including page E and pages E-1 through E-__ Quotation Sheet(s))
- ____ Current Manufacturer catalog(s) ____ Descriptive Literature ____ Other
- ____ Price List(s) ____ Delivery Schedule XX Bid Guarantee (See pages 3 & 13)
- XX Wage Requirements Certification (see "NOTICE TO BIDDERS" for website providing the current wage rate) and (See Attachment C)

Failure to submit the mandatory bid submissions may be cause for your bid to be deemed nonresponsive.

(Bidders Must Complete the **NAME & SIGNATURE REQUIREMENTS** in Part II on the Solicitation, Bid and Award Sheet, Page E)

b. AWARD SUBMISSIONS:

The following checked (XX) items (each of which is described in detail in Section A, B, C, or D) and any related attachments to this solicitation, must be submitted within ten (10) working days after the date of the County's written notification of Intent to Award a Contract:

- XX Minority, Female, Disabled Person Subcontractor Performance Plan. (Attachment B), If requested in the Intent to Award notice.
- ____ Financial Data XX Personnel Data
- ____ Installation Schedules ____ Plans or Drawings
- ____ Other: as follows: _____ XX Performance Bond (See Pages B & 10)
- XX Certificate of Insurance
- XX Wage Requirements Certification of Posting Notice

Failure to submit information in a timely manner as indicated may be cause to consider the Bidder non responsible.

OPTIONAL SUBMISSIONS

The following checked (XX) items (each of which is described in detail in Section A, B, C, or D) and any related attachments to this solicitation), are requested to be submitted with your bid reply:

- ____ Minority, Female, Disabled Person Subcontractor Performance Plan (See Attachment B)
- XX (To ensure a contract can move forward as a result of this solicitation, the plan needs be submitted with your bid.)
- ____ Mid-Atlantic Purchasing Team Rider Clause (See Page D)
- XX References (See Below)
- XX Minority Business Program & Offeror's Representation (Attachment A)

REFERENCES (at least three are requested to be submitted)

If references are required (see Optional Submissions section) for this solicitation, please provide them to the County with your bid. The three references must be from individuals or firms currently being serviced or supplied under similar contracts, or for whom work of a similar scope has been performed within the last year. Names for references shall be of individuals who directly supervised or had direct knowledge of the services or goods provided.

If you do not include them with your bid submission, and you are one of the three low bidders, you may be required to submit references within ten (10) days notice from the County. Failure to provide the County with references within that time frame may result in the Bidder being ruled nonresponsible or nonresponsive by the Director, Office of Procurement or his/her designee and the forfeiture of your bid guarantee (if applicable).

1. Name of Firm: _____
Address: _____ City: _____ ST: _____ Zip: _____
Contact Person: _____ Phone: _____
Email Address: _____
2. Name of Firm: _____
Address: _____ City: _____ ST: _____ Zip: _____
Contact Person: _____ Phone: _____
Email Address: _____
3. Name of Firm: _____
Address: _____ City: _____ ST: _____ Zip: _____
Contact Person: _____ Phone: _____
Email Address: _____

MID-ATLANTIC PURCHASING TEAM RIDER CLAUSE**USE OF CONTRACT(S) BY MEMBERS COMPRISING MID-ATLANTIC PURCHASING TEAM COMMITTEE****A. Extension to Other Jurisdictions**

The [issuing jurisdiction] extends the resultant contracts(s), including pricing, terms and conditions to the members of the Mid-Atlantic Purchasing Team, as well as all other public entities under the jurisdiction of the United States and its territories.

B. Contract Agreement

Any jurisdiction or entity using the resultant contract(s) may enter into its own contract with the successful Contractor(s). There shall be no obligation on the party of any participating jurisdiction to use the resultant contract(s). Contracts entered into with a participating jurisdiction may contain general terms and conditions unique to the jurisdiction including, by way of illustration and not limitation, clauses covering minority participation, non-discrimination, indemnification, naming the jurisdiction as an additional insured under any required Comprehensive General Liability policies, and venue.

C. A negative reply will not adversely affect consideration of your bid.**D. It is the awarded offeror's responsibility to notify the members shown below of the availability of the Contract(s)****E. The issuing jurisdiction shall not be held liable for any costs or damages incurred by another jurisdiction as a result of any award extended to the jurisdiction by the awardee.****F. Inclusion of Governmental and Nonprofit Participants (Optional Clause)**

This shall include but not be limited to private schools, Parochial schools, non-public schools such as charter schools, special districts, intermediate units, non-profit agencies providing services on behalf of government and/or state community and/or private colleges/universities that require these goods, commodities and/or services.

G. Notification and Reporting

The Contractor agrees to notify if requested by the issuing jurisdiction of those entities that wish to use any contract resulting from this solicitation and will also provide usage information, which may be requested. The Contractor will provide the copy of the solicitation and resultant contract documents to any requesting jurisdiction or entity.

MID-ATLANTIC PURCHASING TEAM:

YES	NO	JURISDICTION	YES	NO	JURISDICTION
<input type="checkbox"/>	<input type="checkbox"/>	Alexandria, Virginia	<input type="checkbox"/>	<input type="checkbox"/>	Howard County Schools
<input type="checkbox"/>	<input type="checkbox"/>	Alexandria Public Schools	<input type="checkbox"/>	<input type="checkbox"/>	Herndon, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Alexandria Sanitation Authority	<input type="checkbox"/>	<input type="checkbox"/>	Leesburg, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Annapolis City	<input type="checkbox"/>	<input type="checkbox"/>	Loudoun County, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Anne Arundel County	<input type="checkbox"/>	<input type="checkbox"/>	Loudoun County Public Schools
<input type="checkbox"/>	<input type="checkbox"/>	Anne Arundel Schools	<input type="checkbox"/>	<input type="checkbox"/>	Loudoun County Water Authority
<input type="checkbox"/>	<input type="checkbox"/>	Arlington County, Virginia	<input type="checkbox"/>	<input type="checkbox"/>	Manassas, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Arlington County Public Schools	<input type="checkbox"/>	<input type="checkbox"/>	City of Manassas Public Schools
<input type="checkbox"/>	<input type="checkbox"/>	Baltimore City	<input type="checkbox"/>	<input type="checkbox"/>	Manassas Park, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Baltimore County Schools	<input type="checkbox"/>	<input type="checkbox"/>	MD-National Capital Park & Planning Comm.
<input type="checkbox"/>	<input type="checkbox"/>	Bladensburg, Maryland	<input type="checkbox"/>	<input type="checkbox"/>	Metropolitan Washington Airports Authority
<input type="checkbox"/>	<input type="checkbox"/>	Bowie, Maryland	<input type="checkbox"/>	<input type="checkbox"/>	Metropolitan Washington Council of Governments
<input type="checkbox"/>	<input type="checkbox"/>	BRCPC	<input type="checkbox"/>	<input type="checkbox"/>	Montgomery College
<input type="checkbox"/>	<input type="checkbox"/>	Carroll County	<input type="checkbox"/>	<input type="checkbox"/>	Montgomery County Public Schools
<input type="checkbox"/>	<input type="checkbox"/>	Carroll County Schools	<input type="checkbox"/>	<input type="checkbox"/>	Prince George's County, Maryland
<input type="checkbox"/>	<input type="checkbox"/>	Charles County Government	<input type="checkbox"/>	<input type="checkbox"/>	Prince George's Public Schools
<input type="checkbox"/>	<input type="checkbox"/>	Charles County Schools	<input type="checkbox"/>	<input type="checkbox"/>	Prince William County, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	City of Fredericksburg	<input type="checkbox"/>	<input type="checkbox"/>	Prince William County Public Schools
<input type="checkbox"/>	<input type="checkbox"/>	College Park, Maryland	<input type="checkbox"/>	<input type="checkbox"/>	Prince William County Service Authority
<input type="checkbox"/>	<input type="checkbox"/>	District of Columbia Government	<input type="checkbox"/>	<input type="checkbox"/>	Rockville, Maryland
<input type="checkbox"/>	<input type="checkbox"/>	District of Columbia Schools	<input type="checkbox"/>	<input type="checkbox"/>	Spotsylvania County Govt. & Schools
<input type="checkbox"/>	<input type="checkbox"/>	District of Columbia Water & Sewer Auth.	<input type="checkbox"/>	<input type="checkbox"/>	Stafford County, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Fairfax County, Virginia	<input type="checkbox"/>	<input type="checkbox"/>	Takoma Park, Maryland
<input type="checkbox"/>	<input type="checkbox"/>	Fairfax County Water Authority	<input type="checkbox"/>	<input type="checkbox"/>	Upper Occoquan Sewage Authority
<input type="checkbox"/>	<input type="checkbox"/>	Falls Church, Virginia	<input type="checkbox"/>	<input type="checkbox"/>	University of the District of Columbia
<input type="checkbox"/>	<input type="checkbox"/>	Fauquier County Schools & Govt., Virginia	<input type="checkbox"/>	<input type="checkbox"/>	Vienna, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Frederick, Maryland	<input type="checkbox"/>	<input type="checkbox"/>	Washington Metropolitan Area Transit Auth.
<input type="checkbox"/>	<input type="checkbox"/>	Gaithersburg, Maryland	<input type="checkbox"/>	<input type="checkbox"/>	Washington Suburban Sanitary Commission
<input type="checkbox"/>	<input type="checkbox"/>	Greenbelt, Maryland	<input type="checkbox"/>	<input type="checkbox"/>	Winchester, Virginia
<input type="checkbox"/>	<input type="checkbox"/>	Harford County	<input type="checkbox"/>	<input type="checkbox"/>	Winchester Public Schools
<input type="checkbox"/>	<input type="checkbox"/>	Harford County Schools			
<input type="checkbox"/>	<input type="checkbox"/>	Howard County			

 Vendor Name

IFB # 1086041	MONTGOMERY COUNTY, MARYLAND Underground Parking Air Quality System Testing/Calibration/Repairs and Refurbishment of Fans, Plenums and Control Packages SOLICITATION, BID AND AWARD SHEET	RETURN BID TO: OFFICE OF PROCUREMENT 255 ROCKVILLE PIKE, STE. 180 ROCKVILLE, MD 20850-4166
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PART I: SOLICITATION (Invitation for Bids ("IFB"))

SEALED BIDS IN ORIGINAL AND 3 COPIES TO FURNISH THE SUPPLIES AND/OR SERVICES DESCRIBED ON THE ATTACHED QUOTATION SHEET(S) WILL BE RECEIVED UP TO 11:00 A.M. LOCAL TIME ON 5/6/2019. BIDS WILL BE PUBLICLY OPENED AT THE DATE AND TIME STATED.

BIDS RECEIVED AFTER THE DATE AND TIME SPECIFIED WILL NOT BE CONSIDERED AND WILL BE RETURNED UNOPENED TO THE BIDDER. THE FOLLOWING DOCUMENTS ARE HEREBY INCORPORATED BY REFERENCE INTO AND MADE PART OF ANY CONTRACT AWARDED. In the event of any conflict among the provisions of the bid documents, or those documents comprising the resultant Contract, the conflict must be resolved by giving precedence to the below documents in the following order:

1. The "General Conditions of Contract between County and Contractor", and the "Special Terms and Conditions" shown in Sections B and C of this document.
2. The "Instructions, Conditions and Notices" shown in Section A of this IFB.
3. The specifications/scope of work shown in Section D of this document.
4. All solicitation amendments that change Section D will supersede in the event of a conflict.
5. All representations and certifications listed in this document.
6. This "Solicitation, Bid and Award Sheet" and the attached solicitation Quotation Sheet(s).

PART II-BID

The Bidder, by signing this solicitation, agrees that the County has 120 calendar days from the bid opening date in which to make an award of this solicitation. The Bidder agrees that its prices and/or discounts for all desired goods and/or services shall remain firm for the above time period prior to contract award. Also, the Bidder agrees that all instructions, terms, conditions, specifications, and amendments of this solicitation shall remain firm for the above time period prior to contract award. The County's Standard Payment Terms are Net Thirty (30) Days. This does not preclude an offeror from offering a prompt payment discount for payment of proper invoices in less than (30) days. An optional prompt payment term is not required, but may be offered conditioned on the following basis: Only a prompt payment discount, conditioned on a thirty-day or greater payment basis, will be utilized to recalculate prices for purposes of the Method of Award process for price/cost only. Prompt payment discounts may be offered on a shorter payment basis and adopted by the County at time of award, but will not be considered during the Method of Award process.

NAME AND SIGNATURE REQUIREMENTS FOR BIDS AND CONTRACTS: The correct and full legal business name of the bidder must be used in bids received and on all contracts issued as a result of this solicitation. A trade name (i.e., a shortened or different name under which the firm does business) must not be used when the full legal name is different. Corporations must have names that comply with State Law, which requires a suffix indicating the corporate status of the business (e.g. Inc., Incorporated, etc.). Trade names may be indicated by individuals or corporations with the individual or corporate name followed by "t/a" (trading as) or "d/b/a" (doing business as) respectively. The offeror's signature on the proposal, contract, amendment(s), or related correspondence, must conform to the following:

All signatures must be made by an authorized officer, partner, manager, member, or employee. The signing of an offer or a contract is a representation by the person signing that the person signing is authorized to do so on behalf of the offeror or contractor.

BIDDER'S CORRECT AND FULL LEGAL BUSINESS NAME:	TELEPHONE NO.:
ADDRESS:	TOLL FREE NO.:
REMITTANCE ADDRESS: (If Remittance Address is Different from Above Address)	FAX NO.:
BIDDER'S E-MAIL ADDRESS:	

ACKNOWLEDGEMENT OF AMENDMENTS The bidder acknowledges receipt of amendments to the solicitation for offers and related documents numbered and dated as follows:		NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (TYPE OR PRINT): SIGNATURE OF ABOVE PERSON: _____ DATE: _____
Amendment No./Date	Amendment No./Date	

PART III: AWARD (TO BE MADE BY THE COUNTY'S CONTRACTING OFFICER (OFFICE USE ONLY))

YOUR BID IS ACCEPTED AS TO THE FOLLOWING AND/OR AS ATTACHED TO THIS DOCUMENT:

YOUR CONTRACT NUMBER IS:

1086041

MONTGOMERY COUNTY, MARYLAND

BY _____
 PRINTED NAME OF CONTRACTING OFFICER SIGNATURE OF CONTRACTING OFFICER AWARD DATE

THIS FORM HAS BEEN APPROVED AS TO FORM AND LEGALITY BY THE OFFICE OF THE COUNTY ATTORNEY

QUOTATION SHEETS
UNIT PRICE BID FORM
IFB #1086041

Lines	Item	Repair Category (Spec Section 01000, Part 3 Ref.)	Sub-Cat.	Sub-Category Description	Units	BID UNIT PRICE PER TASK ORDER (T.O.)			Extended Price Total
1									
2	A. HVAC								
3	A.1 Fan Repairs								
4	A.1.1 Replace Belts (A.3)								
5			1	Up to 10 HP.	EA	Quantity per T.O.	10		
6			2	15 to 20 HP.	EA	Bid Unit Cost			
7			3	25 to 30 HP.	EA	Bid Unit Cost			
8			4	35 to 40 HP.	EA	Bid Unit Cost			
9			5	45 to 60 HP.	EA	Bid Unit Cost			
10									
11	A.1.2 Replace Motors (A.4)					Quantity per T.O.	10	Sub Total	
12			1	Up to 10 HP.	EA	Bid Unit Cost			
13			2	15 to 20 HP.	EA	Bid Unit Cost			
14			3	25 to 30 HP.	EA	Bid Unit Cost			
15			4	35 to 40 HP.	EA	Bid Unit Cost			
16			5	45 to 60 HP.	EA	Bid Unit Cost			
17								Sub Total	
18	A.1.3 Replace Fans (A.5)					Quantity per T.O.	10		
19			1	Up to 10 HP.	EA	Bid Unit Cost			
20			2	15 to 20 HP.	EA	Bid Unit Cost			
21			3	25 to 30 HP.	EA	Bid Unit Cost			
22			4	35 to 40 HP.	EA	Bid Unit Cost			
23			5	45 to 60 HP.	EA	Bid Unit Cost			
24								Sub Total	
25	A.1.4 Replace Starter/Disconnect (A.6)					Quantity per T.O.	10		
26			1	Up to 10 HP.	EA	Bid Unit Cost			
27			2	15 to 20 HP.	EA	Bid Unit Cost			
28			3	25 to 30 HP.	EA	Bid Unit Cost			
29			4	35 to 40 HP.	EA	Bid Unit Cost			
30			5	45 to 60 HP.	EA	Bid Unit Cost			
31								Sub Total	
32	A.1.5 Replace VFD (A.7)					Quantity per T.O.	10		
33			1	Up to 10 HP.	EA	Bid Unit Cost			
34			2	15 to 20 HP.	EA	Bid Unit Cost			
35			3	25 to 30 HP.	EA	Bid Unit Cost			
36			4	35 to 40 HP.	EA	Bid Unit Cost			
37			5	45 to 60 HP.	EA	Bid Unit Cost			
38								Sub Total	
39	A.2 Replace CO/NO2 Monitoring & Control								
40	A.2.1 Replace CO Detector/Transmitter (A.9)					Quantity per T.O.	1000		
41			1	Electro-chemical based, wired, 50' radius.	EA	Bid Unit Cost			
42									

QUOTATION SHEETS
UNIT PRICE BID FORM
IFB #1086041

43	A.2.2 Replace NO2 Detector/Transmitter (A.10)					Electro-Chemical based, wired, 50' radius.	EA	Quantity per T.O.	1000			
44				1				Bid Unit Cost		=		
45												
46	A.2.3 Replace Monitor/Controller (A.11)					3 zone, 96 transmitters, output signals to relays or BMS	EA	Quantity per T.O.	100			
47				1				Bid Unit Cost		=		
48												
49	A.2.4 Replace Remote Annunciator (A.12)							Quantity per T.O.	10			
50				1		Audible/visual alarm.	EA	Bid Unit Cost		=		
51												
52	A.2.5 Replace Factory Calibrated Cartridge (A.13)							Quantity per T.O.	1000			
53				1		Replacement CO cartridge.	EA	Bid Unit Cost		=		
54												
55	A.2.6 Replace Power Transformer (A.14)							Quantity per T.O.	5			
56				1		120V to 24V	EA	Bid Unit Cost		=		
57											Sub Total	
58	A.3 Testing, Adjusting & Balancing											
59	A.3.1 Balance Fan (A.16)							Quantity per T.O.	100			
60				1		Fractional to 10 HP by certified	EA	Bid Unit Cost		=		
61				2		15 to 20 HP by certified balanc	EA	Bid Unit Cost		=		
62				3		25 to 30 HP by certified balanc	EA	Bid Unit Cost		=		
63				4		35 to 40 HP by certified balanc	EA	Bid Unit Cost		=		
64				5		45 to 60 HP by certified balancing contractor.	EA	Bid Unit Cost		=		
65											Sub Total	
66	A.4 HVAC Cleaning											
67	A.4.1 Clean Ductwork (A.18)							Quantity per T.O.	10000			
68				1		Clean ductwork by contractor certified in air system cleaning.	SF	Bid Unit Cost /Sq Ft		=		
69												
70	A.4.2 Clean Louvers (A.19)							Quantity per T.O.	5000			
71				1		Clean louvers by contractor certified in air system cleaning.	SF	Bid Unit Cost /Sq Ft		=		
72												
73	A.4.3 Clean Air shaft Walls/Floors, Clg., etc. (A.20)							Quantity per T.O.	10000			
74				1		Clean air shafts by contractor certified in air system cleaning.	SF	Bid Unit Cost / Sq Ft		=		
75											Sub Total	

QUOTATION SHEETS
UNIT PRICE BID FORM
IFB #1086041

[illegible]

[illegible]

**MONTGOMERY COUNTY, MARYLAND
OFFICE OF PROCUREMENT**

SECTION A - INSTRUCTIONS, CONDITIONS AND NOTICES

(Numbers 1-7, 26, 27 and 28 are subject to selection on Bid Cover Sheet)

1. BID GUARANTEE

A Bid Guarantee (Bid Bond, Certified or Treasurer's Check, or Irrevocable Letter of Credit), must be enclosed and accompany each Bid and be duly executed by the Bidder as a principle, and made payable to Montgomery County. See the Bid Cover Sheet for the amount required for the Bid Guarantee for this particular bid. Bid Guarantees, other than Bid Bonds, will be returned to all except the three (3) lowest bidders within 15 days after the formal opening of Bids, and the remaining Guarantees will be returned to the three lowest bidders within 5 days after the County and the accepted Bidder(s) have executed the contract(s). If no contract has been executed within the time specified herein, the Bidder may request the return of the Bid Guarantee. The County reserves the right of approval of any instrument offered as Bid Guarantee.

2. INTENT

- A. The Intent of this Invitation for Bids is to establish a Fixed Price or Rate of Discount Contract for the purchase of goods/services for Montgomery County, Maryland, as per the Terms, Conditions, Specifications, and/or Scope of Work, and Quotation Sheet contained herein.
- B. The Intent of the Invitation for Bids is to establish a Time and Materials Contract(s) with a responsible Contractor(s) to complement County forces at various County facilities, as may be required and as may be directed by the Director, Office of Procurement, and as called for in the SCOPE OF WORK statement(s) attached. All work shall be performed by a Specialty Contractor of established reputation who is regularly engaged in the performance of the specified work and who maintains, and makes available for this purpose, a regular force of skilled workmen.

3. METHOD OF AWARD

- A. The contract will be awarded to the responsible bidder submitting a responsive bid, as determined by the Director, Office of Procurement. The lowest bidder is determined by the aggregate amount of the unit prices extended by the quantities set forth on the Quotation Sheet. Bidders must bid each item in order to be eligible for an award.
- B. The contract will be awarded by group to the responsible bidder submitting a responsive bid, as determined by the Director, Office of Procurement. The lowest bid is determined by the aggregate amount of the unit prices extended by the quantities set forth in each group on the Quotation Sheet. Bidders must bid each item within a particular group in order to be eligible for an award for the group itself.
- C. The contract will be awarded to the responsible bidder submitting a responsive bid, as determined by the Director, Office of Procurement. The lowest bidder is determined by the lowest unit price bid.
- D. The contract will be awarded by line item to the responsible bidder submitting a responsive bid, as determined by the Director, Office of Procurement.
- E. The contract will be awarded by any other Method of Award as stated on the Bid Cover Sheet.

Regardless of which Method of Award is selected for this bid (Items A-E), THE DIRECTOR, OFFICE OF PROCUREMENT, reserves the right to award a contract by individual items, in the aggregate, or in any combination thereof, or to reject any or all bids and to waive any informality in bids received whenever such rejection or waiver is in the best interest of the County. Additionally, bidders are hereby notified that the Montgomery County Code, Section 11B-56 concerning the procurement of recycled materials

and supplies is applicable to this solicitation. The Code requires, where practicable, procurement by the County of materials and supplies recycled from solid waste, and authorize the use of a percentage price preference. The percentage price preference for this solicitation is stated on the Bid Cover Sheet of this particular bid.

Recycled Material as defined by Section 11B-56 means "material recovered from or otherwise diverted from the waste stream, including recycled paper. It includes post-consumer waste, industrial scrap material and obsolete inventories..." A percentage price preference means "the percentage by which a responsive bid from a responsible bidder whose product contains recycled materials (or a greater use of recycled materials) may exceed the lowest responsive bid submitted by a responsible bidder whose product does not contain recycled materials (or a lesser use of recycled materials)."

Bidders offering recycled products as defined by the County Code are cautioned that in order to be eligible for the price preference, the County must be aware at bid opening that the product being offered is recycled. Failure to provide specifications and/or other documentation at bid opening indicating that the product being offered is recycled may result in the bidder not receiving the price preference.

Bidders are also advised that a decision on use of a specification for a good containing recycled materials or a percentage price preference is within the sole discretion of the County and may not be appealed.

4. OPTIONAL PRE-BID CONFERENCE(S)

One or more optional Pre-Bid Conference(s) will be held. It is optional, though highly recommended that prospective bidders attend the pre-bid conference(s). For information regarding the date, time, and place of the conference(s), see the Bid Cover Sheet.

5. OR EQUAL INTERPRETATION

Identification of an item by manufacturer's name, trade name, catalog number, or reference is intended to be descriptive but not restrictive in that it is used for the purpose of describing the type, style, quality, performance and minimum specifications of the product desired, and shall not be interpreted to mean the only acceptable product. Bids on other makes and/or models will be considered provided the bidder clearly states in the spaces provided in the Quotation Sheet what is being proposed and forwards with the bid complete descriptive literature indicating the character of the article being offered and addressing all specifications of this solicitation.

The County reserves the right to accept or reject, in its sole discretion, items offered as an "equal".

6. QUESTIONS

All technical and non-technical questions pertaining to this Invitation for Bids should be directed to the individuals whose names are indicated on the Bid Cover Sheet.

7. SAMPLES

When samples are required it will be so indicated. Samples must be submitted so as to arrive at the designated location prior to the opening of bids and must be identified with the NAME OF BIDDER, BID NUMBER AND BID ITEM NUMBER. Failure to properly identify samples may cause bid to be considered nonresponsive. Samples shall be free of charge and delivered at the bidder's expense. The County will have the right to destroy, alter, or mutilate samples in examination for specification or performance compliance without charge from bidder. Samples may be removed within ten (10) days after award. Samples may at the County's option be retained for the life of any subsequent contract period.

8. ACCEPTANCE TIME

By submission of an offer under this solicitation, the offeror agrees that the County has 120 days after the opening date in order to issue an award. The

County reserves the right to reject, as nonresponsive, any offer that specifies less than 120 days of acceptance time. Upon mutual agreement between the County and the Offeror, the acceptance time for the Offeror's bid may be extended.

9. ALTERNATE OFFERS

Bidders must bid only one (1) product and one (1) price per bid item even though they feel they can offer more than one item that will meet the specifications. Bidders must determine for themselves which to offer. If a bidder submits more than one (1) product and/or more than one (1) price for a given bid item or items, it may be cause for the item or items bid upon to be considered non-responsive and rejected.

10. AWARD OR REJECTION OF BID

- A. Failure to enclose and submit requested data, surety, or other documents in the sealed bid return envelope as may be required herein may be cause for rejection of the bid.
- B. The County reserves the right to accept or reject any or all bids, or portion thereof, to give an offeror an opportunity to cure any deficiency resulting from a minor irregularity in a bid or to waive the deficiency, whichever is to the advantage of the County, and to award the Contract in the best interest of the County. The decision of the Director with respect to whether a defect is a minor informality is made in the sole discretion of the Director and is not subject to review and may not be challenged by a bidder.
- C. Conditional or qualified bids are subject to rejection.
- D. The County reserves the right to reject the bid of a bidder who has previously failed to perform properly or to complete in a timely manner, contracts of a similar nature, or if investigation shows the bidder unable to perform the requirements of the contract.

11. BID PREPARATION EXPENSES

All costs incurred in the preparation and submission of bids will be borne by the bidder and shall not be incurred in anticipation of receiving reimbursement from the County.

12. BID PROTESTS

All protests made pursuant to this solicitation must be in writing and delivered to the Director, Office of Procurement: (a) within ten (10) calendar days after the Director, Office of Procurement, publicly posts the proposed contract award, if the bidder seeks as a remedy the award of the contract or costs under Section 11B-36(h) of the Montgomery County Code, or (b) before the submission date for bids, if the bidder seeks as a remedy the cancellation or amendment of the solicitation. **Each protest must contain a protest filing fee in the amount of \$500 (US currency); if the fee is paid by check, then the check must be made out to "Montgomery County Government". The Director, Office of Procurement, may return the filing fee to the protesting bidder, if the protest is sustained.** The Director, Office of Procurement, must dismiss any protest not timely received.

Only an "aggrieved" bidder may file a protest. Aggrieved means that the bidder who is filing the protest may be eligible for an award of the contract if the protest is sustained (e.g., a fourth ranked bidder is not aggrieved unless the grounds for a protest, if sustained, would disqualify the top three ranked bidders or would require that the solicitation be reissued).

Each protest must contain the following: identification of the solicitation; the name, address, email address, fax and telephone numbers of the protesting offeror; a statement supporting that the bidder is aggrieved; and specification of all grounds for the protest, including submission of detailed facts and all relevant documents, citation to relevant language in the solicitation, regulations, or law relied upon; and, all other matters which the bidder contends supports the protest. The burden of production of all relevant evidence, data, and documents, and the burden of persuasion, to support the protest is on the bidder making the protest.

13. BID WITHDRAWAL/MODIFICATION

Bids may be withdrawn or modified upon receipt of a written request received before the time specified for bid opening date and time. Requests to withdraw or modify a bid received after a bid opening date and time will not be

considered.

14. BIDDER'S PAYMENT TERMS

The County will reject as nonresponsive a bid under this solicitation, which is conditioned on payment of proper invoices in less than thirty (30) days. The County's Standard Payment Terms are Net Thirty (30) Days. This does not preclude an offeror from offering a prompt payment discount for payment of proper invoices in less than thirty (30) days. An optional prompt payment term is not required, but may be offered conditioned on the following basis: Only a prompt payment discount conditioned on a thirty-day or greater payment basis will be utilized to recalculate prices for purposes of the Method of Award process for price only. Prompt payment discounts may be offered on a shorter payment basis and adopted by the County at time of award, but will not be considered during the Method of Award process.

15. BIDS

Sealed Bids are hereby solicited, to be opened in Suite 180, Rockville Center, 255 Rockville Pike, Rockville, MD 20850, for the purchase of Supplies, Material, Equipment, and/or Services in accordance with the Instructions, Terms, Conditions and Specifications and/or scope of work set forth in this Invitation. Bids are to be returned in a sealed envelope which should be at least 9 1/2" X 12 1/2" in size, and be clearly marked with the IFB number, opening date, and the opening time. Bids received after the time specified will not be considered and will be returned unopened to the bidder. The County will not be responsible for premature or late opening of bids improperly addressed or identified.

Information regarding the bid results (apparent low bidder) for this bid or any bid issued by the Montgomery County Office of Procurement, will be posted on Montgomery County's website at:

<http://www.montgomerycountymd.gov/PRO/Awardee.html>

16. ERRORS IN BIDS

- A. Failure of the bidder to thoroughly understand all aspects of the Invitation for Bids before submitting the bid will not act as an excuse to permit withdrawal of the bid nor secure relief on pleas of error.
- B. The unit price will govern in the event of a discrepancy between the unit price bid and the extended price.
- C. The sum of the extended prices will govern in the event of a discrepancy between the aggregate total bid and the extended prices.
- D. The written words will govern in the event of a discrepancy between the prices written in words and the prices written in figures.

17. JOINT PROCUREMENT (Optional Use of the Contract)

The following entities within Montgomery County must be able to purchase directly from contracts resulting from this solicitation:

Maryland-National Capital Park & Planning Commission (M-NCPPC)
Montgomery College (MC)
Montgomery County Public Schools (MCPS)
Montgomery County Revenue Authority
Montgomery County Housing Opportunities Commission (HOC)
Washington Suburban Sanitary Commission (WSSC)
Municipalities & Special Tax Districts in Montgomery County.

While this IFB is prepared on behalf of Montgomery County, it is intended to apply for the benefit of the above-named entities as though they were expressly named throughout the document. Each of these entities may purchase from the successful vendor under the same prices and goods and/or services of the contract with Montgomery County, in accordance with each entity's respective laws and regulations, or an entity may choose not to procure from the successful bidder at the entity's sole discretion. If one of the above-named entities elects to purchase under the contract, the price shall be determined by using unit costs and other pertinent costs that are provided in

the bid. Montgomery County shall not be held liable for any costs, payments, invoices, or damages incurred by the above jurisdictions. Each jurisdiction above will be solely responsible for and contract directly with the bidder under the jurisdictions own procurement laws and regulations. ANY SPECIAL DISCOUNTS UNIQUE TO A PARTICULAR ENTITY (e.g. Montgomery County Public Schools educational discounts) SHOULD BE OFFERED TO THAT ENTITY.

18. MINORITY, FEMALE, DISABLED PERSON PROGRAM COMPLIANCE

Under County law, this solicitation is subject to the Montgomery County Code and the Montgomery County Procurement Regulations regarding participation in the Minority, Female, Disabled Person (MFD) Procurement Program. Further information regarding the County's MFD program is contained within this solicitation (see the provision entitled "Minority-Owned Business Addendum to the General Conditions of Contract between County and Contractor" and its companion document entitled "Minority, Female, and Disabled-Person Subcontractor Performance Plan").

19. MONTGOMERY COUNTY CODE AND PROCUREMENT REGULATIONS

The Montgomery County and Procurement Regulations are applicable to this solicitation and any contract awarded pursuant to this solicitation.

20. NAME AND SIGNATURE REQUIREMENTS FOR BIDS AND CONTRACTS

The correct and full legal business name of the entity involved must be used on bids received and on contract(s) issued as a result of this solicitation. A trade name, i.e., a shortened or different name under which the firm does business, must not be used when the full legal name is different. Corporations must have names that comply with State law, which requires a suffix indicating the corporate status of that business (e.g., Inc., Incorporated, etc.). Trade names may be indicated by individuals or corporations with the individual or corporate name followed by "t/a" (trading as) or "d/b/a" (doing business as), respectively. The signature on the bid, contract, amendment, or related correspondence must conform to the following:

All signatures must be made by an authorized officer, partner, manager, member, or employee. The signing of an offer or a contract is a representation by the person signing that the person signing is authorized to do so on behalf of the offeror or contractor.

No bids will be accepted unless submitted in ink or typewritten. Changes made to the prices bid prior to the opening must be done legibly and initialed by the offeror making the changes.

21. PROMPT PAYMENT DISCOUNT TERMS

Bidders please note: Prompt payment discounts will be considered in the evaluation of your bid if the discount on payments is not conditioned on payment being made in less than thirty (30) days from receipt of invoice.

22. PROPRIETARY & CONFIDENTIAL INFORMATION

This is to notify prospective bidders that the County has unlimited data rights regarding bids submitted in response to its solicitations. Unlimited data rights means that Montgomery County has the right to use, disclose, reproduce, prepare derivative works, distribute copies to the public, or perform publicly and display publicly any information submitted by offerors in response to this or any solicitation issued by the County. However, information that is deemed to be confidential commercial or financial information as defined by the Maryland Information Act, State Government Article §10-617, will be exempted from disclosure if the submitter can show that release of such information would cause substantial competitive harm to the submitter.

It is the responsibility of the bidder to clearly identify each part of his/her offer that it believes is confidential commercial or financial information by stamping the bottom right hand corner of each pertinent page with one inch bold face letters stating the words "confidential" or "proprietary". The bidder agrees, with regard to any portion of the bid that is not stamped "proprietary" or "confidential" that it believes, and expressly permits, the County to deem it not to be proprietary or confidential.

23. PUBLIC POSTING

Of particular importance is the fact that the notice of a decision to make an award will be accomplished by a posting of the proposed contract awardee on a public list located in the Office of Procurement, Rockville Center, 255 Rockville Suite 180, Rockville, Maryland 20850.

The time period for appeal contained in Section 11B-36 commences THE DAY FOLLOWING the date of the posting.

It is the responsibility of the offerors to keep informed of the current status of any proposed awardees for contracts in which they are interested, as per Section 3.2.2 of the Procurement Regulations.

