

PROPOSAL FORM
BALTIMORE COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
TOWSON, MARYLAND

Division of Construction Contracts Administration



Contract No. 23017 SX0
SEWER DESIGN SECTION
Workday No. 010909149
Stemmers Run Sewage Pumping Station Electrical Upgrades
830 Race Road, Essex, Maryland 21221
Essex – District 15c7
Job Order No. 231-201-0090-9149

CONTRACT BASED ON FEBRUARY 2000
STANDARD SPECIFICATIONS FOR CONSTRUCTION & MATERIALS
AND STANDARD DETAILS FOR CONSTRUCTION, 2007

Bidders Information

Pre-bid Meeting: Wednesday, September 6, 2023 at 9:00 a.m. EST at the station located at 830 Race Road, Essex, Maryland 21221. A second site visit will be held on Wednesday, September 13, 2023 at 9:00 a.m. EST at the station. Deadline for questions is Friday, September 22, 2023 at 5:00 p.m. EST. A third site visit will be held on Wednesday, October 4, 2023 at 9:00 a.m. EST at the station. This will be the last chance to visit the station. No questions will be answered at this time.

Prevailing Wage Rate and Local Hiring Affidavit & Requirements **see pages 363-370**
(Contract Disclosure): “Wage rates that are in effect as of the contract solicitation date will be the wage rates through the duration of the project”

MBE/WBE Requirements & Forms **see pages 371-391**.

THIS PROPOSAL FORM INCLUDES AND INCORPORATES ALL DOCUMENTS AND INFORMATION REFLECTED, LISTED, AND/OR REFERENCED IN THIS TABLE OF CONTENTS, AND ALL SUCH DOCUMENTS AND INFORMATION ARE PART OF AND INCORPORATED INTO THE CONTRACT DOCUMENTS.

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SECTION I

INFORMATION FOR BIDDERS

ELECTRONIC SUBMITTAL PROCESS

To be considered, Bids (Section V – Proposal) shall be received by the bid closing date and time to the following email address dpwbid@baltimorecountymd.gov. The contract number and company name should be referenced in the Subject Line of the email. Bids may not be submitted by any other means. Bids that are mailed or otherwise delivered to the Purchasing Division (including emails which indicate links to locations where the bid may be downloaded) and/or emails sent to any other Baltimore County email address will not be accepted.

Late Bids will not be considered. Bidders are strongly encouraged not to wait until the last minute to submit bids. The time stated on the auto-receipt (described below) will be definitive of the time of receipt. Bids received after the deadline will not be accepted. Bidders are advised that the County cannot receive email attachments greater in size than twenty-five (25) megabytes and this size limitation may be further reduced by requirements of the Bidder's email provider which are beyond the control of the County. Bidder should consider separating any large bid attachment into multiple parts and emailing each part separately. In such case, Bidder will note that each email is *1 of 2, 2 of 2*, etc. Multiple part bids will not be considered unless all parts are received by the bid closing date and time.

After submitting a Bid to dpwbid@baltimorecountymd.gov, and upon successful receipt by the County thereof, Bidder will receive an auto-receipt email. This receipt is proof that the bid has been received by the Division of Construction Contracts Administration and should be retained for Bidder's records. In the case of a bid submitted in multiple parts as described above, an auto-receipt email will be generated for each part. The County has no obligation to consider any Bid for which an auto-receipt was not generated.

As with any system, power outages or technology problems may arise that are outside of the County's control and could affect your submission. The County will not be held accountable for such issues that may delay the transmission of any Bid.

NOTE: Electronic copy of the Bid Bond will be accepted at bid opening. The apparent low bidder is required to submit the original Bid Bond within ten (10) days after the bid opening to the Division of Construction Contracts Administration, 111 West Chesapeake Avenue, Room 300B, Towson, Maryland 21204.

INSTRUCTIONS AND SPECIFICATIONS

Refer to the enclosed proposal sheets for quantities to be bid upon. All proposals submitted on the attached form must give the price in clear figures for each item of the proposed work and be signed by the bidder with his name and address. Bidders must not change any item in the proposal for which a price has been stipulated by the County. Any change will cause rejection of the proposal.

Revised 5/18/2020

NOTE: STATEMENT UNDER OATH FORM TO ACCOMPANY BID as per Baltimore County Purchasing Act 65-98, Section 15-94 and 15-95 which requires that the enclosed affidavit (see Proposal Affidavit pages in Section V) be completed and submitted as part of the sealed bid.

Proposals made on any other than the attached form will not be considered. All papers included in, bound thereto, or attached to the Proposal Form are necessary parts thereof and shall not be detached, separated, or altered in their intent.

Changes in the phraseology of the proposal, additions, or limiting provisions will render the proposal informal or void and may cause its rejection.

All right is hereby reserved by the Purchasing Agent to reject any or all proposals and to waive formalities and technicalities as the interest of the County may require.

No successful bidder may withdraw his bid within **NINETY (90)** days after the opening thereof.

The successful bidder will be required to be bonded to Baltimore County, Maryland to the sum of One Hundred per Cent (100%) of the amount of his proposal or proposals according to the form of bond hereto attached for projects in excess of \$25,000.00.

This Proposal must be accompanied by a Bid Bond in an amount of 5% of the bid, the exact amount to be determined by the difference between the low bid and the next lowest bid if two or more bids are received, or 5% of the bid if one bid is received. This guarantees payment of the amount thus determined in case of a default in any matter specified as required before award or in any matter resulting in failure to execute and deliver an Agreement, together with Payment and Performance Bonds, after award. The Bid Bond must be in the form accompanying the Proposal executed by a Surety licensed in the State of Maryland. The Surety must be currently rated "B" or better by the A. M. Best Company, and the bid must be in an amount less than, or equal to, the underwriting limitation contained in Department of Treasury Circular 570 as amended at the time of the underwriting.

All work to be performed under this contract shall be done under strict compliance with Baltimore County Department of Public Works February 2000 Standard Specifications for Construction and Materials and April 2007 Standard Details for Construction and any and all proposed revisions thereto as of the date of advertisement and copies of which are on file and available in the Division of Construction Contracts Administration, County Office Building, Towson, Maryland, and all of which are made a part hereof and incorporated herein (collectively, the "Specifications").

If the bidder to whom an award is made shall fail to execute the contract and bond hereto attached and as herein provided, the award may be annulled and the contract awarded to the lowest responsible bidder who has consented to a time extension, and such bidder shall fulfill every stipulation embraced herein as if he were the original party to whom the award was made, or the Purchasing Agent may reject all of the bids as the interest of the County may require.

The Bid Bond of the three lowest bidders is deemed to be effective until the execution and delivery of the Contract Agreement, together with Payment and Performance Bonds for projects in excess of \$25,000.00 or until rejection of all bids, whereupon Surety is deemed relieved of all further obligations under the bid bonds provided.

Bidders must examine the drawings and specifications carefully and must make a personal examination of the location and nature of the proposed work. In case doubt shall arise as to the meaning or intent of anything shown on the drawings or comprised in the specification, inquiry shall be made of the Director of Public Works at least five (5) days prior to the date of bid opening. The submission of the Proposal shall indicate that the bidder thoroughly understands the drawings and the terms of the Specifications.

To better insure fair competition and to permit a determination of the lowest bidder, unresponsive bids or bids obviously unbalanced may be rejected by the Purchasing Agent.

Bidders are required to fill out the total price column and total their proposals so that the result of the bidding, barring possible arithmetical errors, will be known at once. Any errors in computations will be corrected by the Engineer when the proposals are canvassed. Where the unit price and the total price are at variance, the unit price will prevail.

Bidders must be prepared to complete the work within the time stated in the proposal.

NOTE: ONLY CONTRACTORS FORMALLY PRE-QUALIFIED WITHIN THE ADVERTISED WORK CLASSIFICATION BY THE DIRECTOR OF PUBLIC WORKS OF BALTIMORE COUNTY 10 CALENDAR DAYS PRIOR TO BID OPENING WILL BE ELIGIBLE TO SUBMIT BIDS.

Contracts for work under this proposal will obligate the contractors and subcontractors not to discriminate in employment practices. Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the contract. Successful bidders must be prepared to comply in all respects with the Contract Provisions regarding nondiscrimination.

Baltimore County has adopted a Minority Business Enterprise (MBE) program and Women's Business Enterprise (WBE) Program. The percentage of participation applies to the contract amount awarded to the Contractor. Qualified minority subcontractors are those certified as being a Minority Business Enterprise by the following:

1. Maryland Department of Transportation Certification Committee (MDOT)
2. City of Baltimore, Minority Business Certification Council

Projects funded by the Federal Highway Administration are limited to the certification listed under #1 (MDOT).

More detailed information regarding the County's MBE/WBE Program can be obtained from the County MBE Office, telephone (410) 887-3407. See Executive Order dated June 4, 2009. MBE/WBE Participation Summary and Forms A, B, C, D and E enclosed in this proposal booklet.

NOTE: If you do not complete and submit the enclosed forms with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer **NON-RESPONSIVE** and accordingly the **COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.**

The County reserves the right to require the low bidder to produce evidence indicating that the company's financial condition is equal to, or better than, that enjoyed by the company at the time of prequalification. This additional information may be in the form of a financial statement or other evidence satisfactory to the Office of Budget & Finance.

Bidders' attention is directed to the requirement that a permit must be obtained from the Baltimore County Bureau of Highways and Bureau of Traffic Engineering prior to cutting any County road for the purpose of obtaining sub-surface soils information, and permission must be obtained from the State Highways Administration prior to making any openings in a State road.

Under no circumstances shall a bidder enter upon any property outside a County or State road for the purpose of securing sub-surface soils information until permission is received from the property owner. The fact that the County has obtained a utility easement does not give the bidder the right to enter upon the property.

Prevailing index price of asphalt cement/ton \$620.00.

INCLEMENT WEATHER POLICY: If Baltimore County General Government Offices are open or open with liberal leave the day the bids are due, the bids are due as stated in the bid documents (date and time). **ONLY** when the Baltimore County General Government Offices are **OFFICIALLY CLOSED** the day the bids are due, the bid date will be postponed and an Addendum will be issued the next business (or next day buildings are officially open) day the county offices are open with the new bid date and time.

BID TABULATIONS: All bid tabulations will be confidential until after final award, at which time the total bid amounts for all bidders, as well as the complete bid tabulations for the top three (3) bidders, can be inspected by others when requested in writing pursuant to the Maryland Public Information Act.

ALTERNATIVE SOURCES OF CONTRACT BONDS: In the event your company is unable to qualify for bonding through a traditional commercial surety company, you may qualify for the required bonds through the State of Maryland, Department of Commerce (DOC). The **Maryland Small Business Development Financing Authority (MSBDFa, pronounced Mis-Bid-Fa)**, an agency of DOC, operates a Surety Bond Program designed to assist small businesses, based in Maryland, that are unable to obtain adequate bonding on reasonable terms in the commercial marketplace. MSBDFa provides bid, payment and performance bonds for contracts funded by government agencies, regulated utilities and private entities. The penal sums of the bonds are limited to the aggregate amount of \$2,500,000 and companies may pre-qualify for multiple bonds within pre-approved terms and conditions. MSBDFa also provides lines of credit, term loans and loan guarantees to help qualified businesses purchase equipment and real property, make improvements to leased property, refinance existing debt and assist them with their working capital needs. For more information on how to apply, you may contact: Meridian Management Group, Inc. (MMG), (the Program's Manager), 826 E. Baltimore Street, Baltimore, Maryland 21202, Telephone: (410) 333-4270. Or visit their website at www.mmggroup.com for information, applications and a checklist of required documents and reports that must accompany the application.

Revised 5/18/2020

SECTION II

**Interim Supplemental Specifications
to the
Standard Specifications for Construction and Materials**

This contract shall include by reference the documents known as Supplemental Specifications, the contents of which shall be incorporated in their entirety herein and are in effect for all contracts bid after February 5, 2013:

1. General Conditions Building Projects, last revised March 2010.
2. Addendum 3 to the February 2000 Standard Specifications for Construction and Materials and Standard Details for Construction.
3. #1. and #2. are collectively known as the "Supplemental Specifications."
4. ***Revised General Provisions Pages (19 - 128) and Terms and Conditions (TC) Pages (129 - 141).**

In the event of a conflict between the Supplemental Specifications and the February 2000 Standard Specifications for Construction and Materials and Standard Details for Construction, the Supplemental Specifications shall control.

These documents are subject to change and amendment. It is the responsibility of the parties to this contract to be aware of these Supplemental Specifications. These documents are available for review either (1) at the Department of Public Works, Division of Construction Contracts Administration, County Office Building, Room 300B, 111 West Chesapeake Avenue, Towson, MD, 21204 – Phone (410) 887-3531 or (2) on our website at www.baltimorecountymd.gov/Agencies/publicworks/standardsandspecs/specsanddetails.html

- REVISION to **GP-7.11 Preservation and restoration of Property**, Paragraph (a) of the Standard Specifications Pages 65 and 66.
 - a. The Contractor shall not enter upon public or private property (out-side of the right-of-way or project area) for any purpose without obtaining written permission and he/she shall be responsible for the preservation of all public and private property, trees, monuments, signs and markers and fences thereon, and shall use every precaution necessary to prevent damage or injury thereto. The Contractor shall take suitable precaution to prevent damage to underground or overhead public utility structures. **THE CONTRACTOR SHALL PROTECT CAREFULLY FROM DISTURBANCE OF ALL LAND MONUMENTS AND PROPERTY MARKS LOCATED ON THE CONTRACT DRAWINGS OR FOUND IN THE FIELD. IF DAMAGED OR DISTURBED THEY SHALL BE RESET BY A LICENSED SURVEYOR AT THE CONTRACTORS EXPENSE.**
- REVISION to **GP 7.29 MINORITY BUSINESS ENTERPRISE AND AFFIRMATIVE ACTION** of the Standard Specification Pages 75 to 82 and Pages 10 and 11 of Addendum #3 of the Standard Specifications.
- **GP 7.29.01 County Policy:** It is the policy of the County that MBE's and WBE's, as defined by the most recent County Executive Order and as further described in the Contract Documents, shall have the maximum opportunity to participate in the performance of capital improvement contracts financed by County capital funds and/or County operating funds, in accordance with the most recent County Executive Order. The Contractor shall comply with all MBE/WBE requirements as set forth in the Contract Documents.
- **GP 7.29.02 through 7.29.25:** Superseded by Executive Order Dated June 4, 2009.
- ADDITION to **Section 303.03, Pipe Culvert Construction** of the *Standard Specifications*, Page 227, requiring inspection of interiors of new sewers 12" or larger in diameter with closed circuit TV cameras:

303.03.10 TV Inspection. Contractors shall be required to conduct closed circuit television (CCTV) internal inspections of all new storm drain and culvert construction 12" and larger in diameter or span. This inspection will document and identify any system defects and provide the County with a record of the condition of the storm drain at completion of construction.

The entire length of the pipe shall be shown, and close-up views taken of the entire inner circumference of each pipe joint. Structures occurring along the pipeline shall also be examined on each interior face. Whenever possible, TV inspection shall be done under conditions of minimum or no flow within the pipe system.

The CCTV inspections shall be performed in accordance with *Specification Guidelines: Wastewater Collection Systems Maintenance and Rehabilitation* prepared by the National Association of Sewer Service Companies (NASSCO) and the *Handbook: Sewer Infrastructure Analysis and Rehabilitation*, EPA/625/6-91/030, October, 1991.

The CCTV records, including all logs, photographs and videotape/DVD records, shall be provided to Baltimore County's Bureau of Engineering and Construction, Storm Drain Design Section, for review prior to final acceptance of the construction. Upon approval, the tapes will be forwarded to the Bureau of Utilities for their use.

- ADDITION to Section 1007.03.02, **Acceptance Testing** of the *Standard Specifications*, Page 759, requiring inspection of interiors of new sewers 8" or larger in diameter with closed circuit TV cameras:

(e) **TV Inspection.** Contractors shall be required to conduct closed circuit television (CCTV) internal inspections of all new sewer construction of 8" and larger pipelines. This inspection will document and identify any system defects and provide the County with a record of the condition of the sewer at completion of construction.

The CCTV inspections shall be performed in accordance with *Specification Guidelines: Wastewater Collection Systems Maintenance and Rehabilitation* prepared by the National Association of Sewer Service Companies (NASSCO) and the *Handbook: Sewer Infrastructure Analysis and Rehabilitation*, EPA/625/6-91/030, October, 1991.

The CCTV records, including all logs, photographs and videotape/DVD records, shall be provided to Baltimore County's Bureau of Engineering and Construction, Sewer Design Section, and the Bureau of Utilities for review prior to final acceptance of the construction.

The following changes are made to page 6 of the Consolidated ADDENDUM (#3) to the *Standard Specifications for Construction and Materials* dated February, 2007:

Section GP-2.20 Tie Bids, page 34, (b) Award, last sentence, replace County Code Section in brackets with new numbered reference:

For further options on the bids and the definition of a qualified minority, refer to Baltimore County Code, [Section 15-84(6)] Section 10.2-406(d)(1).

Revise Section 901.01, Aggregates, page 601:

This section covers the material details, quality requirements and test methods applicable to aggregates. Grading requirements are outlined in Tables 901A and 901C; Physical properties in 901 B and 901 D. Force drying may be used in the preparation of samples for grading tests conducted in the field. ***Quarries providing material to Baltimore County Projects must be approved by Maryland State Highway Administration and listed in the current MDSHA Aggregate Bulletin.***

Revise Section 902.10.03, Portland Cement Concrete Mixtures, page 618:

All Portland Cement Concrete mix designs used on Baltimore County projects must have been approved by the Maryland State Highway Administration (MDSHA). The MDSHA mix design approval number must be included on all load tickets. The concrete mixes shall conform to the following:

Revise Section 904.04.02, Mix Design, page 632:

The contractor shall develop a Superpave mix design in conformance with R35. ***All HMA material used on Baltimore County projects must be Maryland State Highway Administration (MDSHA) approved mixes.*** HMA Superpave mixes shall conform to the specification for Superpave Volumetric Mix Design, M323, and shall be designed for Equivalent Single Axle Loading (ESAL) range specified in the Contract Documents.

The contractor may elect to use...

Revise Section 915.01.01, Approval, page 675:

The plant from which the Contractor proposes to obtain material [will be approved by the Regional Engineer before starting deliveries.] ***to be used on Baltimore County projects must have been approved by the Maryland State Highway Administration (MDSHA).***

Rev. 11/09

Revise Section 915.02, HOT MIX ASPHALT (HMA) PLANTS, page 678:

All plants *providing HMA material to Baltimore County projects must be approved by Maryland State Highway Administration (MDSHA) and conform to M 156 except as modified in 915.01 and the following:*

Revise Section 915.03.05, Certified Concrete Plant, page 681:

Concrete plants providing material to Baltimore County Projects must be certified by the Maryland State Highway Administration (MDSHA) and must satisfy all criteria outlined in the Maryland Standard Specifications for Construction and Materials (latest edition). The producer shall be responsible for quality control of plant operations to assure that the material conforms to Specification requirements. The quality control process will be subject to unannounced periodic inspection by representatives of the Regional Engineer. Full participation in the inspection by the plant's certified technician will be required.

The following changes are made to the "Sanitary Sewer Details Index Sheet, Standard Detail S-3, and Roads and Streets Details Index Sheet" of the Consolidated ADDENDUM (#3) to the Standard Details for Construction dated February, 2007.

- 7 D Sanitary Sewer Details Index Sheet
- 7 E Standard Detail S-3
- 7 F Roads and Streets Details Index Sheet

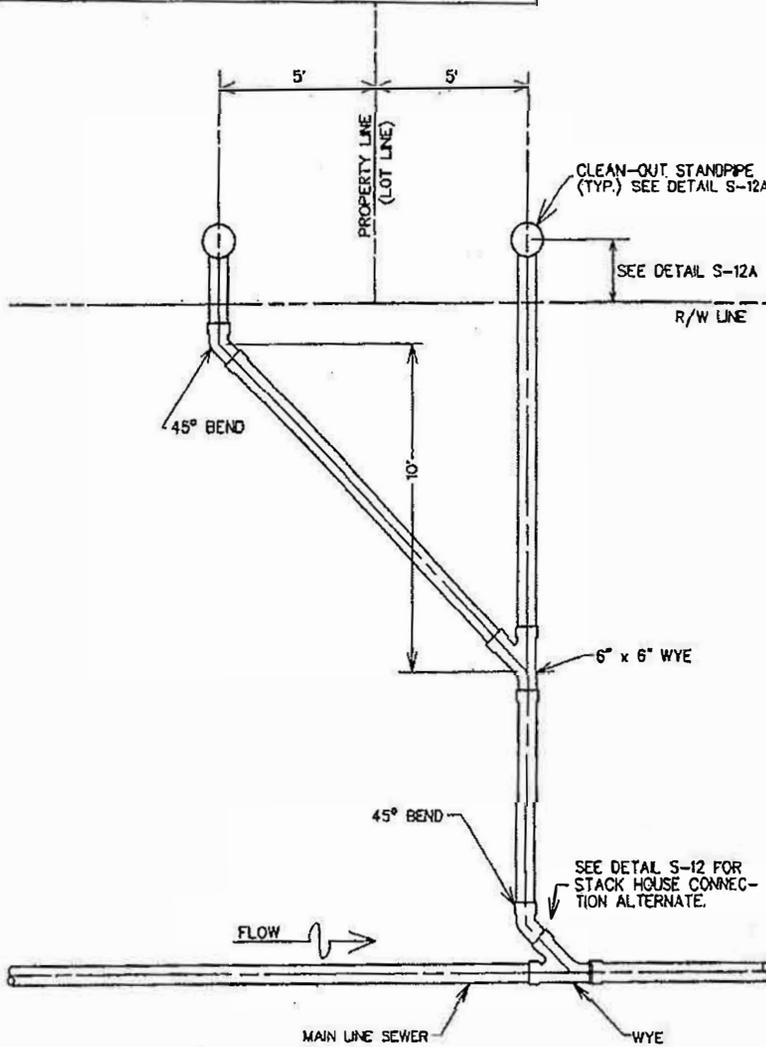
Rev. 11/09

Sanitary Sewer Standard Details

PLATE #	TITLE	SIGNATURE DATE	STD. SPECS. REFERENCE	COMMODITY CODE
S-1	Manhole	3/10/2005	1008	870000
S-2	Shallow Manhole	3/10/2005	1008	872190
S-3	Twin House Conn. Layout	3/18/2002	1007	-
S-4	Precast 48" San.MH	1/2/2007	1008	875000
S-5	60", 72" Precast San. MH	1/2/2007	1008	875000
S-6	Drop MH - Type A & B	3/18/2002	1008	880000, 881000
S-6A	Precast San.Drop MH	12/4/2001	1008	880000, 881000
S-7	Bedding/Gravity PVC Pipe	1/31/2007	1001	-
S-8	Heavy Traffic MH Fr.&Cvr	10/23/1997	1008	877000
S-8B	Sanitary MH Platen Cover – 1	9/12/2000	1008	877000
S-8C	Sanitary MH Platen Cover – 2	9/12/2000	1008	877000
S-12	Stack House Connections	10/23/1997	1007	-
S-12A	House Conn.@ Prop.Line	1/10/2007	1007	-
S-12B	Grinder Pump Conn@Hse.Conn.	1/2/2007	-	-
S-13	Watertight MH Fr.&Cvr	10/23/1997	1008	877000
S-14	Air Relief Valve Vault	3/18/2002	Special Provision	886000
S-15	Precast Doghouse Riser	5/15/2002	1008	-

Rev. 9/09

NOTE: TWIN CONNECTION MAY BE USED ON TOWNHOUSES ONLY.
 ANY OTHER USE MUST BE APPROVED BY THE DIRECTOR
 OF PUBLIC WORKS.

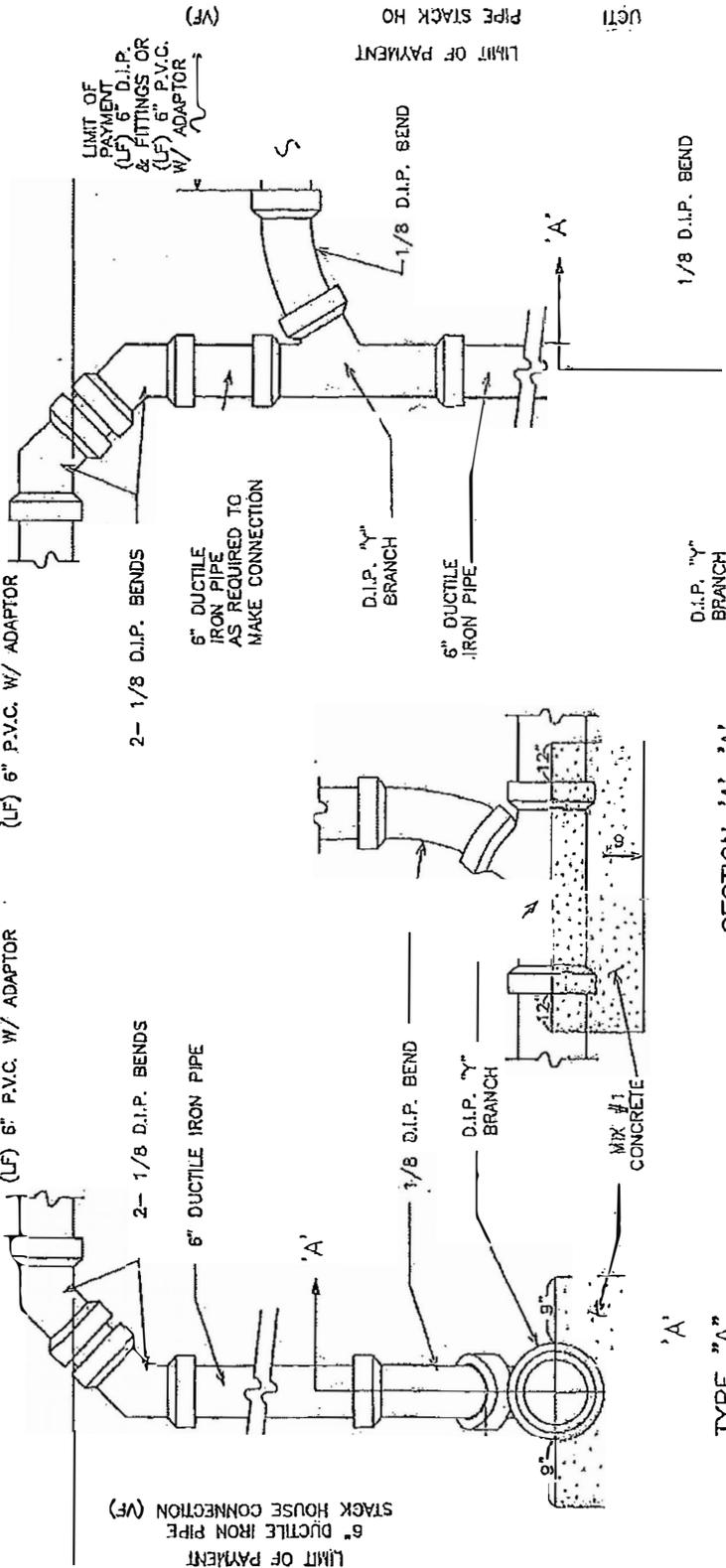


	APPROVED <i>William J. [Signature]</i> DIRECTOR BUR. OF ENGINEERING & CONSTRUCTION 3/1/82 DATE	DEPARTMENT OF PUBLIC WORKS SANITARY SEWER DETAIL TWIN HOUSE CONNECTION LAYOUT	ISSUED: AUGUST, 1977 REVISED: FEBRUARY, 2002 REVISION: PLATE S-3

* SEE PLATE S-12A & B

LIMIT OF PAYMENT * LIMIT OF PAYMENT

(LF) 6" D.I.P. & FITTINGS OR (LF) 6" P.V.C. W/ ADAPTOR
(LF) 6" D.I.P. & FITTINGS OR (LF) 6" P.V.C. W/ ADAPTOR



SECTION 'A'-'A'
N.T.S.

NOTES:

1. USE ALL DUCTILE IRON FITTINGS INCLUDING SEWER WYE.
2. TRENCH WIDTH PAYMENT SHALL BE PAID FROM CENTER LINE OF MAIN LINE TO END OF HOUSE CONNECTION. SEE DETAIL G-6 FOR TRENCH WIDTH.
3. MAIN LINE TO BE DUCTILE IRON PIPE.
4. STACK MUST REMAIN PLUMB DURING BACKFILL.
5. NO STACK CONNECTIONS TO BE BUILT ON VCP OR PVC MAIN.



TYPE "B"

APPROVAL

[Signature]

DIRECTOR

BUR. OF ENGINEERING/CONSTRUCTION

10/31/12

DATE

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
STACK HOUSE
CONNECTIONS

ISSUED: OCTOBER 1927
REVISED: AUGUST 1927
REVISED: JUNE 2013
REVISED: MAY 2, 2014

S-12

Maryland 24" x 9" Straight Wall Frame with Scalloped Flange & Water Tight BALTIMORE COUNTY County Sanitary Sewer Cover with Cam Lock



1545A1GS Assembly

Product Number: 00154548
Design Features: 00154548
Quantity: 1
Company: EJ GROUP, INC.

Drawn by: Hing Gao
Checked by: J. J. ...
Date: 05/20/14
Scale: 1:5

Customer: BALTIMORE COUNTY
Project: ...
Location: ...
Major Component: ...

Quantity: 1
Company: EJ GROUP, INC.
Address: 6115011 ...
Phone: 6115011 ...

00154548
 Quantity: 1

**For In-Roadway Use
 Or Approved Equal.**

Supersedes Detail S-13

1545Z1 Frame

Product Number: 00154512
Design Features: 00154512
Quantity: 1
Company: EJ GROUP, INC.

Drawn by: Hing Gao
Checked by: J. J. ...
Date: 05/20/14
Scale: 1:5

Customer: BALTIMORE COUNTY
Project: ...
Location: ...
Major Component: ...

Quantity: 1
Company: EJ GROUP, INC.
Address: 6115011 ...
Phone: 6115011 ...

00154512
 Quantity: 1

Disclaimer
 Weight (as fig), dimensions (indicated) and details provided for your guidance. You reserve the right to modify specifications without prior notice.

CONFIDENTIAL: This drawing is the property of EJ GROUP, Inc. and embodies confidential information, registered marks, patents, trade secret information, and/or know-how that is the property of EJ GROUP, Inc. Copyright © 2014 EJ GROUP, Inc. All rights reserved.

Contact
 603 676 4853
 ejco.com

CAMPRESSION Assembly



PRELIMINARY
 Submittal Number
 NPT14-954A
 Design Features
 -Materials
 Frame
 Gray Iron (CI.35B)
 Cover
 Ductile iron (70-50-05)

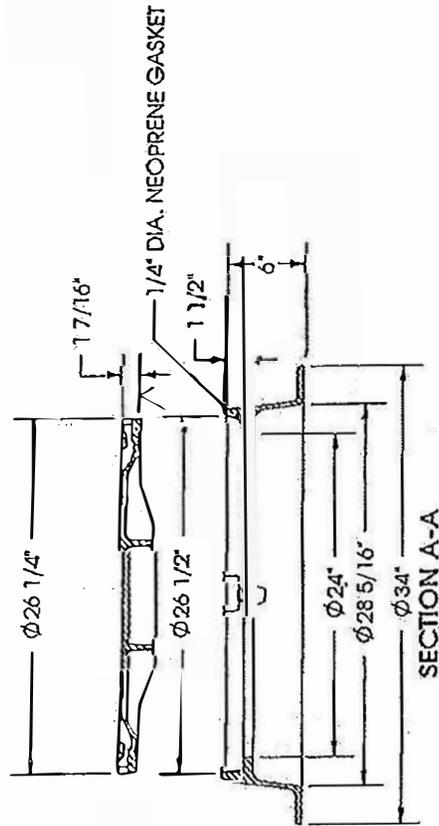
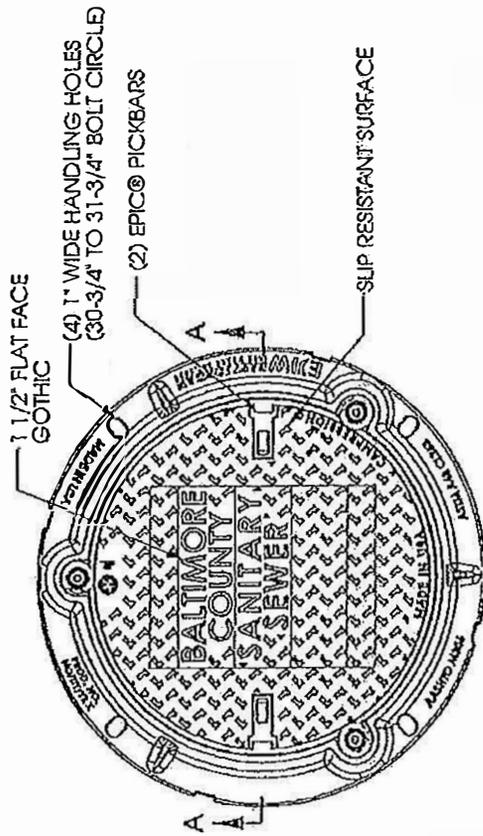
-Design Load
 Heavy Duty
 -Oper. Area
 n/a
 -Coating
 Unclipped
 -√ Designates Machined Surface

Certification
 -ASTM A49
 -ASTM A536
 -Country of Origin: USA
 Major Components
 WT:42339011
 WT:42339016

Drawing Revision
 2/10/2014 Designer: M:14
 Revised By:

Disclaimer:
 Weights (brackets), dimensions (mechanical and drawing) provided for your guidance. We are not liable for any errors or omissions without prior notice.
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Contact:
 RCO 925 4852
 ejco.com



For outside of roadway use.
 Or Approved Equal.
 Supersedes Detail S-13

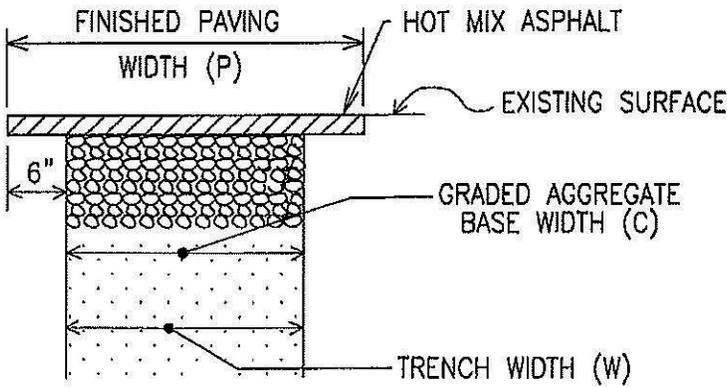
Roads and Streets Standard Details

PLATE #	TITLE	SIGNATURE DATE	STD. SPECS. REFERENCE	COMMODITY CODE
R-1	Pri.Rd.Paving Sections	11/21/2000	501, 504	-
R-2A	Subdiv.Paving Sect.(CBR≥5)	3/10/2005	501, 504	-
R-2B	Subdiv.Paving Sect.(CBR<5)	3/10/2005	501, 504	-
R-10	20'St.(40'R/W)-No Pkg.	10/23/1997	-	-
R-11	22'St.(40'R/W)-No Pkg.	10/23/1997	-	-
R-12	28'St.(50'R/W)-Pkg.1 Side	11/24/1999	-	-
R-13	30'St.(50'R/W)-Pkg.1 Side	11/24/1999	-	-
R-14	Concrete Alleys	2/22/2008	520	581100
R-14A	Concrete Alleys	11/24/1999	520	387404, 387120, 390500
R-15	Drive Entr.-No Curb	10/23/1997	501, 504	520114, 530300
R-15A	Drive Entr.-Sdwk/Curb Var	2/22/2006	520	581100
R-15B	Drive Entr.-SdwkAbutsCurb	2/22/2006	520	581100
R-17	Concrete Alley Joints	11/24/1999	520	581100
R-18	Alley Entrance	2/22/2006	520	581100
R-19	Std.4'Sidewalk	2/22/2006	610	655000
R-20A	H.M.A. Mountable Curb	11/24/1999	609,03.02	615581
R-20B	Extr.Conc.Mount.Curb	10/23/1997	609	615581, 2
R-21	7"Comb.Curb & Gutter	2/22/2006	609	630000, 616000
R-22	Underdrain-Paved Streets	12/4/2001	305	387000, 390500
R-23	Conc.Ditch to Curb & Gtr	2/22/2006	609, 307	631000, 630000
R-24	Concrete Curb	12/20/2002	-	-
R-27	Barricades	10/23/1997	612, 918	659000
R-28	Svce.Station Entr.Chnliz	2/22/2006	520	-
R-29	Svce.Sta.Entr.@Intersect	2/22/2006	520	-
R-30	Commercial Entr.Chnliztn	2/22/2006	520	-
R-31	Comm.Entr.@Intersection	2/22/2006	520	-
R-32	Single Commercial Entr	1/2/2007	520	-
R-32A	Rural Commercial Entr	10/23/1997	501, 504, 303	-
R-33	Valley Gutter-90DegInter.	1/2/2007	520	631010
R-35	Accel.Lane(Min.Widening)	10/23/1997	-	-
R-35A	Accel.Lane(Widened to PL)	10/23/1997	-	-
R-36A	Ped.Ramp/Median/Depressed	12/20/2002	-	-
R-36B	Truncated Pedestrian Ramp	12/20/2002	-	-
R-36C	Detectable Warnings	12/20/2002	-	-
R-36D	Median/Island Ped.Passage	12/20/2002	-	-
R-36E	Pedestrian Bump-Out	12/20/2002	-	-
R-37	7"Valley Gutter/Perp.Pkg	2/22/2006	520	631010
R-38	Flexible Pvg.of Trenches	3/18/2002	505	120550, 81, 83
R-39	Adjusting Utility Frame	10/23/1997	305, 508	590110, 20
R-41	Pavement Failure Repairs	11/24/1999	605	590600, 5
R-42	Hot-Mix Asphalt Paving	10/23/1997	504	556380

**REPAVING QUANTITIES
SHOWN IN TONS PER LINEAR FOOT**

Graded Aggregate Base = 150 Lb./Cu.Ft.