Information regarding the proposed awardee(s) under this bid or any bid issued by the Montgomery County Office of Procurement will be posted on Montgomery County's website at:

<http://www.montgomerycountymd.gov/PRO/Awardee.html>

24. QUALIFICATION OF BIDDERS

Bidders may be required to furnish satisfactory evidence that they are qualified dealers or manufacturers of the items listed, or are regularly engaged in performing the services on which they are submitting a bid, and in both cases maintain a regularly established place of business. An authorized representative of the County may visit and inspect any prospective Contractor's plant, manufacturing facility or place of business, etc. where the goods, services or construction are performed to determine ability, capacity, reliability, financial stability, and other factors necessary to perform the contract. The County may visit and inspect any prospective Contractor's use of a Subcontractor's plant, manufacturing facility or place of business, etc. where the goods, services or construction are performed to determine ability, capacity, reliability, financial stability, and other factors necessary to perform the contract. In both instances above, the information gathered on the visit and inspection on the Contractor or its Subcontractor(s) may be used by the County to determine the responsibility of a Bidder.

If so requested, a bidder may be required to submit information about its reputation, past performance, business, and financial capability, and other factors that demonstrate that the bidder is capable of satisfying the County's needs and requirements for this solicitation.

25. SOLICITATION AMENDMENTS

In the event that an amendment to this solicitation is issued, all solicitation terms and conditions will remain in effect unless they are specifically changed by the amendment. Bidders are responsible for checking the website at

<http://www.montgomerycountymd.gov/PRO/solicitations.html> periodically to remain informed of any solicitation amendments.

OFFERORS MUST ACKNOWLEDGE RECEIPT OF SUCH

SOLICITATION AMENDMENTS, to the place designated, and prior to the hour and date specified in the solicitation (as amended) for receipt of Bids. **UNLESS A WAIVER IS GRANTED, OFFERORS THAT DO NOT**

TIMELY ACKNOWLEDGE RECEIPT OF SOLICITATION

AMENDMENTS BY ONE OF THE FOLLOWING METHODS WILL BE REJECTED:

- (a) by sending the amendment separately to the Office of Procurement prior to the due date and time.
- (b) by acknowledging receipt of the amendment on the Solicitation, Bid, and Award sheet submitted.
- (c) by stating that the amendment is acknowledged in a signed letter that refers to the solicitation and amendment numbers, and is submitted with the bid or prior to the bid due date and time.

A waiver may be granted by the Director, Office of Procurement, if it is deemed to be in the County's best interest. No waiver may be granted, however, until the offeror states in writing that the offeror will be bound by any substantive changes made by the amendment to the terms of the solicitation. If an offeror desires to change an offer that has already been submitted, the change may be made by a signed letter that refers to the solicitation and amendment numbers, and which is received at the place

designated, and prior to the hour and date specified in the solicitation (as amended) for receipt of offers.

26. VERBAL EXPLANATIONS

Verbal explanations or instructions given by a Montgomery County employee to an offeror in regard to this solicitation will not be binding on the County. Any information given to an offeror, in response to a request, will be furnished to all offerors as an amendment to this solicitation, if such information is deemed necessary for the preparation of bids, or if the lack of such information would be detrimental to the uninformed offerors. Such amendments only, when issued by the Director, Office of Procurement, will be considered as being binding on the County.

27. SERVICES CONTRACT (County Code 11B-33A)

Under County law, a solicitation for a contractor to provide services is subject to the Montgomery County Code regarding compliance with certain wage requirements payable to the Contractor's employees. Additional information regarding the County's wage requirements is contained within this solicitation (see the provision entitled "Wage Requirements for Services Contracts Addendum to the General Conditions of Contract between County and Contractor" and its companion documents entitled "Wage Requirements Certification" and "501(a)(3) Non-profit organization/s Employee's Wage and Health Insurance Form). If a bidder fails to submit and complete the required material information on the Wage Requirements Certification form, its bid may be deemed unacceptable under County law and may be rejected for nonresponsiveness.

28. PREVAILING WAGE (County Code §§11B-33C, and 20-75)

The Wage Law applies to all construction contracts. Under County law, a County financed construction contract is subject to the Montgomery County Code regarding compliance with the prevailing wage paid to construction workers, as established for the County by the Maryland State Commissioner of Labor and Industry. Additional information regarding the County's prevailing wage requirements is contained within this solicitation/contract (see the provision entitled "Prevailing Wage Requirements for Construction Contract Addendum to the General Conditions of Contract between County and Contractor").

An aggrieved employee is a third-party beneficiary of this Contract and the employee may, by civil action, recover the difference between the prevailing wage for the type of work performed and the amount actually received, with interest and a reasonable attorney's fee.

29. TIE BIDS

In conjunction with the bid's selected method of award (Section A.3.), tie bids will be resolved by making a proposed award of the contract(s) to the bidder who has its principal place of business in Montgomery County, Maryland. If bids are still tied, then the tie will be resolved in accordance with the criteria in the order stated under Procurement Regulation 4.1.1.4(c).

SECTION B - GENERAL CONDITIONS OF CONTRACT BETWEEN COUNTY & CONTRACTOR

1. ACCOUNTING SYSTEM AND AUDIT. ACCURATE INFORMATION

The contractor certifies that all information the contractor has provided or will provide to the County is true and correct and can be relied upon by the County in awarding, modifying, making payments, or taking any other action with respect to this contract including resolving claims and disputes. Any false or misleading information is a ground for the County to terminate this contract for cause and to pursue any other appropriate remedy. The contractor certifies that the contractor's accounting system conforms with generally accepted accounting principles, is sufficient to comply with the contract's budgetary and financial obligations, and is sufficient to produce reliable financial information.

The County may examine the contractor's and any first tier subcontractor's records to determine and verify compliance with the contract and to resolve or decide any claim or dispute arising under this contract. The contractor and any first tier subcontractor must grant the County access to these records at all reasonable times during the contract term and for 3 years after final payment. If the contract is supported to any extent with federal or state funds, the

appropriate federal or state authorities may also examine these records. The contractor must include the preceding language of this paragraph in all first tier subcontracts.

2. AMERICANS WITH DISABILITIES ACT

The contractor agrees to comply with the nondiscrimination requirements of Titles II and III, and other provisions, of the Americans with Disabilities Act of 1990, Pub. Law 101-336, and ADA Amendments Act of 2008, Pub. Law 110-325, as amended, currently found at 42 U.S.C., § 12101, et seq., and 47 U.S.C., ch. 5.

3. APPLICABLE LAWS

This contract must be construed in accordance with the laws and regulations of Maryland and Montgomery County. The Montgomery County Procurement Regulations are incorporated by reference into, and made a part of, this contract. In the case of any inconsistency between this contract and the Procurement Regulations, the Procurement Regulations govern. The contractor must, without additional cost to the County, pay any necessary fees and charges, obtain any necessary licenses and permits, and comply with applicable federal, state and local laws, codes and regulations. For purposes of litigation involving this contract, except for contract Disputes discussed in paragraph 8 below, exclusive venue and jurisdiction must be in the Circuit Court for Montgomery County, Maryland or in the District Court of Maryland for Montgomery County.

The prevailing wage law (County Code §11B-33C) applies to construction contracts. Specifically, under County law, a County financed construction contract is subject to the Montgomery County Code regarding compliance with the prevailing wage paid to construction workers, as established for the County by the Maryland State Commissioner of Labor and Industry. Additional information regarding the County's prevailing wage requirements is contained within this solicitation/contract (see the provision entitled "Prevailing Wage Requirements for Construction Contract Addendum to the General Conditions of Contract between County and Contractor").

Furthermore, certain non-profit and governmental entities may purchase supplies and services, similar in scope of work and compensation amounts provided for in a County contract, using their own contract and procurement laws and regulations, pursuant to the Md. State Finance and Procurement Article, Section 13-101, et. seq.

Contractor and all of its subcontractors must comply with the provisions of County Code §11B-35A and must not retaliate against a covered employee who discloses an illegal or improper action described in §11B-35A. Furthermore, an aggrieved covered employee under §11B-35A is a third-party beneficiary under this Contract, who may by civil action recover compensatory damages including interest and reasonable attorney's fees, against the contractor or one of its subcontractors for retaliation in violation of that Section.

Contractor and all of its subcontractors must provide the same benefits to an employee with a domestic partner as provided to an employee with a spouse, in accordance with County Code §11B-33D. An aggrieved employee, is a third-party beneficiary who may, by civil action, recover the cash equivalent of any benefit denied in violation of §11B-33D or other compensable damages.

The contractor agrees to comply with the requirements of the Displaced Service Workers Protection Act, which appears in County Code, Chapter 27, Human Rights and Civil Liberties, Article X, Displaced Service Workers Protection Act, §§ 27-64 through 27-66.

Montgomery County's Earned Sick and Safe Leave Law, found at Sections 27-76 through 27-82 of the County Code, became effective October 1, 2016. An employer doing business in the County, as defined under the statute, must comply with this law. This includes an employer vendor awarded a County contract. A vendor may obtain information regarding this law at <http://www.montgomerycountymd.gov/humanrights/>

4. ASSIGNMENTS AND SUBCONTRACTS

The contractor must not assign or transfer this contract, any interest herein or any claim hereunder, except as expressly authorized in writing by the Director, Office of Procurement. Unless performance is separately and expressly waived in writing by the Director, Office of Procurement, an assignment does not release the contractor from responsibility for performance of this contract. Unless otherwise provided in the contract, the contractor may not contract with any other party for furnishing any of the materials or services herein contracted for without the written approval of the Director, Office of Procurement. Any subcontract for any work hereunder must comport with the terms of this Contract and County law, and must include any other terms and conditions that the County deems necessary to protect its interests.

5. CHANGES

The Director, Office of Procurement, may unilaterally change the work, materials and services to be performed. The change must be in writing and within the general scope of the contract. The contract will be modified to reflect any time or money adjustment the contractor is entitled to receive. Contractor must bring to the Contract Administrator, in writing, any claim about an adjustment in time or money resulting from a change, within 30 days from the date the Director, Office of Procurement, issued the change in work, or the claim is waived. Any failure to agree upon a time or money adjustment must be resolved under the "Disputes" clause of this contract. The contractor must proceed with the prosecution of the work as changed, even if there is an unresolved claim. No charge for any extra work, time or material will be allowed, except as provided in this section.

6. CONTRACT ADMINISTRATION

A. The contract administrator, subject to paragraph B below, is the Department representative designated by the Director, Office of Procurement, in writing and is authorized to:

- (1) serve as liaison between the County and the contractor;
- (2) give direction to the contractor to ensure satisfactory and complete performance;
- (3) monitor and inspect the contractor's performance to ensure acceptable timeliness and quality;
- (4) serve as records custodian for this contract, including wage and prevailing wage requirements;
- (5) accept or reject the contractor's performance;
- (6) furnish timely written notice of the contractor's performance failures to the Director, Office of Procurement, and to the County Attorney, as appropriate;
- (7) prepare required reports;
- (8) approve or reject invoices for payment;
- (9) recommend contract modifications or terminations to the Director, Office of Procurement;
- (10) issue notices to proceed; and
- (11) monitor and verify compliance with any MFD Performance Plan.

B. The contract administrator is NOT authorized to make determinations (as opposed to recommendations) that alter, modify, terminate or cancel the contract, interpret ambiguities in contract language, or waive the County's contractual rights.

7. COST & PRICING DATA

Chapter 11B of the County Code and the Montgomery County Procurement Regulations require that cost & pricing data be obtained from proposed awardes/contractors in certain situations. The contractor guarantees that any cost & pricing data provided to the County will be accurate and complete. The contractor grants the Director, Office of Procurement, access to all books, records, documents, and other supporting data in order to permit adequate evaluation of the contractor's proposed price(s). The contractor also agrees that the price to the County, including profit or fee, may, at the option of the County, be reduced to the extent that the price was based on inaccurate, incomplete, or noncurrent data supplied by the contractor.

8. DISPUTES

Any dispute arising under this contract that is not disposed of by agreement must be decided under the Montgomery County Code and the Montgomery County Procurement Regulations. Pending final resolution of a dispute, the Contractor must proceed diligently with contract performance. Subject to subsequent revocation or alteration by the Director, Office of Procurement,

the head of the County department, office or agency ("Department Head") of the contract administrator is the designee of the Director, Office of Procurement, for the purpose of dispute resolution. The Department Head, or his/her designee, must forward to the Director, Office of Procurement, a copy of any written resolution of a dispute. The Department Head may delegate this responsibility to another person (other than the contract administrator). A contractor must notify the contract administrator of a claim in writing, and must attempt to resolve a claim with the contract administrator prior to filing a dispute with the Director, Office of Procurement or designee. The contractor waives any dispute or claim not made in writing and received by the Director, Office of Procurement, within 30 days of the event giving rise to the dispute or claim, whether or not the contract administrator has responded to a written notice of claim or resolved the claim. The Director, Office of Procurement, must dismiss a dispute that is not timely filed. A dispute must be in writing, for specific relief, and any requested relief must be fully supported by affidavit of all relevant calculations, including cost and pricing information, records, and other information. At the County's option, the contractor agrees to be made a party to any related dispute involving another contractor.

9. DOCUMENTS, MATERIALS, AND DATA

All documents materials or data developed as a result of this contract are the County's property. The County has the right to use and reproduce any documents, materials, and data, including confidential information, used in the performance of, or developed as a result of, this contract. The County may use this information for its own purposes, including reporting to state and federal agencies. The contractor warrants that it has title to or right of use of all documents, materials or data used or developed in connection with this contract. The contractor must keep confidential all documents, materials, and data prepared or developed by the contractor or supplied by the County.

10. DURATION OF OBLIGATION

The contractor agrees that all of contractor's obligations and warranties, including all requirements imposed by the Minority Owned Business Addendum to these General Conditions, if any, which directly or indirectly are intended by their nature or by implication to survive contractor performance, do survive the completion of performance, termination for default, termination for convenience, or termination by mutual consent of the contract.

11. ENTIRE AGREEMENT

There are no promises, terms, conditions, or obligations other than those contained in this contract. This contract supersedes all communications, representations, or agreements, either verbal or written, between the parties hereto, with the exception of express warranties given to induce the County to enter into the contract.

12. ETHICS REQUIREMENTS/POLITICAL CONTRIBUTIONS

The contractor must comply with the ethics provisions contained in Chapters 11B and 19A, Montgomery County Code, which include the following:

- (a) a prohibition against making or offering to make certain gifts. Section 11B-51(a).
- (b) a prohibition against kickbacks. Section 11B-51(b).
- (c) a prohibition against a person engaged in a procurement from employing or offering to employ a public employee. Section 11B-52 (a).
- (d) a prohibition against a contractor that is providing a recommendation to the County from assisting another party or seeking to obtain an economic benefit beyond payment under the contract. Section 11B-52 (b).
- (e) a restriction on the use of confidential information obtained in performing a contract. Section 11B-52 (c).
- (f) a prohibition against contingent fees. Section 11B-53.

Furthermore, the contractor specifically agrees to comply with Sections 11B-51, 11B-52, 11B-53, 19A-12, and/or 19A-13 of the Montgomery County Code. In addition, the contractor must comply with the political contribution reporting requirements currently codified under the Election Law at Md. Code Ann., Title 14.

13. GUARANTEE

A. Contractor guarantees for one year from acceptance, or for a longer period that is otherwise expressly stated in the County's written solicitation, all goods, services, and construction offered, including those used in the course of providing the goods, services, and/or construction. This

includes a guarantee that all products offered (or used in the installation of those products) carry a guarantee against any and all defects for a minimum period of one year from acceptance, or for a longer period stated in the County's written solicitation. The contractor must correct any and all defects in material and/or workmanship that may appear during the guarantee period, or any defects that occur within one (1) year of acceptance even if discovered more than one (1) year after acceptance, by repairing, (or replacing with new items or new materials, if necessary) any such defect at no cost to the County and to the County's satisfaction.

- B. Should a manufacturer's or service provider's warranty or guarantee exceed the requirements stated above, that guarantee or warranty will be the primary one used in the case of defect. Copies of manufacturer's or service provider's warranties must be provided upon request.
- C. All warranties and guarantees must be in effect from the date of acceptance by the County of the goods, services, or construction.
- D. The contractor guarantees that all work shall be accomplished in a workmanlike manner, and the contractor must observe and comply with all Federal, State, County and local laws, ordinances and regulations in providing the goods, and performing the services or construction.
- E. Goods and materials provided under this contract must be of first quality, latest model and of current manufacture, and must not be of such age or so deteriorated as to impair their usefulness or safety. Items that are used, rebuilt, or demonstrator models are unacceptable, unless specifically requested by the County in the Specifications.

14. HAZARDOUS AND TOXIC SUBSTANCES

Manufacturers and distributors are required by federal "Hazard Communication" provisions (29 CFR 1910.1200), and the Maryland "Access to Information About Hazardous and Toxic Substances" Law, to label each hazardous material or chemical container, and to provide Material Safety Data Sheets to the purchaser. The contractor must comply with these laws and must provide the County with copies of all relevant documents, including Material Safety Data Sheets, prior to performance of work or contemporaneous with delivery of goods.

15. HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA) COMPLIANCE

In addition to the provisions stated above in Section 3. "Applicable Laws," contractor must comply with all requirements in the federal Health Insurance Portability and Accountability Act (HIPAA), to the extent that HIPAA is applicable to this contract. Furthermore, contractor must enter into the County's standard Business Associate Agreement or Qualified Service Organization Agreement when contractor or the County, as part of this contract, may use or disclose to one another, to the individual whose health information is at issue, or to a third-party, any protected health information that is obtained from, provided to, made available to, or created by, or for, the contractor or the County.

16. IMMIGRATION REFORM AND CONTROL ACT

The contractor warrants that both the contractor and its subcontractors do not, and shall not, hire, recruit or refer for a fee, for employment under this contract or any subcontract, an alien while knowing the alien is an unauthorized alien, or any individual without complying with the requirements of the federal Immigration and Nationality laws, including any verification and record keeping requirements. The contractor further assures the County that, in accordance with those laws, it does not, and will not, discriminate against an individual with respect to hiring, recruitment, or referral for a fee, of an individual for employment or the discharge of an individual from employment, because of the individual's national origin or, in the case of a citizen or prospective citizen, because of the individual's citizenship status.

17. INCONSISTENT PROVISIONS

Notwithstanding any provisions to the contrary in any contract terms or conditions supplied by the contractor, this General Conditions of Contract document supersedes the contractor's terms and conditions, in the event of any inconsistency.

18. INDEMNIFICATION

The contractor is responsible for any loss, personal injury, death and any other damage (including incidental and consequential) that may be done or suffered by reason of the contractor's negligence or failure to perform any contractual obligations. The contractor must indemnify and save the County harmless from any loss, cost, damage and other expenses, including attorney's fees and litigation expenses, suffered or incurred due to the contractor's negligence or failure to perform any of its contractual obligations. If requested by the County, the contractor must defend the County in any action or suit brought against the County arising out of the contractor's negligence, errors, acts or omissions under this contract. The negligence of any agent, subcontractor or employee of the contractor is deemed to be the negligence of the contractor. For the purposes of this paragraph, County includes its boards, agencies, agents, officials and employees.

19. INDEPENDENT CONTRACTOR

The contractor is an independent contractor. The contractor and the contractor's employees or agents are not agents of the County.

20. INSPECTIONS

The County has the right to monitor, inspect and evaluate or test all supplies, goods, services, or construction called for by the contract at all reasonable places (including the contractor's place of business) and times (including the period of preparation or manufacture).

21. INSURANCE

Prior to contract execution by the County, the proposed awardee/contractor must obtain at its own cost and expense the minimum insurance specified in the applicable table (See Tables A and B) or attachment to these General Conditions, with one or more insurance company(s) licensed or qualified to do business in the State of Maryland and acceptable to the County's Division of Risk Management. The minimum limits of coverage listed shall not be construed as the maximum as required by contract or as a limitation of any potential liability on the part of the proposed awardee/contractor to the County, nor shall failure by the County to request evidence of this insurance in any way be construed as a waiver of proposed awardee/contractor's obligation to provide the insurance coverage specified. Contractor must keep this insurance in full force and effect during the term of this contract, including all extensions. Unless expressly provided otherwise, Table A is applicable to this contract. The insurance must be evidenced by one or more Certificate(s) of Insurance and, if requested by the County, the proposed awardee/contractor must provide a copy of any and all insurance policies to the County. At a minimum, the proposed awardee/contractor must submit to the Director, Office of Procurement, one or more Certificate(s) of Insurance prior to award of this contract, and prior to any contract modification extending the term of the contract, as evidence of compliance with this provision. The contractor's insurance must be primary. Montgomery County, MD, including its officials, employees, agents, boards, and agencies, must be named as an additional insured on all liability policies. Contractor must provide to the County at least 30 days written notice of a cancellation of, or a material change to, an insurance policy. In no event may the insurance coverage be less than that shown on the applicable table, attachment, or contract provision for required insurance. After consultation with the Department of Finance, Division of Risk Management, the Director, Office of Procurement, may waive the requirements of this section, in whole or in part.

Please disregard TABLE A. and TABLE B., if they are replaced by the insurance requirements as stated in an attachment to these General Conditions of Contract between County and Contractor.

TABLE A. INSURANCE REQUIREMENTS
(See Paragraph #21 under the General Conditions of Contract
between County and Contractor)

CONTRACT DOLLAR VALUES (IN \$1,000's)

Up To <u>50</u>	Up To <u>100</u>	Up To <u>1,000</u>	Over <u>1,000</u>
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Workers Compensation (for

contractors with employees)

Bodily Injury by

Accident (each)	100	100	100	See
Disease (policy limits)	500	500	500	Attach.
Disease (each employee)	100	100	100	

Commercial General Liability 300 500 1,000 See
for bodily injury and property Attach.
damage per occurrence, including
contractual liability, premises
and operations, and independent
contractors

Minimum Automobile Liability
(including owned, hired and non
owned automobiles)

Bodily Injury

each person	100	250	500	See
each occurrence	300	500	1,000	Attach.

Property Damage 300 300 300
each occurrence

Professional Liability* 250 500 1,000 See
for errors, omissions Attach.
and negligent acts, per
claim and aggregate, with
one year discovery period and
maximum deductible of \$25,000

Certificate Holder
Montgomery County Maryland (Contract #)
Office of Procurement
255 Rockville Pike, Suite 180
Rockville, Maryland 20850 4166

*Professional services contracts only

TABLE B. INSURANCE REQUIREMENTS
(See Paragraph #21 under the General Conditions of Contract
between County and Contractor)

	Up To 50	Up To 100	Up To 1,000	Over 1,000
Commercial General Liability minimum combined single limit for bodily injury and property damage per occurrence, including contractual liability, premises and operations, independent contractors, and product liability	300	500	1,000	See Attach.

Certificate Holder
Montgomery County Maryland (Contract #)
Office of Procurement
255 Rockville Pike, Suite 180
Rockville, Maryland 20850 4166

**22. INTELLECTUAL PROPERTY APPROVAL AND
INDEMNIFICATION - INFRINGEMENT**

If contractor will be preparing, displaying, publicly performing, reproducing, or otherwise using, in any manner or form, any information, document, or material that is subject to a copyright, trademark, patent, or other property or privacy right, then contractor must: obtain all necessary licenses, authorizations, and approvals related to its use; include the County in any approval, authorization, or license related to its use; and indemnify and hold harmless the County related to contractor's alleged infringing or otherwise improper or unauthorized use. Accordingly, the contractor must protect,

indemnify, and hold harmless the County from and against all liabilities, actions, damages, claims, demands, judgments, losses, costs, expenses, suits, or actions, and attorneys' fees and the costs of the defense of the County, in any suit, including appeals, based upon or arising out of any allegation of infringement, violation, unauthorized use, or conversion of any patent, copyright, trademark or trade name, license, proprietary right, or other related property or privacy interest in connection with, or as a result of, this contract or the performance by the contractor of any of its activities or obligations under this contract.

23. NON-CONVICTION OF BRIBERY

The contractor hereby declares and affirms that, to its best knowledge, none of its officers, directors, or partners or employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery, or conspiracy to bribe under any federal, state, or local law.

24. NON-DISCRIMINATION IN EMPLOYMENT

The contractor agrees to comply with the non-discrimination in employment policies and/ or provisions prohibiting unlawful employment practices in County contracts as required by Section 11B 33 and Section 27 19 of the Montgomery County Code, as well as all other applicable state and federal laws and regulations regarding employment discrimination.

The contractor assures the County that, in accordance with applicable law, it does not, and agrees that it will not, discriminate in any manner on the basis of race, color, religious creed, ancestry, national origin, age, sex, marital status, disability, or sexual orientation.

The contractor must bind its subcontractors to the provisions of this section.

25. PAYMENT AUTHORITY

No payment by the County may be made, or is due, under this contract, unless funds for the payment have been appropriated and encumbered by the County. Under no circumstances will the County pay the contractor for legal fees. The contractor must not proceed to perform any work (provide goods, services, or construction) prior to receiving written confirmation that the County has appropriated and encumbered funds for that work. If the contractor fails to obtain this verification from the Office of Procurement prior to performing work, the County has no obligation to pay the contractor for the work.

If this contract provides for an additional contract term for contractor performance beyond its initial term, continuation of contractor's performance under this contract beyond the initial term is contingent upon, and subject to, the appropriation of funds and encumbrance of those appropriated funds for payments under this contract. If funds are not appropriated and encumbered to support continued contractor performance in a subsequent fiscal period, contractor's performance must end without further notice from, or cost to, the County. The contractor acknowledges that the County Executive has no obligation to recommend, and the County Council has no obligation to appropriate, funds for this contract in subsequent fiscal years. Furthermore, the County has no obligation to encumber funds to this contract in subsequent fiscal years, even if appropriated funds may be available. Accordingly, for each subsequent contract term, the contractor must not undertake any performance under this contract until the contractor receives a purchase order or contract amendment from the County that authorizes the contractor to perform work for the next contract term.

26. P-CARD OR SUA PAYMENT METHODS

The County is expressly permitted to pay the vendor for any or all goods, services, or construction under the contract through either a procurement card ("p-card") or a Single Use Account ("SUA") method of payment, if the contractor accepts the noted payment method from any other person. In that event, the County reserves the right to pay any or all amounts due under the contract by using either a p-card (except when a purchase order is required) or a SUA method of payment, and the contractor must accept the County's p-card or a SUA method of payment, as applicable. Under this paragraph, contractor is prohibited from charging or requiring the County to pay any fee, charge, price, or other obligation for any reason related to or associated with the County's use of either a p-card or a SUA method of payment.

27. PERSONAL PROPERTY

All furniture, office equipment, equipment, vehicles, and other similar types of personal property specified in the contract, and purchased with funds provided under the contract, become the property of the County upon the end of the contract term, or upon termination or expiration of this contract, unless expressly stated otherwise.

28. PROTECTION OF PERSONAL INFORMATION BY GOVERNMENT AGENCIES

In any contract under which Contractor is to perform services and the County may disclose to Contractor personal information about an individual, as defined by State law, Contractor must implement and maintain reasonable security procedures and practices that: (a) are appropriate to the nature of the personal information disclosed to the Contractor; and (b) are reasonably designed to help protect the personal information from unauthorized access, use, modification, disclosure, or destruction. Contractor's requirement to implement and maintain reasonable security practices and procedures must include requiring any third-party to whom it discloses personal information that was originally disclosed to Contractor by the County to also implement and maintain reasonable security practices and procedures related to protecting the personal information. Contractor must notify the County of a breach of the security of a system if the unauthorized acquisition of an individual's personal information has occurred or is reasonably likely to occur, and also must share with the County all information related to the breach. Contractor must provide the above notification to the County as soon as reasonably practicable after Contractor discovers or is notified of the breach of the security of a system. Md. Code Ann., State Gov't. § 10-1301 through 10-1308 (2013).

29. TERMINATION FOR DEFAULT

The Director, Office of Procurement, may terminate the contract in whole or in part, and from time to time, whenever the Director, Office of Procurement, determines that the contractor is:

- (a) defaulting in performance or is not complying with any provision of this contract;
- (b) failing to make satisfactory progress in the prosecution of the contract; or
- (c) endangering the performance of this contract.

The Director, Office of Procurement, will provide the contractor with a written notice to cure the default. The termination for default is effective on the date specified in the County's written notice. However, if the County determines that default contributes to the curtailment of an essential service or poses an immediate threat to life, health, or property, the County may terminate the contract immediately upon issuing oral or written notice to the contractor without any prior notice or opportunity to cure. In addition to any other remedies provided by law or the contract, the contractor must compensate the County for additional costs that foreseeably would be incurred by the County, whether the costs are actually incurred or not, to obtain substitute performance. A termination for default is a termination for convenience if the termination for default is later found to be without justification.

30. TERMINATION FOR CONVENIENCE

This contract may be terminated by the County, in whole or in part, upon written notice to the contractor, when the County determines this to be in its best interest. The termination for convenience is effective on the date specified in the County's written notice. Termination for convenience may entitle the contractor to payment for reasonable costs allocable to the contract for work or costs incurred by the contractor up to the date of termination. The contractor must not be paid compensation as a result of a termination for convenience that exceeds the amount encumbered to pay for work to be performed under the contract.

31. TIME

Time is of the essence.

32. WORK UNDER THE CONTRACT

Contractor must not commence work under this contract until all conditions for commencement are met, including execution of the contract by both parties, compliance with insurance requirements, encumbrance of funds, and issuance of any required notice to proceed.

33. WORKPLACE SAFETY

The contractor must ensure adequate health and safety training and/or certification, and must comply with applicable federal, state and local Occupational Safety and Health laws and regulations.

PMMD-45. Revised 11/01/2016

THIS FORM MUST NOT BE MODIFIED WITHOUT THE PRIOR APPROVAL OF THE OFFICE OF THE COUNTY ATTORNEY.

SECTION C - SPECIAL TERMS AND CONDITIONS

(Subject to selection on Bid Cover Sheet)

1. ADD OR DELETE

During the contract term, the County shall have the right to add or delete facilities to be served as may be considered necessary or desirable.

In the event the facilities are added, (except as provided herein) a mutually acceptable price for the routine service will be negotiated in a manner consistent with the contract terms. No payment will be made for facilities deleted.

2. ANNUAL PRICE ADJUSTMENT

Prices quoted are firm for a period of two year after execution of the contract. Any request for a price adjustment after this one-year period, is subject to the following:

- ◆ Approval or rejection by the Director, Office of Procurement or designee.
- ◆ **Must be submitted in writing to the Director, Office of Procurement, and accompanied by supporting documentation justifying the Contractor's request.** A request for any price adjustment may not be approved unless the contractor submits to the County sufficient justification to support that the Contractor's request is based on its net increase in costs in delivering the goods/services to the County under the contract terms.
- ◆ Must be submitted sixty (60) days prior to the contract expiration date, if the contract is being amended.
- ◆ May not be approved in an amount that exceeds the annual percentage change of the Consumer Price Index (CPI) for the twelve-month period immediately prior to the date of the request. **The request must not exceed the CPI for all urban consumers issued for the Washington-Baltimore, DC-MD-VA-WV Metropolitan area by the United States Department of Labor, Bureau of Labor Statistics for ALL ITEMS, unless a commodity or service group is specifically stated on the Bid Cover Sheet.**
- ◆ The County will approve only one price adjustment for each contract term, if a price adjustment is approved. Should be effective sixty (60) days from the date of receipt of the contractor's request.
- ◆ Must be executed by written contract amendment.

3. CATALOG DISCOUNT PRICES

Prices are to be quoted in terms of Percentage Discount from a Current Price List, inclusive of all charges for delivery as specified herein. "List" shall be manufacturer's published catalogs and price lists and/or Contractor's own published catalogs and price lists. Sources of "List Prices" are to be clearly described on the Quotation Sheet.

Price increases as may be reflected in newly published price lists will be honored upon notification in writing and approval of the Director, Office of Procurement or the designee. The discount quoted shall remain firm for the entire contract period.

4. CATALOGS/PRICE LIST REQUIREMENTS

It will be the responsibility of the successful Contractor to provide current, complete manufacturer's catalogs including current styles, models, numbers, and latest published price lists within ten (10) working days of written notification of the County's intent to award a contract. Such material must be provided before finalization of any documents.

Should the vendor fail to provide such materials, the County may consider the bidder as nonresponsive and proceed with award of contract to next lowest responsive bidder.

5. CERTIFICATE OF ORIGIN

Certificate of origin must be submitted with delivery of units. Units delivered without Certificate of Origin and Owner Warranty will not be accepted.

6. CLEANING OF SITE

The Contractor shall at all times, keep the premises free from accumulation of waste materials or rubbish caused by the work performed. Upon completion of the work, waste materials, rubbish, and tools, equipment, machinery and surplus materials shall be removed from and about the project (job). All building surfaces and work areas are to be left "broom clean."

7. CONTRACT ADMINISTRATOR

A Contract Administrator shall be designated by the Director, Office of Procurement or authorized representative. Along with the duties and responsibilities outlined in Provision 6 – Contract Administration of the General Conditions for Contract between County and Contractor, the Contract Administrator shall be responsible for:

- A. Instructing the Contractor of the details of work required including the labor and the material/equipment to be used;
- B. Approving the Contractor's maintained record of time and material used for the job. The Administrator must sign and date these records;
- C. Approving the rental of equipment and/or tools that may be considered "not customary" to the trade;
- D. Inspecting all work performed and authorizes payment upon acceptance.

The designated Contract Administrator for the Department of Transportation is Jose Thommana Chief, Division of Parking Management, 4th Floor 100 Edison Park Drive, Gaithersburg, Maryland 20878.

The Contract Administrator for any other department will be listed on the Purchase Order or the Contract Amendment.

8. CONTRACT TERM

- A. The term of the contract is for 1 year from the date of signature by the Director, Office of Procurement. Before the contract term ends, the Director may (but is not required to) renew this contract, if the Director determines that renewal is in the best interests of the County. The Contractor's satisfactory performance does not guarantee renewal of this Contract. The Director may exercise this option to renew for 4 additional one-year period each.
- B. The contract term shall be for the period of time as stated on the Bid Cover Sheet.

9. CONTRACT VALUE

This is a Requirements Contract for providing a readily available source to serve at the County's discretion for the services specified. The estimated annual expenditure for such requirements as stated on the Quotation Sheet, represents only the County's best estimates, and is not to be taken as a guarantee of any specific dollar expenditure.

In addition, any jobs estimated to exceed \$15,000.00 will not normally be performed under this contract and, instead, may be subjected individually to competitive bidding procedures. Such determination will be made by the Director, Office of Procurement, when determined to be in the County's best interest.

10. CONTRACTOR RESPONSE

In an emergency situation, the Director, Office of Procurement or a designated representative may place a call, day or night, against this contract and the Contractor shall respond within a two (2) hour period to affect repairs/replacement as required. This provision will be used only during a declared Federal, State of Maryland, and/or local Maryland jurisdiction emergency or when any of the County's vital services are impaired, such as

those of the Fire, Police, or Health Departments, or Detention Center. The County will have a representative on the project that will be responsible for advising the Contractor of the problem and signing off on the Contractor's record of time and materials. The Contractor shall provide a phone number for emergency use outside normal business hours. In other than an emergency situation as described above, the Contractor is expected to respond within a twenty-four (24) hour period to calls for service.

11. CORRECTION OF WORK AFTER FINAL PAYMENT

The Contractor shall remedy any defects due to faulty material or workmanship and pay for any damage to other work resulting therefrom, which shall appear or occur within the guarantee period beginning with the date of final payment, or from the date of the County's substantial usage of the project, whichever is earlier. The County shall give notice of observed defects with reasonable promptness.

12. CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor shall promptly remove from the premises all work condemned by the County as failing to conform to the contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute condemned work in accordance with the contract and without expense to the County and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

13. DAMAGE/SHORTAGE

The County will not accept any new units until all damage has been repaired and factory shortages have been received. The County shall not be liable for any equipment delivered which is damaged, short components, or is not fully prepared for service.

14. DEALER STATUS

Bidders, by offering quotations herein, certify that they are current authorized dealers in good status for all quoted manufacturers. Manufacturer's written certification of dealer status must be provided within ten (10) working days prior to award of the Contract, if so requested by the County at any time during the contract period. Should the Contractor lose dealer status at any time during the contract period for any contracted items, that portion of the contract will automatically be cancelled with no further obligation by the County.

15. DELAYS AND EXTENSION OF TIME

If the Contractor is delayed at any time in the delivery of Supplies, Material, Equipment and/or Services by any act or neglect of any separate Contractor employed by the County, or by changes ordered in the Supplies, Materials, Equipment and Services, or by strikes, lockouts, fires, unusual delay in transportation, unavoidable casualties or any causes beyond the Contractor's control, or by delay authorized by the County, the County shall decide the extent of such delay or the justification of any other delay, then the time of completion shall be extended for such reasonable time as the County may decide.

No charges or claims for damages may be made by the Contractor or paid to the Contractor for any delay, disruption, inefficiency, interference or hindrance from any cause whatsoever, whether foreseeable or not, including (i) acts or omissions by the County, its agents, employees or consultants, (ii) contract documents that are negligently prepared or contain inaccurate statements, or (iii) force majeure and circumstances beyond the Contractor's control. The sole remedy for delays, disruptions or hindrances will non-compensable time extensions for completion of the work.

This provision does not apply to claims that meet all of the following conditions:

- a. The claim arises under a contract awarded under a competitive sealed bid;
- b. The claim is for actual and direct damages incurred as a result of a delay in completing the construction project which is the subject of this contract;
- c. The contract establishes a specific time limit for completing the construction project and the claim is for critical path delays that prevent achievement of substantial completion of the contract within that time limit;

- d. The delay for which damages are claimed is caused by the County; and
- e. The delay is not caused by actions taken by the County to protect the public health or safety or to conform to law.

A time extension may be granted only for a excusable delay that is beyond the Contractor's control and occurs without the Contractor's fault or negligence. No time extension will be granted in the absence of a written claim for the time extension. The claim must be received by the Department within 15 days after the date of the alleged cause for extension of time occurred. All claims for a time extension must state specifically the amount of delay that the Contractor believes to have been incurred and must include an analysis of how the delay affects completion of the project. If a claim for a time extension, including the facts and analysis specified above, is not received by the Department within the prescribed time, the claim is waived. No compensation must be paid for any time extensions.

16. DELIVERY INSTRUCTIONS

All deliveries are to be made to the locations identified and listed in the bid and are to be coordinated and scheduled with the individuals as indicated.

17. DEPARTMENTS AUTHORIZED TO USE CONTRACT(S)

The primary user of this contract will be the Department named on the Bid Cover Sheet. This agency is authorized to use its own internal Job Release System and Financial Department methods. All other users of this contract must route their usage through THE CONTRACTING OFFICER, or designee. Contractors are cautioned not to perform work for any other than the primary user without written authorization from the Director, Office of Procurement.

18. EQUIPMENT PREPARATION

New vehicles/equipment service and preparation, as recommended by the manufacturer, shall be completed by the successful Contractor prior to delivery. Equipment delivered shall be prepared and ready for the designed and intended service use. No dealer identification is to be affixed to any new units.

19. ESTIMATES

Prior to the commencement of work on any requirements, the Contract Administrator and the Contractor will prepare an "Estimate to Complete" containing the following:

- A. Brief description of the work to be performed.
- B. Number of labor hours and types of labor.
- C. Material cost estimate.
- D. Estimated completion date.

All estimates must be signed and dated by the Contract Administrator and the Contractor, and reference the contract number. A copy of the estimate must be sent to THE DIRECTOR, OFFICE OF PROCUREMENT; labeled "File with Contract."

20. FAILURE TO PERFORM/DELIVER

In the event of a Contractor's failure to comply with the established delivery schedule, the County reserves the right to make an open market purchase of the required materials and/or services, and to charge as damages, the difference between the established price and the actual cost incurred by the County and to collect such charges from the Contractor, from any money due under this contract, or any other contract with the County. Alternatively, the County may assess liquidated damages at the rate of 1% per day of the cost of such item or service for each day of delay beyond the established delivery date.

21. HEAVY DUTY

The term "heavy duty" shall be interpreted to mean, "the item shall be designed for unusual strain and/or severe service."

22. INVOICES

All true and corrected invoices and all inquiries regarding payment are to be sent to the Contract Administrator listed above by United State Mail and a

copy emailed to designated Capital Projects Managers. **Failure to promptly comply with this requirement must delay payment.**

23. LABOR COSTS

The labor costs for other than normal straight time shall be billed to the County in accordance with labor agreements or the effective company policy. Said labor costs shall be adjusted to reflect only those actual costs paid or accrued by the Contractor and shall include the same rate percent (%) of profit as is included in the straight time labor rate.

24. MANUALS

The Contractor shall provide a minimum of two (2) copies of Operator's Manuals and one (1) copy each of Shop Manual and Parts Manual to be furnished upon delivery of the units.

25. MATERIAL AND WORKMANSHIP

The work shall be under the general direction of the Contractor but subject to the inspection of the Contract Administrator, or the authorized representative, who may require the Contractor to correct defective workmanship and materials without cost to the County.

All material and practices which are necessary, or which are normally provided and performed in order to accomplish the desired results, shall be furnished by the Contractor at the bid price and shall conform in strength, quality of material, appearance, and workmanship to that usually provided by the trade.

26. MATERIALS

The County reserves the right to furnish any or all materials for work under this contract. Normally, the Contractor will furnish required materials. Materials supplied by the Contractor shall be at Contractor's Cost including, if appropriate, material handling costs as part of material costs, shall include only costs clearly excluded from the Labor Hour rate. Material handling cost may include all appropriate indirect costs allocated to direct materials in accordance with the Contractor's usual accounting procedures. Contractor's charges for materials shall be based on established Catalog or List Price in effect when material is furnished, less all applicable discounts and in no event shall the price exceed the Contractor's sales price to its most favored customer for the same item in like quantity, or the current market price, whichever is lower.

27. METHOD OF ORDERING

It is the intention of the County to issue written purchase orders or blanket purchase order(s) to the contractor(s). If blanket purchase order(s) is/are issued, written individual releases against such blanket order(s) will be made by the using agency as required. Issuance of all purchase orders will be contingent upon appropriation of funds by the Montgomery County Council and encumbrance of such funds after July 1, of each year, as provided by the Montgomery County Code.

28. MULTIPLE AWARDS

In the event of multiple awards resulting from this solicitation, the contract period will approximate one (1) year, as it is the County's intent that all contracts awarded under this solicitation terminate on the same date.

29. NET PRICES

Prices are net, inclusive of all charges for transportation FOB Destination, freight prepaid and allowed, and inside delivery, and all other charges necessary for performance under the Contract. Prices are less Federal, State, and Local taxes.

30. NEW MATERIALS

Unless this contract specifies otherwise, the Contractor represents that the supplies and components are new and are not of such age or so deteriorated as to impair their usefulness or safety.

31. OPTION TO INCREASE QUANTITIES

Montgomery County reserves the right, at its option, to increase the quantities for any item awarded, not to exceed 100% of the quantities shown on the Quotation Sheet(s). The County reserves the right to purchase additional units within the date shown by the bidder on the Quotation Sheet(s), or within six (6) months of the date that the initial award is made, whichever is later. The

Contractor agrees to accept such increases at the same unit prices as provided in the initial contract for the initial quantities. No guarantee of purchases of any specific quantity or total dollar amount is made. In addition, all purchases are contingent upon the appropriate fiscal funding.

32. ORDERING TERMS

Orders for goods/services that are placed before the expiration of the contract term and are to be started and/or completed before the expiration of the contract are to be honored with all terms, conditions, and prices of the Contract in effect until the final delivery of goods and/or completion of the work is made and accepted by the County.

33. PARTS/SERVICE

To best serve the needs and interests of Montgomery County, it is the intention of these specifications to secure bids only on units which can be efficiently maintained and serviced without the necessity of the County stocking expensive parts, or being subject to the inconvenience of frequent and/or long periods of interrupted service due to non-availability of parts. Bidders shall specify nearest location of parts depots from which parts may be obtained at any time during the day or night.

34. PAYMENTS

Payment shall be made upon submission of invoices on a monthly basis, by the first day of the month, for all work performed during the previous month. Invoices are to be supported by records of "Time and Material", with the approval signature of the Contract Administrator (or designee). Material prices shall be subject to verification. A copy of paid receipts for material/equipment used or installed for each job performed shall be submitted with invoice only when material purchased for a specific job is of a major cost and when such record is requested by the Director, Office of Procurement.

The Contractor shall be required to adhere to the following procedure for requesting payments from the Montgomery County Department of Transportation:

- a. The sample format in attachment "G" or one similar to it shall be used.
- b. The estimate shall typed on company letterhead.
- c. The original and four copies shall be submitted directly to Mr. Adrian Q. Labor., Capital Projects Manager, 100 Edison Park Drive, 4th floor, Gaithersburg, Maryland, 20878.
- d. The Contractors name, MCDOT CIP Project number, project name, and estimate number shall appear on the top of each page of the estimate; including the signature page.
- e. Signature page shall include total amount due on the estimate.
- f. Estimates shall list all items as they appear in the contract documents including change orders.
- g. Field orders shall appear on the estimates separate from contract items and change orders and shall have no retention withheld.
- h. A 10% retainage shall be withheld from each monthly payment request. The total retainage should be included in the final payment request and will be paid upon completion of the project and acceptance of the work by the County.
- i. Should you have any questions, contact Adrian Q. Labor Capital Projects Manager at 240-777 8725

35. PERFORMANCE BOND

No contract shall exist until the County receives a duly executed Performance Bond (or Certified or Treasurers Check or Irrevocable Letter of Credit) prepared on an approved form in the of 95% of the total base bid. The bond must be made payable to Montgomery County, as security for the faithful performance of the contract and having as surety thereon such surety company or companies as are acceptable to the County and as are authorized to transact business in the State of Maryland. In the event the Performance Bond is not delivered within ten (10) days of Notice of Award then the offer may be ruled null and void and the award made to the next lowest responsive bidder. The County reserves the right of approval of any instrument offered as a Performance Bond.

The Performance Security will provide assurance of faithful performance and discharge of all duties and responsibilities attendant thereto required by law or

as provided herein by the Contractor of all ASPECTS, TERMS AND CONDITIONS of the contract and shall be maintained in full force and effect until the termination of this agreement.

36. (This provision has been intentionally left blank)

37. PROTECTION OF EXISTING FACILITIES

The Contractor shall take all necessary precautions during the period of service to protect existing County facilities from damage by the Contractor, Contractor's employees, subcontractor or subcontractor's employees and shall repair or replace, at the Contractor's own expense, any damaged property caused by the Contractor, Contractor's employees, subcontractor or subcontractor's employees.

38. PURCHASE OF GOODS BY NON-PROFIT ORGANIZATIONS

Pursuant to the requirements set forth in the Montgomery County Code, Chapter 11B-49, the Contractor agrees to extend the same terms, conditions, and prices for the goods provided by the Contractor pursuant to this contract to those Non-Profit organizations which may need the goods in order to perform a contract with the County. Non-Profit Organizations are defined as those organizations that are exempt from taxation under Section 501(c)(3) of the Internal Revenue Code but are not defined as a "public entity" under subsection (n) of Chapter 11B-1 of the Montgomery County Code.

39. PURCHASE ORDERS/JOB RELEASES

Prior to the commencement of work, THE DIRECTOR, OFFICE OF PROCUREMENT or authorized representative, shall authorize each project (job). Such authorization shall be in the form of a Purchase Order or Agency Job Release Number, as appropriate. The authorization shall include a general description of the required work, special instructions, estimated value (from Estimate to Complete), and the name of the individual designated as the Contract Administrator.

40. QUANTITIES

It is estimated that yearly expenditures under this contract will approximate the quantities listed on the Quotation Sheet. Under the terms of this Invitation for Bids, however, the resultant contract shall be considered a "requirements-type" contract only. No guarantee of purchases of any specific yearly quantity or total dollar amount is made. In addition, all purchases are contingent upon the appropriation and encumbrance of fiscal funding.

41. SAFETY STANDARDS

The vehicles/equipment, to include components, furnished under these specifications shall comply with all applicable Federal and Maryland State Standards.

42. SERVICE

The Contractor must be able to provide a qualified local service facility offering a fixed cost annual maintenance agreement (parts and labor) for on-site repairs. The cost of such Annual Maintenance, the location of the service facility, average response time, and contact person is to be included in the appropriate spaces on the Solicitation, Bid, and Award Sheets.

43. SITE INSPECTION

Each bidder is encouraged to visit each facility in order to become familiar with actual site conditions. Failure to visit each facility and to become completely knowledgeable of the requirement of work shall in no way relieve them of all provisions contained in the Invitation for Bids. Site inspections may be arranged by calling Adrian Q. Labor, Capital Project Manager at 240-777 8725

44. TRAVEL TIME

No payment for travel time to or from a job site shall be charged. Charges begin when the Contractor arrives at each job site and end when the Contractor leaves each job site. The Project Coordinator or Contract Administrator will verify time records.

45. WARRANTY

The manufacturer shall provide, with the bid submission, a detailed listing of items that will be covered under the provision of warranty. The terms of

warranty shall include period of warranty both in mileage and time. In addition, the manufacturer is to provide a list of the number of dealers as indicated on the Bid Cover Sheet, other than the selling dealer, within the stated miles radius of Rockville, Maryland that will provide priority warranty repair.

46. LABOR AND MATERIAL PAYMENT BOND

The Contract is not valid until and unless the County receives a duly executed Labor and Material Payment Bond (Certified or Treasurer's Check or Irrevocable Letter of Credit) that is in an approved form, in the amount of 95% of the Total Base Bid, and is made payable to Montgomery County, as security that guarantees payment to suppliers, and subcontractor of the prime contractor of the Contract and having as surety thereon such surety company or companies as are acceptable to the County and as are authorized to transact business in the State of Maryland. The Contractor must maintain the Labor and Material Payment Bond in full force and effect until the termination of the Contract. The county has the right to approve, disapprove or require changes to any instrument offered as a Labor and Material Payment Bond. If the County does not approve the Labor and Performance Payment Bond, the Contractor has until the close of business ten (10) calendar days from the date of disapproval to furnish an acceptable Labor and Material Payment Bond. If not corrected, the County has the option to rescind the recommended award and to commence negotiations with the next highest rated offeror. The Labor and Material Payment Bond must provide assurance of the Contractor's guarantee payment to its suppliers and subcontractors of the prime contractor.

47. PROFESSIONAL SERVICES

The Contractor is required to provide the professional services necessary to perform the work on this project. Professional Services will not be measured for payment but the cost of the services shall be considered incidental to the pertinent item of work.

48. CERTIFICATION OF PAYMENT TO SUBCONTRACTORS AND SUPPLIERS

The Contractor at the time of request for semi-final payment of retention under a contract covered hereunder shall certify in writing that he has made payment from proceeds of prior payments, and that he will make timely payment from the proceeds of the final payment then due him, to his subcontractors and suppliers in accordance with his contractual arrangements with them in conformance with Section 9-112 of the Real Property Article of the Annotated Code of Maryland (1974).

49. LIQUADTED DAMAGES

The Contractor is hereby advised that liquidated damages in the amount of **Five Hundred (\$500) Dollars per Calendar Day** will be assessed for unauthorized extensions beyond the contracted time of completion.

50. NON-PRE-PRICED ITEMS

Quotes for non pre priced items related to any task issued will be based on **RS Means, meanscostwork.com Data.**

SECTION D – DRAWINGS AND SPECIFICATIONS/SCOPE

Division of Parking Management provides access to Revit Model (BIM) and drawings of 23 multi-level Garage structures and 23 Parking Lots to Project Manager, Engineers, Consultants and Contractors through various online platforms.

Typical Details for this Project are attached.

Potential bidders can access Revit Models and associated drawings via BIM360 Platform using links from Projects Website Page.

Underground Garages are:

Garage 60, 921 Wayne Avenue, Silver Spring
Garage 58, 1315 East-West Highway, Silver Spring
Garage 49, 7601 Woodmont avenue, Bethesda
Garage 42, 4720 Cheltenham Drive
Garage 31, 7171 Woodmont Avenue, Bethesda
Garage 13 11219 Grandview Avenue, Wheaton
Garage 3 915 Silver Spring avenue, Silver Spring

Project Website URL: <https://www.montgomerycountymd.gov/DOT-Parking/GarageAirQuality.html>

SECTION 010000 – UNIT QUANTITY WORK ITEMS

PART 1 - GENERAL

1.1 UNIT QUANTITIES SPECIFIED

- A) Initially, Contract Sum will be deemed to include, for all Unit Price Work, amount equal to sum of established unit prices for each separately identified item of Unit Price Work times estimated quantity of each item as indicated in the Bid Form and/or Schedule of Values.
- B) Estimated quantities of items of Unit Price Work are not guaranteed and are solely for purpose of comparison of Bids and determining initial Contract Sum. Owner reserves right to increase or decrease quantities at same unit cost, as required by job conditions. Review and approval of actual quantities and classifications of Unit Price Work performed by Contractor will be by the Engineer.
- C) The Engineer shall have right under Contract to make increases and decreases in quantities and changes in plans, as may be necessary to ensure completion of contemplated Work.

1.2 PAYMENT

- A) Progress payments on account of Unit Price Work will be based on number of units completed.
- B) The Engineer will review and approve actual quantities and determine classification of Unit Price Work performed by Contractor. The Engineer will review Contractor's preliminary determinations on such matters before rendering written decision thereon (by recommendation of Application for Payment or otherwise). The Engineer's written decisions thereon will be final and binding upon Owner and Contractor, unless within ten days after date of any such decision, either Owner or Contractor delivers to the other party to their Agreement, and to the Engineer, written notice of intention to appeal such decision.
- C) Each unit price will be deemed to include the amount considered by the Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

1.3 DEFECT ASSESSMENT

- A) Replace the Work, or portions of the Work, not conforming to specified requirements.
- B) If, in the opinion of the Engineer, it is not practical to remove and replace the Work, the Engineer will direct one of the following remedies:
 - 1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of the Engineer.

2. The defective Work will be partially repaired in accordance with the instructions of the Engineer, and the unit sum/price will be adjusted to a new sum/price at the discretion of the Engineer.
 3. The individual Specification Sections may modify these options or may identify a specific formula or percentage sum/price reduction.
- C) The authority of the Engineer to assess the defect and to identify payment adjustment is final.

PRODUCTS (Not Used)

EXECUTION

3.1 DESCRIPTION OF UNIT QUANTITY WORK ITEMS

- D) Unless otherwise described on the Drawings or elsewhere in the Specifications, Unit Quantity Work noted on the Bid Form, or in the Schedule of Values, shall include the following:
1. General Conditions:
 - a. Setting up and maintaining all necessary general conditions, insurance, temporary protection and facilities, and maintenance of traffic provisions required by state laws and city ordinances. This Work also includes the general mobilization and demobilization of equipment required for completion of the Work as per Contract Documents and in accordance with material manufacturer's recommendations or work ordered by the Engineer. This Work item shall not include any overhead or profit for unit quantity or lump sum contract work included, or incidental, to other work items.
 - b. This Work shall include all coordination and procurement of all necessary building permits, excluding the actual cost of Building Permits. This Work also includes the cost of a municipal consultant, if required, to expedite the procurement of permits. Actual cost of building permit will be separately reimbursed to Contractor by Owner via change order.
 2. Fan Repairs/Replacement (Bid Items A.1):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace fans in their entirety or sub-components (listed below) as required to repair the fan.
 3. Replace Belts (Bid Items A.1.1):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace fan belts in their entirety.
 - b. Unit of Measurement: Each.
 - c. Per fan in the following size categories:

- 1) Up to 10 HP
 - 2) 15 to 20 HP.
 - 3) 25 to 30 HP.
 - 4) 35 to 40 HP.
 - 5) 45 to 60 HP.
4. Replace Motors (Bid Items A.1.2):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace fan motors in their entirety.
 - b. Unit of Measurement: Each.
 - c. Per fan in the following size categories:
 - 1) Up to 10 HP.
 - 2) 15 to 20 HP.
 - 3) 25 to 30 HP.
 - 4) 35 to 40 HP.
 - 5) 45 to 60 HP.
5. Replace Fans (Bid Item A.1.3):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace fans in their entirety.
 - b. Unit of Measurement: Each.
 - c. Per fan in the following size categories:
 - 1) Up to 10 HP.
 - 2) 15 to 20 HP.
 - 3) 25 to 30 HP.
 - 4) 35 to 40 HP.
 - 5) 45 to 60 HP.
6. Replace Starter/Disconnect (Bid Item A.1.4):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace fan starter/disconnects in their entirety.
 - b. Unit of Measurement: Each.
 - c. Per fan in the following size categories:
 - 1) Up to 10 HP.
 - 2) 15 to 20 HP.
 - 3) 25 to 30 HP.
 - 4) 35 to 40 HP.
 - 5) 45 to 60 HP.
7. Replace VFDs (Bid Item A.1.5):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace fan VFDs in their entirety.
 - b. Unit of Measurement: Each.

- c. Per fan in the following size categories:
 - 1) Up to 10 HP.
 - 2) 15 to 20 HP.
 - 3) 25 to 30 HP.
 - 4) 35 to 40 HP.
 - 5) 45 to 60 HP.
- 8. Replace CO/NO2 Monitoring & Control (Bid Items A.2)
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace CO/NO2 Monitoring & Control in its entirety or sub-components (listed below) as required to repair the system as listed as follows:
- 9. Replace CO Detector/Transmitter (Bid Items A.2.1):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace CO Detector/Transmitter in its entirety.
 - b. Unit of Measurement: Each.
 - 1) Electro-chemical based, wired, 50' radius.
- 10. Replace NO2 detector/transmitter (Bid Item A.2.2):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace NO2 Detector/Transmitter in its entirety.
 - b. Unit of Measurement: Each.
 - 1) Electro-chemical based, wired, 50' radius.
- 11. Replace Monitor/Controller (Bid Item A.2.3):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace Monitor/Controller in its entirety.
 - b. Unit of Measurement: Each.
 - 1) 3 zone, 96 transmitters, output signals to relays or BMS
- 12. Replace Remote Annunciator (Bid Item A.2.4):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace Remote Annunciator in its entirety.
 - b. Unit of Measurement: Each.
 - 1) Audible/Visual Alarm.
- 13. Replace Factory Calibrated Cartridge (Bid Item A.2.5):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace Factory Calibrated Cartridge in its entirety.
 - b. Unit of Measurement: Each.
 - 1) CO/NO2 detector cartridge.

14. Replace Power Transformer (Bid Item A.2.6):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to replace Factory Calibrated Cartridge in its entirety.
 - b. Unit of Measurement: Each.
 - 1) 120V to 24V transformer.
15. Testing, Adjusting & Balancing (TAB) (Bid Item A.3):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to verify DDC system components and operation, Test, Adjust & Balance garage ventilation air systems in their entirety or a sub-component as listed below:
16. TAB (Bid Item A.3.1):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to verify DDC system components and operation, Test, Adjust & Balance garage ventilation air systems in their entirety or a sub-component as listed below:
 - b. Unit of Measurement: Each
 - c. Per fan in the following size categories:
 - 1) Fractional to 10 HP by certified balancing contractor.
 - 2) 15 to 20 HP by certified balancing contractor.
 - 3) 25 to 30 HP by certified balancing contractor.
 - 4) 35 to 40 HP by certified balancing contractor.
 - 5) 45 to 60 HP by certified balancing contractor.
17. HVAC Cleaning (Bid Item A.4):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to clean garage ventilation air systems in their entirety or partially as listed below:
18. Clean Ductwork (Bid Item A.4.1):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to clean ductwork in its entirety or partially as listed below:
 - b. Unit of Measurement: Square Foot
 - 1) Clean ductwork by contractor certified in air system cleaning.
19. Clean Louvers (Bid Item A.4.2):
 - a. This Work includes all labor, materials, equipment and incidentals necessary to clean louvers in their entirety or partially as listed below:
 - b. Unit of Measurement: Square Foot
 - 1) Clean louvers by contractor certified in air system cleaning.
20. Clean Air Shaft Walls, Floors, Ceiling (Bid Item A.4.3):

- a. This Work includes all labor, materials, equipment and incidentals necessary to clean air shafts in their entirety or partially as listed below:
 - b. Unit of Measurement: Square Foot
 - 1) Clean air shaft walls, floors, and ceilings by contractor certified in air system cleaning.
21. Measurement and Reporting of Fan Motor Starting Current (Bid Item B.1.1):
- a. This Work includes all labor, materials, equipment, data logger, and incidentals necessary to measure the starting currents as listed below:
 - b. Unit of Measurement: Each.
 - c. Per fan in the following size categories:
 - 1) Up to 10 HP.
 - 2) 15 to 20 HP.
 - 3) 25 to 30 HP.
 - 4) 35 to 40 HP.
 - 5) 45 to 60 HP.
22. DDC System Validation, Documentation & Programming Modifications (Bid Item B.1.2):
- a. This Work includes all labor, materials, equipment and incidentals necessary to validate and document the existing DDC system program logic. Modify CO/NO2 Monitoring & Control system by sensor and component (dampers, actuators, fans and motor starters) in its entirety or sub-components as required to repair or upgrade the system:
 - b. Unit of Measurement: System / Node
23. Garage Exhaust System Validation and Documentation (Bid Item B.1.3):
- a. This Work includes all labor, materials, equipment and incidentals necessary to validate and document the proper operation and functionality of the entire DDC based CO/NO2 Monitoring & Control system. Verify system commands, actuator/damper response, fan response, and annunciation for the entire system:
 - b. Unit of Measurement: System / Node
24. Garage Exhaust DDC System Demonstration and Training (Bid Item B.1.4):
- a. This Work includes all labor, materials, equipment and incidentals necessary to demonstrate and train the proper system operation to the owner and his facility staff.
 - b. Base extent of training on scope and complexity of DDC system indicated and training requirements indicated. Provide extent of training required to satisfy requirements even if more than minimum training requirements are indicated.
 - c. Unit of Measurement: System
25. Complete System Identification (Bid Item B.1.5):

- a. This Work includes all labor, materials, equipment and incidentals necessary to validate, document, identify and update the existing garage exhaust identification system by component (controller, sensor, actuator, fan, and starter) as follows:
 - 1) Control Equipment, Instruments, and Control Devices: Engraved tags.
 - 2) Equipment Warning Labels: Acrylic label with pressure-sensitive adhesive back and peel-off protective jacket.
 - b. Unit of Measurement: Each ID tag
26. Replace Electrical Conduit and Wiring (Bid Item B.2.1):
- a. This Work includes all labor, materials, equipment and incidentals necessary to remove existing conduit / wiring, and then provide and install new conduit and wiring as follows:
 - 1) Intermediate metal conduit, ¾" diameter, to 10' high, including 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF.
 - 2) Intermediate metal conduit, 1" diameter, to 10' high, including 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF.
 - 3) Intermediate metal conduit, 1-1/2" diameter, to 10' high, including 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF.
 - 4) Intermediate metal conduit, 2-1/2" diameter, to 10' high, including 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF.
 - 5) Wire, copper solid, 600V, #12, type THW, in raceway.
 - 6) Wire, copper solid, 600V, #10, type THW, in raceway.
 - 7) Wire, copper solid, 600V, #8, type THW, in raceway.
 - 8) Wire, copper solid, 600V, #6, type THW, in raceway.
 - 9) Low Voltage Control Cable, copper twisted, 18 AWG, type CMG, in raceway.
 - 10) Low Voltage Control Cable, copper twisted, 16 AWG, type CMG, in raceway.
 - 11) Class 1, Control Circuit Conductors, stranded copper, type THHN/THWN in raceway.
 - 12) Class 2, Control Circuit Conductors, stranded copper, type THHN/THWN in raceway.
 - 13) Class 3, Control Circuit Conductors, stranded copper, type THHN/THWN in raceway.
 - b. Unit of Measurement as follows:
 - 1) Conduit: Linear Foot.
 - 2) Wire: 100 Linear Foot.
27. Replace Motor Starter Fuses (Bid Item B.2.2):
- a. This Work includes all labor, materials, equipment and incidentals necessary to replace motor starter primary cartridge fuse set in its entirety.
 - b. Unit of Measurement: Each set of fuses.
28. Replace Power Transformer (Bid Item B.2.3):
- a. This Work includes all labor, materials, equipment and incidentals necessary to replace motor starter thermal overload set in its entirety.

- b. Unit of Measurement: Each set of OL's.
- 29. Other work not listed above but listed on the Bid Form or Schedule of Values, shall be performed in accordance with the details and notes on the Drawings and related Specifications. The Work shall include all labor, materials, equipment, and incidentals necessary to complete the Work as shown on the Drawings as directed by the Engineer.
- 30. Payment for the Work shall be made on the unit basis noted.

END OF SECTION 010000

SECTION 010100 – SUMMARY OF WORK

PART 2 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SECTION INCLUDES

- A) Contract description.
- B) Contractor use of site and premises.
- C) Future work.
- D) Work sequence.
- E) Owner occupancy.

0.3 CONTRACT DESCRIPTION

- A) Contract Type: Stipulated price and unit prices.
- B) Agreement Form: As agreed upon between Owner and Contractor.
- C) Intent of Drawings and Specifications: The intent of the Drawings and Specifications is to describe the Work which the Contractor undertakes to do, in full compliance with the Contract, and it is understood that the Contractor will furnish all materials, machinery, equipment, tools, supplies, transportation, labor, and all other incidentals necessary to the satisfactory prosecution and completion of the Work. The Drawings and Specifications are complementary, and what is called for by either is as binding as if called for by both.
- D) The Special Conditions shall control where in conflict with the Standard Specifications. However, such portions of the Standard Specifications not in conflict with, or not rendered meaningless by, the Special Provisions shall remain in full force and effect and be binding on the parties hereto.
- E) In the event the Contractor discovers any error or discrepancy in the Contract Documents, he shall immediately call upon the Engineer for his decision. The Engineer shall then make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the

Specifications, Special Provisions, Drawings and other Contract Documents, as construed by him and his decision shall be final.

0.4 SCOPE OF WORK

- A) Work under this Contract includes the repairs to County garages using details, materials and methods as shown on the Drawings, noted in the Specifications, and listed on the Bid Form or Schedule of Values.

0.5 CONTRACTOR USE OF SITE AND PREMISES

- A) Limit use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by others and work by Owner.
 - 3. Access by the general public.
- B) Existing emergency building exits shall be usable all times during construction.
- C) Driveways, Walkways and Entrances: Keep driveways, loading areas and entrances serving premises clear and available to Owner, Owner's employees and emergency vehicles at all times. Do not use these areas for parking or storage of materials unless otherwise allowed by Owner.
 - 1. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - 2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D) Construction Operations: Limit to areas noted on Drawings or as directed by the Engineer or owner.

0.6 ALTERATIONS, CANCELLATIONS AND DEDUCTIONS

- A) In the event, in the sole judgment of the Engineer or his representative, a change becomes necessary in the best interest of the project, due to circumstances not known at the time the Contract was entered into or arising thereafter, the Engineer may, during the course of the Work, alter the Scope of Work, add such work as may be necessary and increase or decrease the quantities of Work to be performed in accordance with such changes, including addition to, the deduction from, or cancellation of, any one or more of the unit price items or lump sum items. Such changes shall not be considered as a waiver of any conditions of the Contract nor invalidate any of the provision thereof.
- B) Where the added Work and materials do not appear as specific items in the Contract, accompanied by unit prices, and which, of themselves, or in conjunction with other changes, constitute a major change, and the parties cannot agree on the compensation to be paid for said work and materials,

the Work may be designated by the Engineer as Extra Work and paid for as specified in paragraph 1.7 of these Specifications.

- C) All alterations, cancellations and deductions shall be authorized in writing by the Engineer before work is stated, subject to the approval of the Owner. Such authorizations shall set up the items of work involved and the method of payment for each item.
- D) Claims for Extra Work which have not been authorized in writing by the Engineer and approved by the Owner will be rejected and the Contractor shall not be entitled to payment for the Work.

0.7 EXTRA WORK

- A) If, during the course of construction, it becomes necessary to have work performed of a nature or scope related to, but not clearly covered by the Contract, the Contractor shall perform the work at the request of the Engineer. The Engineer shall advise the Contractor of the character and extent of such work in such sufficient detail as to enable the Contractor and the Owner to mutually agree upon terms for performing the contemplated additional work.
- B) The Engineer may, during an emergency, require the performance of Extra Work by oral direction in order to save life or property. Such oral direction shall be promptly confirmed in writing by the Engineer. The Contractor shall perform the emergency work immediately upon receipt of oral direction from the Engineer and shall not delay performance thereof pending agreement between the Contractor and the Owner as to price or prices and basis for payment.

0.8 UNAUTHORIZED WORK

- A) Work performed which is not provided for in the Contract, and work done beyond limits shown on the Plans or as directed, or Extra Work done without written authorization will be considered as unauthorized, shall be at the expense of the Contractor and will not be measured or paid for by the Owner. Work so done may be ordered removed and replaced at the Contractor's expenses, at the sole discretion of the Engineer.

0.9 WORK SEQUENCE

- A) Construct Work in stages to accommodate Owner's occupancy requirements during the construction period. Coordinate construction schedule and operations with Engineer and Owner. Contractor's bid for the Work shall be based on a projected phasing sequence to accommodate the Owner's occupancy requirements.

0.10 OWNER OCCUPANCY

- A) The Owner will occupy the garage during the entire period of construction. No more than 42 parking spaces may be blocked off for construction purposes during any phase of work. Vehicular access to all levels of the garage must be maintained continuously every day.

- B) Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C) Schedule the Work to accommodate Owner occupancy. All work must be performed between the hours of 8:30 A.M and 4:30 P.M.

0.11 WORK RESTRICTIONS

- A) Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B) Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- C) Noise, Vibration and Odors: Coordinate operations that may result in high levels of noise and vibration, odors or other disruption to Owner occupancy with Owner.
 - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- D) Safety and Health Standards Compliance: The Contractor shall comply (and shall ensure that firms acting as agents or subcontractors to the prime Contractor also comply) with all applicable OSHA Safety and Health Standards for Construction (29CFR1926) and OSHA General Industry Occupational Safety and Health Standards (29CFR1910). Additionally, the Contractor shall comply with all applicable site safety and health requirements. The Owner will provide guidance/consultation regarding specific site requirements.
 - 1. Special Emphasis Standards: While the Contractor is responsible for compliance with all applicable OSHA Safety and Health Standards, special emphasis will be placed upon the following:
 - a. Provide daily monitoring of carbon monoxide in accordance with OSHA and EPA requirements when internal combustion equipment is being used inside the garage. The Contractor shall maintain a log showing daily measured levels which shall be made available to the Engineer and presented at each construction progress meeting. The Contractor shall provide necessary ventilation equipment in order to meet OSHA and EPA requirements.
 - b. Provide dust barriers around work and storage areas and at all openings to interior spaces, storage areas and sensitive machinery or equipment. Dust barriers shall be secured without damage to doors, frames, any other existing materials from the floor to the ceiling where practical and be designed to prevent construction dust and debris from entering the building interior. Dust barriers shall be defined by orange

construction fencing and appropriate safety signage where accessible to pedestrians. Building components affected by general work procedures or work generated dust shall be cleaned or repaired as required to restore the component to its pre-construction condition. Provide fans to collect dust and filter air in the work areas inside of the garage.