Hot Mix Asphalt = 160 Lb./Cu.Ft.



PIPE DIAMETER (INCHES)	12 INCH GRADED * AGGREGATE BASE (TONS / LINEAR FOOT)	2 INCH HOT MIX * ASPHALT PAVING (TONS / LINEAR FOOT)	3 INCH HOT MIX ** ASPHALT PAVING (TONS / LINEAR FOOT)
6"	0.225	0.04	0.08
8"	0.225	0.04	0.08
10"	0.225	0.04	0.08
12"	0.225	0.04	0.08
15" & 16"	0.225	0.04	0.08
18"	0.263	0.047	0.09
20" & 21"	0.263	0.047	0.09
24"	0.30	0.053	0.10
27"	0.375	0.067	0.12
30"	0.375	0.067	0.12
33"	0.413	0.073	0.13
36"	0.413	0.073	0.13
42"	0.488	0.087	0.15
48"	0.525	0.093	0.16
54"	0.60	0.107	0.18
60"	0.638	0.113	0.19
66"	0.675	0.12	0.20
72"	0.75	0.133	0.22
78"	0.825	0.147	0.24
84"	0.863	0.153	0.25
90"	0.90	0.16	0.26
102"	0.975	0.173	0.28
108"	1.05	0.187	0.30
BRACING ADDITIVES			
SINGLE TIER	ADD 0.15	ADD 0.027	ADD 0.04
DOUBLE TIER	ADD 0.30	ADD 0.053	ADD 0.08

* BASED ON TRENCH WIDTH (W)

** BASED ON FINISHED PAVING WIDTH (P)



APPROVAL
[Signature]
DIRECTOR
[Signature]
BUR. OF ENGINEERING/CONSTRUCTION
10/13/17
DATE

DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS
**PAYMENT QUANTITIES FOR
REPAVING TRENCHES**

ISSUED: OCTOBER, 2017
PREVIOUS
REVISION: AUGUST, 1997

PLATE
G-7

1001.05 STEEL PLATES

If the Contractor elects to bridge a trench or open cut excavation within paved areas of the Construction area with steel plates, it shall notify the Engineer forty-eight (48) hours in advance of placement of any steel plate(s). If multiple plate(s) are required to cover an open cut excavation, the Contractor shall also submit a detailed plan to the Engineer showing the placement of all steel plate(s), as well as any support system required, and this detailed plan shall be approved by the Engineer prior to any installation or use of steel plate(s) by the Contractor. If deemed necessary by the County, this plan may need to be sealed by a professional engineer, licensed in the State of Maryland.

The Contractor shall place proper signs at the locations of all steel plate(s) and such signs shall conform to MUTCD specifications. Spacing of any signs shall be determined by the field conditions and shall be approved by the Engineer.

All steel plates must be flat, at least one inch (1") thick, and held in place with pins. Steel plate(s) must be large enough to allow a minimum of one foot (1') of bearing on three (3) sides of the trench or open cut excavation. Steel plate(s) are to be set as flush as possible with the road surface so there is no movement of the steel plate(s) when traversed by vehicles.

Bituminous concrete cold mix must be used on all edges of the steel plate(s) to minimize the hazard to the motoring public. Cold mix must be tapered from the height of the steel plate(s) to the existing road surface to provide a smooth transition for traveling vehicles.

If the steel plate(s) are to be left in any roadway longer than seven (7) calendar days, the steel plate(s) must be recessed as to be flush with the riding surface.

The Contractor must provide the Engineer with at least two (2) contact persons and corresponding phone numbers to respond to any emergencies or problems with any steel plate(s) and/or support system. Should an emergency or problem occur that requires immediate action, County forces shall correct such emergency or problem, and the County shall charge the Contractor for any costs incurred by the County.

Steel plates are considered incidental to any Contract Construction and/or Work. No County payment shall be made to the Contractor for the use or installation of any steel plate(s) or support system, or for any additional permanent or temporary trench repair required by the County.

**The new General Provisions (GP)
and Terms and Conditions (TC)
supersedes the Standard
Specifications dated February
2000 and Addendums**

GENERAL PROVISIONS

GP - SECTION 1 DEFINITIONS AND TERMS

GP-1.01 GENERAL

This volume is based on the Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials dated July 2008, as amended in this volume. It has been prepared as the Manual of Standard Specifications under the authority of Section 32-4-404 of the Baltimore County Code, 2003, as amended from time to time.

Baltimore County has adopted a set of Standard Detail Drawings as its Manual of Standard Details that is published separately under the authority of Section 32-4-404 of the Baltimore County Code, 2003, as amended from time to time.

GP-1.02 ORGANIZATIONAL STRUCTURE

Reference to Specifications or procedures beginning with the letters M, R, or T shall be understood to be AASHTO.

Reference to Specifications or procedures beginning with the letters A, B, C, D, E, F, G, ES or P shall be understood to be ASTM.

GP-1.03 LANGUAGE

It shall be understood that when all such expressions such as “directed, specified, authorized, permitted, approval, acceptable or satisfactory” are used they are implicitly followed by the words “by the Engineer” or “to the Engineer”.

GP-1.04 ABBREVIATIONS

Wherever in these General Provisions or in other Contract Documents the following abbreviations are used, the meaning shall be as follows:

AAN	American Association of Nurserymen
AAPA	American Association of Port Authorities
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AIA	American Institute of Architects

Revised
September 19, 2016

AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ARA	American Railway Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASLA	American Society of Landscape Architects
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Transit Association
AWWA	American Water Works Association
AWS	American Welding Society
AWPA	American Wood Preservers Association
AWG	American Wire Gauge
AGC	Associated General Contractors of America
bccmp	bituminous-coated corrugated metal pipe
bccmpa	bituminous-coated corrugated metal pipe arch
B&S	Brown & Sharpe Wire Gauge
BOCA	Building Officials Code Administrators International
cip	cast iron pipe
cipx	cast iron soil pipe, extra strength
cmp	corrugated metal pipe
CPVC	Chlorinated Poly Vinyl Chloride
CSPA	Clay Sewer Pipe Association
COMAR	Code of Maryland Regulations
CRSI	Concrete Reinforcing Steel Institute
dip	ductile iron pipe
DIPRA	Ductile Iron Pipe Research Association
EI	Edison Electric Institute
EIA	Electronic Industries Association
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration, U.S. Department of Transportation
FCC	Federal Communications Commission
FHWA	Federal Highway Administration, U.S. Department of Transportation
FRA	Federal Railway Administration, U.S. Department of Transportation
FSS	Federal Specifications and Standards, General Services Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineers Society
IMSA	International Municipal Signal Association
IPCEA	Insulated Power Cable Engineers Association
IRT	Institute for Rapid Transit
MBE	Minority Business Enterprise
MBMA	Metal Building Manufacturers Association

MDOT	Maryland Department of Transportation
MSMT	Maryland Standard Method of Tests (as developed by the State Highway Administration)
MUTCD	Manual on Uniform Traffic Control Devices
MdMUTCD	Maryland Manual on Uniform Traffic Control Devices
MdSHA	Maryland State Highway Administration
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
NCHRP	National Cooperative Highway Research Program
NEC	National Electric Code
NESC	National Electric Safety Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
pccp	prestressed concrete cylinder pipe
PCI	Precast Concrete Institute
PVC	Poly Vinyl Chloride
QPL	Qualified Products List
rccp	reinforced concrete culvert pipe
rcsp	reinforced concrete sewer pipe
RLMI	Reflector and Lamp Manufacturers' Institute
RMA	Rubber Manufacturers Association
SAE	Society of Automotive Engineers
SAWP	Society of American Wood Preservers
SHA	State Highway Administration
SSPC	Steel Structures Painting Council
ucpx	unglazed clay pipe, extra strength
UL or ULI	Underwriters Laboratories, Incorporated
UMTA	Urban Mass Transportation Administration, U.S. Department of Transportation
USSG	United States Standard Gauge
USSWG	United States Steel Wire Gauge
WBE	Women's Business Enterprise

GP-1.05 DEFINITIONS

Wherever in these General Provisions or in other Contract Documents the following terms are used, the meaning shall be as follows:

Additional Work - Work not required or provided for in the original Contract.

Administration - Baltimore County, Maryland, a body corporate and politic.

Administrator - The Director of the Department.

Advertisement - The public announcement, as required by law, inviting any and all prequalified contractors to submit a Bid for Work to be performed or provided.

Agreement - The written agreement executed between the County and the successful Bidder covering the performance of the Work by which the Contractor is bound to perform the Work and by which the County is obligated to compensate the Contractor therefor at a mutually established and accepted rate or price. The Agreement shall include all the documents listed under "Contract Documents", as well as any written Contract Modification that is required to complete the Construction and completion of the Work in an acceptable manner, including any authorized extension thereof, all of which constitute one instrument and agreement. The Agreement shall be executed by the Contractor and the County as indicated by the signature of the Contractor's duly and legally authorized representative and the County Executive or his/her legally authorized designee, with evidence thereof of review for legal sufficiency by the County's Office of Law.

Alley - An established passageway for vehicles and pedestrians affording a secondary means of access in the rear to properties abutting on a street or Highway.

Approved Source of Supply - Listing prepared by the Department on a periodic basis and available on the Department's website.

Architect and/or Design Engineer - The Maryland licensed and registered architect and/or design engineer under separate contract with the County to prepare the Plans and Contract Documents.

As-Built Drawings - A complete set of sealed and signed as-built Mylar record Contract Drawings that are based on the marked-up prints or red-lined drawings received from the applicable contractor, the shop drawings, any addenda, any change orders, any requests for information, and any other data utilized by the Contractor so as to provide a complete and accurate as-built record.

Award - The decision and notice given by the County of the acceptance of a Bid or Proposal. The successful Bidder understands and expects the County to substantially, materially and justifiably rely upon its Bid from the date of Award pending execution of the Agreement.

Baltimore County - Baltimore County, Maryland, a body corporate and politic.

Base Course - The one or more layers of specified material and thickness placed on a Subbase or a Subgrade to support a Surface Course.

Bid - A written submission including, but not limited to, price, terms of sale, and description of work technical expertise, work experience, and any other information requested in the Bid Package, offered by a Bidder to the County in response to the County's Bid Package or request for Proposal.

Bid Bond - The security required and described in the Bid Package and GP-2.07 to be included in the Proposal and furnished by the Bidder as a guaranty of good faith to enter into a Contract with the County if the Work is Awarded to the Bidder.

Bid Form - The approved form included in the Bid Package and/or Proposal Form, on which the Administration requires the Bid to be set forth and submitted.

Bid Item - An item of Work specifically described and for which a price, either unit or lump sum, is required. It includes the performance of all Work described herein or described in any Supplemental Specifications or Special Provisions.

Bid Package – Includes, but is not limited to, the Standard Specifications and any Contract Document included and/or incorporated by reference therein, used by the County for soliciting and procuring Bids by competitive sealed Bid and/or requests for Proposals and/or small procurement procedures including, but not limited to, requests for quotations, requests for Bids, etc.

Bidder - A Person formally submitting a Bid for the Work, acting directly or through a duly and legally authorized representative.

Bridge - A structure including supports erected over a depression or an obstruction, such as water, Highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the Road of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. For lengths, all dimensions shall be parallel to the center line of the Road. The dimensions of handrails will not be taken into account in measuring bridge lengths. Any Bridge or Highway grade separation structure includes the connecting Highways, Substructure, Superstructure, Road approaches, entrance plazas, interchanges, overpasses, underpasses, and other Structures which the Administration may deem necessary together with all property rights, Easements, franchises, and interests acquired by the Administration for the Construction and operation of the Bridge.

Business - A corporation, partnership, individual, sole proprietorship, joint venture, or any other legal entity through which commercial activity is conducted.

Business Day - Every day shown on the calendar except Saturdays, Sundays and Holidays.

Calendar Date – The specific calendar date by which Contractor must achieve Full and Final Completion of the Work and all requirements under the Contract.

Calendar Day - Every day shown on the calendar, Saturdays, Sundays and Holidays included.

Certification - A document which states that the Material and/or Work complies with the applicable specifications and includes the actual test results to confirm the statement. The contents of the Certification shall be on the contractor's/vendor's/manufacture's letterhead or

approved document and shall be duly signed by a legally and duly authorized officer. Certifications for metal products, when required, shall include a statement that the metal product was melted and manufactured in the United States.

Change Order - A written order amending the Contract and signed by the responsible Engineer, authorizing and requiring changes to the original Contract, with or without the consent of the Contractor. Each Change Order shall be executed by the Contractor and the County as indicated by the signature of the Contractor's duly and legally authorized representative and the County Executive or his/her legally authorized designee, with evidence thereof of review for legal sufficiency by the County's Office of Law.

Completion Date - The number of Working Days, Calendar Days, or Calendar Date shown in the Contract indicating the time allowed for the Full and Final Completion of the Work contemplated in the Contract.

Construction – To build, alter, Repair, improve and/or demolish any structure, building, or other improvement to real property and/or fixtures.

Construction Strip - An area contiguous to a permanent fee area or Easement, temporarily acquired for the use of the Contractor during the execution of the Work. This area exists only when shown on the Plans.

Contingent Item - Any Bid Item listed in the Contract Documents and included in the Bid for the purpose of obtaining a Contract price. Such Bid Item(s) constitutes tender of an exercisable option to and for the benefit of the County to incorporate such Bid Item(s) into the Work in accordance with the stated Bid prices.

Contract - The written agreement executed between the County and the successful Bidder covering the performance of the Work by which the Contractor is bound to perform the Work and by which the County is obligated to compensate the Contractor therefor at a mutually established and accepted rate or price. The Contract shall include all the documents listed under "Contract Documents", as well as any written Contract Modification that is required to complete the Construction and completion of the Work in an acceptable manner, including any authorized extension thereof, all of which constitute one instrument and agreement. The Contract shall be executed by the Contractor and the County as indicated by the signature of the Contractor's duly and legally authorized representative and the County Executive or his/her legally authorized designee, with evidence thereof of review for legal sufficiency by the County's Office of Law.

Contract Bond – Means Bid Bond, Payment Bond, Performance Bond and/or Proposal Guaranty, as applicable.

Contract Documents - The Contract executed between the Administration and the successful Bidder, covering the performance of the Work by which the Contractor is bound to perform the Work, and by which the Administration is obligated to compensate Contractor therefor at the mutually established and accepted rate or price. The Contract Documents shall include, but not be limited to, the Bid Package (which includes, but is not limited to, the instructions to bidders

document, the information for bidders document and the specifications), Extra Work Order, Proposal Form, Proposal, Contract Bond, General Provisions, Contract Drawings, Special Provisions, Technical Provisions, all Plans and Notices to Proceed, also any Change Order, Contract Modification and Supplemental Agreement that are required to complete the Work in an acceptable manner, including County-authorized extensions of time for completion thereof, the Award, and the Agreement.

Contract Drawings - The official drawings issued by the Administration as part of the Contract Documents, including those incorporated in the Contract Documents by reference.

Contract Item or Pay Item - An item of Work specifically described and for which a price, either unit or lump sum, was provided in the form of a County-approved Bid Item and incorporated into the Contract, unless expressly stated to the contrary by the County. It includes the performance of all Work described therein.

Contract Modification - Any written change to the Contract including, but not limited to, delivery point, date of delivery, Contract period, price, quantity, or other provision of any original and/or existing Contract, whether accomplished in accordance with a Contract provision, or by mutual written action of legally and duly authorized representatives of the parties to the Contract including, but not limited to, any Change Order, Extra Work Order, Supplemental Agreement, and/or other form of Contract Modification. Each Contract Modification shall be executed by the Contractor and the County as indicated by the signature of the Contractor's duly and legally authorized representative and the County Executive or his/her legally authorized designee, with evidence thereof of review for legal sufficiency by the County's Office of Law.

Contract Number - The eight-place combination of numerals and letters by which all Contracts are identified:

9 6 0 0 0 X X 0

The first two digits indicate the year. The next three digits indicate the sequential numbering; the first Contract of each year is numbered 001, the second Contract 002 etc., regardless of the division of the Contract.

The three-space alpha-numeric combination (X X 0 above) indicates the general nature of the Work and the division of the Contract for accounting purposes. The two letters (X X) indicate the general nature of the Work. The last digit indicates the numerical division of the Contract. A zero as the last digit indicates that the Contract will be accounted as a whole.

GENERAL NATURE OF THE WORK

First X	Second X
B - Bridge	D - Development (Public)
C - Culvert	F - Fire Station
D - Storm Drain	L - Library
G - Grading or miscellaneous	

P - Public Building
R - Road
(except when used with RA,
indicates Right-of-Way
Improvement)
S - Sewer
W - Water
U - Utility

O - Operating Building
P - Police Station
X - Capital Improvement
S - Development (Private
other than UA or RA)
A - Agreement (for Private UA and RA)

Contract Time - The number of Working Days, Calendar Days, or a Calendar Date specified in the Contract Documents indicating the time period allowed for the Full and Final Completion of the Contract Work.

Contractor - The party of the second part to the Contract; the Person undertaking the execution of the Work under the terms of the Contract and acting directly or through his, their, or its agents or employees. If the party of the second part is comprised of one or more Persons, each shall be jointly and severally responsible for the performance of the entire Contract and jointly and severally liable to the County.

Controlling Operation - An operation that at the particular time under consideration has a controlling effect on the progress of the project as a whole.

County - Baltimore County, Maryland, a body corporate and politic.

County Roads - Any public Road in the County, excluding State Roads, fee title to which, or Easement for the use of which, is vested in the County by grant of condemnation, dedication, conveyance or by operation of law.

Culvert - Any structure not classified as a Bridge that provides an opening under any Roadway.

Day - Calendar Day unless otherwise designated.

Department - The Department of Public Works of Baltimore County, unless another County department or office is expressly identified and designated by the County.

Domestic Manufacture - When referring to metallic items such as structural steel, pipe, reinforcement, bridge rails, etc., the term Domestic Manufacture means those metal products that have been melted and manufactured within the United States.

Drainage Ditch - In general, any open water course other than gutters, constructed as indicated in the Contract Documents.

Easement - A grant of a) an interest in property and b) a right of use of property of an owner for a certain purpose at the will of the grantee.

Engineer – Unless an official is expressly identified in writing by the County or expressly stated in the Contract Documents, Engineer means any one of the following:

Director of the Department, or his authorized delegated representative,
Deputy Director of the Department (if applicable),
Chief, Division of Construction Contracts Administration of the Department, or
Chief, Bureau of Engineering & Construction of the Department.

Any delegation of the Engineer’s authority must be authorized in writing by any one of the above listed officials or expressly stated in the Contract, and such delegation of authority will pertain only to the specific Contract and/or Contracts as expressly stated in the authorization.

If the Engineer’s authority is delegated as specified above to another County department or office, “Department” shall mean the County department or office delegated such authority, and any references to a director, deputy director, chief, division, or bureau shall mean the corresponding official, employee, division, bureau or office of the County department delegated such authority, as applicable and appropriate; provided that, any references to “Department” rules, lists, or published and/or adopted materials shall continue to refer to the County Department of Public Works.

Equipment - All machinery, tools, and apparatus necessary for the proper Construction and acceptable completion of the Work, together with the necessary supplies for upkeep and maintenance.

Extra Work - Work that was not required or provided for in the original Contract.

Extra Work Order - A written document amending the Contract by adding, deleting, or modifying the Contract to include price, time and/or Extra Work and/or conditions not previously addressed within the Contract. Each Extra Work Order shall be executed by the Contractor and the County as indicated by the signature of the Contractor’s duly and legally authorized representative and the County Executive or his/her legally authorized designee, with evidence thereof of review for legal sufficiency by the County’s Office of Law.

Federal Agencies - Reference to any federal agency or official shall be deemed made to any agency or official succeeding in conformance with law or regulations to the powers, duties, jurisdictions, and authority of the agency or official mentioned.

Final Acceptance for Maintenance - The date upon which all the Work is sufficiently complete in accordance with the Contract so that the County can occupy and utilize the Work for the purposes for which it was intended, and more specifically, the date that the Engineer makes written acceptance of all Work under the Contract for the purpose of the County assuming maintenance responsibilities for all Work, as further described in Section GP-5.13(b) of the Standard Specifications. Final Acceptance for Maintenance will also be considered Substantial Completion for purposes of the Contract and the Work.

Fixed-Price Items - Unit prices established and prescribed by the County to compensate for the cost of Work and Materials that may or may not be necessary for the proper completion of the Contract, and the quantities of which are not amenable to the reliable quantitative estimate prior to Construction. Fixed-Price Items are shown on the Proposal sheets with the estimated quantities, fixed price, and estimated total cost imprinted prior to issuance of the Contract Documents to Bidders.

Full and Final Completion - The date upon which the County acknowledges in writing that the Contractor fully and finally completed all aspects of the Contract and the Contract Work, and met all terms, conditions and obligations of the Contract, as further described in Section GP-8.11 of the Standard Specifications.

General Provisions or GP - Contract provisions published as part of, or provided as a supplement to these Standard Specifications intended for general application and repetitive use.

Highway or Road - Includes rights-of-way, surfaces, Subgrades, Shoulders, Median dividers, drainage facilities and Structures, Road cuts, Road fills, traffic barriers, Bridges, Highway grade elimination Structures, tunnels, overpasses, underpasses, interchanges, entrance plazas, approaches and other Structures forming an integral part of a street, Road, or Highway; including bicycle and walking paths and related storm water management facilities and Structures. In addition, the terms include any other property acquired for the Construction, operation, or use of the Highway.

Highways Standards - Official MdSHA “Book of Standards, Highways and Incidental Structures” edited by the MdSHA with the latest incorporated revisions issued on or before the date of Advertisement of the Contract. These Highway Standards are used where County projects are constructed within MdSHA rights-of-way, or as directed by these Specifications or by the Engineer.

Holidays – Holidays only occur on:

January 1	New Year’s Day
3rd Monday in January	Martin Luther King’s Birthday
3rd Monday in February	President’s Day
4th Monday in May	Memorial Day
July 4	Independence Day
1st Monday in September	Labor Day
2nd Monday in October	Columbus Day
November 11	Veteran’s Day
4th Thursday in November	Thanksgiving Day
December 25	Christmas Day

All days of general and congressional elections (not primary elections) throughout the State.

If a Holiday falls on a Sunday, the following Monday shall be deemed and treated as a Holiday.

If a Holiday falls on a Saturday, the Friday immediately preceding shall be deemed and treated as a Holiday.

Informal Contract - A Private Contract not exceeding twenty-five thousand dollars (\$25,000), subject to the approval of the County's Department of Permits, Approvals and Inspections, bid on a lump sum basis, and not requiring a Contractor Performance Bond or Payment Bond. Informal Contracts may be used for commercial water meters and detector checks two (2) inches and smaller, fire hydrants, sanitary connections, residential water and sewer house connections for four (4) lots or less, and small road and drain projects not exceeding the twenty-five thousand dollars (\$25,000).

Inspector - The authorized representative of the Engineer assigned to make detailed inspection of any or all portions of the Work.

Interim Supplemental Specifications or ISS – Those items required by the Department and the County for all County contracts, which shall be included as part of the Contract Documents and incorporated into the Contract, but which are not formally published in the Standard Specifications. The ISS control over the Standard Specifications but do not control over the Special Provisions.

Laboratory - The testing Laboratory of the State Highway Administration (or other administrations) or any other testing Laboratory designated by the Engineer.

Landscaping (Highway) or Roadside Development - Work for the preservation of natural and landscaped areas and the rehabilitation and protection against erosion of all areas disturbed by Construction through turf establishment and the placing of other ground covers, suitable planting, and other improvements to increase the effectiveness and enhance the appearance of the Highway.

Major Contract Items - The original Contract Items of greatest cost, excluding Contingent Items, (computed from the original price and estimated quantity or lump sum price) plus such other Contract Items next in sequence of lower cost (computed in like manner) as are necessary to show a total cost of original prices and quantities of not less than sixty percent (60%) of the original total cost of the Work, Bid and/or Proposal.

Median - The portion of a divided Highway separating the Traveled Ways for traffic in opposite directions.

Materials - Any substances and/or goods specified for use in the Construction of the Work and its appurtenances.

Minor Contract Items - All Contract Items other than the Major Contract Items and Contingent Items.

Minor Structure - Any structure not classified as a building, Bridge or Culvert. Minor Structures include, but are not limited to, catch basins, fences, inlets, manholes, retaining walls, steps and other miscellaneous items.

Notice to Proceed - A Written Notice to the Contractor of the date on or before which Contractor shall begin the prosecution of the Work to be done under the Contract.

Partial Acceptance for Maintenance - The date upon which the Engineer makes written acceptance of a unit or portion of the Work under the Contract and the County assumes maintenance responsibilities for only that unit or portion of Contract Work, as further described in Section GP-5.13(a) of the Standard Specifications.

Pavement Structure - The surface, base, or Subbase Course placed in layers on a Subgrade to support and distribute the traffic load to the Roadbed.

Pay Item - An item of Work specifically described and for which a price, either unit or lump sum, was provided in the form of a County-approved Bid Item. It includes the performance of all Work described therein.

Payment Bond - A County-approved form of security furnished and executed by the Contractor and Contractor's Surety as a guaranty of good faith to pay promptly, or cause to be paid promptly, in full, such sums as may be due for Material and/or labor supplied or performed, and/or services rendered by third parties in the prosecution of the Work under the Contract. This Payment Bond is in addition to the Performance Bond.

Performance Bond - The County-approved form of security, furnished and executed by the Contractor and Contractor's Surety, guaranteeing Full and Final Completion of the Work in complete compliance with and in accordance with the Contract and all Contract Documents. This Performance Bond is in addition to the Payment Bond.

Person - A corporation, partnership, individual, sole proprietorship, joint venture, or any other legal entity through which commercial activity is conducted.

Plans - The official drawings issued by the Administration as part of the Contract Documents, including, but not limited to, those incorporated in the Contract Documents by reference.

Private Contract - A private contract for Highway, storm drain, water main, utilities, roads, and sanitary sewer Construction let by applicants or Persons, by procedures pursuant to Public Works Agreements with County at no cost to County. The developer, in such a Private Contract, obtains the bid privately using contract forms provided by the Department's Division of Construction Contracts Administration. Private Contracts bearing the letters "UA" or "RA" within their Contract Numbers are governed and initiated by the Baltimore County Department of Permits, Approvals and Inspections Policy for the Construction of Improvements Under Private Contracts, pursuant to Baltimore County Code Section 32-4-301, as amended, and shall be referred to as UA and/or RA, as applicable, in these Standard Specifications.

Procurement Agency - Baltimore County, Maryland, a body corporate and politic.

Profile Grade - The trace of a vertical plane intersecting the top surface of the proposed wearing surface usually along the longitudinal center line of the Road. Profile Grade means either elevation or gradient of the vertical plane.

Proposal – A written submission including, but not limited to, price, terms of sale, and description of work technical expertise, work experience, and any other information requested in the Bid Package, offered by a Bidder to the County in response to the County’s Bid Package or request for Proposal.

Proposal Affidavit – An affidavit form (included in the Invitation for Bid) to be a certified form executed by a legally authorized representative of the Bidder and required to accompany a Bid.

Proposal Form - Includes, but is not limited to, the Standard Specifications and any Contract Document included and/or incorporated by reference therein, used by the County for soliciting and procuring Bids by competitive sealed Bid and/or requests for Proposals and/or small procurement procedures including, but not limited to, requests for quotations, requests for Bids, etc.

Proposal Guaranty - The security required and described in the Bid Package and GP- 2.07 to be included in the Proposal and furnished by the Bidder as a guaranty of good faith to enter into a Contract with the County if the Work is Awarded to said Bidder.

Questionnaire - The approved form or forms upon which the Contractor shall furnish the information as to its ability to perform the Work, its experience in similar Work, the Equipment to be used, and its financial condition as related to its ability to finance the Work.

RA - A private contract for Highway, storm drain, water main, and sanitary sewer Construction is let by land developers, by procedures pursuant to Public Works Agreements with Baltimore County, Maryland. The developer, in such a Contract, obtains the Bid privately using Contract forms provided by the Division of Construction Contracts Administration. Private Contracts bearing the letters “RA” within their Contract Numbers are governed by the Baltimore County Department of Permits, Approvals and Inspections Policy for the Construction of Improvements Under Private Contracts pursuant to Baltimore County Code Section 32-4-301, as amended, and shall be referred to as RA and/or UA Contracts or RA and/or UA in these Standard Specifications.

Ramp - A connecting Road between two intersecting Highways at a Highway separation.

Regional Engineer - Unless an official is expressly identified in writing by the County or expressly stated in the Contract Documents, Regional Engineer means any one of the following:

Director of the Department, or his authorized delegated representative,
Deputy Director of the Department (if applicable),
Chief, Division of Construction Contracts Administration of the Department, or

Chief, Bureau of Engineering & Construction of the Department.

Any delegation of the Regional Engineer's authority must be authorized in writing by any one of the above listed officials or expressly stated in the Contract, and such delegation of authority will pertain only to the specific Contract and/or Contracts as expressly stated in the authorization.

If the Regional Engineer's authority is delegated as specified above to another County department or office, "Department" shall mean the County department or office delegated such authority, and any references to a director, deputy director, chief, division, or bureau shall mean the corresponding official, employee, division, bureau or office of the County department delegated such authority, as applicable and appropriate; provided that, any references to "Department" rules, lists, or published and/or adopted materials shall continue to refer to the County Department of Public Works.

Repair - To restore after injury, deterioration, or wear; to mend, to renovate, by such means as appropriate, and to supply such Materials and labor as necessary to render the item to be repaired sound, solid, true, plumb, square, even, smooth, and fully serviceable. Upon completion of such repair it must be, unless otherwise stated, rendered to such condition as to present a first-class finished work, or in instances where the repaired item serves as a base for additional finish, the repaired work must be such as to permit a first-class finish, to be applied without extra cost to the County. When the word "Repair" is used in connection with machinery or mechanical Equipment, it shall mean, in addition to the above, rendering the Equipment completely serviceable and efficient, ready for the normal use for which it was originally intended.

Responsible Bidder - A Person who is a Prequalified Contractor, as further described in these Standard Specifications and pursuant to the County's Rules for Prequalification of Contractors, as described in GP-2.00 of these Standard Specifications, and who has the capability in all respects to perform fully the Contract requirements and to perform all mandatory and essential requirements of the Bid, and the integrity and reliability that shall assure good faith performance.

Responsive Bid - A Bid submitted in response to a Bid Package that conforms in all material respects to all requirements contained in the Bid Package, including, but not limited to, all mandatory and essential requirements of the Bid.

Responsive Bidder - A Responsible Bidder whose Bid conforms in all material respects to the Bid Package, including, but not limited to, all mandatory and essential requirements of the Bid.

Right-of-Way - The area that has been acquired and reserved by the County for use in constructing the proposed improvement and appurtenances thereto. The area may be held by the County for use in constructing the proposed improvements and appurtenances thereto. The area may be held by the County in fee simple or as an Easement -- perpetual or temporary, recorded or unrecorded.

Roadbed - The graded portion of a Highway within the top and side Slopes prepared as a foundation and/or the top surface of a Road upon which the Pavement Structure, Shoulders, and curbs are constructed.

Road, Roadway or Highway - The words Road, Roadway and Highway include rights-of-way, surfaces, Subgrades, Shoulders, Median dividers, drainage facilities and Structures, Roadway cuts, Roadway fills, traffic barriers, Bridges, Highway grade elimination Structures, tunnels, overpasses, underpasses, interchanges, entrance plazas, approaches, and other Structures forming an integral part of a street, Road, Roadway, or Highway; including bicycle and walking paths and related storm water management facilities and Structures. Any other property acquired for the Construction, operation, or use of the Highway.

Roadside - A general term denoting the area adjoining the outer edge of the Roadbed within the Right-of-Way. Extensive areas between the Road of a divided Highway may also be considered Roadside.

Roadside Development - Work for the preservation of natural and landscaped areas and the rehabilitation and protection against erosion of all areas disturbed by Construction through turf establishment and the placing of other ground covers, suitable planting, and other improvements to increase the effectiveness and enhance the appearance of the Highway.

Seal Coat - An application of asphalt material followed by an application of cover coat aggregate.

Shoulder - The portion of the Roadbed contiguous with the Traveled Way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and Surface Courses.

Sidewalk - The portion of the Road constructed for use by pedestrians.

Slopes - The inclined graded areas beyond the Shoulder, extending from the Shoulders to the natural, undisturbed surface of the ground.

Special Provisions or SP - Specifications for a specific item or condition or requirement peculiar to the Work and not otherwise thoroughly or satisfactorily detailed elsewhere in the Contract Documents. If a Special Provision or SP is in conflict with any portion of the Contract Documents, the Special Provisions shall always control and prevail. Specifically, the Special Provisions control over the Standard Specifications and the Interim Supplemental Specifications.

Standard Details / Standard Detail Drawings / Baltimore County Standard Details for Construction - The Baltimore County, Maryland Department of Public Works Standard Details for Construction published by the Administration for general application and repetitive usage, as may be supplemented, revised and superseded by the Contract Documents, which include detail drawings showing standard methods of Construction for water mains, sanitary sewers, storm drains, roads and streets.

Standard Specifications - The Baltimore County Department of Public Works Standard Specifications for Construction and Materials published by the Administration for general application and repetitive use, as may be supplemented, revised and superseded by the Contract Documents.

State - The State of Maryland.

State Agency - A State agency or official thereof, including any agency or official succeeding to their powers, duties, jurisdictions and authority in accordance with law.

State Highway System - The system of Roads owned, operated, or maintained by the State of Maryland.

State Road - Any public Road included in the Maryland State Highway System.

Structure(s) - Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, end walls, buildings, sewers, service pipes, underdrains, foundation drains, steps, fences, and other features that may be encountered in the Work and not otherwise classified.

Subbase - The layers of specified or selected material of designed thickness placed on a Subgrade to support a Base Course or Surface Course.

Subcontract - Any agreement entered into by the Contractor with a Subcontractor for a portion of the Construction or any other part of the Work in connection with, and under the terms of, the Contract.

Subcontractor - Any Person undertaking a portion of the Construction or any other part of the Work under the terms of the Contract, by virtue of an agreement with the Contractor. Subcontractor does not include an employee with an employment contract, or an employee organization with a collective bargaining agreement. It includes one who furnished Material worked to a special design according to the Plans and Specifications for the Work. It excludes one who merely furnished Material not so worked.

Subgrade (Highways) - The top surface of a Roadbed upon which the Pavement Structure, Shoulders, and curbs are constructed.

Subgrade (Pipes) - The soil foundation layer upon which a pipe, cradle, or encasement is placed such that the prescribed invert elevation of the pipe will be achieved.

Subgrade (Structures) - The soil foundation layer upon which the structural foundation is built to achieve prescribed elevations of subsequent structural elements or controls.

Substantial Completion / substantial completion - The date upon which all the Work is sufficiently complete in accordance with the Contract so that the County can occupy and utilize the Work for the purposes for which it was intended, and more specifically, the date that the Engineer makes written acceptance of all Work under the Contract for the purpose of the County assuming maintenance responsibilities for all Work, as further described in Section GP-5.13(b) of the Standard Specifications. Substantial Completion will also be considered Final Acceptance for Maintenance for purposes of the Contract and the Work.

Substructure - All of that part of the Structure below bottoms of bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, together with the back walls and wing walls.

Superintendent - The executive representative of the Contractor duly authorized by the Contractor, in accordance with Contractor's organizational documents and requirements to receive and execute instructions from the Engineer, and who shall supervise and direct the Construction and the Work.

Superstructure - All of that part of the Structure above bottoms of bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, except as noted above for Substructure.

Supplemental Agreement - Any written Contract Modification or Change Order evidencing, among other things, the terms, conditions, costs and time, mutually agreeable to the Contractor and the County as indicated by the signature of the Contractor's duly and legally authorized representative and the County Executive or his/her legally authorized designee, with evidence of review for legal sufficiency by the County's Office of Law.

Surety - The Person providing any or all of the Contract Bonds for the Contractor, for the Bid and the Full and Final Completion of the Contract and/or for the payment for all of the Work in connection with the Contract.

Surface Course - One or more layers of a pavement designed to accommodate direct traffic loading.