- c. Provide filter fabric on all garage fans. Filter fabric must be changed at least once per week whenever dust generating work takes place during that week. Filter fabric on fans inside work areas must be changed twice per week. Contractor must clean all the fans at end of the project and have associated bearings lubricated.

- E) Nonsmoking Campus: Smoking is not permitted anywhere on the property.
- F) Controlled Substances: Use of tobacco products and other controlled substances on the property is not permitted.
- G) Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H) Employee Screening: Comply with Owner's requirements for dug and background screening of Contractor personnel working on Project site.

0.12 RESTORATION AND CLEAN-UP

- A) During the construction period, the Contractor shall, on a daily basis, place all of his waste materials and "non-broomable" debris into containers.
- B) Contractor is responsible to assure that filtration of concrete materials occurs appropriately prior to entering the garage drainage system. Drainage clogged as a result of work shall be remedied immediately by the Contractor at no expense to the Owner. If necessary, concrete runoff and clean solutions shall be treated prior to entering drainage per EPA guidelines. If there is a sump and its condition differs significantly at the end of the project from its condition during the pre-construction survey, the Contractor shall be responsible for any additional charges beyond regular service charges to clean the sump.
- C) Upon completion of the Work and before acceptance and final payment is made, the Work shall be cleaned of all rubbish, excess materials, false work, temporary structures and equipment; and all parts of the Work shall be left in a neat, presentable condition, satisfactory to the Owner. This Work shall be considered incidental to the overall project and no additional compensation will be allowed.

UNDERGROUND PARKING AIR QUALITY SYSTEM TESTING/
CALIBRATION/REPAIR AND REFURBISHMENT OF FANS, PLENUM
AND CONTROL PACKAGES
MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION
DIVISION OF PARKING MANAGEMENT

IFB #1086041

PART 3 - PRODUCTS (Not Used)

PART 4 - EXECUTION (Not Used)

END OF SECTION 010100

SECTION 010350 – MODIFICATION PROCEDURES

PART 5 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedural requirements for handling and processing contract modifications.
- B) Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 01 Section "Unit Prices" for administrative requirements governing use of unit prices.
 - 2. Division 01 Section "Submittals" for requirements for the Contractor's Construction Schedule.
 - 3. Division 01 Section "Application for Payment" for administrative procedures governing applications for payment.
 - 4. Division 01 Section "Product Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

0.3 MINOR CHANGES IN THE WORK

- A) Supplemental instructions authorizing minor changes in the work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Engineer on AIA Form G710, Architect's Supplemental Instructions.

0.4 CHANGE ORDER PROPOSAL REQUESTS

- A) Owner-Initiated Proposal Requests: Proposed changes in the work that will require adjustment to the Contract Sum or Contract Time will be issued by the Engineer, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
 - 1. Proposal requests issued by the Engineer are for information only. Do not consider them an instruction either to stop work in process or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within 20 days of receipt of the proposed request, submit to the Engineer for the Owner's review an estimate of cost unnecessary to execute the proposed change.

- a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the work will have on the Contract Time.
- B) Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Engineer.
 1. Include a statement outlining the reasons for the change and the effect of the change on the work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.
 4. Comply with requirements in Section "Product Substitutions" if the proposed change in the work requires the substitution of one product or system for a product or system specified.
- C) Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests.

0.5 CONSTRUCTION CHANGE DIRECTIVE

- A) Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Engineer may issue a Construction Change Directive on AIA Form G714, instructing the Contractor to proceed with a change in the work, for subsequent inclusion in a Change Order.
 1. The Construction Change Directive will contain a complete description of the change in the work and designate the method to be followed to determine change in the Contract Sum or Contract Time.
- B) Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

0.6 CHANGE ORDER PROCEDURES

- A) Upon the Owner's approval of a Change Order Proposal Request, the Engineer will issue a Change Order for signatures of the Owner and Contractor on AIA Form G701, as provided in the Conditions of the Contract.

PART 6 - PRODUCTS (Not Used)

PART 7 - EXECUTION (Not Used)

END OF SECTION 010350

SECTION 010400 – PROJECT COORDINATION

PART 8 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and supervisory requirements necessary for project coordination, including, but not necessarily limited to:
 - 1. Coordination.
 - 2. Administrative and supervisory personnel.
 - 3. General installation provisions.
 - 4. Cleaning and protection.
- B) Field engineering is included in Section "Field Engineering".
- C) Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings".
- D) Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

0.3 COORDINATION

- A) Coordination: Coordinate construction activities included under various Sections of these specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different Sections of the specifications that are dependent upon each other for proper installation, connection and operation.
 - 1. Where installation of one part of the work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
 - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B) Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports and attendance at meetings.

- C) Administrative Procedures. Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project close-out activities.

0.4 SUBMITTALS

- A) Coordination Drawings: Prepare and submit coordination drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the interrelationship of components shown on separate shop drawings.
2. Indicate required installation sequences.
3. Comply with requirements contained in Section "Submittals".
4. Refer to Division 13 Section "Basic Mechanical Requirements" and Division 16 Section "Basic Electrical Requirements" for specific coordination drawing requirements for mechanical and electrical installations.

- B) Staff Names: Within 15 days of Notice-to-Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

1. Post copies of the list in the project meeting room, the temporary field office and each temporary telephone.

PART 9 - PRODUCTS (Not Used)

PART 10 - EXECUTION

0.1 GENERAL INSTALLATION PROVISIONS

- A) Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B) Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.

- C) Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D) Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
- E) Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Engineer for final decision.
- F) Recheck measurements and dimensions before starting each installation.
- G) Install each component during weather conditions and project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H) Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.
- D) Mounting Heights: Where mounting heights are not indicated, submit, to the Engineer for approval, proposed mounting heights based on standard mounting heights recognized within the industry for the particular application indicated and coordinated with all other installed equipment and system.

0.2 CLEANING AND PROTECTION

- A) During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B) Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C) Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessive internal or external pressures.
 - 3. Excessively high or low temperatures.
 - 4. Thermal shock.
 - 5. Excessive high or low humidity.
 - 6. Air contamination or pollution.
 - 7. Water or ice.
 - 8. Solvents.
 - 9. Chemicals.

10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION 010400

SECTION 010450 – CUTTING AND PATCHING

PART 11 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedural requirements for cutting and patching.
- B) Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the work.
 - 1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division 15 and Division 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.
- C) Demolition of selected portions of the building for alterations is included in Section "Selective Demolition".

0.3 SUBMITTALS

- A) Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
 - 2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform work.
 - 4. Indicate dates when cutting and patching is to be performed.
 - 5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 - 6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

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

0.4 QUALITY ASSURANCE

- A) Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
 1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Lintels.
 - f. Structural decking.
 - g. Stair systems.
 - h. Miscellaneous structural metals.
 - i. Equipment supports.
 - j. Piping, ductwork, vessels and equipment.
- B) Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
- C) Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Owner's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner.
 1. If possible, retain the original installer or fabricator to cut and patch the following categories of exposed work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:
 - a. Processed concrete finishes.
 - b. Ornamental metal.
 - c. Exterior coating system.
 - d. Painted walls.
 - e. Plaza deck paving system.
 - f. HVAC enclosures, cabinets or covers.
 - g. Parking deck membrane system.

PART 12 - PRODUCTS

0.1 MATERIALS

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

PART 13 - EXECUTION

0.1 INSPECTION

- A) Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be preformed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

0.2 PREPARATION

- A) Temporary Support: Provide temporary support of work to be cut.
- B) Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the project that might be exposed during cutting and patching operations.
- C) Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D) Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

0.3 PERFORMANCE

- A) General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B) Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible, review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 3. Cut through concrete and masonry using a cutting machine, such as a carborundum saw or diamond core drill.
 4. Comply with requirements of applicable Sections of Division 2 where cutting and patching requires excavating and backfilling.
 5. By-pass utility services, such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C) Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched area has received primer and second coat.
 4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

0.4 CLEANING

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

END OF SECTION 010450

SECTION 010500 – FIELD ENGINEERING

PART 14 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) General: This Section specifies administrative and procedural requirements for field engineering services, including, but not necessarily limited to, the following:
 - 1. Survey work.
 - 2. Civil engineering services.
 - 3. Concrete formwork and shoring engineering services.

0.3 SUBMITTALS

- A) Certificates: Submit a certificate signed by the land surveyor or professional engineer certifying that the location and elevation of improvements comply with the Contract Documents.
- B) Final Survey: Submit 5 copies of the final property survey.
- C) Project Record Documents: Submit a record of work performed and record survey data as required under provisions of Sections "Submittals" and "Project Closeout".

0.4 QUALITY ASSURANCE

- A) Surveyor: Engage a land surveyor registered in the jurisdiction where the project is located to perform surveying services required.
- B) Engineer: Engage a professional engineer of the discipline required, registered in the jurisdiction in which the project is located, to perform required engineering services.

PART 15 - PRODUCTS (Not Used)

PART 16 - EXECUTION

0.1 EXAMINATION

- A) The Owner will identify existing control points and property line corner stakes.
- B) Verify layout information shown on the drawings, in relation to the survey and existing benchmarks, before proceeding to layout the work. Locate all existing slab edges, openings, depressions, changes in slopes, curbs, etc. prior to beginning demolition. Locate all rails, posts, parking wheelstops, etc. supported by existing slab to facilitate replacement on repaired slab. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
 - 1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
 - 2. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.
- C) Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of utilities and other construction.

0.2 PERFORMANCE

- A) Working from lines and levels established by the survey, establish benchmarks and markers to set lines and levels at each stage of construction and elsewhere as needed to properly locate each element of the project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale drawings to determine dimensions.
 - 1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
 - 2. As construction proceeds, check every major element for line, level and plumb.
- B) Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference.
 - 1. Record deviations from required lines and levels, and advise the Engineer when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
 - 2. On completion of work requiring field engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and site work.

- C) Building Renovations: Locate and lay out building renovations, including slab overlay repairs, utility slopes and invert elevations by instrumentation and similar appropriate means.
- D) Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical work.
- E) Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by, construction. Coordinate with local authorities having jurisdiction.
- F) Final Survey: Before Substantial Completion, prepare a final survey showing significant features (real property) for the project. Include on the survey a certification, signed by the surveyor, to the effect that principal metes, bounds, lines and levels of the project are accurately positioned as shown on the survey.

END OF SECTION 010500

SECTION 010950 – REFERENCE STANDARDS AND DEFINITIONS

PART 17 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) General: Basic Contract definitions are included in the General Conditions.
- B) Indicated: The term "indicated" refers to graphic representations, notes or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms, such as "shown", "noted", "scheduled", and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.
- C) Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases.
- D) Approve: The term "approved", where used in conjunction with the Engineer's action on the Contractor's submittals, applications and requests, is limited to the Engineer's duties and responsibilities as stated in General and Supplementary Conditions.
- E) Regulation: The term "regulations" includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the work.
- F) Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations".
- G) Install: The term "install" is used to describe operations at project site, including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations".
- H) Provide: The term "provide" means "to furnish and install, complete and ready for the intended use".
- I) Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor, for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced" when used with the term "Installer" means having a minimum of 5 previous projects similar in size and scope of this project, being familiar with the precautions required, and having complied with requirements of the authority having jurisdiction.
2. Trades: Use of titles, such as "carpentry", is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter". It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

0.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A) Specification Format: These Specifications are organized into divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTERSPEC numbering system.
- B) Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words and phrases when used in particular situations or circumstances. These conventions are explained as follows:
 1. Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the full context of the Contract Documents so indicates.
 2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the test, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
 - a. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

0.4 INDUSTRY STANDARDS

- A) Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.
- B) Publication Dates: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of Contract Documents.
- C) Conflicting Requirements: Where compliance with two or more standards is specified, and the standards establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the Engineer for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Engineer for a decision before proceeding.
- D) Copies of Standards: Each entity engaged in construction on the project is required to be familiar with industry standards applicable to the entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.
 1. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.
- E) Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.

0.5 GOVERNING REGULATIONS/AUTHORITIES

- A) Contact authorities having jurisdiction directly for information and decisions having a bearing on the work.

0.6 SUBMITTALS

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

PART 18 - PRODUCTS (Not Used)

PART 19 - EXECUTION (Not Used)

END OF SECTION 010950

SECTION 012000 – PROJECT MEETINGS

PART 20 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedural requirements for project meetings, including, but not limited to:
 - 1. Pre-Construction Conference.
 - 2. Progress Meetings.

0.3 PRE-CONSTRUCTION CONFERENCE

- A) Schedule a Pre-Construction Conference and Organizational Meeting at the project site or other convenient location no later than 15 days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B) Attendees: The Owner, Engineer and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.
- C) Agenda: Discuss items of significance that could affect progress, including such topics as:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.
 - 5. Procedures for processing Applications for Payment.
 - 6. Distribution of Contract Documents.
 - 7. Submittal of shop drawings, product data and samples.
 - 8. Preparation of record documents.
 - 9. Use of the premises.
 - 10. Office, work and storage areas.
 - 11. Equipment deliveries and priorities.
 - 12. Safety procedures.

13. First aid.
14. Security.
15. Housekeeping.
16. Working hours.

0.4 PROGRESS MEETINGS

- A) Conduct progress meetings at the project site at two-week intervals. Notify the Owner and Engineer of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B) Attendees: In addition to representatives of the Owner and Engineer, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the project and authorized to conclude matters relating to progress.
- C) Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the project.
 1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 2. Review the present and future needs of each entity present, including such items as:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences.
 - d. Deliveries.
 - e. Off-site fabrication problems.
 - f. Access.
 - g. Site utilization.
 - h. Temporary facilities and services.
 - i. Hours of work.
 - j. Hazards and risks.
 - k. Housekeeping.
 - l. Quality and work standards.
 - m. Change Orders.
 - n. Documentation of information for payment requests.
- D) Reporting: No later than 3 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 21 - PRODUCTS (Not Used)

PART 22 - EXECUTION (Not Used)

END OF SECTION 012000

SECTION 012900 - PAYMENT PROCEDURES

PART 23 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B) Related Requirements:
 - 1. Division 01 Section "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 3. Division 01 Section "Unit Quantity Work Items" for administrative requirements governing the use of unit prices.
 - 4. Division 01 Section "Submittals" for administrative requirements governing the preparation and submittal of Contractor's construction schedule.

0.3 DEFINITIONS

- A) Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

0.4 SCHEDULE OF VALUES

- A) Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.

- c. Items required to be indicated as separate activities in Contractor's construction schedule.
 2. Submit the schedule of values to Engineer at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
- B) Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Engineer.
 - c. Engineer's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Change Orders (numbers) that affect value.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
 7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by

- measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
 10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
 11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

0.5 APPLICATIONS FOR PAYMENT

- A) Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B) Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C) Payment Application Times: Submit Application for Payment to Engineer by the 10th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Engineer.
- D) Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E) Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F) Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G) Transmittal: Submit three signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H) Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I) Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- J) Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire Owner's insurance.
- K) Application for Payment at Substantial Completion: After Engineer issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L) Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.

UNDERGROUND PARKING AIR QUALITY SYSTEM TESTING/
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8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 24 - PRODUCTS (Not Used)

PART 25 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 012900 - PAYMENT PROCEDURES

PART 26 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B) Related Requirements:
 - 1. Division 01 Section "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 3. Division 01 Section "Unit Quantity Work Items" for administrative requirements governing the use of unit prices.
 - 4. Division 01 Section "Submittals" for administrative requirements governing the preparation and submittal of Contractor's construction schedule.

0.3 DEFINITIONS

- A) Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

0.4 SCHEDULE OF VALUES

- A) Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
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 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
- B) Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Engineer.
 - c. Engineer's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
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- C) Payment Application Times: Submit Application for Payment to Engineer by the 10th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Engineer.
- D) Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E) Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F) Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G) Transmittal: Submit three signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H) Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I) Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- J) Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire Owner's insurance.
- K) Application for Payment at Substantial Completion: After Engineer issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L) Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.

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8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 27 - PRODUCTS (Not Used)

PART 28 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013000 – SUBMITTALS

PART 29 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedural requirements for submittals required for performance of the work, including:
 - 1. Contractor's construction schedule.
 - 2. Submittal schedule.
 - 3. Daily construction reports.
 - 4. Shop Drawings.
 - 5. Product data.
 - 6. Samples.
- B) Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
 - 1. Permits.
 - 2. Applications for payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of subcontractors.
- C) The Schedule of Values submittal is included in Section "Applications for Payment".
- D) Inspection and test reports are included in Section "Quality Control Services".

0.3 SUBMITTAL PROCEDURES

- A) Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
 - a. Submittals submitted without the Contractor's approval stamp, where specified in the General Conditions to be reviewed and approved by the Contractor, will be returned without review.
 - b. Allow three weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 - c. If an intermediate submittal is necessary, process the same as the initial submittal.
 - d. Allow two weeks for processing each resubmittal.
 - e. No extension of contract time will be authorized because of failure to transmit submittals or resubmittals to the Engineer sufficiently in advance of the work to permit processing.
- B) Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space approximately 4"x5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 2. Include the following information on the label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate specification section.
 - i. Drawing number and detail references, as appropriate.
- C) Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor

variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

0.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A) Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's Construction Schedule. Submit within 30 days of the date established for "Commencement of the Work".
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the work as indicated in the "Schedule of Values".
 2. Within each time bar, indicate completion percentage in 10 percent increments. As work progresses, place a contrasting mark in each bar to indicate actual completion.
 3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 4. Secure time commitments for performing critical elements of the work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the work.
 5. Coordinate the Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.
 6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Engineer's procedures necessary for certification of Substantial Completion.
- B) Phasing: Provide notations on the schedule to show how the sequence of the work is affected by requirements for phased completion to permit partial occupancy by the Owner prior to Substantial Completion.
- C) Work Stages: Indicate important stages of construction for each major portion of the work, including testing and installation.
- D) Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E) Cost Correlation: At the head of the schedule, provide a two item cost correlation line, indicating "pre-calculated" and "actual" costs. On the line, show dollar-volume of work performed as of the dates used for preparation of payment requests.
1. Refer to Section "Applications for Payment" for cost reporting and payment procedures.
- F) Distribution: Following response to the initial submittal, print and distribute copies to the Engineer, Owner, subcontractors and other parties required to comply with scheduled dates. Post copies in the project meeting room and temporary field office.

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

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

0.5 SUBMITTAL SCHEDULE

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

1. Coordinate submittal schedule with the list of subcontracts, schedule of values and list of products as well as the Contractor's Construction Schedule.
2. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:
 - a. Schedule date for the first submittal.
 - b. Related Section number.
 - c. Submittal category.
 - d. Name of subcontractor.
 - e. Description of the part of the work covered.
 - f. Scheduled date for resubmittal.
 - g. Scheduled date of the Engineer's final release or approval.

- B) Distribution: Following response to initial submittal, print and distribute copies to the Engineer, Owner, subcontractors and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.

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

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

0.6 DAILY CONSTRUCTION REPORTS

- A) Prepare a Daily Construction Report, recording the following information concerning events at the site, and submit duplicate copies to the Engineer at weekly intervals:

1. List of subcontractors at the site.
2. Approximate count of personnel at the site.
3. High and low temperatures, general weather conditions.
4. Accidents and unusual events.

5. Meetings and significant decisions.
6. Stoppages, delays, shortages, losses.
7. Meter readings and similar recordings.
8. Emergency procedures.
9. Orders and requests of governing authorities.
10. Change Orders received, implemented.
11. Services connected, disconnected.
12. Equipment or system tests and start-ups.
13. Partial completions, occupancies.
14. Substantial Completions authorized.

0.7 SHOP DRAWINGS

- A) Submit newly prepared information, drawn to accurate scale. Highlight, encircle or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the project is not considered Shop Drawings.
- B) Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 1. Dimensions.
 2. Identification of products and materials included.
 3. Compliance with specified standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
 6. Sheet Size: Except for templates, patterns and similar full-size drawings, submit Shop Drawings on sheets at least 8½"x11", but no larger than 36"x48".
 7. Initial Submittal and Resubmittal: Submit two correctable translucent reproducible print and four blue- or black-line prints for the Engineer's review. Upon completion of review, the Engineer will return one reproducible print and one blue- or black-line print to the Contractor; one reproducible and one print to the Owner and retain two prints for his use.
 8. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- C) Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
 1. Preparation of coordination drawings is specified in Section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.
 2. Submit coordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

0.8 PRODUCT DATA

- A) Collect Product Data into single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings".
1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 - g. Structural load capacities, if applicable.
 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 3. Preliminary Submittal: Submit a preliminary two copies (minimum) of Product Data where selection of options is required.
 4. Submittals: Submit six copies of each required submittal. The Engineer will retain two copies and will return two copies to the Contractor and two copies to the Owner marked with action taken and corrections or modifications required.
 5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until an approved copy of Product Data applicable is in the installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

0.9 SAMPLES

- A) Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets and swatches showing color, texture and pattern.
1. Mount, display or package Samples in the manner specified to facilitate review of qualities indicated. Include the following:
 - a. Generic description of the Sample.

- b. Sample source.
 - c. Product name or name of manufacturer.
 - d. Compliance with recognized standards.
 - e. Availability and delivery time.
 2. Submit Samples for review of kind, color, pattern and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3) that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
 3. Preliminary Submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
 - a. Preliminary submittals will be reviewed and returned with the Engineer's mark indicating selection and other action.
 4. Submittals: Except for Samples illustrating assembly details, workmanship,, fabrication techniques, connections, operation and similar characteristics, submit four sets; one will be returned marked with the action taken.
 5. Maintain sets of Samples, as returned, at the project site for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B) Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers and others as required for performance of the work. Show distribution on transmittal forms.
1. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the work will be judged.
 - a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

0.10 ENGINEER'S ACTION

- A) Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B) Action Stamp: The Engineer will distribute the submittal to design professional responsible for review of the submittal information who will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
 - 1. Final Unrestricted Release: Where submittals are marked "Approved", that part of the work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 - 2. Final-But-Restricted Release: When submittals are marked "Approved as Noted", that part of the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
 - 3. Returned for Resubmittal: When submittal is marked "Disapproved", do not proceed with that part of the work covered by the submittal, including purchase, fabrication delivery or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat, if necessary, to obtain a different action mark.
 - a. Do not permit submittals marked "Disapproved" to be used at the project site or elsewhere where work is in progress.
 - 4. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required" or "Reviewed for Information".

PART 30 - PRODUCTS (Not Used)

PART 31 - EXECUTION (Not Used)

END OF SECTION 013000

SECTION 014000 – QUALITY CONTROL SERVICES

PART 32 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedural requirements for quality control services.
- B) Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities and the Contractor. They do not include contract enforcement activities performed by the Engineer.
- C) Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- D) Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - 1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
 - 2. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for the Contractor to provide quality control services required by the Engineer, Owner or authorities having jurisdiction are not limited by provisions of this Section.

0.3 RESPONSIBILITIES

- A) Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

1. The Contractor shall employ and pay an independent agency to perform specified quality control services.
 2. The Owner will engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibility.
 - a. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the work and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
 3. Retesting: Where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements requiring revisions to, or replacement of, construction, the revised or replaced construction shall be retested by the inspection agency which performed the original inspection.
 - a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
 4. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to:
 - a. Providing access to the work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 - b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 - c. Providing facilities for storage and curing of test samples and delivery of samples to testing laboratories.
 - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 - e. Security and protection of samples and test equipment at the project site.
 - f. Maintaining at the job site, and providing access to, up-to-date record copies of Contract Documents, Addendums, Change Orders, Directives, Correspondence, Approved Shop Drawings, Samples and any other information which affects the work required to be inspected by the agency.
 - g. Providing to the agency, one copy of Contract Documents, Addendums, Change Orders, Directives, Correspondence or Approved Shop Drawings which affects the work required to be inspected by the agency regardless of who pays the agency.
- B) Owner Responsibilities: The Owner will provide inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. Costs for these services are not included in the Contract Sum.

1. The Owner will employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform services which are the Owner's responsibility.
- C) Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Engineer and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
 1. The agency shall notify the Engineer and Contractor promptly of irregularities or deficiencies observed in the work during performance of its services.
 2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents or approve or accept any portion of the work.
 3. The agency shall not perform any duties of the Contractor.
- D) Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition, the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
 1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

0.4 SUBMITTALS

- A) The independent testing agency shall submit a certified written report of each inspection, test or similar service to the Engineer, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certificate written report of each inspection, test or similar service through the Contractor, in duplicate.
 1. Submit additional copies of each written report directly to the Owner and to the governing authority, when the authority so directs.
 2. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and an interpretation of test results.
 - j. Ambient conditions at the time of sample taking and testing.
 - k. Comments or professional opinion as to whether inspected or testing work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.

- m. Recommendations on retesting.
- n. Name, signature and seal of registered professional engineer responsible for certification of results.

0.5 QUALITY ASSURANCE

- A) Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are pre-qualified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
 - 1. Each independent inspection and testing agency engaged on the project shall be authorized by authorities having jurisdiction to operate in the state in which the project is located.
 - 2. The work of each agency shall be performed under the direction and control of a professional Engineer registered in the project's jurisdiction.

PART 33 - PRODUCTS (Not Used)

PART 34 - EXECUTION

0.1 REPAIR AND PROTECTION

- A) General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching".
- B) Protect construction exposed by or for quality control service activities and protect repaired construction.
- C) Repair and protection is the Contractor's responsibility regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 014000

SECTION 015000 – TEMPORARY FACILITIES

PART 35 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B) Temporary utilities required include, but are not limited to:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Telephone service.
- C) Temporary construction and support facilities required include, but are not limited to:
 - 1. Temporary heat.
 - 2. Field offices and storage sheds.
 - 3. Sanitary facilities, including drinking water.
 - 4. Dewatering facilities and drains.
 - 5. Temporary enclosures.
 - 6. Hoists and temporary elevator use.
 - 7. Temporary project identification signs and bulletin boards.
 - 8. Waste disposal services.
 - 9. Rodent and pest control.
 - 10. Construction aids and miscellaneous services and facilities.
- D) Security and protection facilities required include, but are not limited to:
 - 1. Temporary fire protection.
 - 2. Barricades, warning signs, lights.
 - 3. Sidewalk bridge or enclosure fence for the site.
 - 4. Environmental protection.

0.3 SUBMITTALS

- A) Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.
- B) Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the work.

0.4 QUALITY ASSURANCE

- A) Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including, but not limited to:
 - 1. Building code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, fire department and rescue squad rules.
 - 5. Environmental protection regulations.
 - 6. The Owner's regulations and policies.
- B) Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities".
 - 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
 - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C) Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

0.5 PROJECT CONDITIONS

- A) Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility.
- B) Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions or public nuisances to develop or persist on the site.

PART 36 - PRODUCTS

0.1 MATERIALS

- A) General: Provide new materials, if acceptable to the Engineer; undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B) Lumber and Plywood:
 - 1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire-treated lumber and plywood for framing, sheathing and siding.
 - 2. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thicknesses indicated.
 - 3. For fences and vision barriers, provide exterior type, minimum $\frac{3}{8}$ " thick plywood.
 - 4. For safety barriers, sidewalk bridges and similar uses, provide minimum $\frac{5}{8}$ " thick exterior plywood.
- C) Paint:
 - 1. For job-built temporary offices, shops, sheds, fences and other exposed lumber and plywood, provide exterior grade acrylic-latex emulsion over exterior primer.
 - 2. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.
- D) Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire-retardant tarpaulins.
- E) Water: Provide potable water approved by local health authorities.
- F) Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand and galvanized steel pipe posts, $1\frac{1}{2}$ " I.D. for line posts and $2\frac{1}{2}$ " I.D. for corner posts.

0.2 EQUIPMENT

- A) General: Provide new equipment; if acceptable to the Engineer; undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for intended use.
- B) Water Hoses: Provide $\frac{3}{4}$ " heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
- C) Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

- D) Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- E) Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F) Heating Units: Provide temporary heating units, if required, that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
- G) Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H) Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.
- I) First Aid Supplies: Comply with governing regulations.
- J) Fire Extinguishers: Provide hand-carried, portable UL-rate, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
 - 1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 37 - EXECUTION

0.1 INSTALLATION

- A) Use qualified personnel for installation of temporary facilities. Locate facilities in areas acceptable to the Owner where they will serve the project adequately and result in minimum interference with performance of the work. Relocate and modify facilities as required.
- B) Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

0.2 TEMPORARY UTILITY INSTALLATION

- A) General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder

with matching, compatible materials and equipment; comply with the company's recommendations.

1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 3. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.
 4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer, and will not be accepted as a basis of claims for a Change Order.
- B) Water Service: Install water service and distribution piping of sizes and pressures adequate for construction.
1. Sterilization: Sterilize temporary water piping prior to use.
- C) Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.
1. Power Distribution System: Install wiring where least exposed to damage. Where permitted, wiring circuits not exceeding 125 volts, AC 20 ampere rating and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
 2. Emergency Power System: Provide a temporary emergency power system to operate emergency egress lighting and other equipment during disruptions to the normal power supply as required by the local authorities.
- D) Temporary Lighting: Provide temporary lighting with local switching.
1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations, traffic conditions and emergency egress.
- E) Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Install telephone on a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.
- F) Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.
1. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge. Treat effluent

- to achieve alkalinity level acceptable to the officials having authority for the system receiving the discharge.
- 2. Connect temporary sewers to the system as directed by the Owner or the officials having authority for that system.
- 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

- G) Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.
- H) Provide temporary ventilation system to remove dust and fumes from construction area while providing fresh air to maintain a safe environment for the construction personnel and building occupants.

0.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A) Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access in areas acceptable to the Owner.
 - 1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B) Provide incombustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.
- C) Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
- D) Heating Facilities: Provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open flame or salamander-type heating units is prohibited.
- E) Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as required for Contractor's operations.
- F) Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully-enclosed spaces within the building or elsewhere on the site at locations approved by the Owner.

- G) Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the project's needs in areas approved by the Owner.
 - 1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
 - 2. Toilets. Use of the Owner's existing toilet facilities will not be permitted.
- H) Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
- I) Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
- J) Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper supply.
 - 1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55° F (7 to 13° C).
- K) Food and Beverage Facilities: Provide adequate safe and clean areas within staging or construction areas for the construction personnel's storage and consumption of food and beverages.
 - 1. Food and beverage vending machines may be installed at the Contractor's expense in areas approved by the Owner.
 - 2. All areas designated as food and beverage facilities must be kept clean and all trash removed daily.
- L) Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
- M) Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities and as noted on the drawings.
 - 1. Where heat is needed, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 - 2. Install tarpaulins securely with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
 - 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

4. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.
- N) Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- O) Temporary Elevator Use: Do not use elevators for construction activities or access unless otherwise authorized by the Owner.
- P) Project Identification and Temporary Signs: Prepare project signs of adequate size to maintain traffic control and emergency egress. Install signs where indicated to inform the public and persons utilizing the project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.
1. Project Identification Signs: Project identification signs are not permitted.
 2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
 3. Traffic Control: Provide adequate signage to maintain a safe temporary traffic pattern in occupied areas of the garage as noted on the drawings. Cover permanent traffic markings as required to avoid conflicting directions.
 4. Emergency Egress: Provide signs to clearly denote temporary emergency egress paths during construction.
- Q) Temporary Exterior Lighting: Install exterior yard and sign lights so that signs are visible when work is being performed.
- R) Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80° F. Handle hazardous, dangerous or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
- S) Stairs: Existing stairs shall not be used for transportation of construction material. Construction personnel may use the stairs for access between levels only when use of ramps is unfeasible and approval is given by the Owner. The Contractor shall keep the stairs continuously clean of dirt and debris.
- T) Ramps: Existing ramps shall be used for transportation of construction materials, personnel, equipment and debris. Follow the traffic patterns posted and yield the right-of-way to the public vehicles and pedestrians in the garage. Immediately clean up any spillage of material or debris.
- U) Construction Aids: Scaffolding, platforms, swing stages, ramps, waste chutes and similar construction aids required for construction shall be designed by the Contractor to meet all applicable codes and shall be constructed in a safe manner in locations acceptable to the Owner.

0.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A) Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Engineer.
- B) Temporary Fire Protection: If construction requires the temporary disruption of permanent fire protection facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations".
 - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
 - 4. Provide supervision of welding operations, combustion-type temporary heating units and similar sources of fire ignition.
- C) Permanent Fire Protection: At the earliest feasible date in each area of the project, restore use of the permanent fire protection facility, including connected services.
- D) Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- E) Enclosure Fence: When excavation or demolition begins, install an enclosure fence with lockable entrance gates. Locate where indicated or enclose the portion of the site determined sufficient to accommodate construction operations. Install in a manner that will prevent vehicles, people, dogs and other animals from easily entering the site, except by the entrance gates.
 - 1. Provide open-mesh, chain-link fencing or plywood partition as noted on the drawing. Maintain the enclosure walls erected for demolition as specified in Section 02070 for use through all construction activities.
- F) Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security. Arrange security enclosures to maintain adequate emergency egress paths as required by the Owner and/or governing authority.
 - 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

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

0.5 OPERATION, TERMINATION AND REMOVAL

- A) Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B) Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Protection: Prevent water-filled piping from freezing. Protect from damage during construction operations.
- C) Termination and Removal: Unless the Engineer requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of project identification signs.
 - 2. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including, but not limited to:
 - a. Replace air filters and clean inside of ductwork and housings.
 - b. Replace significantly worn parts and parts that haven subject to unusual operating conditions.
 - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION 015000

SECTION 016000 – MATERIALS AND EQUIPMENT

PART 38 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the project.
- B) The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals".
- C) Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- D) Administrative procedures for handling requests for substitutions made after award of the contract are included under Section "Product Substitutions".

0.3 DEFINITIONS

- A) Definitions used in this article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "systems", "structure", "finishes", "accessories" and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.
 - 1. "Products" are items purchased for incorporation in the work, whether purchased for the project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system" and terms of similar intent.
 - a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature that is current as of the date of the Contract Documents.
 - b. "Foreign Products", as designated from "domestic products", are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of nor living within the United States and its possessions.

2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished or otherwise fabricated, processed or installed to form a part of the work.
3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

0.4 SUBMITTALS

A) Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Engineer. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate the product list schedule with the Contractor's Construction Schedule and the Schedule of Submittals.
2. Form: Prepare the product listing schedule with information on each item tabulated under the following column headings:
 - a. Related Specification Section number.
 - b. Generic name used in Contract Documents.
 - c. Proprietary name, model number and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.
 - g. Projected delivery date or time span of delivery period.
3. Initial Submittal: Within 30 days after date of commencement of the work, submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data and for known variations from contract requirements.
 - a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the contract period.
4. Completed Schedule: Within 60 days after date of commencement of the work, submit 3 copies of the completed product list schedule. Provide a written explanation for omissions of data and for known variations from contract requirements.
5. Engineer's Action: The Engineer will respond in writing to the Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of this requirement that products comply with Contract Documents. The Engineer's response will include the following:
 - a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

0.5 QUALITY ASSURANCE

- A) Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
- B) Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C) Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
 - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

0.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A) Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
 - 1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged or sensitive to deterioration, theft and other losses.
 - 3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
 - 4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
 - 5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
 - 6. Store heavy materials away from the project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 39 - PRODUCTS

0.1 PRODUCT SELECTION

- A) General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
 1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
 2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B) Product Selection Procedures: Product selection is governed by the Contract Documents and governing relations, not by previous project experience. Procedures governing product selection include the following:
 1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
 2. Semi-Proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.
 - a. Where products or manufacturers are specified by name, accompanied by the term "or equal" or "or approved equal", comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
 3. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the work, but do not restrict the Contractor to use of these products only, the Contract may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
 4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with contract requirements.
 5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.

- a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.
6. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
7. Visual Matching: Where Specifications require matching an established Sample, the Engineer's decision will be final on whether a proposed product matches satisfactorily.
 - a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.
8. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Engineer will select the color, pattern and texture from the product line selected.

PART 40 - EXECUTION

0.1 INSTALLATION OF PRODUCTS

- A) Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work.
 1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 016000

SECTION 160600 – GENERAL ELECTRICAL REQUIREMENTS, MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 WORK INCLUDED

- A. Provide all materials, labor, equipment and services necessary to modify, furnish and install all electrical items noted in this specification or on the construction drawings.

1.3 RELATED WORK

- A. The following work is related to this Section:
 - 1. Selective Demolition Section 020700
 - 2. Concrete Repairs Section 033500
- B. Coordinate all work specified in this Division with the work of all other trades required for project.
- C. Locate, identify and protect other services passing through demolition area and serving other areas outside the demolition limits.

1.4 SYSTEM DESCRIPTION

- A. Prior to submitting Bid for the work specified in this Division, review Contract Documents, including as they related to the work of all other trades required for the project. All fees and costs necessary to work electrical modifications into the project shall be included in the Bid. No subsequent extras will be allowed for materials and labor not included by Bidder for electrical work due to lack of familiarity with Contract Documents, including as they related to the work of all other trades.
- B. Drawings are generally diagrammatic and indicative of the work to be installed. Do not scale drawings; determine from field measurements.
- C. Visit the site prior to Bidding. Review existing field conditions for location of panels, fixtures and other electrical work. Notify the Engineer immediately, and confirm in writing, of any conflicts.

- D. Electrical circuits within the slab may not necessarily only serve the electrical system within the parking garage. These circuits are included in the scope of this work and must be traced and relocated with the other circuits.
- E. The Contractor shall install and connect all equipment and materials in accordance with the best engineering practice and, unless otherwise shown or specified, follow the manufacturer's instructions and recommendations and furnish and install all required auxiliary items complete.
- F. It is not possible to indicate all offsets or fittings which may be required. Plan accordingly, furnishing such offsets and fittings as may be required to install the work without interferences with other items.
- G. Permits: Take out all necessary permits, arrange for all required inspections and pay all fees and expenses associated with performing electrical work.

1.5 QUALITY ASSURANCE

- A. Workmanship, equipment, materials and testing shall conform to the requirements of the latest specifications of:
 - 1. American National Standards Institute (ANSI).
 - 2. American Society for Testing and Materials (ASTM).
 - 3. National Fire Protection Association (NFPA).
 - 4. Underwriters' Laboratories, Inc. (UL).
 - 5. National Electric Code (NEC).
 - 6. All local, state and federal rules and regulations.
 - 7. Public utilities within the jurisdiction.
- B. If any change in the drawings and specifications is required to comply with local regulations, notify Engineer at least 5 days before Bids are to be submitted. After entering into contract, Contractor will be held to complete all work necessary to meet local requirements without extra expense to Owner.
- C. Complete testing as required by local jurisdictions or to verify the system is functioning properly.
- D. All equipment installed shall be new and shall conform in all respects to the latest approval standards of IEEE, ANSI, NEMA and Underwriters' Laboratories, Inc. (unless indicated otherwise).
- E. The Contractor shall notify the Owner when the project is approximately 75% complete in order to schedule a pre-final review of construction. Final review shall be scheduled at 100% completion. All punch list items must be accomplished prior to final acceptance.

1.6 SUBMITTALS

- A. Submit shop drawings and manufacturer's catalog sheets. Include:

1. Switch and fixture layout.
2. Panel modifications and circuitry.

- B. Submit a schedule outlining operations as coordinated with other trades.
- C. At completion of construction, submit all testing and inspection certificates.

1.7 DELIVERY AND STORAGE

- A. Deliver materials to project in good condition. Store materials off-ground and protected from elements.

1.8 EXISTING CONDITIONS

- A. Verify existing field conditions for location of panels, fixtures, circuitry and other electrical work.
- B. Verify dimensions in the field prior to beginning work. Verify calling heights or other architectural and structural conditions before installing any work.
- C. Notify Engineer, in writing, of any difference which may be found before proceeding with work.
- D. Maintain a minimum clearance of 6'-8" between top of slab and all overhead work at the lowest point, including fittings and fixtures.

1.9 WARRANTY

- A. Furnish, to the Owner, a written guarantee against defects in materials, workmanship for all equipment and materials furnished and for entire workmanship of installation for period of one year from date of acceptance of the work.
- B. Repair all defects in workmanship or material provided under this Section during the guarantee period and without expense to Owner.

1.10 BASIS OF PAYMENT

- A. All quantities shall be paid based on the unit of measure specified in Section 01026, Unit Prices. Where no unit price is specified, it shall be paid based on lump sum agreed to under the conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Raceways, Boxes and Conduits:

1. Outdoors (in Garage) Wiring Methods: Using the following wiring methods:

- a. Exposed: Rigid or intermediate metal conduit.
- b. Concealed: Rigid or intermediate metal conduit.
- c. Boxes and Enclosures: NEMA Type 3R or Type 4.

B. Wire and Cable: All conductors shall be copper, minimum #10, with 600 volt type "THHN-THWN" insulation. Conductors shall be stranded.

C. ELECTRICAL IDENTIFICATION

1. Conductor Color Coding: Provide color coding for feeders and branch circuit conductors as follows:

<u>208/120 Volts</u>	<u>Phase</u>	<u>480/277 Volts</u>
Black	A	Yellow
Red	B	Brown
Blue	C	Orange
White	Neutral	Gray
Green	Ground	Green

D. Grounding: All circuits shall contain an insulated ground conductor.

E. Panel Boards: Panel board shall be equal to Square D Type NEHB, unless otherwise noted.

PART 3 - EXECUTION

3.1 GENERAL

A. Inspect areas to receive the work and report immediately, in writing to the Engineer as required in the General Conditions, any deficiencies which render it unsuitable for proper execution of this work. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of work implies acceptance of related work.

B. Coordinate with related work.

3.2 PREPARATION/INSTALLATION

- A. Schedule work so as to coordinate with other contractors.
- B. Provide temporary services for lighting and power equipment (drills, saws, etc.). Verify temporary requirements with General Contractor. Temporary lighting and power shall meet OSHA requirements and local code.
- C. Unless specifically noted on the plans, remove all lighting, switches and associated circuitry. Circuitry to be removed shall be conductors and any exposed raceways, including all raceway that becomes exposed when removal of walls, ceilings and deteriorated concrete. Not all devices to be removed are shown on plans.

Fixtures to be reused shall be clean before inspection. The lamp fixtures having defective lamps with lamps furnished by Owner.

Unless specifically noted on the plans, all circuitry, equipment, devices, etc., not noted as existing to remain or to be relocated, shall be new. Remove all devices and circuitry not being reused.

- D. Install circuitry to occupy a minimum of space. Install parallel and close to walls, ceilings, columns or other members.
- E. Where possible, locate all runs in areas which are out of direct public view.
- F. Support Devices.
 - 1. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements and any additional local codes.
 - 2. Coordinate with the building structural system and with other electrical installations.
- G. Grounding: Ground electrical systems and equipment in accordance with NEC, except where grounding in excess of NEC requirements is indicated.
- H. Panel Boards: Panel board circuiting shall meet code requirements. Circuiting changes must be approved by the Owner.
- I. All abandoned conduit in sound concrete shall have the conductors removed and be grouted solid over the length of the conduit. Refer to Section 03350.
- J. Cleanup: At completion of work under this Contract, remove from site and dispose of all rubbish and discarded materials and restore disturbed facilities and surfaces.

3.3 FINAL TESTING

- A. At the time of final inspection and tests, all connections at panel boards, devices and equipment and all splices must be completed. Each branch circuit and its respective connected equipment must test free of short circuits.

END OF SECTION 160600

SECTION 016310 – PRODUCT SUBSTITUTIONS

PART 41 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedural requirements for substitutions made after award of the contract.
- B) The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals".
- C) Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- D) Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment".

0.3 DEFINITIONS

- A) Definitions used in this article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B) Substitutions: Requests for changes in products, materials, equipment and methods of construction required by Contract Documents proposed by the Contractor after award of the contract are considered requests for "substitutions". The following are not considered substitutions:
 - 1. Substitutions requested by bidders during the bidding period, and accepted prior to award of contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to Contract Documents requested by the Owner or Engineer. Specified options of products and construction methods included in Contract Documents.
 - 3. The Contractor's determination of, and compliance with, governing regulations and orders issued by governing authorities.

0.4 SUBMITTALS

- A) Substitution Request Submittal: Requests for substitution will be considered if received within 60 days after commencement of the work. Requests received more than 60 days after commencement of the work may be considered or rejected at the discretion of the Engineer.
1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
 2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related specification Section and drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate.
 - a. Product data, including drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the work specified. Significant qualities may include elements, such as size, weight, durability, performance and visual effect.
 - d. Coordination information, including a list of changes or modifications needed to other parts of the work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall contract time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
 3. Engineer's Action: Within two weeks of receipt of the request for substitution, the Engineer will request additional information or documentation necessary for evaluation of the request. Within 3 weeks of receipt of the request, or 2 weeks of receipt of the additional information or documentation, whichever is later, the Engineer will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form a Change Order.

PART 42 - PRODUCTS

0.1 SUBSTITUTIONS

- A) Conditions: The Contractor's substitution request will be received and considered by the Engineer when one or more of the following conditions are satisfied, as determined by the Engineer;

otherwise requests will be returned without action, except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of Contract Documents.
 3. The request is timely, fully documented and properly submitted.
 4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
 5. The specified product or method of construction cannot be provided within the contract time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the work promptly or coordinate activities properly.
 6. The specified product or method of construction cannot receive necessary approval by a governing agency, and the requested substitution can be approved.
 7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
- B) The Contractor's submittal and Engineer's acceptance of shop drawings, product data or samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 43 - EXECUTION (Not Used)

END OF SECTION 016310

SECTION 017000 – PROJECT CLOSEOUT

PART 44 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedure requirements for project closeout, including, but not limited to:
 - 1. Substantial completion procedures.
 - 2. Final completion procedures.
 - 3. Submittal of warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B) Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 02 through 16.
- C) Related Requirements:
 - 1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 2. Section 017200 "Project Record Documents" for submitting Record Drawings, Record Specifications and Record Product Data.

0.3 SUBSTANTIAL COMPLETION

- A) Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.

2. Advise Owner of pending insurance change-over requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage surveys and similar final record information.
5. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
6. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials and similar items, and deliver to location designed by Owner. Label with manufacturer's name and model number.
7. Submit testing, adjusting and balancing records.
8. Submit changeover information related to Owner's occupancy, use, operation and maintenance.
9. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
10. Complete start-up testing of systems and instruction of the Owner's operating and maintenance personnel.
11. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups and similar elements.
12. Perform preventative maintenance on equipment used prior to Substantial Completion.
13. Instruct Owner's personnel in operation, adjustment and maintenance of products, equipment and systems.
14. Participate with Owner in conducting inspection and walk-through with local emergency responders.
15. Complete final clean-up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B) Inspection Procedures: On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Engineer will repeat inspection when requested and assured that the work has been substantially completed.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

0.4 FINAL COMPLETION PROCEDURES

A) Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Engineer.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
8. Submit final project photographs damage or settlement survey and similar final record information.

B) Re-Inspection Procedure: The Engineer will re-inspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Engineer.

1. Upon completion of re-inspection, the Engineer will prepare a certificate of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled, but are requested for final acceptance.
2. If necessary, re-inspection will be repeated.

0.5 SUBMITTAL OF PROJECT WARRANTIES

- A) Time of Submittal: Submit written warranties on request of Owner for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B) Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C) Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D) Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1. Submit by email to Owner.

E) Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½ by 11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of the installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project name and name of Contractor.

F) Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 45 - PRODUCTS (Not Used)

PART 46 - EXECUTION

0.1 FINAL CLEANING

- A) General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".
- B) Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
 1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion:
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth even-textured surface.
 - f. Remove tools, construction equipment, machinery and surplus material from Project site.

- g. Remove snow and ice to provide safe access to building.
 - h. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - i. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers and grills.
 - j. Clean ducts, blower and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA ACR. Provide written report on completion of cleaning.
 - k. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
- C) Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.
- D) Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
- 1. Where extra materials or value remaining after completion of associated work have become the Owner's property, arrange for disposition of these materials as directed.

0.2 REPAIR OF THE WORK

- A) Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B) Repair, or remove and replace, defective construction. Repair includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
- 1. Remove and replace chipped, scratched and broken glass, reflective surfaces and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impeded operation or reduce longevity.

4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017000

SECTION 017200 – PROJECT RECORD DOCUMENTS

PART 47 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) This Section specifies administrative and procedure requirements for Project Record Documents.
- B) Project Record Documents required include:
 - 1. Marked-up copies of Contract Drawings.
 - 2. Marked-up copies of Shop Drawings.
 - 3. Newly prepared drawings.
 - 4. Marked-up copies of specifications, addenda and change orders.
 - 5. Marked-up product data submittals.
 - 6. Record samples.
 - 7. Field records for variable and concealed conditions.
 - 8. Record information on work that is recorded only schematically.
- C) Specific record copy requirements that expand requirements of this Section are included in the individual sections of Divisions 02 through 16.
- D) General project closeout requirements are included in Section 017000 "Project Closeout".
- E) General requirements for submittal of Project Record Documents are included in Section 013000 "Submittals".
- F) Maintenance of Documents and Samples: Store record documents and samples in the field office apart from Contract Documents used for construction. Do not permit Project Record Documents to be used for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and samples available at all times for inspection by the Engineer.

0.3 RECORD DRAWINGS

- A) Mark-Up Procedure: During the construction period, maintain a set of blue- or black-line white-prints of Contract Drawings and Shop Drawings for Project Record Document purposes.

1. Mark these drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements which would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to:
 - a. Dimensional changes to the drawings.
 - b. Revisions to details shown on the drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Duct size and routing.
 - h. Locations of concealed internal utilities.
 - i. Changes made by Change Order.
 - j. Details not on original Contract Drawings.
 - k. Locations and quantities of concrete repairs.
- B) Mark completely and accurately record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
 1. Mark record sets with red erasable colored pencil; use other colors to distinguish between changes for difference categories of the work at the same location.
 2. Mark important additional information which was either shown schematically or omitted from original drawings.
 3. Note construction change directive numbers, alternate numbers, Change Order numbers and similar identification.
 4. Responsibility for Mark-Up: Where feasible, the individual or entity who obtained record data, whether the individual or entity is the installer, subcontractor or similar entity, is required to prepare the mark-up on record drawings.
 - a. Accurately record information in an understandable drawing technique.
 - b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
- C) Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Engineer. When authorized, prepare full sets of corrected digital data files of the Contract Drawings, as follows:
 1. Format: One set in the same digital data software program, version and operating system as the original Contract Drawings and one set in PDF format.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw and add details and notations where applicable.
 3. Refer instances of uncertainty to Engineer for resolution.
 4. Engineer will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.

- a. Engineer will provide data file layer information. Record markups in separate layers.
 5. Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet as follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS".
 - d. Name of Engineer.
 - e. Name of Contractor.
 6. Submit record digital data files in both formats on a digital storage media.
- D) Newly Prepared Record Drawings: Prepare new drawings instead of following procedures specified for preparation of record drawings where new drawings are required by a Change Order issued as a result of acceptance of an alternate, substitution or other modification, and the Engineer determines that neither the original Contract Drawings nor Shop Drawings are suitable to show the actual installation.
1. Consult with the Engineer for the proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. When completed and accepted, integrate newly prepared drawings with procedures specified for organizing, copying, binding and submittal of record drawings.

0.4 RECORD SPECIFICATIONS

- A) During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.
1. Mark the specifications to indicate the actual installation where the installation varies substantially from that indicated in specifications and modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options and information on concealed installations that would be difficult to identify or measure and record later.
 - a. In each specification section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
 - b. Record the name of the manufacturer, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with record product data submittals and maintenance materials.
 - c. Note related record product data, where applicable. For each principal product specified, indicate whether record product data has been submitted in maintenance manual instead of submitted as record product data.
 2. Upon completion of mark-up, submit record specifications to the Engineer for Owner's records.

0.5 RECORD PRODUCT DATA

- A) During the construction period, maintain one copy of each Product Data Submittal for Project Record Document purposes.
1. Mark product data to indicate the actual product installation where the installation varies substantially from that indicated in product data submitted. Include significant changes in the product delivered to the site and change in manufacturer's instructions and recommendations for installation.
 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 3. Note related Change Orders and mark-up of record drawings, where applicable.
 4. Upon completion of mark-up, submit a complete set of record product data to the Engineer for the Owner's records.
 5. Where record product data is required as part of maintenance manuals, submit marked-up product data as an insert in the manual instead of submittal as record product data.

0.6 RECORD SAMPLE SUBMITTAL

- A) Immediately prior to date of Substantial Completion, the Contractor shall meet with the Engineer and, if desired, the Owner's personnel at the site to determine which of the samples maintained during the construction period shall be transmitted to the Owner for record purposes. Comply with the Engineer's instructions for packaging, identification marking and delivery to Owner's sample storage space. Dispose of other samples in manner specified for disposal of surplus and waste materials.

0.7 MISCELLANEOUS RECORD SUBMITTALS

- A) Refer to other specification sections for miscellaneous recordkeeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Architect for the Owner's records.
1. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
 - a. Field records on excavations and foundations.
 - b. Field records on underground construction and similar work.
 - c. Survey showing locations and elevations of underground lines.
 - d. Invert elevations of drainage piping.
 - e. Surveys establishing building lines and levels.
 - f. Authorized measurements utilizing unit prices or allowances.
 - g. Records of plant treatment.
 - h. Ambient and substrate condition tests.
 - i. Certifications received in lieu of labels on bulk products.
 - j. Batch mixing and bulk delivery records.

- k. Testing and qualification of tradesmen.
- l. Documented qualification of installation firms.
- m. Load and performance testing.
- n. Inspections and certifications by governing authorities.
- o. Leakage and water-penetration tests.
- p. Final inspection and correction procedures.

PART 48 - PRODUCTS (Not Used)

PART 49 - EXECUTION

0.1 RECORDING

- A) Post changes and modifications to the documents as they occur. Do not wait until the end of the project. The Engineer will periodically review record documents to assure compliance with this requirement.

END OF SECTION 017200

SECTION 017400 – WARRANTIES AND BONDS

PART 50 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) General: This Section specifies administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties.
 - 1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
 - 2. General closeout requirements are included in Section "Project Closeout".
 - 3. Specific requirements for warranties for the work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions 02 through 16.
 - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B) Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

0.3 DEFINITIONS

- A) Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B) Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

0.4 WARRANTY REQUIREMENTS

- A) Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.
- B) Reinstatement of Warranty: When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C) Replacement Cost: Upon determination that work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life.
- D) Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights or remedies.
 - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E) The Owner reserves the right to refuse to accept work for the project where a special warranty, certification or similar commitment is required on such work or part of the work, until evidence is presented that entities required to countersign such commitments are willing to do so.

0.5 SUBMITTALS

- A) Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer's certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the work, or a designated portion of the work, submit written warranties upon request of the Engineer.
 - 1. When a designated portion of the work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen (15) days of completion of that designed portion of the work.
- B) When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Engineer for approval prior to final execution.

1. Refer to individual Sections of Divisions 03 through 16 for specific content requirements and particular requirements for submittal of special warranties.
- C) Form of Submittal: At final completion, compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the project manual.
- D) Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½" by 11" paper.
 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the project or installation, including the name of the product, and the name, address and telephone number of the installer.
 2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the project title or name, and the name of the Contractor.
 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 51 - PRODUCTS (Not Used)

PART 52 - EXECUTION

0.1 SCHEDULE OF WARRANTIES

- A) Provide schedule of warranties as specified below:
 1. The General Contractor shall provide a 5 year warranty for all work performed under Contract to conform with the specifications, applicable codes and industry standards in addition to specific warranties for individual products. This warranty shall provide for labor and materials necessary to replace, or repair, any work performed under this contract.
 2. Concrete (Division 03): The Contractor shall provide a single source materials and performance warranty for all concrete work performed to conform with the Contract Documents, applicable codes and industry standards and against premature deterioration for a period of 5 years.
 3. Epoxy Injection (Division 03): The Contractor shall provide a single source materials and performance warranty that the epoxy resin injection system will not tear or fail for a period of three years.
 4. Waterproofing (Division 07):
 - a. Section 079500 – Expansion Joint Systems: The Contractor shall provide a single source materials and performance warranty that the installed expansion joint system,

- including related work in the slab, will not leak water or debond from adjacent concrete for a period of 5 years.
- b. Section 071000 – Deck Coating and Sealants: The Contractor shall provide a single source materials and performance warranty that the installed sealants and/or deck coating system or surface sealer, including related work, will not allow water beneath the system, will not debond from the structural slab, crack or prematurely deteriorate for a period of 5 years.

END OF SECTION 017400

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 53 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B) Related Requirements:
 - 1. Section 013000 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

0.3 DEFINITIONS

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

0.4 CLOSEOUT SUBMITTALS

- A) Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Engineer and Owner will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B) Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit by email to Engineer and Owner. Enable reviewer comments on draft submittals.
- C) Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Engineer and Owner will comment on whether general scope and content of manual are acceptable.
- D) Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Engineer and Owner will return copy with comments.
 - 1. Correct or revise each manual to comply with Engineer and Owner's comments. Submit copies of each corrected manual within 15 days of receipt of comments and prior to commencing demonstration and training.
- E) Comply with Section 017000 "Project Closeout" for schedule for submitting operation and maintenance documentation.

0.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A) Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B) Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

- b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

0.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

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

1. Title page.
2. Table of contents.
3. Manual contents.

- B) Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

- C) Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D) Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E) Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

0.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A) Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

0.8 EMERGENCY MANUALS

- A) Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B) Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C) Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

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

E) Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

0.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A) Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B) Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C) Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D) Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

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

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

0.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A) Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

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

- C) Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D) Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- E) Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- F) Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G) Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H) Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

- I) Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.
- J) Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of maintenance manuals.

0.11 PRODUCT MAINTENANCE MANUALS

- A) Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B) Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C) Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D) Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E) Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- F) Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

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

1. Include procedures to follow and required notifications for warranty claims.

PART 54 - PRODUCTS (Not Used)

PART 55 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 230923 - DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC

PART 56 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section Includes:

- 1. System review, inspection, testing, troubleshooting, validation, and reporting of existing DDC system for monitoring and controlling of HVAC / Exhaust systems serving underground parking garages and gas systems.
 - 2. Documentation, demonstration and training for the owner's staff of the newly proven gas detection and exhaust system, including any interface with existing life safety systems.

- B) Related Requirements:

- 1. Section 230993.11 "Sequence of Operations for HVAC DDC" for control sequences in DDC systems.
 - 2. Raceways:
 - a. Section 260533 "Raceways and Boxes for Electrical Systems" for raceways for low-voltage control cable.
 - 3. Section 260553 "Identification for Electrical Systems" for identification requirements for electrical components.

0.3 DEFINITIONS

- A) Algorithm: A logical procedure for solving a recurrent mathematical problem. A prescribed set of well-defined rules or processes for solving a problem in a finite number of steps.
- B) Analog: A continuously varying signal value, such as current, flow, pressure, or temperature.
- C) BACnet Specific Definitions:

1. BACnet: Building Automation Control Network Protocol, ASHRAE 135. A communications protocol allowing devices to communicate data over and services over a network.
 2. BACnet Interoperability Building Blocks (BIBBs): BIBB defines a small portion of BACnet functionality that is needed to perform a particular task. BIBBs are combined to build the BACnet functional requirements for a device.
 3. BACnet/IP: Defines and allows using a reserved UDP socket to transmit BACnet messages over IP networks. A BACnet/IP network is a collection of one or more IP subnetworks that share the same BACnet network number.
 4. BACnet Testing Laboratories (BTL): Organization responsible for testing products for compliance with ASHRAE 135, operated under direction of BACnet International.
 5. PICS (Protocol Implementation Conformance Statement): Written document that identifies the particular options specified by BACnet that are implemented in a device.
- D) Binary: Two-state signal where a high signal level represents ON" or "OPEN" condition and a low signal level represents "OFF" or "CLOSED" condition. "Digital" is sometimes used interchangeably with "Binary" to indicate a two-state signal.
- E) Controller: Generic term for any standalone, microprocessor-based, digital controller residing on a network, used for local or global control. Three types of controllers are indicated: Network Controller, Programmable Application Controller, and Application-Specific Controller.
- F) Control System Integrator: An entity that assists in expansion of existing enterprise system and support of additional operator interfaces to I/O being added to existing enterprise system.
- G) COV: Changes of value.
- H) DDC System Provider: Authorized representative of, and trained by, DDC system manufacturer and responsible for execution of DDC system Work indicated.
- I) Distributed Control: Processing of system data is decentralized and control decisions are made at subsystem level. System operational programs and information are provided to remote subsystems and status is reported back. On loss of communication, subsystems shall be capable of operating in a standalone mode using the last best available data.
- J) DOCSIS: Data-Over Cable Service Interface Specifications.
- K) E/P: Voltage to pneumatic.
- L) Gateway: Bidirectional protocol translator that connects control systems that use different communication protocols.
- M) HLC: Heavy load conditions.
- N) I/O: System through which information is received and transmitted. I/O refers to analog input (AI), binary input (BI), analog output (AO) and binary output (BO). Analog signals are continuous and represent control influences such as flow, level, moisture, pressure, and temperature. Binary signals convert electronic signals to digital pulses (values) and generally

represent two-position operating and alarm status. "Digital," (DI and (DO), is sometimes used interchangeably with "Binary," (BI) and (BO), respectively.

- O) I/P: Current to pneumatic.
- P) LAN: Local area network.
- Q) LNS: LonWorks Network Services.
- R) LON Specific Definitions:
 - 1. FTT-10: Echelon Transmitter-Free Topology Transceiver.
 - 2. LonMark: Association comprising suppliers and installers of LonTalk products. Association provides guidelines for implementing LonTalk protocol to ensure interoperability through a standard or consistent implementation.
 - 3. LonTalk: An open standard protocol developed by the Echelon Corporation that uses a "Neuron Chip" for communication. LonTalk is a register trademark of Echelon.
 - 4. LonWorks: Network technology developed by Echelon.
 - 5. Node: Device that communicates using CEA-709.1-C protocol and that is connected to a CEA-709.1-C network.
 - 6. Node Address: The logical address of a node on the network, consisting of a Domain number, Subnet number, and Node number. "Node number" portion of an address is a number assigned to device during installation, is unique within a subnet, and is not a factory-set unique Node ID.
 - 7. Node ID: A unique 48-bit identifier assigned at factory to each CEA-709.1-C device. Sometimes called a "Neuron ID."
 - 8. Program ID: An identifier (number) stored in a device (usually EEPROM) that identifies node manufacturer, functionality of device (application and sequence), transceiver used, and intended device usage.
 - 9. Standard Configuration Property Type (SCPT): Pronounced "skip-it." A standard format type maintained by LonMark International for configuration properties.
 - 10. Standard Network Variable Type (SNVT): Pronounced "snivet." A standard format type maintained by LonMark used to define data information transmitted and received by individual nodes. "SNVT" is used in two ways. It is an acronym for "Standard Network Variable Type" and is often used to indicate a network variable itself (i.e., it can mean "a network variable of a standard network variable type").
 - 11. Subnet: Consists of a logical grouping of up to 127 nodes, where logical grouping is defined by node addressing. Each subnet is assigned a number, which is unique within a Domain. See "Node Address."
 - 12. TP/FT-10: Free Topology Twisted Pair network defined by CEA-709.3 and is most common media type for a CEA-709.1-C control network.
 - 13. TP/XF-1250: High-speed, 1.25-Mbps, twisted-pair, doubly terminated bus network defined by "LonMark Interoperability Guidelines" typically used only to connect multiple TP/FT-10 networks.
 - 14. User-Defined Configuration Property Type (UCPT): Pronounced "U-Keep-It." A Configuration Property format type that is defined by device manufacturer.

15. User-Defined Network Variable Type (UNVT): Network variable format defined by device manufacturer. UNVTs create non-standard communications that other vendors' devices may not correctly interpret and may negatively impact system operation. UNVTs are not allowed.
- S) Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.
- T) Mobile Device: A data-enabled phone or tablet computer capable of connecting to a cellular data network and running a native control application or accessing a web interface.
- U) Modbus TCP/IP: An open protocol for exchange of process data.
- V) MS/TP: Master-slave/token-passing, IEE 8802-3. Datalink protocol LAN option that uses twisted-pair wire for low-speed communication.
- W) MTBF: Mean time between failures.
- X) Network Controller: Digital controller, which supports a family of programmable application controllers and application-specific controllers, that communicates on peer-to-peer network for transmission of global data.
- Y) Network Repeater: Device that receives data packet from one network and rebroadcasts it to another network. No routing information is added to protocol.
- Z) Peer to Peer: Networking architecture that treats all network stations as equal partners.
- AA) POT: Portable operator's terminal.
- BB) PUE: Performance usage effectiveness.
- CC) RAM: Random access memory.
- DD) RF: Radio frequency.
- EE) Router: Device connecting two or more networks at network layer.
- FF) Server: Computer used to maintain system configuration, historical and programming database.
- GG) TCP/IP: Transport control protocol/Internet protocol.
- HH) UPS: Uninterruptible power supply.
- II) USB: Universal Serial Bus.
- JJ) User Datagram Protocol (UDP): This protocol assumes that the IP is used as the underlying protocol.

KK) VAV: Variable air volume.

LL) WLED: White light emitting diode.

0.4 INFORMATIONAL SUBMITTALS

A) Qualification Data:

1. Provider Qualification Data:

- a. Resume of project manager assigned to Project.
- b. Resumes of application engineering staff assigned to Project.
- c. Resumes of installation and programming technicians assigned to Project.
- d. Resumes of service technicians assigned to Project.
- e. Brief description of past project including physical address, floor area, number of floors, building system cooling and heating capacity and building's primary function.
- f. Description of past project DDC system, noting similarities to Project scope and complexity indicated.
- g. Names of staff assigned to past project that will also be assigned to execute work of this Project.
- h. Owner contact information for past project including name, phone number, and e-mail address.
- i. Contractor contact information for past project including name, phone number, and e-mail address.
- j. Engineer of Record contact information for past project including name, phone number, and e-mail address.

2. Manufacturer's qualification data.

3. Testing agency's qualifications data.

B) Existing Conditions Test Reports: For each separate test performed.

C) Source quality-control reports.

D) Field quality-control reports.

0.5 CLOSEOUT SUBMITTALS

A) Operation and Maintenance Data: For DDC system to include in emergency, operation and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

- a. Project Record Drawings of as-built versions of submittal Shop Drawings provided in electronic PDF format.
- b. Testing and commissioning reports and checklists of completed final versions of reports, checklists, and trend logs.
- c. As-built versions of submittal Product Data.
- d. Names, addresses, e-mail addresses and 24-hour telephone numbers of Installer and service representatives for DDC system and products.
- e. Operator's manual with procedures for operating control systems including logging on and off, handling alarms, producing point reports, trending data, overriding computer control and changing set points and variables.
- f. Programming manuals with description of programming language and syntax, of statements for algorithms and calculations used, of point database creation and modification, of program creation and modification, and of editor use.
- g. Engineering, installation, and maintenance manuals that explain how to:
 - 1) Design and install new points, panels, and other hardware.
 - 2) Perform preventive maintenance and calibration.
 - 3) Debug hardware problems.
 - 4) Repair or replace hardware.
- h. Documentation of all programs created using custom programming language including set points, tuning parameters, and object database.
- i. Backup copy of graphic files, programs, and database on electronic media such as DVDs.
- j. List of recommended spare parts with part numbers and suppliers.
- k. Complete original-issue documentation, installation, and maintenance information for furnished third-party hardware including computer equipment and sensors.
- l. Complete original-issue copies of furnished software, including operating systems, custom programming language, operator workstation software, and graphics software.
- m. Licenses, guarantees, and warranty documents.
- n. Recommended preventive maintenance procedures for system components, including schedule of tasks such as inspection, cleaning, and calibration; time between tasks; and task descriptions.
- o. Owner training materials.

PART 57 - PRODUCTS

0.1 PERFORMANCE REQUIREMENTS

- A) Delegated Design: Engage a qualified professional to validate DDC system to satisfy requirements indicated.
 - 1. System Performance Objectives:

- a. DDC system shall manage HVAC / Exhaust systems.
- b. DDC system control shall operate HVAC / Exhaust systems to achieve optimum operating costs while using least possible energy and maintaining specified performance.
- c. DDC system shall respond to power failures, HVAC / Exhaust system equipment failures, and adverse and emergency conditions encountered through connected I/O points.
- d. DDC system shall operate while unattended by an operator and through operator interaction.
- e. DDC system shall record trends and transaction of events and produce report information such as performance, energy, occupancies, and equipment operation.

0.2 SOURCE QUALITY CONTROL

- A) Testing Agency: Engage a qualified testing agency to evaluate the following according to industry standards for each product, and to verify DDC system reliability specified in performance requirements:
 1. DDC controllers.
 2. Gateways.
 3. Routers.
 4. Operator workstations.
- B) Product(s) and material(s) will be considered defective if they do not pass tests and inspections.
- C) Prepare test and inspection reports.

PART 58 - EXECUTION

0.1 EXAMINATION

- A) Examine and inspect existing DDC system for identified performance and conditions for compliance with requirements affecting performance of the Work.
 1. Verify compatibility with and suitability of components.
- B) Prepare written report, endorsed by inspector, listing conditions detrimental to performance of the system.

0.2 DDC SYSTEM INTERFACE WITH OTHER SYSTEMS AND EQUIPMENT

- A) Communication Interface to Equipment with Integral Controls:

1. DDC system shall have communication interface with equipment having integral controls and having a communication interface for remote monitoring or control.
2. Equipment Connected:
 - a. Motor-control centers.
 - b. Enclosed motor controllers

B) Communication Interface to Other Building Systems:

1. DDC system shall have a communication interface with systems having a communication interface.
2. Systems Connected:
 - a. Fire-alarm system.
 - b. CO / NO2 gas detection system.

0.3 IDENTIFICATION

- A) Identify system components, wiring, cabling, and terminals. Comply with requirements in Section 260553 "Identification for Electrical Systems" for identification products and installation.
- B) Install self-adhesive warning labels and melamine plastic signs with unique identification on face for each of the following:
 1. Operator workstation.
 2. Server.
 3. Printer.
 4. Gateway.
 5. Router.
 6. DDC controller.
 7. Enclosure.
 8. Electrical power device.
 9. UPS unit.
 10. Accessory.
- C) Install unique instrument identification on face of each instrument connected to a DDC controller. Coordinate ID with the owner.
- D) Install unique identification on face of each control damper actuator connected to a DDC controller. Coordinate ID with the owner.
- E) Where product is installed above accessible tile ceiling, also install matching identification on face of ceiling grid located directly below.
- F) Where product is installed above an inaccessible ceiling, also install identification on face of access door directly below.
- G) Warning Labels and Signs:

1. Shall be permanently attached to equipment that can be automatically started by DDC control system.
2. Shall be located in highly visible location near power service entry points.