Technical Provisions - The technical provisions included in the Proposal Form and/or Invitation for Bid, which are a part of and incorporated into the Contract.

Third Tier Contracting - The process where the Contractor subcontracts a portion of the Contract to a Subcontractor who in turn subcontracts a portion of the Contract to a third party. This latter action is termed entering into a Third Tier Contract.

Traveled Way - The portion of the Roadway for the movement of vehicles, exclusive of Shoulders.

Trench - An excavation made for the purpose of installing or removing pipes, drains, catch basins, etc., which is later refilled.

UA - A private contract for Highway, storm drain, water main, and sanitary sewer Construction is let by land developers, by procedures pursuant to Public Works Agreements with Baltimore County. The developer, in such a Private Contract, obtains the bid privately using contract forms provided by the Department's Division of Construction Contracts Administration. Private Contracts bearing the letters "UA" within their Contract Numbers are governed by the Baltimore County Department of Permits, Approvals and Inspections Policy for the Construction of

Improvements Under Private Contracts, pursuant to Baltimore County Code Section 32-4-301, as amended, and shall be referred to as UA and/or RA Contracts or UA and/or RA in these Standard Specifications.

Unclassified Excavation - Excavation not defined within Standard Specifications' classifications, including, but not limited to, rock, logs, stumps, water, debris. (Excavation of all utility Trenches to subgrade.)

Utility Agreements/Right-of-Way Agreements or UA/RA- These UA/RA are initiated in the County Department of Permits, Approvals and Inspections (PAI), or any successor County department, by the applicant, including, but not limited to developers, schools, or commercial property owners for the Construction and installation of improvements to utilities or roads at no cost to the County. PAI reviews and approves, if and as applicable, the cost estimates, Construction drawings, UA and/or RA, as applicable, and collects any security and fees.

Utility Companies – Entities or Persons which may have utility facilities in a proposed Work area (e.g. BG&E and Verizon, etc.)

Work – The Contractor's furnishing of all labor, Materials, Equipment, services, supplies, Construction, construction-related services and/or other incidentals necessary to successfully perform and complete the Contract and carry out of all the duties and obligations imposed by the Contract.

Working Day - A Calendar Day upon which, in the judgment of the Engineer, weather and soil conditions are such that the Contractor can advantageously Work more than half of his current normal force for more than five (5) consecutive hours on a Controlling Operation. Working Days will not be charged on Saturdays, Sundays, and Holidays unless the Contractor actually Works more than five (5) hours on a Controlling Operation.

Working Drawings - Stress sheets, shop drawings, fabrication details, erection Plans, Plans for false work, forms, centering, cribs, cofferdams and masonry layouts, bending and placing drawings, bar schedules for reinforcement steel, and any other supplementary Plans or similar data that the Contractor may be required to furnish.

Written Notice - Shall be deemed to have been duly served if delivered with signed receipt or if sent by certified registered mail with signed receipt to the last business address known to party who gives the notice.

GP - SECTION 2 BIDDING REQUIREMENTS AND CONDITIONS

GP-2.00 GENERAL

All terms that are capitalized in this GP - Section 2 shall be in accordance with the Department Rules for Prequalification of Contractors, adopted November 28, 2006. Only the Bid of a

Contractor who holds a valid Certificate ten (10) Days prior to the date of Bid Opening will be considered. A Prequalified Contractor is one whose rating and classification have been determined by the Prequalification Committee and ratified by the Director of the Department.

All applicants for prequalification must comply with all Procedures for Prequalification as described in Article II of the Rules for Prequalification of Contractors.

All information must be filed with the Department in sufficient time for action to be completed ten (10) Days before the date of Bid opening.

A prospective Bidder, when prequalifying, shall state in the Application the extent and type of work it considers it is qualified to handle at one time and shall show the exact type of work it has performed during the preceding five (5) years. The information and all other information required by Procedures for Prequalification, as described in Article II of the Rules for Prequalification of Contractors, shall be the basis for a determination of the Bidder's financial rating and work classifications. Following the evaluation, the Contractor may receive a Certificate of Prequalification from the Director of the Department of Public Works.

A Prequalification Certificate, subject to the following provision, is valid through the expiration date stated on the Certificate. The County reserves the right to re-evaluate a Prequalified Contractor. A Bidder who holds a Prequalification Certificate shall furnish additional information bearing on its qualification as may be required. The County reserves the right to reject unopened the Bid of any Bidder who fails to furnish promptly and properly all the information called for when so notified.

A Contractor, dissatisfied with its rating or classification or both, may request a reconsideration on the basis of additional or revised information submitted to the committee in writing and may request a meeting with the Prequalification Committee to support its resubmittal in accordance with the Rules for Prequalification.

EACH BIDDER AND/OR APPLICABLE SUBCONTRACTOR SHALL FURTHER QUALIFY AS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS.

A prospective Bidder may purchase Plans if his Prequalification Certificate is valid. Materials suppliers and other interested parties may purchase Plans without prequalification, such Plans to be marked: "NOT FOR BIDDING PURPOSES".

GP-2.01 BID IRREVOCABLE

Unless otherwise provided in the Bid Package, Bid prices are irrevocable for ninety (90) Days following Bid opening.

GP-2.02 CONTENTS OF BID FORMS

All papers included in, bound thereto or attached to the Invitation for Bid and/or the Proposal Form are necessary parts thereof and shall not be detached, separated or altered. The Plans, Standard Specifications, and all other Contract Documents are part of the Invitation for Bid and/or the Proposal Form whether attached thereto or not.

GP-2.03 INTERPRETATION OF QUANTITIES IN BID SCHEDULE

Where designated as estimated quantities, the quantities in the prepared Invitation for Bid are approximate only. Payment to the Contractor will be made only for the actual quantities of Work performed or Materials furnished in accordance with the Contract and as provided in GP-4.04, Variations in Estimated Quantities.

GP-2.04 SITE INVESTIGATION

The Contractor acknowledges that it has investigated and satisfied itself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of Materials, availability of labor, water, electric power, Roads and uncertainties of weather, river stages, tides or similar physical conditions at the site, and the Contractor has further confirmed conditions of the ground, and the character of Equipment and facilities needed preliminary to and during prosecution of the Work. The Contractor further acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface Materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory Work done by the County, as well as from information presented by the drawings and Standard Specifications made a part of this Contract. Any failure by the Contractor to acquaint itself with the available information will not relieve Contractor from responsibility for estimating properly the difficulty or cost of successfully performing the Work. The County assumes no responsibility or liability of any kind, nature or amount for any conclusions or interpretations made by the Contractor on the basis of the information made available by the County.

Notwithstanding anything to the contrary in the Standard Specifications or the Contract Documents, including, but not limited to, GP-4.05, any and all subsurface soil/test borings, sample borings, boring logs, test pits, and/or related documents, reports or materials (collectively, the "Boring Materials") provided by the County, or its engineer, architect, or consultant, to any Bidders or the Contractor are for the convenience of the Bidders and/or the Contractor. THE COUNTY NEITHER EXPRESSLY NOR IMPLIEDLY WARRANTS OR GUARANTEES THAT THE ACTUAL SITE CONDITIONS ENCOUNTERED UNDER THIS CONTRACT WILL BE THE SAME OR SIMILAR TO THOSE SITE CONDITIONS INDICATED BY ANY BORING MATERIALS.

THE CONTRACTOR HAS THE EXPRESS DUTY AND RESPONSIBILITY TO EXAMINE AND SATISFY ITSELF AS TO THE PHYSICAL CONDITIONS OF THE CONTRACT SITE, including, but not limited to, conformation and condition of the ground, character, quantity, and quality of subsurface materials which may be encountered, surface and subsurface conditions

including the presence of rock or groundwater, and all other physical conditions of the Contract site which may affect the Contractor's performance and/or costs and expenses under the Contract. THE CONTRACTOR SHALL NOT RELY ON THE COUNTY AND/OR ANY BORING MATERIALS TO FULFILL THIS EXPRESS DUTY AND RESPONSIBILITY UNDER THE CONTRACT.

NO ADDITIONAL COMPENSATION OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, ADJUSTMENT OF COST OR SCHEDULING, WILL BE CONSIDERED BY THE COUNTY FOR THE CONTRACTOR'S FAILURE TO PROPERLY EXAMINE AND SATISFY ITSELF AS TO THE PHYSICAL CONDITIONS OF THE CONTRACT SITE. NOR WILL SUCH FAILURE BY THE CONTRACTOR RELIEVE THE CONTRACTOR OF ITS OBLIGATIONS, RESPONSIBILITIES, AND LIABILITIES TO ACHIEVE FULL AND FINAL COMPLETION OF THE CONTRACT TO THE COUNTY'S SATISFACTION.

GP-2.05 TAXES - RESPONSIBILITY FOR PAYMENT, EXEMPTIONS, FORMS TO FILE, ETC.

(a) The Contractor is responsible for, and by submitting a Bid agrees to pay, all retail sales, income, real estate, sales and use, transportation and special taxes applicable to and assessable against any Materials, Equipment, processes and operations incident to or involved in the Construction and/or Work. The Contractor is responsible for ascertaining and acquainting itself with such taxes and making all necessary arrangements to pay same.

(b) The County's Director, Office of Budget and Finance, may not authorize payment to a Contractor who has submitted an invoice if that Contractor is indebted by virtue of unpaid taxes or other obligations when in an amount of fifty dollars (\$50) or more to the State of Maryland or any County department or agency or affiliated entity. In this regard, Contractors shall indicate their federal tax identification or social security number as required by the Rules for Prequalification of Contractors.

(c) If taxes or other obligations are owed to the State of Maryland or any County department or agency or affiliated entity, payment shall be deferred, and the Contractor shall be promptly notified. Subsequent release of the deferred payment shall be made promptly when the taxes or other obligations are satisfactorily resolved with no late fee and/or interest of any kind thereon.

(d) The County hereby reserves the right to withhold final payments under this Contract until the Contractor and/or any Subcontractors and/or Third Tier Contracting parties performing any duties under this Contract have paid all taxes or other obligations due the State or the County or any County affiliated entity.

GP-2.06 PREPARATION OF BID

(a) The Bidder shall submit the Bid upon the blank forms furnished by the Administration. The Bidder shall specify a price in U.S. dollars and cents for each Bid Item given, and shall show

the products of the respective unit prices and quantities written in figures in the column provided for that purpose, together with the total amount of the Bid obtained by adding the amounts of the several items.

(b) The Bid Form(s), including the fully and properly executed MBE/WBE forms, shall be filled out legibly in ink or typed. The Bid shall be signed by the Contractor's duly and legally authorized representative or officer, if and as applicable, of the Bidder, and attested by the Contractor's appropriate officer, if and as applicable. There must be on file with the County a copy of the current organizational documents and/or resolution, duly certified by the corporate secretary, if applicable, showing the authority, of the Person so signing on behalf of the Contractor. In lieu thereof, the Contractor may file such evidence with the Administration, duly certified by the corporate secretary, if applicable, together with a list of the names of the Contractor's officers having legal and authority to execute Contract Documents on behalf of and legally bind the Contractor, duly certified, if applicable, which listing shall remain in full force and effect, and shall be materially relied upon by the Administration, until the Director of the Department receives Written Notice to the contrary. In any case, where a Bid is signed by an attorney in fact, the same must be accompanied by a copy of the appointing document, duly certified as described above. All Bids shall be signed in ink. All erasures and/or alterations shall be initialed by the signer in ink.

(c) If the Bid Package requires the Bidder to furnish samples or descriptive literature, it shall be submitted with the Bid, unless the Bid Package provides otherwise.

(d) Bidders must specifically identify any portions of their Proposals deemed to contain confidential, proprietary information or trade secrets. Such designations will not necessarily be conclusive and Bidders may be required to justify why such material should not, upon request, be disclosed by the County under the Maryland Public Information Act, Title 4, of the General Provisional Article of the Annotated Code of Maryland, as amended.

(e) Bid Items for which quantities are identified in the "Summary of Quantity" sheet of the Plans, in the column headed "Contingent" or listed in the "Bid Form" are established for the purpose of obtaining Bids on one or more Bid Items that may be incorporated into the Work.

The Engineer shall have sole discretion in determining whether and to what extent such Bid Items will be incorporated into the Work. The Engineer may order incorporation of such Bid Items at any location within the Contract and at anytime during the Work. These Bid Items may not be located on the Plans. The estimated quantities set out in the Bid Package for such Bid Items are presented solely for the purpose of obtaining a representative Bid price. The actual quantities employed may be only a fraction of, or many times the estimated quantity. Neither party shall make claims for additional compensation because of any increase, decrease or elimination of such Bid Items.

The Contractor is required to pay tax, as applicable, on Materials and supplies that will be incorporated into the Work. The Contractor must pay tax, as applicable, on all Equipment that is purchased and pertains to the Work

Revised,
October 1, 2015

GP-2.07 PROPOSAL GUARANTY/BID SECURITY

No Proposal will be considered unless accompanied by a guaranty of the amount specified in the Proposal in the form of either a certified check, bank cashier's check or a Bid Bond on the form provided therein or an exact facsimile thereof. The Bid Bond must be executed by a Surety that is, as of the date of the Bid: (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. The Bid Bond must guaranty payment to the County of liquidated damages as follows: (a) if only one Bid is received, the guaranteed payment shall be five (5%) percent of the Bidder's Bid amount, (b) if two or more Bids are received, the guaranteed payment shall be the difference between the Bidder's Bid amount and the next lowest Bid amount, subject to the limitation that the guaranteed payment not be greater than five (5%) percent of the Bidder's Bid amount. This Bid Bond is required in case the successful Bidder, after issuance of notice of Award, fails to comply, timely and completely, with each of the requirements set forth under Section GP-3.04.

GP-2.08 DELIVERY OF BIDS

Each Bid must be submitted in a sealed envelope plainly marked to indicate its contents. When sent by mail, the sealed Bid must be addressed to the Administration at the address and in care of the official in whose office the Bids are to be received. All Bids shall be filed prior to the time and at the place specified in the Bid Package. Bids received after the time for opening of Bids will be treated in accordance with the provisions of GP-2.12.

GP-2.09 COMMUNICATIONS AND INTERPRETATIONS - PRIOR TO BID OPENING

Any information regarding the requirements or the interpretation of any provision of the General Provisions, Special Provisions, Standard Specifications, Interim Supplemental Specifications or any part of the Bid Package, Bid and/or Bid Form shall be requested, in writing, from the Engineer, and delivered no later than five (5) Days prior to the scheduled date of Bid opening. Responses to questions or inquiries having any material effect on the Bids shall be made by written addenda, or by written notice sent to all purchasers of Contract Documents. **THE CONTRACTOR SHALL NOT MAKE VERBAL INQUIRIES TO THE COUNTY, AS VERBAL INQUIRIES MAY NOT BE ACKNOWLEDGED AND SHALL NOT BE BINDING UPON THE COUNTY IN ANY MANNER OR EXTENT.**

Any and all verbal interpretations and/or oral pre-Bid statements made by the Engineer, County employees or their respective representatives and/or agents shall not be binding in any manner or extent upon the County.

Revised
February 4, 2015

Pre-Bid conferences may be conducted by the Department of Public Works or the applicable County agency or department. If they are to be conducted, notice of the same will be contained in the Bid Package. Any minutes of Pre-Bid conferences are provided as a courtesy to the Bidders and ANY MINUTES PROVIDED ARE NOT BINDING UPON THE COUNTY IN ANY MANNER OR EXTENT.

GP-2.10 AMENDMENTS TO INVITATIONS FOR BIDS

(a) **Form.** Pre-Bid amendments shall be identified as addenda and shall require that the Bidder acknowledge receipt of all addenda issued. The addenda shall reference the portion of the proposed Invitation for Bid and/or Proposal Form it amends. Any addenda shall be issued in writing by the County.

(b) **Distribution.** Addenda shall be sent to all purchasers of Contract Documents.

(c) **Timeliness.** Addenda shall be distributed to allow Bidders a reasonable time to consider them in preparing their Bids. The Bid receipt date shall be changed in the addenda only if the distribution of the addenda, in the sole determination of the Administration, does not permit timely preparation and distribution thereof. If the Administration deems that there is adequate time for consideration of the addenda, the addenda may be silent as to the Bid receipt date.

GP-2.11 PRE-OPENING MODIFICATION OR WITHDRAWAL OF BIDS

(a) **Procedure.** Bids may be modified or withdrawn by Written Notice executed by a duly and legally authorized representative of the Bidder, received in the office designated in the Bid Package before the time and date set for Bid opening.

(b) **Disposition of Bid Security.** If a Bid is withdrawn in accordance with this GP-2.11, the Bid Bond, if any, shall be returned to the Bidder.

GP-2.12 LATE BIDS, LATE WITHDRAWALS, AND LATE MODIFICATION

(a) **Policy.** Any Bid is late if not received at the place designated in the Invitation for Bid and/or Proposal Form at or prior to the time and date set for receipt of Bids. Any request for withdrawal or request for modification received at the place designated in the Invitation for Bid and/or Proposal Form after the time and date set for receipt of Bids is late.

(b) **Treatment.** A late Bid, late request for modification, or late request for withdrawal shall not be considered. Late Bids will be returned to the Bidder unopened.

GP-2.13 OPENING AND RECORDING OF BIDS

(a) Bids, and modifications pursuant to GP-2.11, shall be opened publicly, at the time, date, and place designated in the Bid Package. The name of each Bidder, the Bid price, and such other information as is deemed appropriate by the County shall be read aloud or otherwise made available to the public. This information also shall be recorded at the time of Bid opening. The Bids shall be tabulated or a Bid abstract made. If the Bidder designates in writing trade secrets or other proprietary data to be confidential, in accordance with applicable State law, regulations, and/or these Standard Specifications including, but not limited to, GP-2.06, material so designated in writing by the Bidder shall accompany the Bid but Bidder shall make such readily separable from the Bid in order to facilitate public inspection of the nonconfidential portion of the Bid. After Contract Award, prices, makes, and model or catalog numbers of the items offered, deliveries, and terms of payment shall be available for public inspection at a reasonable time regardless of any designation to the contrary at the time of Bid opening.

(b) The Engineer shall examine the Bids to determine the validity of any requests for nondisclosure of trade secrets and other proprietary data identified in writing by the Bidder. Confidential, proprietary information, and trade secrets furnished by a Bidder may be disclosed to State and/or other County department, or agencies if there is a need for the information and may not be disclosed outside of the County except as provided by the Maryland Public Information Act or other applicable laws and/or regulations.

GP-2.14 MISTAKES IN BIDS

(a) **Mistakes Discovered Before Opening.** A Bidder may correct mistakes discovered before the time and date set for Bid opening by withdrawing or correcting the Bid as provided in GP-2.11.

(b) **Mistakes Discovered After Opening But Prior To Award.** If the Director of the Department knows or has reason to conclude that a mistake may have been made, the Bidder may be required to confirm the Bid. Situations in which confirmation may be requested include obvious, apparent errors on the face of the Bid or a Bid unreasonably lower than the other Bids submitted. If the Bidder alleges mistake, the Bid may only be corrected or withdrawn upon the written approval of the County's Director, Office of Budget and Finance, as follows:

(1) If the mistake and intended correction are clearly evident on the face of the Bid document, the Bid shall be corrected to the intended correct Bid and may not be withdrawn. Examples of mistakes that may be clearly evident on the face of the Bid document are typographical errors, errors in extending unit prices, transposition errors, and arithmetical errors.

(2) Subject to the written approval of the County's Director, Office of Budget and Finance, a Bidder may be permitted to withdraw a low Bid if:

(a) A mistake is clearly evident on the face of the Bid document but the intended correct Bid is not similarly clearly evident; or

(b) The Bidder submits proof of evidentiary value that clearly and convincingly demonstrates that a mistake was made.

(c) **Mistakes Discovered After Award.** Mistakes may not be corrected after Award of the Contract unless and only when the County's Director, Office of Budget and Finance, determines that it would be unconscionable not to allow the mistake to be corrected. Changes in price are not permitted, except as allowed in the County's sole discretion. Corrections, if permitted, shall be submitted to and approved by the County's Director, Office of Budget and Finance before being incorporated into the Contract.

GP-2.15 MINOR IRREGULARITIES

Minor irregularities in Bids, as defined below, may be waived if the County's Director, Office of Budget and Finance, determines, in his sole discretion, that it shall be in the County's best interest. The County's Director, Office of Budget and Finance, may either give a Bidder an opportunity to cure any minor irregularity in its Bid, or waive the minor irregularity where it is to the County's advantage to do so.

When at any public opening of Bids, a Bid appears to be irregular, as herein specified, this apparent fact may be announced when read. Said Bid shall be read as other Bids and then referred to the Director of the Department for consideration and appropriate action thereon in accordance with these General Provisions, laws and regulations, as applicable.

A minor irregularity is one that is merely a matter of form and not of substance, or pertains to some immaterial or inconsequential defect or variation of a Bid or Proposal from the exact requirement of the Bid Package and/or Proposal Form, the correction or waiver of which would not be prejudicial to other Bidders. The defect or variation in the Bid or Proposal is immaterial and inconsequential when its significance as to price, quantity, quality, or delivery is trivial or negligible when contrasted with the total cost or scope of the Bid Package and the labor, Materials, Equipment, services and supplies being procured, and when the intent and meaning of the entire Bid or Proposal is clear.

GP-2.16 CANCELLATION OF INVITATIONS FOR BIDS

(a) Before opening of the Bids, an Invitation for Bid may be canceled, in whole or in part, when the County determines this action is fiscally advantageous or otherwise in its best interest.

(b) When an Invitation for Bid is canceled before Bid opening, the Bids shall be returned to the Bidders submitting them and notice of cancellation shall be included and no party or Person including, but not limited to, the County shall have any liability or obligation of any amount, kind, or nature to another or any other in connection therewith.

GP-2.17 REJECTION OF INDIVIDUAL BIDS OR PROPOSALS

(a) Any Bid may be rejected, in whole or in part, when it is in the best interest of the County to do so.

(b) Reasons for rejection of a Bid may include but are not limited to:

(1) It is not a Responsive Bid.

(2) Unreasonable price.

(3) The Bidder submitting the Bid is determined to be nonresponsible. A determination of nonresponsibility may be made for, but is not limited to, any of the following reasons:

(a) Bidder debarred or ineligible and period of debarment or ineligibility not expired.

(b) The unit prices contained in a Bid are unbalanced.

(c) Evidence of collusion among Bidders.

(d) Inadequate quantity and/or quality of experience, plant, equipment, financing, manpower or other resources required to perform the Contract.

(e) Bidder's workload that, in the judgment of the Administration, might hinder or prevent the prompt completion of the subject Work if Awarded.

(f) Default by the Bidder on other contracts.

(g) Failure to pay or satisfactorily settle all reasonable and just bills due for labor and material on prior or current contracts.

(h) The same Person has an interest in more than one Bid on a Contract exclusive of being named by another Bidder as a Subcontractor.

(i) Failure to perform satisfactorily on other contracts awarded, and the conditions leading to unsatisfactory performance remain unresolved.

(j) Any other reason affecting the Bidder's ability to perform, or a record of business integrity.

(k) Bidder not otherwise qualified and eligible to receive an Award under applicable laws and regulations.

(4) The Bidder fails to supply information to the Engineer promptly, after notification from the Engineer that such information is required in connection with a determination to be made pursuant to this GP-2.17.

GP-2.18 REJECTION OF ALL BIDS, IN WHOLE OR IN PART

(a) After opening of Bids or Proposals but before Award, all Bids or Proposals may be rejected, in whole or in part, when the Engineer, with the approval of the using-County department or agency head, or his/her designee, determines such rejection is fiscally advantageous or otherwise in the County's best interest.

(b) If and as applicable, notice of rejection of all Bids shall be sent to all Bidders that submitted Bids, and Bids which have been opened shall be retained by the Department's Division of Construction Contracts Administration.

GP-2.19 BID EVALUATION AND AWARD

(a) **General.** The Contract is to be Awarded to a Responsible Bidder who is also a Responsive Bidder and whose Bid meets the requirements and evaluation criteria set forth in the Bid Package, and is either the lowest Bid price or lowest evaluated Bid price, in the County's sole discretion.

(b) **Determination of Lowest Bidder.** Bids shall be evaluated to determine which Bidder offers the lowest cost to the County in accordance with the evaluation criteria set forth in the Bid Package.

Except as otherwise provided under GP-2.14 Mistakes in Bids:

(1) The unit price will govern in the event of a discrepancy between the unit price and the extended price (product of unit price multiplied by the quantity).

(2) The sum of the extended prices will govern in the event of a discrepancy between the total lump sum and the extended prices.

(3) The written words for the lump sum will govern in the event of a discrepancy between the lump sum prices written in words and the lump sum prices written in figures.

(4) If a unit price was omitted, the unit price will be determined by dividing the extended price by the quantity.

The Administration reserves the right to make the Award by Bid Item, or groups of Bid Items, rather than total Bid if it is in the best interest of the County to do so, unless the Bidder expressly stated in its Bid that a particular or progressive Award was not acceptable to the Bidder.

(c) **Award.** Upon determination of the Responsible Bidder who is also a Responsive Bidder, and whose Bid meets the requirements and evaluation criteria of the Bid Package and is the lowest Bidder in accordance with these Standard Specifications and the Bid Package, the Contract may be Awarded to that Bidder. In accordance with these Standard Specifications and the Bid Package, a Contract may be Awarded to a Bidder offering a higher quality item than that designated in the Bid Package if that Bidder is a Responsible Bidder with the lowest Responsive Bid whose Bid meets the requirements and evaluation criteria of the Bid Package.

GP-2.20 TIE BIDS

(a) **Definition.** Tie Bids are Responsive Bids from Responsible Bidders that are identical in price, terms and conditions and which meet all the requirements and evaluation criteria set forth in the Bid Package.

(b) **Award.** If two or more Bidders shall be tied for the lowest Bid, quality and service being equal, the Contract shall be Awarded to the Bidder qualified as a minority, as defined in the State procurement regulations. If both Bidders are qualified minorities, as defined in the State procurement regulations, the Contract shall be Awarded to the minority that is a local Bidder. Please see Baltimore County Code, 2003, as amended, Article 10, Title 2, for more information and the governing statute regarding minority Bidders and local Bidders.

GP-2.21 – Reserved.

GP-2.22 MULTIPLE OR ALTERNATE BIDS

Unless multiple or alternate Bids are requested in the Bid Package, such multiple or alternate Bids may not be accepted. However, if a Bidder clearly indicates a base Bid, it shall be considered for Award as though it were the only Bid submitted by the Bidder.

GP-2.23 BID PROTESTS

(a) **Bidder Protest of Award or Alleged Improprieties.** The Bidder must file a written Bid protest of Award pursuant to this GP-2.23 of the Standard Specifications. The Bid protest of Award must be in writing and filed with the Engineer. Oral objections, whether or not acted on, are not protests.

(1) **Time for Filing.** A Bid protest of Award shall be filed not sooner than the date of Award and not later than three (3) Business Days after the date of Award. A protest based on alleged improprieties in the Bid Package which are apparent before the Bid opening or the closing date for receipt of Bids shall be filed not later than five (5) Business Days before the Bid opening date.

(2) **Content of Written Protest.** The written protest must state: the name and address of the Bidder; the Bid or Contract Number; the reasons for protest; and any supporting exhibits, evidence or documents to support the protest.

(b) **Bidder Protest of Bid Rejection.** The Bidder must file a written Bid protest of Bid rejection with the Engineer not later than three (3) Business Days from the date of the Bid rejection. Oral objections, whether or not acted on, are not protests. The written Bid protest must comply with GP-2.23(a)(2).

(c) **Department Response to Bidder Protest.** The Department's Chief of Division of Construction Contracts Administration, or other designated County official, will review the Bidder's protest, as filed pursuant to GP-2.23(a) or (b), and respond to the Bidder in writing within ten (10) Working Days of receipt of protest.

(d) **Bidder Appeal.** The Bidder may appeal the decision by the Department's Chief of Division of Construction Contracts Administration, or other designated County official, (a) to the County's Director of the Office of Budget and Finance for all MBE/WBE-related protests or (b) to the Director, or other designated County director, for all other protests.

The Bidder must file a written appeal with the relevant director not later than three (3) Business Days from the date of the Department response in GP-2.23(c). Oral objections, whether or not acted on, are not appeals. The appeal must comply with GP-2.23(a)(1) and (2), but may include any additional documentation as deemed necessary and appropriate by the Bidder.

(e) **Director Response to Bidder Appeal.** The relevant County director, as appropriate and applicable, will review the Bidder's appeal under GP-2.23(d) and respond to the Bidder in writing within fifteen (15) Working Days of receipt of appeal.

(f) **Second Bidder Appeal.** The Bidder may appeal the decision by the relevant County director, as appropriate and applicable, to the County Administrative Officer (CAO).

The Bidder must file a written appeal with the CAO not later than three (3) Business Days from the date of the director response in GP-2.23(e). Oral objections, whether or not acted on, are not appeals. The appeal must comply with GP-2.23(a)(1) and(2), but may include any additional documentation as deemed necessary and appropriate by the Bidder.

(g) **CAO Response to Bidder Appeal.** The CAO, or his/her duly authorized designee, will review the Bidder's appeal under GP-2.23(f) and respond to the Bidder in writing within twenty (20) Working Days of receipt of appeal. The CAO's, or his/her duly authorized designee's, written decision is final and binding on all involved parties.

GP - SECTION 3 AWARD AND EXECUTION OF CONTRACT

GP-3.01 AWARD OF CONTRACT (See GP-2.19)

Notice of Award shall be faxed, where available, at the number provided with the Bid and/or mailed, by first class mail, to the successful Bidder at the address submitted with the Bid. In addition, the Department's Division of Construction Contracts Administration shall maintain for public inspection a record of the date of the notice of Award for each Contract, if Awarded and as applicable.

(a) The notice of Award, if it be Awarded, shall be within ninety (90) Calendar Days (or as otherwise specified in the Contract) after the opening of the Bid, and will be to the Responsible Bidder with the lowest Responsive Bid whose Bid complies with all the requirements prescribed in these Standard Specifications and the Invitation for Bid. The successful Bidder will be notified by letter, as stated above, to the address shown on its Bid, that its Bid has been accepted and that it has been Awarded the right to execute the Contract Documents with the County. The notice of Award shall be deemed to have been received three (3) Calendar Days after the date on the notice of Award. The successful Bidder will also be deemed to be on notice of the information contained in the public record log referred to above.

(b) If a Contract is jointly Bid by more than one Person, all Persons will be, upon Award, notified and shall execute the Control thereafter and will be held jointly and severally responsible for the performance and Full and Final Completion of the entire Contract.

(c) The right is reserved to cancel and rescind any notice of Award at any time before the County fully executes the Contract Documents. Upon the County's cancellation and rescission of the notice of Award the County shall not be liable or obligated in any kind, nature or amount to any Person.

GP-3.02 RETURN OF PROPOSAL GUARANTY

If a Bid is withdrawn by Written Notice received in the office designated in the Bid Package before the time and date set for Bid opening, the Proposal Guaranty will be returned if requested. Each Proposal Guaranty submitted, other than the three low Bidders, will be considered released immediately following opening and review of the Bids. The Proposal Guaranty of the 2nd and 3rd low Bidders will be returned upon request only, following execution of the Contract with the lowest Bidder, and the Proposal Guaranty of the lowest Bidder (i.e., the Contractor) can only be released upon execution of the Contract and submittal of the Performance Bond and the Payment Bond by the Contractor, as required by GP-3.03.

GP-3.03 PERFORMANCE BOND AND PAYMENT BOND REQUIREMENTS

(a) Acceptable security in the County-required forms for the Performance Bond and a Payment Bond are included in the Bid Package.

(b) A Performance Bond and a Payment Bond must be provided by Contractor from a Surety acceptable to the County who is (1) licensed in the State of Maryland, (2) rated "B" or better by the A.M. Best Company, (3) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (4) in good standing as determined by the County's Engineer as amended at the time of the underwriting and provision of the Payment Bond and Performance Bond.

A Payment Bond and Performance Bond are required for every and each Contract in excess of twenty-five thousand dollars (\$25,000). Each Payment Bond and each Performance Bond shall be in the amount equal to at least one hundred (100%) percent of the Contract price. The fully executed Payment Bond and fully executed Performance Bond shall be delivered by the Bidder to the Department's Division of Construction Contracts Administration no later than the time the Contract is to be executed by the Contractor. If the Bidder fails to deliver the required Payment Bond and the required Performance Bond in a timely manner, the Bid shall be rejected, the Proposal Guaranty shall be enforced, and Award of the Contract may be made to the Responsible Bidder with the next lowest Responsive Bid in accordance with the Invitation for Bid and these Standard Specifications.

All Bond premiums shall be paid by the Contractor. At the direction of the Department, the Contractor may be required to increase the Payment Bond and Performance Bond with such increase to be paid for by the County in the amount of the documented actual cost to the Contractor.

GP-3.04 EXECUTION OF CONTRACT/SUBMISSION OF REQUIRED DOCUMENTS AND MBE/WBE FORMS

The successful Bidder for the Contract will be provided, upon Award of the Contract, five (5) sets of Bid Proposal Forms and Plans and two (2) sets of cross sections free of charge (this number of copies may be increased to fifteen (15) for certain large building projects, in the sole discretion of the Administrator). Any additional Plan sets required by the Contractor may be purchased at the price noted in Bid Package. Individual Plan sheets or complete sets of Plans may be purchased at the prevailing price set by the County.

(a) Not later than ten (10) Business Days after the date of the notice of Award, the successful Bidder shall have obtained and returned the Contract Documents to the County and two (2) sets of cross sections, including, but not limited to: (1) the fully and properly executed Contract Proposal Form, (2) the fully and properly executed Payment Bond and Performance Bond, if required under GP-3.03, (3) the fully and properly completed evidence of insurance required pursuant to GP-7.14 of these Standard Specifications and the Bid Package, and (4) the Proposal Affidavit. The documents referred to in this GP-3.04 (a) (1), (2), (3), and (4) are to be delivered to the Department's Division of Construction Contracts Administration unless expressly specified otherwise by the Engineer or in the Contract Documents.

(b) The Department's Division of Construction Contracts Administration shall record in the public record log, referred to in GP-3.01, the date it received from the successful Bidder each of the properly completed Contract Documents required in GP-3.04 (a) (1), (2), (3), (4) and (5)

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above, and the date it received notification from the County's Office of Fair Practices that the successful Bidder's MBE/WBE forms required by the County have been approved. The successful Bidder is deemed to be on notice of such information so recorded.

(c) In the event the County fails to fully execute the Contract Documents within thirty (30) Business Days after the date all of the required documents in this section have been received by the Department, the successful Bidder will have, as its sole remedy, the option to declare the Contract terminated or to agree to an extension of the time for the County to execute the Contract. Should Bidder declare the Contract terminated, in no event shall County be liable or obligated for any losses, costs, expenses or damages in any amount, nature, or kind incurred by any Person including, but not limited to, the Bidder. If the successful Bidder, however, shall fail within thirty-five (35) Business Days of the aforementioned date to deliver Written Notice to the Department's Division of Construction Contracts Administration that it elects to rescind its Bid and have the Contract terminated, the time period for the County to execute the Contract shall automatically be extended for an additional fifteen (15) Business Days.

(d) All Contract Documents remain the property of the County and must not be used on other work but shall be returned to the County upon request by Engineer.

GP-3.05 FAILURE TO EXECUTE CONTRACT

Failure to deliver to the County the required items listed in GP-3.04 within the time specified therein shall be just cause for the annulment and rescission of the notice of Award and the Contractor's and Surety's forfeiture of the Proposal Guaranty to the County, not as a penalty, but in liquidation of damages sustained. Notice of Award may then be made to the Responsible Bidder with the next lowest Responsive Bid, or, at the County's option, the Work may be re-advertised.

GP - SECTION 4 SCOPE OF WORK

GP-4.01 INTENT OF CONTRACT

(a) The Contractor shall (within specified tolerances) perform all Work in accordance with the Contract Documents including, but not limited to, the lines, grades, typical cross sections, dimensions, and other data shown on the Plans or as modified by Contract Modification including the furnishing of all Materials, implements, machinery, Equipment, tools, supplies, transportation, labor, and all other things necessary to the satisfactory prosecution and completion of the Work in full compliance with the Contract Documents.

(b) The Contract Documents are intended to be complementary, and to describe the Construction and completion of the Work. Anything mentioned in the Contract Documents and not shown on the Contract Drawings, or shown on the Contract Drawing, and not elsewhere

mentioned in the Contract Documents shall be of like effect as if it is shown or mentioned in both.

(c) Omissions from the Contract Documents including, but not limited to, Contract Drawings or the misdescription of details of Work which are manifestly necessary to carry out the intent of the Contract Documents and/or Contract Drawings or which are customarily performed shall not relieve the Contractor from performing such omitted or misdescribed details of Work, but they shall be performed as if fully and correctly set forth and described in the Contract Drawings and Contract Documents. The Engineer shall consider modifications of the Bid and/or postponement of Bid opening as may best serve all interested parties where Written Notice of apparent omissions is received by the Engineer five (5) Business Days before the hour prescribed for Bid opening. This is not to be construed as a limitation on the Engineer. If justified and deemed appropriate by the County, the Engineer may issue a Contract Modification or, if after execution of the Contract, prepare a Supplemental Agreement(s) for Extra Work that was not anticipated and/or shown on the Contract Drawings or described in the Contract Documents.