0.4 CONTROL WIRE, CABLE AND RACEWAYS INSTALLATION

A) Comply with NECA 1.

B) Wire and Cable Installation:

1. Comply with installation requirements in Section 260523 "Control-Voltage Electrical Power Cables."
2. Install cables with protective sheathing that is waterproof and capable of withstanding continuous temperatures of 90 deg C with no measurable effect on physical and electrical properties of cable.
 - a. Provide shielding to prevent interference and distortion from adjacent cables and equipment.
3. Terminate wiring in a junction box.
 - a. Clamp cable over jacket in junction box.
 - b. Individual conductors in the stripped section of the cable shall be slack between the clamping point and terminal block.
4. Terminate field wiring and cable not directly connected to instruments and control devices having integral wiring terminals using terminal blocks.
5. Install signal transmission components according to IEEE C2, REA Form 511a, NFPA 70, and as indicated.
6. Use shielded cable to transmitters.
7. Use shielded cable to temperature sensors.
8. Perform continuity and meager testing on wire and cable after installation.

C) Conduit Installation:

1. Comply with Section "260533 "Raceways and Boxes for Electrical Systems" for control-voltage conductors.

0.5 FIELD QUALITY CONTROL

- A) Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and installations, including connections.
- B) Perform the following tests and inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C) Testing:

1. Final Testing: Perform full functional test of existing system to demonstrate acceptability as exists. Testing shall be performed according to a test plan developed by DDC system manufacturer. Defective Work or material shall be corrected and retested. As a minimum, final testing for cable system, shall verify conformance of attenuation, length, and bandwidth parameters with performance indicated.
2. Test Results: Record test results and submit copy of test results for Project record.

0.6 DDC SYSTEM I/O CHECKOUT PROCEDURES

- A) Check installed products before continuity tests, leak tests and calibration.
- B) Check instruments for proper location and accessibility.
- C) Check instruments for proper installation on direction of flow, elevation, orientation, insertion depth, or other applicable considerations that will impact performance.
- D) Control Damper Checkout:
 1. Verify that control dampers are installed correctly for flow direction.
 2. Verify that proper blade alignment, either parallel or opposed, has been provided.
 3. Verify that damper frame attachment is properly secured and sealed.
 4. Verify that damper actuator and linkage attachment is secure.
 5. Verify that actuator wiring is complete, enclosed and connected to correct power source.
 6. Verify that damper blade travel is unobstructed.
- E) Instrument Checkout:
 1. Verify that instrument is correctly installed for location, orientation, direction and operating clearances.
 2. Verify that attachment is properly secured and sealed.
 3. Verify that conduit connections are properly secured and sealed.
 4. Verify that wiring is properly labeled with unique identification, correct type and size and is securely attached to proper terminals.
 5. Inspect instrument tag against approved submittal.

0.7 SYSTEM I/O ADJUSTMENT, CALIBRATION AND TESTING:

- A) Calibrate each instrument installed that is not factory calibrated and provided with calibration documentation.

- B) Provide a written description of proposed field procedures and equipment for calibrating each type of instrument. Submit procedures before calibration and adjustment.
- C) For each analog instrument, make a three-point test of calibration for both linearity and accuracy.
- D) Equipment and procedures used for calibration shall comply with instrument manufacturer's written instructions.
- E) Provide diagnostic and test equipment for calibration and adjustment.
- F) Field instruments and equipment used to test and calibrate installed instruments shall have accuracy at least twice the instrument accuracy being calibrated. An installed instrument with an accuracy of 1 percent shall be checked by an instrument with an accuracy of 0.5 percent.
- G) Calibrate each instrument according to instrument instruction manual supplied by manufacturer.
- H) If after calibration indicated performance cannot be achieved, replace out-of-tolerance instruments.
- I) Comply with field testing requirements and procedures indicated by ASHRAE's Guideline 11, "Field Testing of HVAC Control Components," in the absence of specific requirements, and to supplement requirements indicated.
- J) Analog Signals:
 - 1. Check analog voltage signals using a precision voltage meter at zero, 50, and 100 percent.
 - 2. Check analog current signals using a precision current meter at zero, 50, and 100 percent.
 - 3. Check resistance signals for temperature sensors at zero, 50, and 100 percent of operating span using a precision-resistant source.
- K) Digital Signals:
 - 1. Check digital signals using a jumper wire.
 - 2. Check digital signals using an ohmmeter to test for contact making or breaking.
- L) Control Dampers:
 - 1. Stroke and adjust control dampers following manufacturer's recommended procedure, from 100 percent open to 100 percent closed and back to 100 percent open.
 - 2. Stroke control dampers with pilot positioners. Adjust damper and positioner following manufacturer's recommended procedure, so damper is 100 percent closed, 50 percent closed and 100 percent open at proper air pressure.
 - 3. Check and document open and close cycle times for applications with a cycle time less than 30 seconds.
 - 4. For control dampers equipped with positive position indication, check feedback signal at multiple positions to confirm proper position indication.
- M) Meters: Check sensors at zero, 50, and 100 percent of Project design values.

- N) Sensors: Check sensors at zero, 50, and 100 percent of Project design values.
- O) Switches: Calibrate switches to make or break contact at set points indicated.
- P) Transmitters:
 - 1. Check and calibrate transmitters at zero, 50, and 100 percent of Project design values.
 - 2. Calibrate resistance temperature transmitters at zero, 50, and 100 percent of span using a precision-resistant source.

0.8 DDC SYSTEM CONTROLLER CHECKOUT

- A) Verify power supply.
 - 1. Verify voltage, phase and hertz.
 - 2. Verify that protection from power surges is installed and functioning.
 - 3. Verify that ground fault protection is installed.
 - 4. If applicable, verify if connected to UPS unit.
 - 5. If applicable, verify if connected to a backup power source.
 - 6. If applicable, verify that power conditioning units, transient voltage suppression and high-frequency noise filter units are installed.
- B) Verify that wire and cabling is properly secured to terminals and labeled with unique identification.
- C) Verify that spare I/O capacity is provided.

0.9 DDC CONTROLLER I/O CONTROL LOOP TESTS

- A) Testing:
 - 1. Test every I/O point connected to DDC controller to verify that safety and operating control set points are as indicated and as required to operate controlled system safely and at optimum performance.
 - 2. Test every I/O point throughout its full operating range.
 - 3. Test every control loop to verify operation is stable and accurate.
 - 4. Adjust control loop proportional, integral and derivative settings to achieve optimum performance while complying with performance requirements indicated. Document testing of each control loop's precision and stability via trend logs.
 - 5. Test and adjust every control loop for proper operation according to sequence of operation.
 - 6. Test software and hardware interlocks for proper operation. Correct deficiencies.
 - 7. Operate each analog point at the following:
 - a. Upper quarter of range.
 - b. Lower quarter of range.
 - c. At midpoint of range.

8. Exercise each binary point.
9. For every I/O point in DDC system, read and record each value at operator workstation, at DDC controller and at field instrument simultaneously. Value displayed at operator workstation, at DDC controller and at field instrument shall match.
10. Prepare and submit a report documenting results for each I/O point in DDC system and include in each I/O point a description of corrective measures and adjustments made to achieve desired results.

0.10 DDC SYSTEM VALIDATION TESTS

- A) Perform validation tests before requesting final review of system. Before beginning testing, first submit Pretest Checklist and Test Plan.
- B) After approval of Test Plan, execute all tests and procedures indicated in plan.
- C) After testing is complete, submit completed test checklist.
- D) Pretest Checklist: Submit the following list with items checked off once verified:
 1. Detailed explanation for any items that are not completed or verified.
 2. Required mechanical installation work is successfully completed and HVAC equipment is working correctly.
 3. HVAC equipment motors operate below full-load amperage ratings.
 4. Required DDC system components, wiring, and accessories are installed.
 5. Installed DDC system architecture matches approved Drawings.
 6. Control electric power circuits operate at proper voltage and are free from faults.
 7. Required surge protection is installed.
 8. DDC system network communications function properly, including uploading and downloading programming changes.
 9. Using BACnet protocol analyzer, verify that communications are error free.
 10. Each controller's programming is backed up.
 11. Equipment, products, tubing, wiring cable and conduits are properly labeled.
 12. All I/O points are programmed into controllers.
 13. Testing, adjusting and balancing work affecting controls is complete.
 14. Dampers and actuators zero and span adjustments are set properly.
 15. Each control damper and actuator goes to failed position on loss of power.
 16. Actuators zero and span adjustments are set properly.
 17. Each actuator goes to failed position on loss of power.
 18. Meter, sensor and transmitter readings are accurate and calibrated.
 19. Control loops are tuned for smooth and stable operation.
 20. View trend data where applicable.
 21. Each controller works properly in standalone mode.
 22. Safety controls and devices function properly.
 23. Interfaces with fire-alarm system function properly.
 24. Electrical interlocks function properly.

25. Operator workstations and other interfaces are delivered, all system and database software is installed, and graphic are created.
26. Record Drawings are completed.

E) Test Plan:

1. Prepare and submit a validation test plan including test procedures for performance validation tests.
2. Test plan shall address all specified functions of DDC system and sequences of operation.
3. Explain detailed actions and expected results to demonstrate compliance with requirements indicated.
4. Explain method for simulating necessary conditions of operation used to demonstrate performance.
5. Include a test checklist to be used to check and initial that each test has been successfully completed.
6. Submit test plan documentation 20 business days before start of tests.

F) Validation Test:

1. Verify operating performance of each I/O point in DDC system.
 - a. Verify analog I/O points at operating value.
 - b. Make adjustments to out-of-tolerance I/O points.
 - 1) Identify I/O points for future reference.
 - 2) Simulate abnormal conditions to demonstrate proper function of safety devices.
 - 3) Replace instruments and controllers that cannot maintain performance indicated after adjustments.
2. Simulate conditions to demonstrate proper sequence of control.
3. Readjust settings to design values and observe ability of DDC system to establish desired conditions.
4. After 24 Hours following Initial Validation Test:
 - a. Re-check I/O points that required corrections during initial test.
 - b. Identify I/O points that still require additional correction and make corrections necessary to achieve desired results.
5. After 24 Hours of Second Validation Test:
 - a. Re-check I/O points that required corrections during second test.
 - b. Continue validation testing until I/O point is normal on two consecutive tests.
6. Completely check out, calibrate, and test all connected hardware and software to ensure that DDC system performs according to requirements indicated.

7. After validation testing is complete, prepare and submit a report indicating all I/O points that required correction and how many validation re-tests it took to pass. Identify adjustments made for each test and indicate instruments that were replaced.

G) DDC System Response Time Test:

1. Simulate HLC.
 - a. Heavy load shall be an occurrence of 50 percent of total connected binary COV, one-half of which represent an "alarm" condition, and 50 percent of total connected analog COV, one-half of which represent an "alarm" condition, that are initiated simultaneously on a one-time basis.
2. Initiate 10 successive occurrences of HLC and measure response time to typical alarms and status changes.
3. Measure with a timer having at least 0.1-second resolution and 0.01 percent accuracy.
4. Purpose of test is to demonstrate DDC system, as follows:
 - a. Reaction to COV and alarm conditions during HLC.
 - b. Ability to update DDC system database during HLC.
5. Passing test is contingent on the following:
 - a. Alarm reporting at printer beginning no more than two seconds after the initiation (time zero) of HLC.
 - b. All alarms, both binary and analog, are reported and printed; none are lost.
 - c. Compliance with response times specified.
6. Prepare and submit a report documenting HLC tested and results of test including time stamp and print out of all alarms.

H) DDC System Network Bandwidth Test:

1. Test network bandwidth usage on all DDC system networks to demonstrate bandwidth usage under DDC system normal operating conditions and under simulated HLC.
2. To pass, none of DDC system networks shall use more than 70 percent of available bandwidth under normal and HLC operation.

0.11 FINAL REVIEW

- A) Submit written request to Engineer and Owner when DDC system is ready for final review. Written request shall state the following:
1. DDC system has been thoroughly inspected for compliance with contract documents and found to be in full compliance.

2. DDC system has been calibrated, adjusted and tested and found to comply with requirements of operational stability, accuracy, speed and other performance requirements indicated.
 3. DDC system monitoring and control of HVAC systems results in operation according to sequences of operation indicated.
 4. DDC system is complete and ready for final review.
- B) Review by Engineer and Owner shall be made after receipt of written request. A field report shall be issued to document observations and deficiencies.
- C) Take prompt action to remedy deficiencies indicated in field report and submit a second written request when all deficiencies have been corrected. Repeat process until no deficiencies are reported.
- D) A part of DDC system final review shall include a demonstration to parties participating in final review.
1. Provide staff familiar with DDC system installed to demonstrate operation of DDC system during final review.
 2. Provide testing equipment to demonstrate accuracy and other performance requirements of DDC system that is requested by reviewers during final review.
 3. Demonstration shall include, but not be limited to, the following:
 - a. Accuracy and calibration of 10 I/O points randomly selected by reviewers. If review finds that some I/O points are not properly calibrated and not satisfying performance requirements indicated, additional I/O points may be selected by reviewers until total I/O points being reviewed that satisfy requirements equals quantity indicated.
 - b. HVAC equipment and system hardwired and software safeties and life-safety functions are operating according to sequence of operation. Up to 10 I/O points shall be randomly selected by reviewers. Additional I/O points may be selected by reviewers to discover problems with operation.
 - c. Correct sequence of operation after electrical power interruption and resumption after electrical power is restored for randomly selected HVAC systems.
 - d. Operation of randomly selected dampers in normal-on, normal-off and failed positions.
 - e. Reporting of alarm conditions for randomly selected alarms, including different classes of alarms, to ensure that alarms are properly received by operators and operator workstations.
 - f. Trends, summaries, logs and reports set-up for Project.
 - g. For HVAC / Exhaust system use graph trends to show that sequence of operation is executed in correct manner and that HVAC systems operate properly through complete sequence of operation including different modes of operations indicated. Show that control loops are stable and operating at set points and respond to changes in set point of 20 percent or more.
 - h. Software's ability to communicate with controllers, operator workstations, uploading and downloading of control programs.
 - i. Software's ability to edit control programs off-line.

- j. Data entry to show Project-specific customizing capability including parameter changes.
- k. Step through penetration tree, display all graphics, demonstrate dynamic update, and direct access to graphics.
- l. Execution of digital and analog commands in graphic mode.
- m. System speed of response compared to requirements indicated.
- n. For each controller:
 - 1) Memory: Programmed data, parameters, trend and alarm history collected during normal operation is not lost during power failure.
 - 2) Operator Interface: Ability to connect directly to each type of digital controller with a portable workstation and mobile device. Show that maintenance personnel interface tools perform as indicated in manufacturer's technical literature.
 - 3) Standalone Ability: Demonstrate that controllers provide stable and reliable standalone operation using default values or other method for values normally read over network.
 - 4) Electric Power: Ability to disconnect any controller safely from its power source.
 - 5) Wiring Labels: Match control drawings.
 - 6) Network Communication: Ability to locate a controller's location on network and communication architecture matches Shop Drawings.
 - 7) Nameplates and Tags: Accurate and permanently attached to control panel doors, instrument, actuators and devices.
- o. For Each Operator Workstation:
 - 1) I/O points lists agree with naming conventions.
 - 2) Graphics are complete.
 - 3) UPS unit, if applicable, operates.
- p. Communications and Interoperability: Demonstrate proper interoperability of data sharing, alarm and event management, trending, scheduling, and device and network management. Use ASHRAE 135 protocol analyzer to help identify devices, view network traffic, and verify interoperability. Requirements must be met even if only one manufacturer's equipment is installed.
 - 1) Data Presentation: On each operator workstation, demonstrate graphic display capabilities.
 - 2) Reading of Any Property: Demonstrate ability to read and display any used readable object property of any device on network.
 - 3) Set Point and Parameter Modifications: Show ability to modify set points and tuning parameters indicated. Modifications are made with messages and write services initiated by an operator using workstation graphics, or by completing a field in a menu with instructional text.

- 4) Peer-to-Peer Data Exchange: Network devices are installed and configured to perform without need for operator intervention to implement Project sequence of operation and to share global data.
- 5) Alarm and Event Management: Alarms and events are installed and prioritized according to Owner. Demonstrate that time delays and other logic are set up to avoid nuisance tripping. Show that operators with sufficient privileges are permitted.
- 6) Schedule Lists: Schedules are configured for start and stop, mode change, occupant overrides, and night setback as defined in sequence of operations.
- 7) Schedule Display and Modification: Ability to display any schedule with start and stop times for calendar year. Show that all calendar entries and schedules are modifiable from any connected operator workstation by an operator with sufficient privilege.
- 8) Archival Storage of Data: Data archiving is handled by operator workstation and server and local trend archiving and display is accomplished.
- 9) Modification of Trend Log Object Parameters: Operator with sufficient privilege can change logged data points, sampling rate, and trend duration.
- 10) Device and Network Management:
 - a) Display of network device status.
 - b) Display of BACnet Object Information.
 - c) Silencing devices transmitting erroneous data.
 - d) Time synchronization.
 - e) Remote device re-initialization.
 - f) Backup and restore network device programming and master database(s).
 - g) Configuration management of routers.

0.12 ADJUSTING

- A) Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

0.13 DEMONSTRATION

- A) Engage a factory-authorized service representative with complete knowledge of Project-specific system installed to train Owner's maintenance personnel to adjust, operate, and maintain DDC system.
- B) Extent of Training:
 1. Base extent of training on scope and complexity of DDC system indicated and training requirements indicated. Provide extent of training required to satisfy requirements indicated even if more than minimum training requirements are indicated.

2. Inform Owner of anticipated training requirements if more than minimum training requirements are indicated.
 3. Minimum Training Requirements:
 - a. Provide not less than two (2) days of training total.
 - b. Stagger training over multiple training classes to accommodate Owner's requirements.
 - c. Total days of training shall be broken into not more than four (4) separate training classes.
- C) Training Schedule:
1. Schedule training to provide Owner with at least 20 business days of notice in advance of training.
 2. Training shall occur within normal business hours at a mutually agreed on time. Unless otherwise agreed to, training shall occur Monday through Friday, except on U.S. Federal or County holidays, with two morning sessions and two afternoon sessions. Each morning session and afternoon session shall be split in half with 15-minute break between sessions. Morning and afternoon sessions shall be separated by 60-minute lunch period. Training, including breaks and excluding lunch period, shall not exceed eight hours per day.
 3. Provide staggered training schedule as requested by Owner.
- D) Attendee Training Manuals:
1. Provide each attendee with a color hard copy of all training materials and visual presentations.
 2. Hard-copy materials shall be organized in a three-ring binder with table of contents and individual divider tabs marked for each logical grouping of subject matter. Organize material to provide space for attendees to take handwritten notes within training manuals.
 3. In addition to hard-copy materials included in training manual, provide each binder with a sleeve or pocket that includes a DVD or flash drive with PDF copy of all hard-copy materials.
- E) Instructor Requirements:
1. One or multiple qualified instructors, as required, to provide training.
 2. Instructors shall have not less than five years of providing instructional training on not less than five past projects with similar DDC system scope and complexity to DDC system installed.
- F) Organization of Training Sessions:
1. Organize training sessions into logical groupings of technical content and to reflect different levels of operators having access to system. Plan training sessions to accommodate the following three levels of operators:
 - a. Daily operators.
 - b. Advanced operators.
 - c. System managers and administrators.

2. Plan and organize training sessions to group training content to protect DDC system security. Some attendees may be restricted to some training sessions that cover restricted content for purposes of maintaining DDC system security.

G) Training Outline:

1. Submit training outline for Owner review at least 10 business day before scheduling training.
2. Outline shall include a detailed agenda for each training day that is broken down into each of four training sessions that day, training objectives for each training session and synopses for each lesson planned.

H) On-Site Training:

1. Owner will provide conditioned classroom or workspace with ample desks or tables, chairs, power and data connectivity for instructor and each attendee.
2. Instructor shall provide training materials, projector and other audiovisual equipment used in training.
3. Provide as much of training located on-site as deemed feasible and practical by Owner.
4. On-site training shall include regular walk-through tours, as required, to observe each unique product type installed with hands-on review of operation, calibration and service requirements.
5. Operator workstation provided with DDC system shall be used in training. If operator workstation is not indicated, provide a temporary workstation to convey training content.

I) Off-Site Training:

1. Provide conditioned training rooms and workspace with ample tables desks or tables, chairs, power and data connectivity for each attendee.
2. Provide capability to remotely access to Project DDC system for use in training.
3. Provide a workstation for use by each attendee.

J) Training Content for Daily Operators:

1. Basic operation of system.
2. Understanding DDC system architecture and configuration.
3. Understanding each unique product type installed including performance and service requirements for each.
4. Understanding operation of each system and equipment controlled by DDC system including sequences of operation, each unique control algorithm and each unique optimization routine.
5. Operating operator workstations, printers and other peripherals.
6. Logging on and off system.
7. Accessing graphics, reports and alarms.
8. Adjusting and changing set points and time schedules.
9. Recognizing DDC system malfunctions.
10. Understanding content of operation and maintenance manuals including control drawings.

11. Understanding physical location and placement of DDC controllers and I/O hardware.
12. Accessing data from DDC controllers.
13. Operating portable operator workstations.
14. Review of DDC testing results to establish basic understanding of DDC system operating performance and HVAC system limitations as of Substantial Completion.
15. Running each specified report and log.
16. Displaying and demonstrating each data entry to show Project-specific customizing capability. Demonstrating parameter changes.
17. Stepping through graphics penetration tree, displaying all graphics, demonstrating dynamic updating, and direct access to graphics.
18. Executing digital and analog commands in graphic mode.
19. Demonstrating control loop precision and stability via trend logs of I/O for not less than 10 percent of I/O installed.
20. Demonstrating DDC system performance through trend logs and command tracing.
21. Demonstrating scan, update, and alarm responsiveness.
22. Demonstrating spreadsheet and curve plot software, and its integration with database.
23. Demonstrating on-line user guide and help function and mail facility.
24. Demonstrating multitasking by showing dynamic curve plot, and graphic construction operating simultaneously via split screen.
25. Demonstrating the following for HVAC systems and equipment controlled by DDC system:
 - a. Operation of HVAC / Garage Exhaust equipment in normal-off, -on and failed conditions while observing individual equipment, dampers and valves for correct position under each condition.
 - b. For HVAC / Garage Exhaust equipment with factory-installed software, show that integration into DDC system is able to communicate with DDC controllers or gateways, as applicable.
 - c. Using graphed trends, show that sequence of operation is executed in correct manner, and HVAC / Garage Exhaust systems operate properly through complete sequence of operation including seasonal change, occupied and unoccupied modes, warm-up and cool-down cycles and other modes of operation indicated.
 - d. Hardware interlocks and safeties function properly and DDC system performs correct sequence of operation after electrical power interruption and resumption after power is restored.
 - e. Reporting of alarm conditions for each alarm, and confirm that alarms are received at assigned locations, including operator workstations.
 - f. Each control loop responds to set point adjustment and stabilizes within time period indicated.
 - g. Sharing of previously graphed trends of all control loops to demonstrate that each control loop is stable and set points are being maintained.

K) Training Content for System Managers and Administrators:

1. DDC system software maintenance and backups.
2. Uploading, downloading and off-line archiving of all DDC system software and databases.
3. Interface with Project-specific, third-party operator software.

4. Understanding password and security procedures.
5. Adding new operators and making modifications to existing operators.
6. Operator password assignments and modification.
7. Operator authority assignment and modification.
8. Workstation data segregation and modification.

L) Video of Training Sessions:

1. Provide a digital video and audio recording of each training session. Create a separate recording file for each session.
2. Stamp each recording file with training session number, session name and date.
3. Provide Owner with two (2) copies of digital files on DVDs or flash drives for later reference and for use in future training.
4. Owner retains right to make additional copies for intended training purposes without having to pay royalties.

END OF SECTION 230923

SECTION 230993.11 - SEQUENCE OF OPERATIONS FOR HVAC DDC

PART 59 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section includes control sequences for DDC for HVAC systems, subsystems, and equipment.
- B) Related Requirements:
 - 1. Section 230923 "DDC Systems for HVAC" for control equipment.

0.3 DEFINITIONS

- A) Analog Output: Proportional output signal (zero- to 10-V dc, 4 to 20 mA).
- B) Binary Output: On/off output signal or contact closure.
- C) DDC: Direct digital control.
- D) Digital Output: Data output that must be interpreted digitally.

0.4 ACTION SUBMITTALS

- A) Product Data:
 - 1. An instrumentation list for each controlled system. Label each element of the controlled system in table format. Show, in the table element name, type of device, manufacturer, model number, and control device product data sheet number.
 - 2. A complete description of the operation of the control system, including sequences of operation. Include and reference a schematic diagram of the controlled system.
- B) Shop Drawings:
 - 1. Riser diagrams showing control network layout, communication protocol, and wire types.
 - 2. Schematic diagram of each controlled system. Include all control points labeled with point names shown or listed. Show the location of control elements in the system.

3. Wiring diagram for each controlled system. Show all control elements labels. Where a control element is the same as that shown on the control system schematic, label with the same name. Label all terminals.

0.5 VENTILATION SEQUENCES

A) Exhaust Fan: Gas Detection System or space thermostat.

1. Input:
 - a. Device: Direct response to gas detection system (CO or NO2 sensor / transmitter) or electric thermostat.
 - b. Location: Space.
2. Output:
 - a. Device: Hard wired.
 - b. Location: Motor controller or enclosed starter.
 - c. Transference: Starter relay.
3. Action: Cycle fans on in direct response to gas detection system alarm, or space temperature rises above set point.

PART 60 - PRODUCTS (Not Applicable)

PART 61 - EXECUTION (Not Applicable)

END OF SECTION 230993.11

SECTION 233300 - AIR DUCT ACCESSORIES

PART 62 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section Includes:
 - 1. Backdraft dampers.
 - 2. Control dampers.
 - 3. Remote damper operators.
 - 4. Duct accessory hardware.

0.3 ACTION SUBMITTALS

- A) Product Data: For each type of product.
- B) Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
 - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
 - a. Special fittings.
 - b. Control-damper installations.
 - c. Wiring Diagrams: For power, signal, and control wiring.

0.4 INFORMATIONAL SUBMITTALS

- A) Source quality-control reports.

0.5 CLOSEOUT SUBMITTALS

- A) Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

0.6 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.

PART 63 - PRODUCTS

0.1 ASSEMBLY DESCRIPTION

- A) Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B) Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

0.2 MATERIALS

- A) Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90 (Z275).
 - 2. Exposed-Surface Finish: Mill phosphatized.
- B) Extruded Aluminum: Comply with ASTM B 221 (ASTM B 221M), Alloy 6063, Temper T6.
- C) Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- D) Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for lengths 36 inches (900 mm) or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).

0.3 BACKDRAFT AND PRESSURE RELIEF DAMPERS

- A) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Warming and Ventilating; a Mestek Architectural Group company.
 - 2. Greenheck Fan Corporation.
 - 3. Nailor Industries Inc.
 - 4. Ruskin Company.
- B) Description: Gravity balanced.

- C) Maximum Air Velocity: 1000 fpm (5.1 m/s) 1250 fpm (6.4 m/s) 2000 fpm (10 m/s) or 3000 fpm (15 m/s) (project specific).
- D) Maximum System Pressure: 1-inch wg (0.25 kPa) 2-inch wg (0.5 kPa), 3-inch wg (0.8 kPa) 6-inch wg (1.5 kPa).
- E) Frame: Hat-shaped, 0.094-inch- (2.4-mm-) thick, galvanized sheet steel, with welded corners or mechanically attached and mounting flange.
- F) Blades: Multiple single-piece blades, center pivoted maximum 6-inch (150-mm) width, 0.050-inch- (1.2-mm-) thick aluminum sheet with sealed edges.
- G) Blade Action: Parallel.
- H) Blade Seals: Vinyl foam.
- I) Blade Axles:
 - 1. Material: Galvanized steel.
 - 2. Diameter: 0.20 inch (5 mm).
- J) Tie Bars and Brackets: Galvanized steel.
- K) Return Spring: Adjustable tension.
- L) Bearings: Steel ball.
- M) Accessories:
 - 1. Adjustment device to permit setting for varying differential static pressure.
 - 2. Counterweights and spring-assist kits for vertical airflow installations.
 - 3. Electric actuators.
 - 4. Chain pulls.
 - 5. Screen Mounting: Front mounted in sleeve.
 - a. Sleeve Thickness: 20 gage (1.0 mm) minimum.
 - b. Sleeve Length: 6 inches (152 mm) minimum.
 - 6. Screen Mounting: Rear mounted.
 - 7. Screen Material: Galvanized steel.
 - 8. Screen Type: Bird.
 - 9. 90-degree stops.
 - 10. platform for insulated duct mounting.

0.4 CONTROL DAMPERS

- A) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a Mestek Architectural Group company.
 2. Greenheck Fan Corporation.
 3. Nailor Industries Inc.
 4. Ruskin Company.
- B) Low-leakage rating, with linkage outside airstream, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.
- C) Frames:
1. Hat shaped.
 2. 0.094-inch- (2.4-mm-) thick, galvanized sheet steel.
 3. Mitered and welded corners.
- D) Blades:
1. Multiple blade with maximum blade width of 6 inches (152 mm) (200 mm).
 2. Parallel-blade design.
 3. Galvanized-steel.
 4. 0.064 inch (1.62 mm) thick single skin.
 5. Blade Edging: Closed-cell neoprene.
 6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.
- E) Blade Axles: 1/2-inch- (13-mm-) diameter; galvanized steel; blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
1. Operating Temperature Range: From minus 40 to plus 200 deg F (minus 40 to plus 93 deg C).
- F) Bearings:
1. Oil-impregnated bronze.
 2. Dampers in ducts with pressure classes of 3-inch wg (750 Pa) or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 3. Thrust bearings at each end of every blade.

0.5 FLANGE CONNECTORS

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

1. CL WARD & Family Inc.
2. Ductmate Industries, Inc.
3. Hardcast, Inc.
4. Ward Industries; a brand of Hart & Cooley, Inc.

- B) Description: Add-on, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.
- C) Material: Galvanized steel.
- D) Gage and Shape: Match connecting ductwork.

0.6 DUCT ACCESSORY HARDWARE

- A) Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B) Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 64 - EXECUTION

0.1 INSTALLATION

- A) Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts.
- B) Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

0.2 FIELD QUALITY CONTROL

- A) Tests and Inspections:
1. Operate dampers to verify full range of movement.
 2. Inspect locations of access doors and verify that purpose of access door can be performed.
 3. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION 233300

SECTION 260010 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Summary of Work:

- 1. Provide a complete integrated electrical system in accordance with the intent of these specifications and the accompanying drawings.

- B. This Section includes general administrative and procedural requirements, as well as the following basic electrical materials and methods:

- 1. Wire & Cable
 - 2. Wiring devices and wall plates
 - 3. Rough-in
 - 4. Electrical Installation
 - 5. Cutting & Patching
 - 6. Protection of Work
 - 7. Cutting and Patching.
 - 8. Access to Electrical Installations.
 - 9. Equipment Provided Under Different Divisions
 - 10. Record Drawings
 - 11. Close Out
 - 12. Inspection
 - 13. Demolition
 - 14. Repair & Restoration
 - 15. Final Cleaning
 - 16. Punch-Out

1.3 REFERENCED ORGANIZATIONS AND CODES

- A. The following list of abbreviations, are utilized within the specifications and are provided as a reference.
- B. All work in Divisions 26 shall comply with the applicable version of following codes and regulations as adopted by the Montgomery County, State of Maryland and the State Fire Marshal, unless otherwise specified.

1. NFPA (National Fire Protection Association).
2. NESC (National Electrical Safety Code).
3. ADA (American with Disabilities Act).
4. ANSI (American National Standards Inst.).
5. OSHA (Occupational Safety & Health Act).
6. COMAR (Code of Maryland Regulations).
7. UL (Underwriters Laboratories).
8. IBC (International Building Code).
9. State of Maryland Fire Prevention Code.
10. ANSI/EIA/TIA.
11. NETA (National Electrical Testing Association).
12. NEMA (National Electrical Manufacturer's Association).
13. NECA (National Electrical Contractors Association).

1.4 SITE VISIT

- A. Prior to preparing the bid, the electrical subcontractor shall visit the site and become familiar with all existing conditions. Make all necessary investigations as to locations of utilities and all other matters which can affect the work. No additional compensation will be made to the contractor as a result of his failure to familiarize himself with the existing conditions under which the work must be performed.

1.5 OUTAGES

- A. For all work requiring an outage, the contractor shall submit an outage request to the Project Manager, using the Standard Request for Outage Form. The existing mechanical/electrical systems shall remain operational unless turned off by the Owner's personnel during the construction of the project. For each electrical outage request include a photograph of the panel index schedule for each panel affected by the outage.
- B. Unless otherwise specified, outages of any services required for the performance of this contract and affecting areas other than the immediate work area shall be scheduled at least ten days (10) days in advance with the Office of Facilities Management. All such outages shall be performed on other than normal duty hours.
- C. All electrical outages which will interfere with the normal use of the building in any manner shall be done at such times as shall be mutually agreed upon by the contractor and the Owner.
- D. The contractor shall include in his price the cost of all premium time required for outages and other work which interferes with the normal use of the building, which will be performed, in most cases, during other than normal work time and at the convenience of the Owner.
- E. The operation of electrical equipment; required to achieve an outage must be accomplished by the Owner's personnel only. Prospective subcontractors under this section are cautioned that the unauthorized operation of electrical equipment or other control devices by their personnel can result in extremely serious consequences for which the contractor will be held accountable.

1.6 INSTALLER'S QUALIFICATIONS

- A. Electrical Installer shall submit the following evidence:
 - 1. Five (5) comparable completed projects.
 - 2. Reference letters from minimum of three (3) registered professional engineers, general contractors, building owners, explaining proficiency, quality of work, or other attribute on projects of similar size or substance.
 - 3. Copy of Maryland Master Electrician's License.
 - 4. Local or State license where required.
 - 5. BICSI and NICET certification, where required by these specifications.
- B. The electrical installer shall utilize a full-time project foreman in charge of all electrical work.
 - 1. Fully qualified and experienced in such work.
 - 2. Available, on site, at all times during construction.
 - 3. All communication shall be through this person.
- C. Installer of specialized systems such as Fire Alarms, telecommunication systems, etc. shall meet the requirements of the associated spec section(s).

1.7 CUTTING, WELDING, BURNING

- A. Before the contractor and/or any sub-contractor commence's any cutting, welding, and/or burning, the contractor shall obtain a hot work permit from the Owner.
- B. The hot work permit copy shall remain on the job site at the hot work location until such work is completed at which time the permit shall be returned to the Owner.

1.8 WORK PERFORMANCE

- A. All electrical work must comply with the requirements of NFPA 70 (NEC), NFPA 70B, NFPA 70E, OSHA Part 1910 subpart J, OSHA Part 1910 subpart S and OSHA Part 1910 subpart K in addition to other references required by the contract.
- B. Before initiating any work, a job specific work plan must be developed by the contractor. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, and safety equipment to be used and exit pathways.
- C. Job site and worker safety are the responsibility of the contractor. Compliance with the requirements of NFPA 70E is subject to ongoing inspection by the Owner's personnel and failure to comply will result in an immediate Stop Work order being issued and enforced at the contractor's expense.

- D. Energized electrical conductors and circuit parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee performs work any time the employee is within the limited approach boundary or, where an increased risk of injury from an exposure to an arc flash hazard exists.
- E. Outages should be scheduled a minimum of seven (7) days in advance.
- F. Mandatory Requirements: The following requirements are mandatory:
 - 1. Protective Equipment: Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
 - 2. Energized Work Permit: An Energized Work Permit is required for any work on energized circuits or equipment. Permit must be approved prior to performing energized work. Submit the work permit with the outage request.

1.9 SUBMITTALS

- A. General: Follow the procedures specified in Division 1 Section "Submittals."
- B. Product data as specified in the electrical specifications.
- C. Shop drawings detailing fabrication and installation requirements for electrical equipment.
- D. In addition to the following list, submit other shop drawings as may be requested by the Owner.
 - 1. Divisions 26:
- E. In instances of complex field wired systems, including but not limited to: fire alarm system, the contractor shall submit:
 - 1. Cut sheets of every component such as control panels, fire alarm devices, wire, etc.
 - 2. The contractor shall submit detailed riser diagrams detailing point-by-point connections. Diagrams shall indicate cable on raceway between points.
 - 3. Corresponding floor plans showing only this particular system with conduit and wire runs between points.
 - 4. Both riser and floor plan shall indicate address of devices where applicable.
 - 5. Calculations for battery capacity and voltage drop.
 - 6. Preliminary programming information.
- F. Increase, by the quantity listed below, the number of electrical related shop drawings, product data, and samples submitted, to allow for required distribution plus two copies of each submittal required, which will be retained by the Electrical Consulting Engineer.

1. Shop Drawings: Initial Submittal: One (1) additional blue or black line prints.
2. Shop Drawings: Final Submittal: One (1) additional blue or black line prints.
3. Product Data: One (1) additional copy of each item.
4. Eight copies of all above final submittals and data, to be retained by the Owner.

G. Additional copies may be required by individual sections of these Specifications.

1.10 QUALITY ASSURANCE

- A. Comply with NFPA 70 for components and installation.
- B. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 1. The Terms "Listed and Labeled": As defined in the National Electrical Code, Article 100.
 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- C. Install all components and equipment per manufacturer's written instructions.
- D. Provide installation in accordance with recognized trade organizations and standards:
 1. NEMA.
 2. NECA "Standards of Installation"

1.11 COORDINATION DRAWINGS

- A. Prepare coordination drawings in accordance with Division 1 Section "Project Coordination," to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of electrical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 1. Indicate the proposed locations of electrical equipment, and materials. Include the following:
 - a. Planned electrical systems layout, including conduit elbow radii and accessories.
 - b. Clearances for servicing and maintaining electrical equipment.
 - c. Exterior wall and foundation penetrations.
 - d. Fire rated wall and floor penetrations.
 - e. Sizes and location of required concrete pads and bases.
 - f. Size and location of all electrical panels.
 2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations. Show all access doors for concealed junction boxes devices.

4. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, cable trays, sprinklers, access doors and other ceiling mounted items.

1.12 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Division 1 Section "Contract Closeout." In addition to the requirements specified in Division 1, indicate the following installed conditions:
 1. Conduit and wire runs between the points
 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 3. Approved substitutions, Contract Modifications, RFI responses and actual equipment and materials installed.

1.13 OPERATION AND MAINTENANCE MANUALS

- A. Electrical O & M Manual File: Provide one (1) electronic file "pdf format" for the projects Electrical Operation and Maintenance Manual for the Material and Equipment installed in the project included in Divisions 26 on a CD-R. The electronic Electrical O & M manual shall include one copy of each approved submittal, any manufacturer's maintenance manuals, all warranty certificates, arranged in file folders for each submittal. Also include the address, phone number and contact person for each supplier. Files shall be stacked and include both a book mark and tree structure for accessing each submittal file as indicated in Division 1 Closeout Procedures.

1.14 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

1.15 SEQUENCING AND SCHEDULING

- A. Coordinate electrical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.
- C. Coordinate the installation of required supporting devices and set sleeves in poured in place concrete and other structural components as they are constructed.
- D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.
- E. Coordinate connection of electrical services.

- F. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
- G. Coordinate requirements for access panels and doors where electrical items requiring access are concealed behind finished surfaces. Access panels and doors are specified in the Architectural Specifications.
- H. Coordinate installation of identifying devices after completing covering and painting where devices are applied to surfaces. Install identifying devices prior to installing acoustical ceilings and similar concealment.

1.16 VARIANCES

- A. Where variances occur between the drawings and specifications or within either document itself, the item or arrangement of better quality, greater quantity or higher cost shall be included in the contract price. The Engineer shall decide on the item and manner in which the work shall be provided.

1.17 GUARANTEE/WARRANTY:

- A. All materials, equipment, etc. provided by the general contractor and/or his subcontractors shall be guaranteed and warranted to be free from defects in workmanship and materials for a period of two (2) years after date of certificate of completion and acceptance of work by the Owner. Any defects in workmanship, materials, or performance which appear within the guarantee period shall be corrected by the contractor without cost to the owner, within a reasonable time, to be specified by the Owner. In default thereof, owner may have such work done and charge the cost of same to the contractor. In addition to the above statement the Guarantee/Warranty Period shall include all labor cost related to all warranty work. For select equipment indicated in specific sections include an additional three (3) year Guarantee/Warranty Period.

PART 2 - PRODUCTS

BASIC MATERIALS

- A. All products shall be UL (Underwriters Laboratories) listed.
- B. Nameplates: Engraved, Phenolic laminated plastic, 0.125 inch thick, black background with white core, with beveled edges. ALL LETTERING SHALL BE UPPERCASE. Shall be attached using self tapping screws.
 - 1. Nameplate shall be installed on all equipment items. Use ¼" high engravings.
 - 2. Nameplates shall be installed on all feeder circuits and all outdoor circuits.
 - a. Attach nameplates to each cable or wire located in pullboxes and at each splice and termination. Use ¼" letters. Cable nameplates shall be secured in place with

¼" cable ties. Nameplates shall indicate which panel and circuit breaker the feeder or circuits is fed from.

3. Phases of all 600V wire shall be identified at all splice and termination points using colored tape. Colors shall be black, red, and blue for 208 volt phase conductors, white for neutrals, and green for ground conductors. Utilize orange, brown, and yellow for 480 volt phase conductors, gray for neutrals, and green for ground conductors.
- C. Warning Signs: Provide warning signs for electrical equipment per OSHA and NFPA.
- D. Label junction boxes with panel #, and circuit breaker # of where circuits originate – use permanent marker.
- E. Steel – all steel products shall be galvanized or treated for corrosion.
- F. Conduit and fittings:
1. Use only specified raceway in the following indoor and outdoor locations:
 - a. Exposed outdoor locations: Only rigid galvanized steel conduit shall be used.
 - b. Exposed dry interior locations: EMT or rigid steel in areas with motorized vehicles.
 - c. Connections to vibration producing equipment or motors shall be liquid tight flexible metallic conduit.
 - d. New Construction: raceway/conduit in finished areas shall be concealed by architectural surfaces.
 - e. Electrical Feeder Distribution conduits within a building shall not be in the concrete slab or underground.
 2. Use of the following types of conduits and fittings shall not be permitted in any application for this project:
 - a. "Die-cast metal" conduit fittings.
 - b. Aluminum Conduit, Cable Tray and fittings.
 - c. PVC Type 'EB'.
- G. Electrical Boxes
1. Interior – metal only, approved for the specific location and application.
 2. Exterior – metal, NEMA approved for outdoor locations.

WIRE AND CABLE

- A. Building Wire:
1. Feeders and Branch Circuits Larger Than 10 AWG: Copper, stranded conductor, 600 volt insulation, THHN/THWN, rated at 75 degree C.
 2. Feeders and Branch Circuits 10 AWG and Smaller: Copper, 600 volt insulation, THHN/THWN solid conductor, rated at 75 degree C. No conductor smaller than #12 AWG is acceptable.
- B. Forbidden Cables:
1. Use of BX (Armored) Cable, UF, and Romex Cable is not permitted.
- C. Color coding shall be a permanent part of and uniform throughout the entire length of the

jacket material of the cable and shall be used throughout the building for feeder circuits. Color applied to the outer surface only is not acceptable. Taping (6" minimum) at termination points is acceptable. Color coding shall be:

	480/277 Volts	208/120 Volts
Phase	Color	Color
A	Orange	Black
B	Brown	Red
C	Yellow	Blue
Neutral	Gray	White
Ground	Green	Green

WIRING DE-
VICES AND

WALL PLATES

A. Receptacle:

1. Use specification grade receptacles and switches.
2. GFCI Receptacle: Duplex convenience receptacle with integral ground fault current interrupter, test and reset push buttons.
3. Device plates for interior use on flush-mounted devices shall be satin finish type 302 stainless steel.
4. Device plates for interior use on surface-mounted devices shall be galvanized sheet metal with rounded corners.

B. Weatherproof Cover Plate: Match receptacle configuration provided for equipment connection. Gasketed cast metal with gasketed device covers.

1. A receptacle installed in a wet location where the product intended to be plugged into is not attended while in use (e.g. sprinkler system controller, landscape lighting, holiday lights, etc.) shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed.
2. A receptacle installed in a wet location where the product intended to be plugged into is attended while in use (e.g. portable tools, etc.) shall have an enclosure that is weatherproof when the attachment is removed.

PART 3 – EXECUTION

3.1 DEMOLITION:

- A. Remove and dispose of all existing materials not required for re-use or re-installation.
- B. Deliver on the premises, where directed, existing material and equipment which is to be salvaged and remain property of Owner.

- C. All other materials removed shall become the property of the Contractor and shall be removed from the premises.
- D. Remove conduit, hangers, supports, etc. to a point below the finished floors or behind finished walls and cap. Cut such items flush with masonry surfaces.
- E. Remove wiring and conduit back to source panelboard or switch, or to last remaining device on the circuit. Remove conduit, hangers, supports, etc. unless otherwise noted. Conduit may remain to be reused for new work provided it is of the specified size and type and in condition acceptable to the Owner.
- F. Any conduit abandoned in concrete slabs, walls, or other inaccessible locations shall be left with a nylon pull wire. Ends shall be capped with push plugs for future use.

3.2 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. For equipment rough-in requirements see specifications for electrical equipment.

3.3 ELECTRICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:
 - 1. Coordinate electrical systems, equipment, and materials installation with other building components.
 - 2. Verify all dimensions by field measurements.
 - 3. Install systems, materials, and equipment to conform with approved submittal data, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Owner.
 - 4. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
 - 5. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
 - 6. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.4 CUTTING AND PATCHING

- A. General: Perform cutting and patching in accordance with Division 1 Section "Cutting and Patching." In addition to the requirements specified in Division 1, the following requirements apply:
 - 1. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- B. Perform cutting, fitting, and patching of electrical equipment and materials required to:
 - 1. Uncover Work to provide for installation of ill timed Work.
 - 2. Remove and replace defective Work.
 - 3. Remove and replace Work not conforming to requirements of the Contract Documents.
 - 4. Disconnect installed work as specified for testing.
 - 5. Install equipment and materials in existing structures.
 - 6. Upon written instructions from the Owner, uncover and restore Work to provide for the Owner's observation of concealed Work.
- C. Cut, remove and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical systems and equipment as indicated on the drawings and specifications and other electrical items made obsolete by the new Work.
- D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
 - 1. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
 - a. Refer to Division 1 Section "Definitions and Standards" for definition of "experienced Installer."
 - 2. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
 - a. Refer to Division 1 Section "Definitions and Standards" for definition of "experienced Installer."

3.5 PROTECTION OF WORK

- A. Protect work, material and equipment from weather and construction operations before, during and after installation. Where concrete slab is scheduled to be removed over the electrical room, provide protection, if need be, coordinated and designed by the project structural engineer
- B. Properly store and handle all materials and equipment.

- C. Cover temporary openings for electrical equipment to prevent the entrance of water, dirt, debris, and other foreign matter.

3.6 PROVISIONS FOR ACCESS

- A. Furnish and install adequate access to all electrical components. The following list shall be used as a guide only:
 - 1. Equipment such as transformers, generators, etc.
 - 2. Distribution panels.
 - 3. Switch Gear.
 - 4. Disconnects.
 - 5. Variable frequency drives.
- B. Access shall be as required by code and/or as determined by the Architect and Engineer.
- C. Refer to contract drawings where access panels have been specifically located.
- D. Where access is by means of lift out ceiling tiles or panels mark access each panel using small color coded or numbered tabs. Provide an index chart for identification. Place markers in corner of tile.

3.7 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of equipment and systems to Owner's personnel a minimum two (2) weeks prior to date of final inspection.
 - 1. For equipment requiring seasonal operation, perform instructions for other seasons at the same time.
 - 2. Training period shall be performed within one (1) week period.
- B. Use operation and maintenance manuals and video as basis of instruction. Review contents of manual and video with personnel in detail to explain all aspects of operation and maintenance.
- C. Demonstrate the following:
 - 1. Start up.
 - 2. Operation.
 - 3. Control.
 - 4. Adjustment.
 - 5. Trouble shooting.
 - 6. Servicing.
 - 7. Maintenance.
 - 8. Shutdown.
- D. Provide at least forty (16) hours straight time instruction to the operating personnel.

1. This instruction period shall consist of not less than two (2) eight (8) hour days.
2. Time of instruction shall be designated by the Owner.
3. This instruction shall be in addition to instructional requirements of specific equipment specified elsewhere in the mechanical specifications.

3.8 EQUIPMENT PROVIDED UNDER ANOTHER DIVISION AND BY OTHERS

- A. The Installer of products under Divisions 26, 27, & 28 shall make all system connections required to equipment furnished and installed under another division and by others.
- B. It shall be the responsibility of the Installer to obtain all necessary data from the equipment supplied under other Divisions.

3.9 CLOSEOUT PROCEDURES

- A. Operating and Maintenance Instructions: Submit Complete Package At Least Two (2) weeks Prior To Substantial Completion. Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
 1. Maintenance manuals, including a customized list of preventive maintenance items and annual schedule for maintenance.
 2. Record documents.
 3. Complete inventory of spare parts and materials.
 4. Tools.
 5. Identification systems.
 6. Control sequences.
 7. Hazards.
 8. Cleaning.
 9. Warranties and bonds.
 10. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate the following procedures:
 1. Start up.
 2. Shut down.
 3. Emergency operations.
 4. Noise and vibration adjustments.
 5. Safety procedures.
 6. Economy and efficiency adjustments.
 7. Effective energy utilization.

3.10 INSPECTIONS

- A. Contractor shall:

1. Schedule, pay for (as applicable) and attend all inspections required by the Authorities Having Jurisdiction.
 2. Deliver all certificates to the Owner prior to final acceptance of work.
- B. Notify the Owner in advance of scheduled inspections.
- C. An electrical foreman, superintendent or other supervisor familiar with the project shall be in attendance for all scheduled electrical inspections.
- D. Electrical inspection shall be by the Owner's inspection department personnel.
- E. Schedule the preliminary and rough-in inspections in a timely manner. Any work covered prior to any inspection in a manner which, in the inspector's opinion, precludes a complete inspection shall be uncovered at the installer's cost.

3.11 REPAIRS & RESTORATION OF SURFACES AND FINISHES:

- A. Restore all finishes, equipment and surfaces to original condition, where affected by the work. Provide the following, where applicable, in accordance with accepted trade standards and to Owner's satisfaction:
1. Replace damaged ceiling tiles.
 2. Replace ceiling tiles where removal has left holes or cuts in original tiles.
 3. Patch, repair and repaint all walls and surfaces cut, penetrated or otherwise disturbed by the work.
 4. Patch holes and penetrations in wood, masonry and plaster.
 5. Provide suitable cover plates for all recessed back boxes of equipment removed and not covered by new devices.
 6. Provide larger trim or cover plates for new devices, where old back boxes, holes, etc. are not concealed by new work.

3.12 FINAL CLEANING

- A. General: General cleaning during construction is required by the General Conditions and included in Section Temporary Facilities.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- C. Remove all electrical clippings, wiring, nuts, bolts, etc. left on top of ceilings and ceiling tiles.

3.13 PROJECT PUNCH OUT

- A. Engineer will perform punch out reviews and will provide the Contractor with a list of punch list items to be completed before contract close out. Each and every punch list item shall be initialed and dated by the Contractor when the work is complete. The Engineer will not perform any punch list verification until all items have been completed, initialed, dated and the list returned to the Architect/Engineer. If any items have been initialed as being completed by the Contractor and the Engineer determines that the work is not complete, the Engineer shall be reimbursed by the Contractor at his regular hourly rate for any and all items requiring revisiting of the site by the Engineer. Reimbursement shall be made by deducting the Engineer fee from the Contractor's final payment.

END OF SECTION 010100

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 65 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section Includes:
 - 1. Copper building wire rated 600 V or less.
 - 2. Connectors, splices, and terminations rated 600 V and less.
- B) Product Schedule: Indicate type, use, location, and termination locations.

PART 66 - PRODUCTS

0.1 COPPER BUILDING WIRE

- A) Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Okonite Company (The).
 - 2. Southwire Company.
 - 3. WESCO.
- C) Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. RoHS compliant.
 - 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D) Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E) Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.
2. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
3. Type XHHW-2: Comply with UL 44.

PART 67 - EXECUTION

0.1 CONDUCTOR MATERIAL APPLICATIONS

- A) Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B) Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C) Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- D) Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

0.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

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

0.3 INSTALLATION OF CONDUCTORS AND CABLES

- A) Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B) Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C) Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D) Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

- E) Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F) Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

0.4 CONNECTIONS

- A) Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B) Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

0.5 IDENTIFICATION

- A) Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B) Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 68 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section includes grounding and bonding systems and equipment, plus the following special applications:
 - 1. Foundation steel electrodes.

0.3 ACTION SUBMITTALS

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

PART 69 - PRODUCTS

0.1 SYSTEM DESCRIPTION

- A) Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B) Comply with UL 467 for grounding and bonding materials and equipment.
- C) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Burndy; Part of Hubbell Electrical Systems.
 - 2. ERICO International Corporation.
 - 3. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 4. Thomas & Betts Corporation; A Member of the ABB Group.

0.2 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 Conductor: No. 4 or No. 6 AWG, stranded conductor.

0.3 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) Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C) Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- D) Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- E) Conduit Hubs: Mechanical type, terminal with threaded hub.
1. U-bolt type with malleable-iron clamp and copper ground connector.

PART 70 - EXECUTION

0.1 APPLICATIONS

- A) Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B) Conductor Terminations and Connections:
1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 2. Connections to Structural Steel: Welded connectors.

0.2 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. Three-phase motor and appliance branch circuits.
- C) Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

0.3 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.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 71 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section Includes:
 - 1. Conduit and cable support devices.
 - 2. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

0.3 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. Clamps.
 - b. Hangers.
 - c. Fasteners.
 - d. Anchors.

0.4 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A) Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- B) Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) B-line, an Eaton business.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) ITW Ramset/Red Head; Illinois Tool Works, Inc.
2. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
 3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
 4. Hanger Rods: Threaded steel.

PART 72 - EXECUTION

0.1 APPLICATION

- A) Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 1. NECA 1.
 2. NECA 101
- B) Comply with requirements for raceways and boxes specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."
- C) Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- D) Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

0.2 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 (0.05 mm).
- B) Touchup: Comply with requirements in Section 09 91 13 "Exterior Painting" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C) 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 73 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section Includes:
 - 1. Metal conduits and fittings.
 - 2. Nonmetallic conduits and fittings.
 - 3. Boxes, enclosures, and cabinets.

0.3 DEFINITIONS

- A) GRC: Galvanized rigid steel conduit.
- B) IMC: Intermediate metal conduit.

0.4 ACTION SUBMITTALS

- A) Product Data: For wireways and fittings, and cabinets.

PART 74 - PRODUCTS

0.1 METAL CONDUITS AND FITTINGS

- A) Metal Conduit:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit; a part of Atkore International.
 - b. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - c. Republic Conduit.
 - 2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

3. GRC: Comply with ANSI C80.1 and UL 6.
4. IMC: Comply with ANSI C80.6 and UL 1242.
5. EMT: Comply with ANSI C80.3 and UL 797.
6. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B) Metal Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit; a part of Atkore International.
 - b. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - c. Republic Conduit.
2. Comply with NEMA FB 1 and UL 514B.
3. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
4. Fittings, General: Listed and labeled for type of conduit, location, and use.
5. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: compression.
6. Expansion Fittings: Steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

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

0.2 BOXES, ENCLOSURES, AND CABINETS

- A) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Crouse-Hinds, an Eaton business.
 2. EGS/Appleton Electric.
 3. Hubbell Incorporated.
 4. O-Z/Gedney; a brand of Emerson Industrial Automation.
- 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) Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.
- F) Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- G) Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- H) Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- I) Device Box Dimensions: 4 inches square by 2-1/8 inches deep (**100 mm square by 60 mm deep**).
- J) Gangable boxes are prohibited.
- 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.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 75 - EXECUTION

0.1 RACEWAY APPLICATION

- A) Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC, IMC.
 - 2. 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, Subject to Physical Damage: IMC.
 - 3. Exposed and Subject to Severe Physical Damage: GRC.
 - 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.
 - 6. Damp or Wet Locations: GRC or IMC.

7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in wet locations.
- C) Minimum Raceway Size: 3/4-inch (21-mm) trade size.
- D) Raceway Fittings: Compatible with raceways and suitable for use and location.
 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
 3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

0.2 INSTALLATION

- A) Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.
- B) Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- C) Do not fasten conduits onto the bottom side of a metal deck roof.
- D) Complete raceway installation before starting conductor installation.
- 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 (300 mm) of changes in direction.
- G) Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- H) Support conduit within 12 inches (300 mm) of enclosures to which attached.
- I) Raceways Embedded in Slabs:
 1. Run conduit larger than 1-inch (27-mm) 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 (3-m) intervals.
 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 3. Arrange raceways to keep a minimum of 2 inches (50 mm) of concrete cover in all directions.
 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.

5. Change from ENT to GRC before rising above floor.
- J) 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.
 - K) Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
 - L) 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 (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
 - M) Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
 - N) 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.
 - O) Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
 - P) Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
 - Q) Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch (50-mm) radius control at bend points.
 - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
 - R) Expansion-Joint Fittings:
 - 1. Install in each run of aboveground RMC and IMC conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
 - 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 (70 deg C) temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.

- c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
 - 3. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) 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.
- S) Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches (915 mm) of flexible conduit for structural jumpers throughout the garage.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- T) 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.
- U) 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.
- V) Locate boxes so that cover or plate will not span different building finishes.
- W) Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

0.3 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 paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 76 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section Includes:
 - 1. Color and legend requirements for raceways, conductors, and warning labels and signs.
 - 2. Labels.
 - 3. Signs.
 - 4. Cable ties.
 - 5. Fasteners for labels and signs.

0.3 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 electrical identification products.
- B) Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C) Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 77 - PRODUCTS

0.1 PERFORMANCE REQUIREMENTS

- A) Comply with ASME A13.1.
- 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.

0.2 COLOR AND LEGEND REQUIREMENTS

- A) Color-Coding for Phase- and Voltage-Level, Identification, 600 V or Less: Use colors listed below for ungrounded branch-circuit conductors.
 - 1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
 - 2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - 3. Colors for 240-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - 4. Colors for 480/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - 5. Color for Neutral: White or gray.
 - 6. Color for Equipment Grounds: Green.
- B) Warning Label Colors:
 - 1. Identify system voltage with black letters on an orange background.
- C) Warning labels and signs shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
- D) Equipment Identification Labels:
 - 1. Black letters on a white field.

0.3 CABLE TIES

- A) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ideal Industries, Inc.
 2. Marking Services, Inc.
 3. Panduit Corp.
- B) General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and 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.

0.4 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A) Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B) Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 78 - EXECUTION

0.1 PREPARATION

- A) Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.
- B) Cable Ties: General purpose, for attaching tags, except as listed below:
1. Outdoors: UV-stabilized nylon.

0.2 IDENTIFICATION SCHEDULE

- A) Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

- B) Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- C) Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels.
 - 1. Apply to exterior of door, cover, or other access.
 - 2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
 - a. Controls with external control power connections.
- D) Equipment Identification Labels:
 - 1. Indoor Equipment: Self-adhesive label.
 - 2. Equipment to Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Access doors and panels for concealed electrical items.
 - d. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
 - e. Push-button stations.
 - f. Contactors.

END OF SECTION 260553

SECTION 262913.03 - MANUAL AND MAGNETIC MOTOR CONTROLLERS

PART 79 - GENERAL

0.1 RELATED DOCUMENTS

- A) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

0.2 SUMMARY

- A) Section Includes:
 - 1. Manual motor controllers.
 - 2. Enclosed full-voltage magnetic motor controllers.
 - 3. Combination full-voltage magnetic motor controllers.
 - 4. Enclosures.
 - 5. Accessories.
 - 6. Identification.

0.3 DEFINITIONS

- A) CPT: Control power transformer.
- B) MCCB: Molded-case circuit breaker.
- C) MCP: Motor circuit protector.
- D) NC: Normally closed.
- E) OCPD: Overcurrent protective device.
- F) SCCR: Short-circuit current rating.
- G) SCPD: Short-circuit protective device.

0.4 ACTION SUBMITTALS

- A) Product Data: For each type of product.
 - 1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B) Shop Drawings: For each type of magnetic controller.

1. Include plans, elevations, sections, and mounting details.
2. Indicate dimensions, weights, required clearances, and location and size of each field connection.
3. Wire Termination Diagrams and Schedules: Include diagrams for signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features. Differentiate between manufacturer-installed and field-installed wiring.
4. Include features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

C) Product Schedule: List the following for each enclosed controller:

1. Each installed magnetic controller type.
2. NRTL listing.
3. Factory-installed accessories.
4. Nameplate legends.
5. SCCR of integrated unit.
6. For each combination magnetic controller include features, characteristics, ratings, and factory setting of the SCPD and OCPD.
 - a. Listing document proving Type 2 coordination.
7. For each series-rated combination state the listed integrated short-circuit current (withstand) rating of SCPD and OCPDs by an NRTL acceptable to authorities having jurisdiction.

0.5 INFORMATIONAL SUBMITTALS

- A) Field quality-control reports.

0.6 CLOSEOUT SUBMITTALS

- A) Operation and Maintenance Data: For magnetic controllers to include in operation and maintenance manuals.

1. Include the following:
 - a. Routine maintenance requirements for magnetic controllers and installed components.
 - b. Manufacturer's written instructions for testing and adjusting circuit breaker and MCP trip settings.
 - c. Manufacturer's written instructions for setting field-adjustable overload relays.
 - d. Load-Current and Overload-Relay Heater List: Compile after motors have been installed and arrange to demonstrate that selection of heaters suits actual motor nameplate full-load currents.

0.7 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. Fuses for Fused Switches: Equal to 10 percent of quantity installed for each size and type, but no fewer than three (3) of each size and type.
 - 2. Control Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two (2) of each size and type.
 - 3. Indicating Lights: Two of each type and color installed.
 - 4. Auxiliary Contacts: Furnish one (1) spare for each size and type of magnetic controller installed.
 - 5. Power Contacts: Furnish three (3) spares for each size and type of magnetic contactor installed.

0.8 DELIVERY, STORAGE, AND HANDLING

- A) Store controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.

0.9 FIELD CONDITIONS

- A) Ambient Environment Ratings: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than 23 deg F (minus 5 deg C) and not exceeding 104 deg F (40 deg C).
 - 2. Altitude: Not exceeding 6600 feet (2010 m) for electromagnetic and manual devices.
 - 3. The effect of solar radiation is not significant.

PART 80 - PRODUCTS

0.1 PERFORMANCE REQUIREMENTS

- A) Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B) UL Compliance: Fabricate and label magnetic motor controllers to comply with UL 508 and UL 60947-4-1.
- C) NEMA Compliance: Fabricate motor controllers to comply with ICS 2.

0.2 ENCLOSED FULL-VOLTAGE MAGNETIC MOTOR CONTROLLERS

- A) Description: Across-the-line start, electrically held, for nominal system voltage of 600-V ac and less.
- B) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton.
 - 2. General Electric Company.
 - 3. Square D; by Schneider Electric.
- C) Standard: Comply with NEMA ICS 2, general purpose, Class A.
- D) Configuration: Nonreversing.
- E) Contactor Coils: Pressure-encapsulated type with coil transient suppressors.
 - 1. Operating Voltage: Manufacturer's standard, unless indicated.
- F) Control Power:
 - 1. For on-board control power, obtain from line circuit or from integral CPT. The CPT shall have capacity to operate integral devices and remotely located pilot, indicating, and control devices.
 - a. Spare CPT Capacity: 100 VA.
- G) Overload Relays:
 - 1. Thermal Overload Relays:
 - a. Inverse-time-current characteristic.
 - b. Class 20 tripping characteristic.
 - c. Heaters in each phase shall be matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
 - 2. Solid-State Overload Relay:
 - a. Switch or dial selectable for motor-running overload protection.
 - b. Sensors in each phase.
 - c. Class 20 tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
- H) Digital communication module, using RS-485 Modbus, to transmit the following to the LAN:
 - 1. Instantaneous rms current each phase, and 3-phase average.

2. Voltage: L-L for each phase, L-L 3-phase average, L-N each phase and L-N 3-phase average - rms.
3. Active Energy (kWh): 3-phase total.
4. Power Factor: Each phase and 3-phase total.

0.3 COMBINATION FULL-VOLTAGE MAGNETIC MOTOR CONTROLLER

- A) Description: Factory-assembled, combination full-voltage magnetic motor controller consisting of the controller described in this article, indicated disconnecting means, SCPD and OCPD, in a single enclosure.
- B) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Eaton.
 2. General Electric Company.
 3. Square D; by Schneider Electric.
- C) Standard: Comply with NEMA ICS 2, general purpose, Class A.
- D) Configuration: Nonreversing.
- E) Contactor Coils: Pressure-encapsulated type with coil transient suppressors.
1. Operating Voltage: Manufacturer's standard, unless indicated.
- F) Control Power:
1. For on-board control power, obtain from line circuit or from integral CPT. The CPT shall have capacity to operate integral devices and remotely located pilot, indicating, and control devices.
 - a. Spare CPT Capacity: 100 VA.
- G) Overload Relays:
1. Thermal Overload Relays:
 - a. Inverse-time-current characteristic.
 - b. Class 20 tripping characteristic.
 - c. Heaters in each phase shall be matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
 2. Solid-State Overload Relay:
 - a. Switch or dial selectable for motor-running overload protection.
 - b. Sensors in each phase.

-
- c. Class 10/20 selectable tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
- H) Digital communication module, using RS-485 Modbus, to transmit the following to the LAN:
- 1. Instantaneous rms current each phase, and 3-phase average.
 - 2. Voltage: L-L for each phase, L-L 3-phase average, L-N each phase and L-N 3-phase average - rms.
 - 3. Active Energy (kWh): 3-phase total.
 - 4. Power Factor: Each phase and 3-phase total.
- I) Fusible Disconnecting Means:
- 1. NEMA KS 1, heavy-duty, horsepower-rated, fusible switch with clips or bolt pads to accommodate indicated fuses.
 - 2. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
- J) Nonfusible Disconnecting Means:
- 1. NEMA KS 1, heavy-duty, horsepower-rated, nonfusible switch.
 - 2. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
- K) MCP Disconnecting Means:
- 1. UL 489 and NEMA AB 3, with interrupting capacity to comply with available fault currents, instantaneous-only circuit breaker with front-mounted, field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.
 - 2. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
- L) MCCB Disconnecting Means:
- 1. UL 489 and NEMA AB 3, with interrupting capacity to comply with available fault currents; thermal-magnetic MCCB, with inverse-time-current element for low-level overloads and instantaneous magnetic trip element for short circuits.
 - 2. Front-mounted, adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 3. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
- 0.4 ENCLOSURES
- A) Comply with NEMA 250, type designations as indicated on Drawings, complying with environmental conditions at installed location.
 - B) The construction of the enclosures shall comply with NEMA ICS 6.
 - C) Controllers in hazardous (classified) locations shall comply with UL 1203.

0.5 ACCESSORIES

- A) General Requirements for Control Circuit and Pilot Devices: NEMA ICS 5; factory installed in controller enclosure cover unless otherwise indicated.
 - 1. Push Buttons, Pilot Lights, and Selector Switches: Standard-duty, except as needed to match enclosure type. Heavy-duty or oil-tight where indicated in the controller schedule.
 - a. Push Buttons: As indicated in the controller schedule.
 - b. Pilot Lights: As indicated in the controller schedule.
 - 2. Meters: Panel type, 2-1/2-inch (64-mm) minimum size with 90- or 120-degree scale and plus or minus two percent accuracy. Where indicated, provide selector switches with an off position.
- B) Motor protection relays shall be with solid-state sensing circuit and isolated output contacts for hardwired connections.
 - 1. Phase-failure.
 - 2. Phase-reversal, with bicolor LED to indicate normal and fault conditions. Automatic reset when phase reversal is corrected.
 - 3. Under/overvoltage, operate when the circuit voltage reaches a preset value, and drop out when the operating voltage drops to a level below the preset value. Include adjustable time-delay setting.

0.6 IDENTIFICATION

- A) Controller Nameplates: Laminated acrylic or melamine plastic signs, as described in Section 260553 "Identification for Electrical Systems," for each compartment, mounted with corrosion-resistant screws.
- B) Arc-Flash Warning Labels:
 - 1. Comply with requirements in Section 260553 "Identification for Electrical Systems." Produce a 3.5-by-5-inch (89-by-127-mm) self-adhesive equipment label for each work location included in the analysis. Labels shall be machine printed, with no field-applied markings.
 - a. The label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:
 - 1) Location designation.
 - 2) Nominal voltage.
 - 3) Flash protection boundary.
 - 4) Hazard risk category.
 - 5) Incident energy.
 - 6) Working distance.
 - 7) Engineering report number, revision number, and issue date.

- b. Labels shall be machine printed, with no field-applied markings.

PART 81 - EXECUTION

0.1 EXAMINATION

- A) Examine areas and space conditions for compliance with requirements for motor controllers, their relationship with the motors, and other conditions affecting performance of the Work.

0.2 INSTALLATION

- A) Comply with NECA 1.
- B) Wall-Mounted Controllers: Install magnetic controllers on walls with tops at uniform height indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems" unless otherwise indicated.
- C) Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.
- D) Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
- E) Setting of Overload Relays: Select and set overloads on the basis of full-load current rating as shown on motor nameplate. Adjust setting value for special motors as required by NFPA 70 for motors that are high-torque, high-efficiency, and so on.

0.3 IDENTIFICATION

- A) Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

0.4 FIELD QUALITY CONTROL

- A) Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B) Perform tests and inspections with the assistance of a factory-authorized service representative.
- C) Tests and Inspections:
 - 1. Comply with the provisions of NFPA 70B, "Testing and Test Methods" Chapter.
 - 2. Visual and Mechanical Inspection:

- a. Compare equipment nameplate data with drawings and specifications.
 - b. Inspect physical and mechanical condition.
 - c. Inspect anchorage, alignment, and grounding.
 - d. Verify the unit is clean.
 - e. Inspect contactors:
 - 1) Verify mechanical operation.
 - 2) Verify contact gap, wipe, alignment, and pressure are according to manufacturer's published data.
 - f. Motor-Running Protection:
 - 1) Verify overload element rating is correct for its application.
 - 2) If motor-running protection is provided by fuses, verify correct fuse rating.
 - g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter. Compare bolted connection resistance values with values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - h. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
3. Electrical Tests:
- a. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Insulation-resistance values shall be according to manufacturer's published data or NETA ATS Table 100.1. In the absence of manufacturer's published data, use Table 100.5. Values of insulation resistance less than those of this table or manufacturer's recommendations shall be investigated and corrected.
 - b. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
 - c. Test motor protection devices according to manufacturer's published data.
 - d. Test circuit breakers as follows:
 - 1) Operate the circuit breaker to ensure smooth operation.
 - 2) For adjustable circuit breakers, adjust protective device settings according to the coordination study. Comply with coordination study recommendations.
 - e. Perform operational tests by initiating control devices.