(d) Work described in words that have a well-known technical or trade meaning shall be held to refer to such recognized standard use.

(e) The Contractor shall keep in the office on the Work site a complete set of all Contract Drawings, Standard Specifications, shop drawings, schedules, etc., in good order and available to the Engineer and representatives of the County.

GP-4.02 CONTRACT DOCUMENTS

The Contract Documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete Work. In the event of any discrepancy between the drawing and figures written thereon, the figures, unless obviously incorrect, will govern over scaled dimensions. In the event of any discrepancy between the Plans and the Standard Specifications, the Plans will govern. If there is a discrepancy between the Standard Specifications and Interim Supplemental Specification, the Interim Supplemental Specifications will govern. Special Provisions will govern over Standard Specifications, Interim Supplemental Specification and Plans.

Special Provisions govern over all other Contract Documents unless expressly stated to the contrary in the Contract Documents.

GP-4.03 ENTIRE CONTRACT

The Contract represents the entire and integrated agreement between the parties thereto and supersedes all prior negotiations, representations or agreements, either written or oral.

GP-4.04 VARIATIONS IN ESTIMATED QUANTITIES

(a) Where the quantity of a Major Contract Item in this Contract is an estimated quantity and where the actual quantity of such Pay Item varies more than twenty-five (25%) percent above or below the estimated quantity stated in this Contract, an equitable adjustment in the Contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above one hundred twenty-five (125%) percent or below seventy-five (75%) percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Engineer shall, upon receipt of a written request for an extension of time within ten (10) Days from the beginning of the delay, or within a further period of time which may be granted by the Engineer before the date of final settlement of the Contract, ascertain the facts and make the adjustment for extending the Completion Date as in Engineer's judgment the findings justify.

(b) Should any Contract Items contained in the Bid Package be found unnecessary for the proper completion of the Work, the Engineer may, upon written order to the Contractor, eliminate such Contract Items from the Contract and no allowance will be made for Contract Items so eliminated in making final payment to the Contractor except for Material costs documented incurred prior to notification of the elimination of the Contract Items and for which there is no other possible or reasonable use.

GP-4.05 DIFFERING SITE CONDITIONS

(a) Pursuant to and incorporated GP-2.04, the Contractor is solely responsible for ascertaining soil conditions impacting any and all portions of the Work and soils testing shall be performed by an independent testing firm at Contractor's sole cost and expense. Unless waived in writing by the Engineer, the independent testing shall be performed by a professional engineer licensed by the State of Maryland. The Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of:

(1) Subsurface or latent physical conditions at the site differing materially from those indicated in this Contract; or

(2) Unknown physical conditions at the site of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Contract. The Engineer shall promptly investigate the conditions, and if he finds, in his sole discretion, that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the Work under this Contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the Contract modified in writing accordingly.

(b) No claim of the Contractor under this General Provision shall be allowed unless the Contractor has given the notice required in (a) above; provided however, the time prescribed therefor may be extended by the County, in its sole discretion.

(c) No claim by the Contractor for an equitable adjustment under this General Provision shall be allowed if asserted after final payment under this Contract.

GP - 4.06 CHANGES

(a) The Engineer may unilaterally, at any time, and without notice to the Surety, if any, by a Change Order, make any change in the Work within the general scope of the Contract, including but not limited to changes:

- (1) In the Contract Documents (including, but not limited to, Contract Drawings and designs);
- (2) In the method or manner of performance of the Work;
- (3) In the County-furnished facilities, Equipment, Materials, services, or Work site; or
- (4) Directing acceleration in the performance of the Work.

If the Contractor intends to assert an equitable adjustment claim under this GP-4.06(a) for changes made by the Engineer, it shall, within thirty (30) Days after receipt of a written Change Order submit to the Engineer a Written Notice setting forth the general nature and monetary extent of such claim for equitable adjustment and the Contractor's position relative to Contract Time, unless the Contract Time was already extended by the County.

(b) The Contractor may request a Change Order by providing the Engineer with Written Notice stating the date, circumstances, and the source of any written or oral order from the County causing the change in Work. Except for claims based on defective Contract Documents, no claim for any change under this GP-4.06(b) shall be allowed for any costs incurred more than twenty (20) Days before the Contractor gives Written Notice as required. Further, in the case of defective Contract Documents in the Bid Package for which the County is responsible, the equitable adjustment shall include any increased costs reasonably incurred by the Contractor in attempting to comply with such defective Contract Documents in the Bid Package.

If the Contractor intends to assert an equitable adjustment claim under this GP-4.06(b) for changes it requested, it shall, within thirty (30) Days after the furnishing of Written Notice submit to the Engineer a written statement setting forth the general nature and monetary extent of such claim and the Contractor's position relative to Contract Time, unless the Contract Time was already extended by the County. This statement of claim for equitable adjustment may be included in the Written Notice submitted pursuant to this GP-4.06(b).

The Engineer will consider the Written Notice provided, and all facts at hand or that can be readily obtained, without unduly delaying the Work, and:

(1) Where the Engineer finds the change presented by the Contractor would cause a difference in Contract cost or Contract Time, he/she will consider alternatives to minimize impacts in the Contract cost or Contract Time in the mutual interest of both parties and commit his final decision to writing in a Change Order; or

(2) Where the Engineer does not find in favor of the change presented by the Contractor, he shall commit his instructions to writing and direct the Contractor's and the Engineer's staff to proceed as if a force account, as further described in GP-9.02, were ordered to provide a record for later re-evaluation as to merits of the change and any adjustments that may be needed.

Both parties are duty-bound to minimize the accumulation of expenses during the time the Engineer requires to complete the evaluation required in this GP-4.06(b). Delay costs and time, to the extent judged reasonable and unavoidable, are to be considered in the Engineer's Change Order, if any.

(c) No order, statement, or conduct of the Engineer shall be treated as a change under this General Provision or entitle the Contractor to an equitable adjustment unless made in a properly authorized and executed Change Order or Contract Modification.

(d) Each Contract Modification or Change Order that affects Contract price, whether an increase or a decrease, shall be subject to the prior written approval of the Engineer and other appropriate authorities and to prior Certification of the County's Office of Budget and Finance of fund availability and the effect of the Contract Modification or Change Order on the Contract budget or the total Contract cost. If, according to the Certification of the County's Office of Budget and Finance, the Contract Modification or Change Order will cause an increase in Contract cost that will exceed budgeted and available funds, the Contract Modification or Change Order may not be made unless sufficient additional funds are made available or the scope of the Contract is adjusted to permit its completion within the Contract budget.

(e) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment is made pursuant to GP-9.04 and this Contract.

(f) No claim for Extra Work by the Contractor will be granted which includes cost of delays or Work stoppage due to strikes, lockouts, fire, avoidable casualties or damage or delay in transportation for which the County or its agents are not responsible.

GP-4.07 NEGOTIATED PAYMENT PROVISION

(a) The County, without invalidating the Contract, may order changes in the Work by altering, adding to or deducting from the Work, the Contract amount being adjusted accordingly in a Change Order. Extension of time made, or if necessary thereby, shall be adjusted at and documented in a Change Order.

(b) The Engineer shall have the authority to make minor changes in the Work not involving extra cost and not inconsistent with the purpose of the Contract and/or Work. Otherwise, except in an emergency endangering life or property, no Extra Work or change shall be made unless a written order from the Department signed by the Director has been received by the Contractor. No claim for addition to the Contract sum shall be valid unless so ordered in writing by the Director.

(c) The value of any such Extra Work or change under this GP-4.07 shall be determined in one or more of the following ways as determined by the Department:

(1) By Estimate and Acceptance of a Lump Sum

(a) The Contractor shall furnish a breakdown of the estimated Construction cost. The breakdown shall be of sufficient detail to describe the Extra Work and related costs for labor, Material, overhead and profit.

(b) Overhead and Profit

1. Extra Work by Subcontractor:

Subcontractor will be allowed 10% overhead and 10% profit added to the direct labor and Material costs. The Contractor will be allowed to increase the Subcontractors total lump sum by 10% to cover its administration.

2. Extra Work by Contractor:

The Contractor will be allowed 10% overhead and 10% profit added to the labor and Material costs.

(c) The Contractor will be allowed 1% for Contract Bond added to the labor and Material costs, as applicable.

(d) The allowed overhead will include all supervision; no additional allowance will be made for it.

(2) By Unit Prices Named in the Contract or Subsequently Agreed Upon

Such unit prices are to include all supervision, overhead, taxes, insurance and profit.

(3) By Cost and a Fixed Fee

Added to the cost is a fixed fee portion that is to include supervision, overhead, insurance and profit.

(4) By Force Account (Labor and Material Cost plus)

See GP-9.02 entitled "Force Account Work".

Should none of the methods stated in Paragraph 4.07(c) 1, 2, or 3 be applicable, the Contractor shall, providing the Contractor receives an order as defined in Paragraph 4.07(b) of this General Provision, proceed with the Work in accordance with GP-9.02 entitled "Force Account Work". The Contractor and Engineer shall keep accurate costs, in such form as the Engineer may direct, for presentation, together with vouchers, to the Department for determination of the value of the Extra Work included in each Change Order. Pending determination of the final value and the execution of the Change Order, the Engineer may include payments for Materials and labor, as stated in General Provision - Section 9, "Payment", in monthly vouchers.

GP-4.08 UNAUTHORIZED WORK

Work done contrary to or regardless of the instructions of the Engineer, Work done beyond the lines and grades shown on the Contract Drawings, or as given, or any Extra Work done without written authority of the Engineer is unauthorized and at the sole cost and expense of the Contractor and will not be measured or paid for. Work so done may be ordered removed and/or replaced at the Contractor's sole cost and expense.

GP-4.09 FINAL CLEAN UP

Upon Final Acceptance for Maintenance of the Work specified in the Contract and before final payment will be made, the Construction area and all other adjoining areas occupied by the Contractor during the Construction of said Contract, other than those owned by the Contractor, shall be cleaned of all surplus and discarded Materials, spilled Materials, excess Materials left deposited on the permanent Work as a result of the Contractor's operations, falsework, and rubbish and temporary Structures and buildings, that were placed thereon by the Contractor. The adjoining areas mentioned above, outside the normal pay limits for seeding, will be reshaped, seeded and mulched, or otherwise restored as directed by the Engineer at the Contractor's expense.

GP-4.10 WARRANTY OF CONSTRUCTION

(a) In addition to any other warranties at law and specified in the Special Provisions of the Contract, the Contractor warrants for two (2) years after the date of Final Acceptance for Maintenance by the County, that Work performed under this Contract shall conform to the Contract requirements and is free of any defect of Equipment, Material or design furnished, or workmanship performed by the Contractor or any of the Contractor's Subcontractors or suppliers at any tier. Under this warranty, the Contractor at its own and sole cost and expense shall make any Repairs or replacements which, in the judgment of the Engineer, may become necessary during this warranty period on account of any failures or defects. In addition, the Contractor

shall remedy at its own and sole cost and expense any damage to County-owned or controlled real or personal property, when that damage is the result of the Contractor's failure to conform to Contract requirements or any such defect of Equipment, Material, workmanship, or design. The Contractor shall also promptly restore any Work damaged in fulfilling the terms of this General Provision. The Contractor's warranty with respect to Work Repaired or replaced hereunder will run for two (2) years from the date of the County's acceptance of such Repair or replacement; provided that the terms and conditions of all warranties in place following the Final Acceptance for Maintenance shall continue to remain in full force and effect.

(b) The County shall notify the Contractor in writing within a reasonable time after the discovery of any failure, defect, or damage.

(c) Should the Contractor fail to remedy any failure, defect, or damage described in (a) above within a reasonable time after receipt of notice thereof, or in the case of an emergency, the County shall have the right to replace, Repair, or otherwise remedy such failure, defect, or damage at the Contractor's sole cost and expense. To insure the County against the nonpayment of any such costs, on the date of Final Acceptance for Maintenance, the County will either require the retainage of five percent (5%) of the total value of the Contract or require the Contractor to submit a value equivalent maintenance bond. Said maintenance bond shall be in a form and with a Surety approved by the County, binding the Contractor as principal, and the Surety, to promptly and properly replace any improper Work or Materials that may become apparent within the two (2) year warranty period following the date of Final Acceptance for Maintenance. In lieu of a bond, other forms of security such as irrevocable letters of credit, or a bank cashier's or treasurer's check may be accepted. Upon acceptance and approval by the County of such a bond or other security, the sum retained by the County will be released pursuant to GP-Section 9.

(d) In addition to the other rights and remedies provided by this General Provision, all Subcontractors', manufacturers', and suppliers' warranties expressed or implied, respecting any Work and/or Materials shall, at the direction of the County, be enforced by the Contractor for the benefit of the County. In such case if the Contractor's warranty under (a) above has expired, any suit directed by the County to enforce a Subcontractor's, manufacturer's or supplier's warranty shall be at the expense of the County. The Contractor shall obtain any warranties that the Subcontractors, manufacturers, or suppliers would give in normal commercial practice.

(e) If directed by the Engineer, the Contractor shall require any such warranties under this GP-4.10 to be executed in writing to the County.

(f) Notwithstanding any other provision of this General Provision, unless such a defect is caused by the negligence of the Contractor or its Subcontractors or suppliers at any tier, the Contractor shall not be liable for the Repair or any defects of material or design furnished by the County nor for the Repair of any damage which results from any such defect in County furnished Material or design.

(g) The warranty specified herein shall not limit the County's rights under GP-5.13 "Acceptance for Maintenance", or any other rights available to County under the Contract, at law, and/or in equity.

GP - SECTION 5 CONTROL OF THE WORK

GP-5.01 AUTHORITY OF THE ENGINEER

(a) The Engineer shall decide: all questions which may arise as to the quality and acceptability of Materials furnished and Work performed and as to the rate of progress of said Work; all questions which may arise as to the interpretation of any or all Plans and Contract Documents; and all questions as to the acceptable fulfillment of the Contract on the part of the Contractor.

(b) The Engineer shall determine the amount and quantity of Work performed and Materials which are to be paid for under the Contract.

(c) The Engineer shall have the authority to suspend the Work wholly or in part due to the failure of the Contractor to carry out any provisions of the Contract.

GP-5.02 CONFORMITY WITH CONTRACT REQUIREMENTS

All Work performed and all Materials furnished shall be in conformity with the Contract requirements.

In the event the Engineer finds the Materials or the finished product in which the Materials are used or the Work performed are not in reasonably close conformity with the Contract requirements and have resulted in an inferior or unsatisfactory product, the Work or Materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.

In the event the Engineer finds the Materials or the finished product in which the Materials are used are not in conformity with the Contract requirements but that acceptable Work has been produced, he shall then make a determination if the Work shall be accepted in the Engineer's sole discretion. In this event, the Engineer will document the basis of acceptance by a Change Order that will, if applicable, provide for an appropriate adjustment in the Contract price. Any action taken pursuant to this General Provision shall not result in an increase of the Contract price.

GP-5.03 DISCREPANCIES IN THE CONTRACT DOCUMENTS

In the event the Contractor discovers any discrepancies in the Contract Documents, the Contractor shall immediately notify the Engineer in writing. The Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the Contract.

GP-5.04 COOPERATION BY CONTRACTOR

The Contractor will keep available on the Work site at all times one complete set of Contract Documents.

The Contractor shall give the Work the constant attention necessary to facilitate the timely progress thereof, and shall cooperate with the Engineer and the Engineer's Inspector at all times and in every way possible.

The Contractor shall assign to the Contract as his agent, a competent Superintendent capable of communicating in English and capable of reading and thoroughly understanding the Contract Documents and thoroughly experienced in the type of Work being performed, who shall receive instructions from the Engineer or his authorized representatives. The Superintendent shall have full authority to execute the order or directions of the Engineer without delay, and to promptly supply such Materials, Equipment, tools, labor and incidentals as may be required. Such superintendence shall be furnished irrespective of the amount of Work sublet. Said Superintendent shall be on the Work site at all times when the Work is in progress.

The Contractor shall so schedule the Work as to ensure efficient and uninterrupted progress and to hold to an absolute minimum the cutting and patching of new Work. All cutting, patching and digging necessary to the execution of the Work is included in the Contract.

The Contractor shall so schedule (to include Subcontracts) the Construction performed by each group or trade that each installation or portion of the Construction shall member with and join with all other Work as required for a complete installation, all according to accepted good Construction practice.

The Contractor shall be responsible for the coordination of the Work of all Subcontractors.

GP-5.05 COOPERATION WITH UTILITIES

It is understood and agreed that the Contractor has considered in its Bid all of the permanent and temporary utility appurtenances in their present or relocated positions and that no additional compensation will be allowed for delays, inconvenience, or damage sustained by the Contractor due to any interference from the said utility appurtenances or the operation of moving them.

The Contractor shall have responsibility for notifying all affected Utility Companies before performing any Work on their utilities and shall cooperate with them. All damage to utility

facilities caused by the Contractor's operations shall be the sole financial and legal obligations, liability and responsibility of the Contractor.

MISS UTILITY: Sections 12-101, *et seq.*, of the Public Utility Companies Article of the Maryland Annotated Code, as amended from time to time, establish requirements regarding protection of existing underground utilities from excavation and demolition activities.

The Contractor shall notify Utility Companies and their public agencies at least forty-eight (48) hours but not more than ten (10) Days before digging. Locate requests may be processed through Ticket Check by calling this special toll-free number: 1-866-821-4226, where the caller will be prompted through the steps to retrieve ticket status, using a 10 digit Contractor's number. Contact the MISS UTILITY help desk at 410-712-0056, x4040 or check the www.missutility.net/maryland web site for more information on how to use the Ticket Check system.

One call to 1-800-257-7777 or use of Ticket Check will reach most companies and organizations that have underground facilities in the County. A list of member utilities belonging to MISS UTILITY is on the MISS UTILITY website at www.missutility.net/maryland. Other utilities, which are non-participants in MISS UTILITY, may also be encountered. It is the Contractor's responsibility to identify all utilities, to inform the proper authorities of Work near the utility line, and to exercise caution at all times in regard to them.

The UTILITY SERVICE PROTECTION CENTER (MISS UTILITY: (800 257-7777) may also be called between 7:00 a.m. and 5:00 p.m., Monday through Friday, excluding Holidays. Emergencies will be processed promptly on a 24-hour basis.

FIRE HYDRANTS: The Contractor shall notify the County Fire Department's Fire Dispatch Liaison Officer (410 887-4592) prior to starting any Work involving the removal or relocation of existing fire hydrants.

SANITARY SEWERS: To protect against accidental clogging, existing sanitary sewer channels shall be covered within manholes, as directed by the Engineer, prior to any grubbing or grading operations. This will not be a separate Pay Item, but shall be included in the cost of other Pay Items.