4. Infrared Inspection: Perform the survey during periods of maximum possible loading. Remove all necessary covers prior to the inspection.
 - a. Comply with the recommendations of NFPA 70B, "Testing and Test Methods" Chapter, "Infrared Inspection" Article.
 - b. After Substantial Completion, but not more than 60 days after Final Acceptance, perform infrared inspection of the electrical power connections of each motor controller.
 - c. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each motor controller 11 months after date of Substantial Completion.
 - d. Report of Infrared Inspection: Prepare a certified report that identifies the testing technician and equipment used, and lists the following results:
 - 1) Description of equipment to be tested.
 - 2) Discrepancies.
 - 3) Temperature difference between the area of concern and the reference area.
 - 4) Probable cause of temperature difference.
 - 5) Areas inspected. Identify inaccessible and unobservable areas and equipment.
 - 6) Load conditions at time of inspection.
 - 7) Photographs and thermograms of the deficient area.
 - 8) Recommended action.
 - e. Equipment: Inspect distribution systems with imaging equipment capable of detecting a minimum temperature difference of 1°C at 30°C. The equipment shall detect emitted radiation and convert detected radiation to a visual signal.
 - f. Act on inspection results and recommended action, and considering the recommendations of NETA ATS, Table 100.18. Correct possible and probable deficiencies as soon as Owner's operations permit. Retest until deficiencies are corrected.
- D) Motor controller will be considered defective if it does not pass tests and inspections.
- E) Prepare test and inspection reports.

0.5 SYSTEM FUNCTION TESTS

- A) System function tests shall prove the correct interaction of sensing, processing, and action devices. Perform system function tests after field quality control tests have been completed and all components have passed specified tests.
 1. Develop test parameters and perform tests for the purpose of evaluating performance of integral components and their functioning as a complete unit within design requirements and manufacturer's published data.
 2. Verify the correct operation of interlock safety devices for fail-safe functions in addition to design function.
 3. Verify the correct operation of sensing devices, alarms, and indicating devices.
- B) Motor controller will be considered defective if it does not pass the system function tests and inspections.

- C) Prepare test and inspection reports.

0.6 DEMONSTRATION

- A) Train Owner's maintenance personnel to adjust, operate, and maintain motor controllers.

END OF SECTION 262913.03

ATTACHMENT A

MINORITY BUSINESS PROGRAM & OFFEROR'S REPRESENTATION

It is the policy of the County to recruit actively, minority-owned businesses to provide goods and services to perform governmental functions pursuant to Section 11B-57 of the County Code. Minority-owned businesses are described in County law as Minority/Female/Disabled Person owned businesses (MFD). MFD businesses include certain non-profit entities organized to promote the interests of persons with a disability demonstrating (on a contract by contract basis) that at least 51% of the persons used by the non-profit entity to perform the services or manufacture the goods contracted for by the County, are persons with a disability. MFD firms also include those firms that are 51% owned, controlled and managed by one or more members of a socially or economically disadvantaged minority group, which include African Americans who are not of Hispanic origin, Hispanic Americans, Native Americans, Asian Americans, Women and Mentally or Physically Disabled Persons.

Section 7 - "Minority Contracting", Montgomery County Procurement Regulations specifies the procedure to be followed and will govern the evaluation of offers received pursuant to this solicitation. A copy of Section 7 of the Procurement Regulations is available upon request.

Prior to awarding contracts with a value of \$50,000 or more, a prospective Contractor must demonstrate that a minimum percentage of the overall contract value as set by the County, will be subcontracted to certified MFD businesses. A decision as to whether the prospective Contractor has demonstrated a good faith effort to meet this subcontracting requirement will be made by the Director, Office of Procurement, or his/her designee, who may waive this requirement.

A sample of the MFD Report of payment Received is attached. This form is mailed to the MFD Subcontractor to complete for documentation of payment by the Prime Contractor. It is not to be completed by the Prime Contractor nor submitted with the MFD Subcontractor Performance Plan.

The Director, Office of Procurement, or his /her designee determines whether a waiver of MFD subcontracting would be appropriate, under Section 7.3.3.5 of the Procurement Regulations.

For further information regarding the MFD Business Program, please contact the MFD Program Manager, Division of Business Relations and Compliance at (240) 777-9912.

Offerors are encouraged (but not required) to complete the following:

I hereby represent that this is a Minority Business firm as indicated below (CIRCLE ONE):

AFRICAN AMERICAN	ASIAN AMERICAN	DISABLED PERSON
FEMALE	HISPANIC AMERICAN	NATIVE AMERICAN

Attach one of the following certification documents from: Maryland Department of Transportation (MDOT); Federal SBA 8(a); MD/DC Minority Supplier Development Council, Women's Business Enterprise National Council; or City of Baltimore.

ATTACHMENT B

MONTGOMERY COUNTY, MARYLAND
MINORITY, FEMALE, DISABLED PERSON SUBCONTRACTOR
PERFORMANCE PLAN

Contractor's

Name: _____

Address: _____

City: _____

State: _____

Zip: _____

Phone Number: _____

Fax Number: _____

Email: _____

CONTRACT NUMBER/PROJECT DESCRIPTION: _____

A. Individual assigned by Contractor to ensure Contractor's compliance with MFD Subcontractor Performance Plan:

Name: _____

Title: _____

Address: _____

City: _____

State: _____

Zip: _____

Phone Number: _____

Fax Number: _____

Email: _____

B. This Plan covers the life of the contract from contract execution through the final contract expiration date.

C. The percentage of total contract dollars, including modifications and renewals, to be paid to all certified minority owned business subcontractors, is _____ % of the total dollars awarded to Contractor.

D. Each of the following certified minority owned businesses will be paid the percentage of total contract dollars indicated below as a subcontractor under the contract.

I hereby certify that the business(s) listed below are certified by one of the following: Maryland Department of Transportation (MDOT); Federal SBA (8A); MD/DC Minority Supplier Development Council (MSDC); Women's Business Enterprise National Council (WBENC); or City of Baltimore.

A Certification Letter must be attached.

For assistance, call 240-777-9912.

1. Certified by: _____

Subcontractor Name: _____

Title: _____

Address: _____

City: _____

State: _____

Zip: _____

Phone Number: _____

Fax Number: _____

Email: _____

CONTACT PERSON: _____

Circle MFD Type:

AFRICAN AMERICAN

ASIAN AMERICAN

DISABLED PERSON

FEMALE

HISPANIC AMERICAN

NATIVE AMERICAN

The percentage of total contract dollars to be paid to this subcontractor:

This subcontractor will provide the following goods and/or services:

2. Certified by:

Subcontractor Name:

Title:

Address:

City:

State:

Zip:

Phone Number:

Fax Number:

Email:

CONTACT PERSON:

Circle MFD Type:

AFRICAN AMERICAN
FEMALE

ASIAN AMERICAN
HISPANIC AMERICAN

DISABLED PERSON
NATIVE AMERICAN

The percentage of total contract dollars to be paid to this subcontractor:

This subcontractor will provide the following goods and/or services:

3. Certified by:

Subcontractor Name:

Title:

Address:

City:

State:

Zip:

Phone Number:

Fax Number:

Email:

CONTACT PERSON:

Circle MFD Type:

AFRICAN AMERICAN
FEMALE

ASIAN AMERICAN
HISPANIC AMERICAN

DISABLED PERSON
NATIVE AMERICAN

The percentage of total contract dollars to be paid to this subcontractor:

This subcontractor will provide the following goods and/or services:

4. Certified By:

Subcontractor Name:

Title:

Address: _____

City: _____

State: _____

Zip: _____

Phone Number: _____

Fax Number: _____

Email: _____

CONTACT PERSON: _____

Circle MFD Type:

AFRICAN AMERICAN

ASIAN AMERICAN

DISABLED PERSON

FEMALE

HISPANIC AMERICAN

NATIVE AMERICAN

The percentage of total contract dollars to be paid to this subcontractor: _____

This subcontractor will provide the following goods and/or services: _____

E. The following language will be inserted in each subcontract with a certified minority owned business listed in D above, regarding the use of binding arbitration with a neutral arbitrator to resolve disputes with the minority owned business subcontractor; the language must describe how the costs of dispute resolution will be apportioned:

F. Provide a statement below, or on a separate sheet, that summarizes maximum good faith efforts achieved, and/or the intent to increase minority participation throughout the life of the contract or the basis for a full waiver request.

G. A full waiver request must be justified and attached.

Full Waiver Approved: _____

Date: _____

Partial Waiver Approved: _____

Date: _____

MFD Program Officer

MFD Program Officer

Full Waiver Approved: _____

Date: _____

Partial Waiver Approved: _____

Date: _____

Director
Cherri Branson
Office of Procurement

Director
Cherri Branson
Office of Procurement

The Contractor submits this MFD Subcontractor Performance Plan (Plan Modification No. _____) in accordance with the Minority Owned Business Addendum to General Conditions of Contract between County and Contractor.

CONTRACTOR SIGNATURE

USE ONE:

PMMD-65 08/17

1. TYPE CONTRACTOR'S NAME: _____

Signature

Typed Name

Date

2. TYPE CORPORATE CONTRACTOR'S NAME: _____

Signature

Typed Name

Date

I hereby affirm that the above named person is a corporate officer or a designee empowered to sign contractual agreements for the corporation.

Signature

Typed Name

Title

Date

APPROVED:

Cherri Branson, Director, Office of Procurement

Date

Section 7.3.3.4(a) of the Procurement Regulations requires:

The Contractor must notify the Director, Office of Procurement of any proposed change to the Subcontractor Performance Plan.

Montgomery County
Office of Business
Relations and Compliance

MFD Report of Payments Received

For Office Use

SAMPLE ONLY! NOT TO BE USED BY PRIME

MFD Subcontractor Company Name: _____

Prime Contractor Company Name: _____

Title: _____

MFD Subcontract Amount: _____

\$ _____

READ CAREFULLY BEFORE SIGNING

This certifies that for the month of _____, my company received \$ _____ for work performed, services rendered and/or materials supplied on the above contract.

TOTAL AMOUNT OF SUBMITTED INVOICES TO DATE: \$ _____

TOTAL PAYMENTS RECEIVED TO DATE: \$ _____

Are you experiencing any contract problems with the prime contractor and/or the project?

YES ☐ NO ☐

Comments: _____

I certify that the above information is true and accurate to the best of my record documentation and knowledge.

(TYPED/PRINTED COMPANY NAME) _____

(TYPED/PRINTED NAME OF COMPANY OFFICIAL) _____

(TITLE) _____

SIGNATURE OF COMPANY OFFICIAL) _____

(DATE) _____

() -
TELEPHONE() -
FAX

E-MAIL _____

Return by: Email – MFD@montgomerycountymd.gov FAX – 240-777-9952

For assistance, contact the MFD Office at 240-777-9912

ATTACHMENT C

Requirements for Services Contract
Addendum to The General Conditions of Contract Between County and Contractor

- A. This contract is subject to the Wage Requirements Law, found at Section 11B-33A of the Montgomery County Code ("WRL" or "11B-33A"). A County contract for the procurement of services must require the contractor and any of its subcontractors to comply with the WRL, subject to the exceptions for particular contractors noted in 11B-33A (b) and for particular employees noted in 11B-33A (f).
- B. Conflicting requirements (11B-33A (h)): If any federal, state, or County law or regulation requires payment of a higher wage, that law or regulation controls. For an existing County Contract, if an applicable collective bargaining agreement (CBA) that existed prior to May 10, 2016, governs the parties, then that CBA controls. If the term of the CBA mentioned in the preceding sentence ends during the Contract, the WRL will then control.
- C. A nonprofit organization that is exempt from the WRL under 11B-33A (b)(3), must specify, in each bid or proposal, the wage the organization intends to pay to those employees who will perform direct, measurable work under the contract, and any health insurance coverage the organization intends to provide to those employees. Section 11B-33A (c)(2).
- D. A contractor must not split or subdivide a contract, pay an employee through a third party, or treat an employee as a subcontractor or independent contractor, to avoid the imposition of any requirement in 11B-33A. Section 11B-33A (c)(3).
- E. Each contractor and subcontractor covered under the WRL must: certify that it is aware of and will comply with the applicable wage requirements; keep and submit any records necessary to show compliance; and conspicuously post notices approved and/or supplied by the County, informing employees of the requirements in 11B-33A. Section 11B-33A (i).
- F. An employer must comply with the WRL during the initial term of the contract and all subsequent renewal periods, and must pay the adjusted wage rate increase required under 11B-33A (e)(2), if any, which is effective July 1 of each year. The County will adjust the wage rate by the annual average increase in the Consumer Price Index for all urban consumers for the Washington-Baltimore metropolitan area, or successor index, for the previous calendar year and must calculate the adjustment to the nearest multiple of 5 cents. Section 11B-33A (e)(2).
- G. An employer must not discharge or otherwise retaliate against an employee for asserting any right, or filing a complaint of a violation, under the WRL. Section 11B-33A (i)(3).
- H. The sanctions under Section 11B-33 (b), which apply to noncompliance with nondiscrimination requirements, apply with equal force and scope to noncompliance with the wage requirements of the WRL. Section 11B-33A (i)(4).
- I. In the event of a breach of this contract as a result of a contractor's or subcontractor's violation of the WRL, the County may seek its available remedies, which include but are not limited to liquidated damages, withholding of payment, and recoupment of audit costs that are described below. The Contractor is jointly and severally liable for any noncompliance by a subcontractor. An aggrieved employee, as a third-party beneficiary, may by civil action against the violating Contractor or subcontractor enforce the payment of wages due under the WRL and recover from the Contractor or subcontractor any unpaid wages with interest, a reasonable attorney's fee, and damages for any retaliation by the Contractor or subcontractor arising from the employee asserting any right, including filing a complaint under the WRL. Section 11B-33A (i)(5). Furthermore, the contractor expressly acknowledges that the County may assess liquidated damages against the Contractor in the event that it, as a covered employer, fails to pay the required wage, or violates the wage

reporting or payroll records reporting requirement found at 11B-33A (g), including its providing late or inaccurate payroll records.

(i) Liquidated Damages

The County may assess liquidated damages for any noncompliance by contractor or its subcontractor at the rate of 1% per day of the total contract amount, or the estimated annual contract value of a requirements contract, for each day of the violation. This liquidated damages amount includes the amount of any unpaid wages, with interest. The Contractor must pay to the County liquidated damages noted above, in addition to any other remedies available to the County. Contractor and County acknowledge that damages that would result to the County as a result of a breach under the WRL are difficult to reasonably ascertain, and that the liquidated damages provided for in this paragraph is a fair and reasonable estimate of damages the County would incur as a result of contractor's or subcontractor's violation of the WRL.

(ii) Withholding of Payment

If the Director determines that a provision of the WRL has been violated, the Director must issue a written decision, including imposing appropriate sanctions and assessing liquidated damages (as outlined above) and audit costs (as outlined below), and may withhold from payment due the contractor, pending a final decision, an amount sufficient to: (a) pay each employee of the contractor or subcontractor the full amount of wages due under the WRL; (b) reimburse the County for audit costs; and (c) satisfy a liability of a contractor or subcontractor for liquidated damages.

(iii) Audit Costs

If the County determines, as a result of a WRL audit, that the Contractor has violated requirements of the WRL, the Contractor must reimburse to the County the cost incurred by the County in conducting the audit. Section 11B-33A (i)(2)(C).

- J. The County must conduct, and the contractor or subcontractor must comply with, random or regular audits to assure compliance with the WRL. Section 11B-33A (i)(2). The Director may conduct an on-site inspection(s) for the purpose of determining compliance. Some of the documents that may be required during an audit are listed on the Wage Requirements Law FAQ web page:
<http://www.montgomerycountymd.gov/PRO/DBRC/WRL.html>

- K. The Contractor is in breach of this Contract if the Contractor fails to submit timely documentation demonstrating compliance with the WRL to the satisfaction of the Director, including: the Wage Requirements Law Payroll Report Form (PMMD-183), which is required to be submitted by the 14th day of the month following the end of each quarter (January, April, July, October); documents requested in conjunction with a random or regular audit by the County; or, documents otherwise requested by the Director. Section 11B-33A (g)(2).

If a contractor or subcontractor fails to submit, or is late in submitting, copies of any payroll record or other report required to be submitted under the WRL, the County may deem invoices unacceptable until the contractor or subcontractor provides the required records or reports, and may postpone processing payments due under the contract or under an agreement to finance the contract.

For any questions, please contact the Wage Requirements Law Program Manager at 240-777-9918 or WRL@montgomerycountymd.gov.

Wage Requirements Law Certification

(Montgomery County Code, Section 11B-33A)

Business Name					
Address					
City		State		Zip Code	
Phone Number		Fax Number			
E-Mail Address					

Provide, in the spaces below, the contact name and information of the individual designated by your firm to monitor your compliance with the County's Wage Requirements Law, unless exempt under Section 11B-33A (b) (see Section B. below):

Contact Name			Title	
Phone Number		Fax Number		
E-mail Address				

In the event that you, the "Offeror," are awarded the contract and become a Contractor, YOU MUST MARK ☒ or ☒ in ALL BOXES BELOW that apply.

☐ **A. Wage Requirements Compliance**

This Contractor, as a "covered employer", must comply with the requirements under Montgomery County Code Section 11B-33A, "Wage Requirements" ("Wage Requirements Law" or "WRL"). Contractor and its subcontractors must pay all employees not exempt under the WRL, and who perform direct measurable work for the County, the required gross wage rate effective at the time the work is performed. For employees who are not paid an hourly wage, Contractor's compliance with the WRL must be measured by dividing the amount paid to the employee each pay period by the number of hours worked by that employee during each pay period. A covered employer must not make any deduction for any item necessary for an employee to perform the essential job function unless the deduction is permitted by Executive Regulation. The offer price(s) submitted under this solicitation include(s) sufficient funds to meet the requirements of the WRL. A "covered employer" must submit, within 14 days after the end of each quarter (by the 14th of January, April, July, and October, for the quarter ending the preceding month), certified payroll records for each payroll period and for all employees of the contractor or a subcontractor performing services under the County contract governed by the WRL. The payroll records must contain a statement signed by the contractor or subcontractor certifying that the payroll records are correct and the wage rates paid are not less than those required by the WRL. These payroll records must include the following: name, address and telephone number of the contractor or subcontractor; the name and location of the job; and each employee's name, current home address, daily straight time and overtime hours, total straight time and overtime hours for the payroll period, rate of pay, fringe benefits by type and amount, gross wages, race and gender of the employee, and the employer and the employee share of any health insurance premium provided to the employee. The Contractor must ensure that **NO** Social Security number of any person, other than the last four digits, is included on the quarterly report. A sample, blank Payroll Report Form, for your use and completion, can be found at: <http://www.montgomerycountymd.gov/PRO/DBRC/WRL.html>. The above must be submitted to the

Division of Business Relations and Compliance, Attn: Wage Requirements Law Program Manager
(preferably via email to WRL@montgomerycountymd.gov),

Each Contractor must: keep payroll records covering work performed on a contract covered by the WRL for not less than 5 years after the work is completed; and, subject to reasonable notice, permit the County to inspect the payroll records at any reasonable time and as often as the County deems necessary. If the Contractor or subcontractor fails to submit, or is late in submitting, copies of any payroll record or other report required to be submitted under the WRL, the County may deem invoices unacceptable until the Contractor or subcontractor provides the required records or reports, and may postpone processing payments due under the contract or under an agreement to finance the contract. A violation of the WRL, including the late submission or non-submission of the information noted above, may result in action by the County, including: (a) withholding contract payments, reducing payment amounts, or otherwise assessing damages against Contractor, in an amount sufficient to: (i) pay each employee of the Contractor or subcontractor the full amount of wages due under the WRL; (ii) reimburse the County for audit costs; or (iii) satisfy a liability of a contractor or subcontractor for liquidated damages; (b) terminating the contract; or, (c) otherwise taking action to enforce the contract or the WRL. Violation of the WRL may also result in a finding of non-responsibility for a future contract, or may form the basis for debarment or suspension.

B. Exemption Status (if applicable)

This Contractor is exempt from Section 11B-33A, "Wage Requirements," because it is:

- ☐ 1. Reserved – [Intentionally left blank].
- ☐ 2. a contractor who, at the time a contract is signed, has received less than \$50,000 from the County in the most recent 12-month period, and will be entitled to receive less than \$50,000 from the County under that contract in the next 12-month period. Section 11B-33A (b)(1).
- ☐ 3. a public entity. Section 11B-33A (b)(2).
- ☐ 4. a non-profit organization that has qualified for an exemption from federal income taxes under Section 501(c)(3) of the Internal Revenue Code. Section 11B-33A (b)(3) (**must complete item C below**).
- ☐ 5. an employer expressly precluded from complying with the WRL by the terms of any federal or state law, contract, or grant. Section 11B-33A (b)(7) (**must specify the law, or furnish a copy of the contract or grant**).

☐ **C. Nonprofit Wage & Health Information**

This Contractor is a non-profit organization that is exempt from coverage under Section 11B-33A (b)(3). Accordingly, the contractor has completed the 501 (c)(3) Nonprofit Organization's Employee's Wage and Health Insurance Form, which is attached. See Section 11B-33A (c)(2). Also, the contractor must provide proof of its 501(c)(3) status (i.e. Letter from the IRS).

☐ **D. Nonprofit's Comparison Price(s) (if desired)**

This Contractor is a non-profit organization that is opting to pay its covered employees the hourly rate specified in the wage requirements. Accordingly, Contractor is duplicating the blanket-cost quotation sheet on which it is submitting its price(s) in the Solicitation, and is submitting on this duplicate form its price(s) to the County had it not opted to pay its employees the hourly rate specified in the WRL. For proposal evaluation purposes, this price(s) will be compared to price(s) of another nonprofit organization(s) that is paying its employees an amount consistent with its exemption from paying the hourly rate under the WRL. This revised information on the duplicate cost sheet must be clearly marked as your

nonprofit organization comparison price(s). In order for the County to compare your price(s), the revised information on the duplicate cost sheet must be submitted with your offer on or before the offer opening date, and must show how the difference between your nonprofit organization price(s) and other organization comparison price(s) was calculated. Section 11B-33A (c)(2).



E. Sole Proprietorship

Sole Proprietorships are subject to the WRL. In order to be excused from the posting and reporting requirements of the WRL, the individual who is the sole proprietor must sign the certifications below in order to attest to the fact that the Sole Proprietorship:

- (1) is aware of, and will comply with, the WRL, as applicable;
- (2) has no employee other than the sole proprietor; and
- (3) will inform the Montgomery County Division of Business Relations and Compliance if the sole proprietor employs any worker other than the sole proprietor.

Contractor Certification

CONTRACTOR SIGNATURE: Contractor submits this certification form in accordance with Section 11B-33A of the Montgomery County Code. Contractor certifies that it, and any and all of its subcontractors that perform services under the resultant contract with the County, adhere to Section 11B-33A of the Montgomery County Code.

Authorized Signature		Title of Authorized Person	
Typed or Printed Name		Date	

501(c)(3) Nonprofit Organization's Employee's Wage and Health Insurance Form

Business Name					
Address					
City		State		Zip Code	
Phone Number		Fax Number		E-Mail	

Please provide below the employee labor category of each employee(s) who will perform direct measurable work under this contract, the hourly wage the organization pays for that employee labor category, and any health insurance the organization intends to provide for that employee labor category. This information is collected for statistical reporting purposes only.

[illegible]

* IF NO HEALTH INSURANCE PLAN IS PROVIDED PLEASE STATE "NONE".

ATTACHMENT D

**Prevailing Wage Requirements for Construction Contract Addendum to the General Conditions of Contract
between County and Contractor**

The Contractor and all Subcontractors must comply with the Prevailing Wage Law contained in Chapters 11B-33C and 20-75 of the Montgomery County Code. Prevailing wage means the wage rate paid by employers that is determined by a governmental authority, based upon a particular geographic area, for a given class of labor and type of project. The purpose of a prevailing wage is to ensure that construction workers who work on public works contracts are paid the going rate for their services. The prevailing wage rates are established by the State of Maryland and apply to all of the Contractor's employees and any and all Subcontractors. The Contractor and all Subcontractors must comply with all of the requirements of the Prevailing Wage Law including, but not limited to, the following:

1. Pay employees the prescribed rate as annually established by the State of Maryland Commissioner of Labor and Industry; the prevailing wage rates in effect on the date a solicitation is issued will apply throughout the term of a contract resulting from that solicitation.
2. Pay employees overtime for work more than 10 hours in any single day, work more than 40 hours in a work week, or work on Sunday or legal holiday;
3. Classify employees in their proper work classification in conformance with the schedule established by the State of Maryland Commissioner of Labor and Industry;
4. Electronically submit payroll records through www.LCPTTracker.net, within 14 days after the end of each payroll period, to verify that Prevailing Wage rates have been paid to employees. The payroll records must include the following:
 - A. The name, address and telephone number of the Contractor or Subcontractor;
 - B. The name and location of the job;
 - C. Each employee's:
 - a. Name;
 - b. Current address unless previously reported;
 - c. Specific work classification;
 - d. Daily straight time and overtime hours;
 - e. Total straight time and overtime hours for the payroll period;
 - f. Rate of pay;
 - g. Fringe benefits by type and amount;
 - h. Gross wages.
5. If a Contractor or any Subcontractors are late in submitting copies of any payroll records required to be submitted under the Prevailing Wage Law, the County may deem Contractor's invoice(s) submitted to the County for payment unacceptable until the Contractor and Subcontractors provide the required records; and, the County may postpone processing payments otherwise due under the Contract or under an agreement to finance the Contract;
6. The Contractor and all Subcontractors must retain all payroll records for a period not less than five (5) years after the Work is completed;
7. The County may inspect the payroll records at any reasonable time and as often as it deems necessary;
8. The County may perform random or regular audits and investigate any complaint of a violation of the Prevailing Wage Law;
9. In the event the County determines that a provision of the Prevailing Wage Law has been violated, the County may withhold payment to the Contractor in an amount sufficient to pay each employee of the Contractor or any

Subcontractors the full amount of wages due under the Prevailing Wage Law, and an amount sufficient to satisfy a liability of a Contractor or any Subcontractors for liquidated damages as provided under the Prevailing Wage Law, pending a final decision on the violation by the County;

10. Contractor may appeal a written decision of the Director, Office of Procurement, that the Contractor violated a provision of the Prevailing Wage Law to the Chief Administrative Officer ("CAO"), within ten (10) days after receiving a copy of the decision. The CAO must designate a hearing officer to conduct a hearing upon receipt of a timely appeal. If the Contractor does not appeal a written decision within ten (10) days after receipt, the decision of the Director, becomes final and binding;
11. Contractor and all Subcontractors must not discharge, or otherwise retaliate against, an employee for asserting any right under the Prevailing Wage Law or for filing a complaint of a violation;
12. An aggrieved employee is a third-party beneficiary of this Contract and the employee may by civil action recover the difference between the prevailing wage for the type of work performed and the amount actually received, with interest and a reasonable attorney's fee; and
13. Each Contract subject to the Prevailing Wage Law may specify the payment of liquidated damages to the County by the Contractor and any Subcontractors for any noncompliance with the Prevailing Wage Law. Liquidated damages are: \$10 for each calendar day that the payroll records are late; \$20 per day for each day that an employee is misclassified; and \$50 per violation of the requirement to post the prevailing wage rates at the work site.
14. Where the initial Contract Sum is below the \$500,000.00 threshold, but it is subsequently increased and exceeds the \$500,000.00 threshold due to an approved Contract Modification, the amount of any such Contract Modification that causes the Contract Sum to exceed the \$500,000.00 threshold is subject to the Prevailing Wage Law.
15. The Contractor and all Subcontractors must post a clearly legible statement of each prevailing wage rate in a prominent and easily accessible place at the Work Site during the entire time Work is being performed, in English and any other language that is primarily spoken by the employees, at the Work Site.

ATTACHMENT E

Minority-Owned Business Addendum to General Conditions of Contract Between County and Contractor

- A. This contract is subject to the Montgomery County Code and the Montgomery County Procurement Regulations regarding participation in the Minority-Female-Disabled Person (MFD) procurement program.
- B. Contractor must subcontract a percentage goals listed below of the total dollar value of the contract, including all modifications and renewals, to certified minority owned businesses. The MFD subcontracting goal may be waived under appropriate circumstances by submission of a letter to the Minority Business Program Manager. The letter must explain why a waiver is appropriate. The Director of the Office of Procurement or designee may waive, in whole or in part, the MFD subcontracting goal if the Director determines that a waiver is appropriate under Section 7.3.3.5 of the Montgomery County Procurement Regulations. In determining if a waiver should be granted, the Director may require the Contractor to submit additional information; the Director may require the Contractor to submit some or all of this information on forms approved by the Director.
- For Goals by each purchasing category, please refer to www.montgomerycountymd.gov/mfd
- C. The attached MFD Subcontractor Performance Plan, which must be approved by the Director, is an integral part of the contract between County and Contractor. In a multi-term contract, Contractor must submit a MFD Subcontract Performance Plan to be in effect for the life of the contract, including any renewal or modification.
- D. Contractor must include in each subcontract with a minority owned business a provision that requires the use of binding arbitration with a neutral arbitrator to resolve disputes between the Contractor and the minority owned business subcontractor. This arbitration provision must describe how the cost of dispute resolution will be apportioned; the apportionment must not, in the judgment of the Director, attempt to penalize a minority owned business subcontractor for filing an arbitration claim.
- E. County approval of the MFD Subcontractor Performance Plan does not create a contractual relationship between the County and the minority owned business subcontractor.
- F. Contractor must notify and obtain prior written approval from the Director regarding any change in the MFD Subcontractor Performance Plan.
- G. Before receiving final payment under this contract, Contractor must submit documentation showing compliance with the MFD Subcontracting Performance Plan. Documentation may include, at the direction of the Director, invoices, copies of subcontracts with minority owned businesses, cancelled checks, affidavits executed by minority owned business subcontractors, waivers, and arbitration decisions. The Director may require Contractor to submit periodic reports on a form approved by the Director. The Director may conduct an on-site inspection for the purpose of determining compliance with the MFD Subcontractor Performance Plan. If this is a multi-term contract, final payment means the final payment due for performance rendered for each term of the contract.

If the Contractor fails to submit documentation demonstrating compliance with the MFD Subcontractor Performance Plan, to the satisfaction of the Director, after considering relevant waivers and arbitration decisions, the Contractor is in breach of this contract. In the event of a breach of contract under this addendum, the Contractor must pay to the County liquidated damages equal to the difference between all amounts the Contractor has agreed under its Plan to pay minority owned business subcontractors and all amounts actually paid minority owned business subcontractors with appropriate credit given for any relevant waiver or arbitration decision. Contractor and County acknowledge that damages which would result to the County as a result of a breach under this addendum are difficult to ascertain, and that the liquidated damages provided for in this addendum are fair and reasonable in estimating the damage to the County of a breach of this addendum by Contractor. In addition, the County may terminate the contract. As the result of a breach under this addendum, The Director of the Office of Procurement must find the Contractor non-responsible for purposes of future procurement with the County for the ensuing three years.

ATTACHMENT F

Appendix to Section B

MANDATORY INSURANCE REQUIREMENTS***Parking Garage Repair of Underground Parking Air Quality Systems***

Prior to the execution of the contract by the County, the proposed awardee/contractor and their contractors (if requested by County) must obtain, at their own cost and expense, the following *minimum* (not maximum) insurance coverage with an insurance company/companies licensed to conduct business in the State of Maryland and acceptable to the Division of Risk Management. This insurance must be kept in full force and effect during the term of this contract, including all extensions. The insurance must be evidenced by a certificate of insurance, and if requested by the County, the proposed awardee/contractor shall provide a copy of the insurance policies and additional insured endorsements. The minimum limits of coverage listed below shall not be construed as the maximum as required by contract or as a limitation of any potential liability on the part of the proposed awardee/contractor to the County nor shall failure to request evidence of this insurance in any way be construed as a waiver of proposed awardee / contractor's obligation to provide the insurance coverage specified. The Contractor's insurance shall be primary. Coverage pursuant to this Section shall not include any provision that would bar, restrict, or preclude coverage for claims by Montgomery County against Contractor, including but not limited to "cross-liability" or "insured vs insured" exclusion provisions.

Commercial General Liability

A minimum limit of liability of ***one million dollars (\$1,000,000), per occurrence***, for bodily injury, personal injury and property damage coverage per occurrence including the following coverages:

- Contractual Liability
- Premises and Operations
- Independent Contractors & Subcontractors
- Products and Completed Operations
- Explosion, Collapse, Underground Hazard

Business Automobile Liability Coverage

A minimum limit of liability of ***five hundred thousand dollars (\$500,000)***, combined single limit, for bodily injury and property damage coverage per occurrence including the following:

- owned automobiles
- hired automobiles
- non-owned automobiles
- loading and unloading

Worker's Compensation/Employer's Liability

Meeting all statutory requirements of the State of Maryland Law and with the following minimum Employers' Liability limits:

- Bodily Injury by Accident - \$100,000 each accident***
- Bodily Injury by Disease - \$500,000 policy limits***
- Bodily Injury by Disease - \$100,000 each employee***

Additional Insured

Montgomery County, Maryland, its elected and appointed officials, officers, consultants, agents and employees, must be included as an additional insured on Contractor's commercial general, automobile insurance, and contractor's excess/umbrella insurance if used to satisfy the Contractor's minimum insurance requirements under this contract, for liability arising out of contractor's products, goods and services provided under this contract. The stipulated limits of coverage above shall not be construed as a limitation of any potential liability of the contractor.

Policy Cancellation

Should any of the above policies be cancelled before the expiration date thereof, written notice must be delivered to the County in accordance with the policy provisions.

Certificate Holder

Montgomery County, Maryland
 Parking Operations / Tim O'Gwin
 100 Edison Drive, 4th floor
 Gaithersburg, Maryland 20878

IFB #1086041

ATTACHMENT G

SAMPLE PAYMENT REQUEST FORMAT

CONSTRUCTION COMPANY NAME
STREET ADDRESS
CITY – STATE – ZIP CODE
PHONE NO.

Date _____

Montgomery County, Maryland
Department of Transportation
Division of Parking Management
100 Edison Park Drive, 4th floor
Gaithersburg, Maryland 20878

Attn: Name of Capital Projects Manager

Re: IFB No. _____
MCDOT Project No. _____
Project Name _____

Final Estimate (Use when

applicable)

Final Payment (Use when

applicable)

Estimate No.

ITEM NO. TOTAL	ITEM DESCRIPTION	CONTRACT QUANTITY	UNIT PRICE	COMPLETED QUANTITY
101 \$00.00	Clearing and Grubbing	Lump Sum	\$00.00	_____%
201 \$00.00	Class I Excavation	XXX CY	\$00.00	XXX

Total

Less (10%) Retainage

Balance

Less Previous Estimates

AMOUNT DUE

IFB #1086041

I hereby certify this invoice is correct for all work performed and all materials furnishes and that payment as indicated is due.

(Use the following sentence on Final Payment.)

I further certify that all sub-contractors and suppliers have been paid or will be paid with the proceeds from this Final Payment.

Construction Company Name

Representative's Name – Title

Date