ADDITIONAL COSTS: The cost of charges for marking the locations for water and sewer utilities by the organizations which are part of the MISS UTILITY program shall be included as an incidental cost in the Contractor's Bid.

Water mains, gas mains, storm drains, sanitary sewers, and other utilities are shown on the Plans, in accordance with the best information available to the County, for the convenience of the Contractor. THE COUNTY ASSUMES NO RESPONSIBILITY FOR ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN ON THE PLANS AND THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UTILITIES. Existing mains and services shall be carefully protected and any damage to them caused by the Work and/or the Contractor shall be immediately Repaired to

the satisfaction of the Engineer by the Contractor at its own expense, using Materials of the quality and kinds damaged.

GP-5.06 COOPERATION BETWEEN CONTRACTORS

(a) Each and every contractor under contract with the County, with regard to any adjoining or overlapping Work or work of or with another under contract with the County, shall cooperate with each other as necessary. Such cooperation shall include:

- (1) Arrangement and conduct of Work and/or work; and
- (2) Storage and disposal of Materials, etc., by each in such manner as to not unnecessarily interfere with or hinder the progress of the Work and/or work being performed by other contractors. Contiguous Work shall be joined in an acceptable manner.

(b) The Administration and Department shall have the right, at any time, to contract for and perform other Work and/or work on, near, over or under the Work covered by this Contract. In addition, other Work and/or work may be performed under the jurisdiction of another public body, public entity, the County agency or entity, County affiliate or any public educational or college entity. In such cases, when a dispute arises among one or more contractors, the Engineer will decide which department, body, or entity has jurisdiction over said dispute. The Contractor shall cooperate fully with such other contractors and carefully fit Contractor's own Work to such other work as may be directed by the Engineer.

(c) The Contractor agrees that in the event of dispute as to cooperation the Engineer will act as referee. The Contractor waives its rights and remedies to make a claim or take any other action of any kind against the Administration for any inconvenience, delay or loss experienced by Contractor because of the presence and operations of other contractors.

(d) The County reserves the right to let other contracts in connection with paving and utilities adjoining this Work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate its Work with theirs.

If any part of the Contractor's Work depends for proper execution or results upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. Failure to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the Work. The Contractor shall take all reasonable precautions during construction to prevent damages to previously installed work. The Contractor shall monitor the previously installed area/work while performing its assigned Work, and shall advise the Engineer immediately if defects in that previously installed work become apparent.

To ensure the proper execution of Contractor's subsequent Work, the Contractor shall verify Work already in place and shall at once report to the Engineer any discrepancy between the executed Work and the Contract Drawings.

GP-5.07 AUTHORITY AND DUTIES OF INSPECTORS

The Inspector shall be authorized to inspect all Work done and all Material furnished. Such inspection may extend to all or any part of the Work and to the preparation, fabrication or manufacture of the Materials to be used. The Inspector is not authorized to revoke, alter or waive any requirements of the Contract, nor is he authorized to approve or accept any portion of the Work. The Inspector is authorized to call the attention of the Contractor to any failure of the Work or Materials to conform to the Contract. The Inspector shall have the authority to reject Materials or suspend the Work until any questions at issue can be referred to and decided by the Engineer. The Inspector shall perform his duties at such times and in such manner as will not unnecessarily impede progress on the Contract.

The Inspector shall in no case act as foreman or perform any other duties for the Contractor, nor interfere with the management of the Work by the Contractor. Any advice, instruction, direction or other order which the Inspector may give the Contractor shall not be construed as binding the Engineer in any way, or releasing the Contractor from fulfilling all of the terms of the Contract.

Where there is disagreement between the Contractor, the Superintendent, or any other contractor and the Inspector, such as refusal by the Contractor to use properly approved Material, performing Work not in compliance with Plans and Contract Documents, and/or refusing to suspend Work until problems at issue can be referred to and decided by the Engineer, the Inspector will immediately direct the Engineer's attention to the issues of disagreement. If the Contractor still refuses to make corrections and/or comply or suspend Work, as applicable, the Engineer may prepare and deliver in writing to the Contractor, by mail or otherwise, a written order suspending the Work and explaining the reason for such shutdown. As soon as the Inspector is advised of the delivery of the shutdown order, the Inspector shall immediately leave the site of the Work and any Work performed during the Inspector's absence will not be accepted or paid for and may, in the sole discretion of the Engineer be required to be removed and disposed of at the Contractor's sole cost and expense.

GP-5.08 INSPECTION OF WORK

All Materials and each part or detail of the Work shall be subject at all times to inspection by the Engineer and/or the Inspector, and the Contractor will be held strictly to the Materials, workmanship, and the diligent execution of the Contract. Such inspection may include mill, plant or shop inspection, and any Material furnished under the Contract is subject to such inspection. The Engineer and/or Inspector shall be allowed access to all parts of the Work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection of all parts of the Work.

If the Engineer requests it, the Contractor, at any time before Partial Acceptance for Maintenance and/or Final Acceptance for Maintenance of any Work, shall remove or uncover such portions of the finished Work as may be directed. After examination, the Contractor shall restore said portions of the Work to the standards required by the Contract. Should the Work thus exposed or examined prove acceptable, adjustments in Contract Time and price will be made pursuant to Section GP-4.06 for the uncovering or removing, and the replacing of the covering or making good of the parts removed. Should the Work so exposed or examined prove unacceptable, the uncovering, or removing and replacing, shall be at the Contractor's sole cost or expense.

When the United States Government, the State, another local government or municipality, or any railroad, corporation or other Person is to pay a portion of the cost of the Work covered by this Contract, their respective representatives shall have the right to inspect and approve the Work.

If the Contract Documents, the Engineer's instructions, laws, regulations, executive orders, ordinances, or any public authority require any Work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection, and if the inspection is by another authority, the date fixed for such inspection. Inspections by the Engineer shall be made promptly, and where practicable, at the source of supply. Any Work covered without approval of the Engineer must, if required, be uncovered for examination at the Contractor's sole cost and expense.

If initial tests and/or inspections show substandard products, Materials, workmanship, etc. and the Contractor elects, with the Engineer's approval, to perform additional tests and/or inspections to prove the acceptability of the substandard products, Materials, workmanship etc., the Contractor shall perform same at Contractor's sole cost and expense.

GP-5.09 REMOVAL OF DEFECTIVE WORK

All Work and Materials which do not conform to the requirements of the Contract will be considered unacceptable, unless otherwise determined acceptable under the provisions in GP-5.02.

Any defective Work, whether the result of poor workmanship, use of defective Materials, damage through carelessness or any other cause, found to exist shall be removed and replaced by Work and Materials which shall conform to the Contract Documents or shall be remedied otherwise in an acceptable manner authorized by the Engineer.

Upon failure on the part of the Contractor to comply promptly with any order of the Engineer made pursuant to these General Provisions, the Engineer shall have authority to cause defective Work to be remedied or removed and replaced and unauthorized Work to be removed and to deduct the costs from any monies due or to become due the Contractor under this Contract.

GP-5.10 LOAD RESTRICTIONS

- (a) The Contractor shall comply with all applicable State and local laws, regulations and requirements pertaining to speed, size and weight of motor vehicles.
- (b) The Administration may indicate in the Contract any load restrictions on any Road or Structure within the vicinity of the Work site.
- (c) The Contractor shall take into account any and all posted Bridges, the crossing of which might be contemplated by the Work of the Contract. No loads in excess of posted limits will be allowed in the prosecution of the Work on any Contract, unless the required permits are obtained from the appropriate State and local governmental agencies.
- (d) The Contractor shall consider possible detrimental effects of operating heavy paving and grading Equipment contiguous to retaining walls, pipe Culverts, arches, forms for concrete Work as well as any Construction existing prior to this Contract.
- (e) The Engineer shall have the right to limit passage of heavy Equipment (plus loads) when such passage or usage is causing apparent or visible damage to embankments, paving, Structures or any other property.
- (f) Within Baltimore City limits, and within the limits of the Baltimore City-maintained watershed properties, the Department of Transportation of the City of Baltimore has jurisdiction for oversize and overweight vehicle movements. Permits are obtainable from the Baltimore City Department of Transportation.

GP-5.11 MAINTENANCE OF WORK DURING CONSTRUCTION

- (a) The Contractor shall maintain the Work during Construction and until Final Acceptance for Maintenance by the County. This maintenance shall constitute continuous and effective Work prosecuted as required with adequate Equipment and forces to the end that all parts of the Work be kept in satisfactory condition at all times.

The Contractor shall at all times keep the Work site free from accumulations of waste Material or rubbish caused by its employees, Subcontractors, or Work, and at the Final Acceptance for Maintenance of the Work, shall remove all rubbish, waste, Contractor's tools, scaffolding and surplus Material from and about the Work site. In case of dispute, the County may remove the waste and rubbish and charge the cost to the Contractor as the Engineer shall determine to be just, in his sole discretion.

All debris shall be kept sprinkled to reduce dust and shall be promptly removed from any Structure, and no combustible Materials shall be stored against perimeter walls of any Work.

The Contractor shall clean entirely any Structure as it is completed, wash all windows, scrub all floors at least once, and leave all floors free from spots and blemishes. The interior of any Structure and the entire Work site shall be left "broom clean," or its equivalent.

(b) Particular attention shall be given to drainage, both permanent and temporary. The Contractor shall use all reasonable precautionary measures to avoid damage or loss that might result from accumulations and concentrations of drainage water, and material carried by such water and such drainage shall be diverted or removed when necessary to prevent damage to excavation, embankments, surfacing, Structures or any other property. Suitable measures shall be taken by the Contractor to prevent the erosion of soil in all Construction areas where the existing ground cover has been removed and/or disturbed.

The Contractor shall remove all water, including rain water, encountered during the entire progress of the Work, using pumps, drains or other methods approved by the Engineer. Excavations and the Work site shall be kept free from water until all backfilling is completed. The water shall be discharged to catch basins, or other drainage points as directed by the Engineer.

(c) All cost of maintenance Work during Construction and before Final Acceptance for Maintenance by the County shall be included in the Bid and the Contractor will not be paid an additional amount for such Work, except as otherwise provided in the Contract Documents.

(d) In the event that the Contractor's Work is ordered to shut down for failure to comply with any provision of the Contract, the Contractor shall maintain the entire Work site as provided herein, and provide such ingress and egress for local residents or tenants adjacent to the Work site, for tenants of the Work site, and for the general public as may be necessary during the period of suspended Work or until the Contract has been declared in default.

(e) On Contracts where traffic flow is maintained, the Contractor shall be responsible for Repair of all traffic damages to the Work, either partially or totally completed, until Final Acceptance for Maintenance of the Work is achieved. Responsible, as used here, shall mean the responsibility for restoration and the cost thereof unless otherwise expressly provided for in the Special Provisions.

GP-5.12 FAILURE TO MAINTAIN ENTIRE PROJECT

Failure on the part of the Contractor, at any time, to respond to the provisions of GP-5.11 will result in the Engineer's immediately notifying the Contractor to comply with the required maintenance provisions. In the event the Contractor fails to proceed with corrections to unsatisfactory maintenance so as to conform to the provisions of GP-5.11 within four (4) hours after receipt of such notice, the Engineer may notify the Contractor to suspend all other Work on the Contract until the unsatisfactory maintenance is corrected. In the event that the Contractor has failed to commence with adequate corrective measures within four (4) hours after receipt of such notice the Engineer may immediately proceed with adequate forces and Equipment to maintain the Contract Work and the entire cost of this maintenance will be deducted from any monies due or to become due to the Contractor from the County. The Contractor is and remains responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time until Final Acceptance for Maintenance by the County. The Engineer may suspend Work as further described in GP-8.07.

GP-5.13 ACCEPTANCE FOR MAINTENANCE

(a) **Partial Acceptance for Maintenance.** If at any time during the performance of the Work the Contractor substantially completes a unit or portion of the Work, the Contractor may request the Engineer to make final inspection of that unit or portion. If the Engineer determines upon inspection that the unit has been satisfactorily completed in compliance with the Contract, the Engineer may make a written Partial Acceptance for Maintenance of that unit or portion of Work, and the Contractor may be relieved of further maintenance responsibility for that unit or portion of Work. Generally, Partial Acceptance for Maintenance will only be considered when the Administration feels that such action is in the public interest. Such Partial Acceptance for Maintenance of any unit or portion of Work shall in no way void or alter any of the terms of the Contract.

(b) **Final Acceptance for Maintenance.** Upon due notice from the Contractor of presumptive completion of the Contract Work, the Engineer shall make a Construction inspection and if at such inspection all Construction and Contract Work provided for and contemplated by the Contract is found completed, such inspection shall constitute the final inspection and the Engineer shall make the Final Acceptance for Maintenance of the Work as of that date, and the Contractor shall be notified of such Final Acceptance for Maintenance in writing. After Final Acceptance for Maintenance, the Administration will assume responsibility for maintenance except where otherwise provided by the Contract.

(c) If, however, at any Construction inspection any Contract Work, in whole or in part, is found unsatisfactory, the Engineer shall give the Contractor the necessary instructions as to the Contract Work required for Final Acceptance for Maintenance by the County. The Contractor forthwith shall comply with and execute such instructions. Upon completion of such Contract Work, another inspection shall be made which shall constitute the final inspection if the said Contract Work is completed satisfactorily. In such event, the Engineer shall make the Final Acceptance for Maintenance and the Contractor shall be notified as aforesaid. After Final Acceptance for Maintenance, the Administration will assume responsibility for maintenance except where otherwise provided by the Contract.

(d) Unless otherwise provided in this Contract, Partial Acceptance for Maintenance and/or Final Acceptance for Maintenance by the County shall be made as promptly as practicable after completion and inspection of all Work required by this Contract, or that portion of the Work that the Engineer determines can be accepted separately. Partial Acceptance for Maintenance and/or Final Acceptance for Maintenance shall be final and conclusive except as regards latent defects, fraud, and such gross mistakes as may amount to fraud or the County's rights under any warranty or guarantee or any claims or counter claims reserved by the County.

(e) No claim for Extra Work will be granted which includes cost of delays or Work stoppage due to strikes, lockouts, fire, avoidable casualties or damage or delay in transportation for which the County or officials, employees, or its agents are not responsible.

GP-5.14 CLAIMS

Unless a shorter period is prescribed by law or elsewhere in this Contract:

(a) The Contractor shall file a Written Notice of claim for extension of time, equitable adjustment, extra compensation, damages, or any other matter (whether under or relating to this Contract) with the Engineer within ninety (90) Days after the basis for the claim is known or should have been known, whichever is earlier.

(b) Contemporaneously with or within ninety (90) Days of the filing of a notice of a claim, but no later than the date that final payment for the Pay Item and/or portion of the Work for which the claim is made, a Contractor shall submit the claim to the appropriate Engineer. The claim shall be in writing and shall contain:

- (1) An explanation of the claim, including reference to all Contract provisions upon which it is based;
- (2) The amount of the claim;
- (3) The facts upon which the claim is based;
- (4) All pertinent data and correspondence that the Contractor relies upon to substantiate the claim;
- (5) A Certification by a legally authorized representative of the Contractor or Subcontractor, as applicable, that, to the best of the Person's knowledge and belief, the claim is made in good faith, supporting data are accurate and complete, and the amount requested accurately reflects the Contract adjustment for which the Person believes the Administration is liable; and
- (6) Itemized supporting data for the elements of cost the Contractor claims to have incurred or which the Contractor will incur. This data shall be in sufficient detail to permit analysis by the Administration of Material, labor, Equipment, Subcontract and overhead costs as well as profit and shall include all Work covered by the claim, whether deleted, added, or changed. Subcontractors' costs shall be supported by similar detailed data.

(c) A notice of claim or a claim that is not filed within the prescribed time shall be dismissed.

GP-5.15 DISPUTES

(a) Except as otherwise may be provided by applicable law or regulation, all disputes arising under or as a result of a breach of this Contract that are not disposed of by mutual agreement shall be resolved in accordance with this General Provision.

(b) As used herein, "claim" means a written demand or assertion by one of the parties seeking, as a legal right, the payment of money, adjustment or interpretation of Contract terms, or other relief, arising under or relating to this Contract.

A voucher, invoice, or request for payment that is not in dispute when submitted is not a claim under this General Provision. However, if the submission subsequently is not acted upon in a reasonable time, or is disputed either as to liability or amount, it may be converted to a claim for the purpose of this General Provision.

(c) When a claim cannot be resolved by mutual agreement, the Contractor shall submit a written request for decision to the Department's Chief of the Division of Construction Contracts Administration, or other designated County official, for his decision in consultation with the County Office of Law. The Contractor's written request shall set forth all the facts surrounding the controversy, including, but not limited to, those items listed in GP-5.14(b). Any claim by the County shall be decided in like manner.

(d) The Contractor, at the discretion of the Engineer, may be afforded an opportunity to be heard and to offer evidence in support of his claim. Pending resolution of a claim, the Contractor shall proceed diligently with the performance of the Contract.

(e) The Department's Chief of the Division of Construction Contracts Administration, or other designated County official, shall decide any and all claims. The decision by the Department's Chief of the Division of Construction Contracts Administration, or other designated County official, shall be issued within ninety (90) Days on matters of less than fifty thousand dollars (\$50,000) and within one hundred eighty (180) Days on matters of fifty thousand dollars (\$50,000) or more. The written decision of the Department's Chief of the Division of Construction Contracts Administration, or other designated County official, shall be final and binding unless appealed in writing to the Director of the Department within thirty (30) Days of the Chief's, or other designated County official's, written opinion to the parties. If the Chief's, or other designated County official's, decision is timely appealed in writing to the Director of the Department, the Director of the Department, serving as referee, will review the written appeal submitted to assure all reasonable attempts were made to resolve the appeal.

(f) The Director shall issue his/her decision in writing within ninety (90) Days. The Director's decision shall be final and conclusive unless a written appeal is mailed or otherwise filed with the County Administrative Officer within thirty (30) Days of the Director's written decision.

(g) When the County Administrative Officer is satisfied all efforts at the Department level were made to resolve the dispute, a claim shall be resolved as follows:

(1) Subject to, and without in any way enlarging or limiting the other provisions of the Contract, the parties to any Agreement which adopts or incorporates by reference these Standard Specifications, appoint the County Administrative Officer as an administrative hearing

officer pursuant to Article 25A, "Chartered Counties of Maryland", of the Annotated Code of Maryland.

(2) The parties further grant the County Administrative Officer the right to delegate this responsibility and authority in writing to a County official who is a registered professional engineer, independent of the Department of Public Works's Division of Construction Contracts Administration, or to any other County official.

(3) For disputes involving ten thousand dollars (\$10,000) or more the decision of the administrative hearing officer shall be final and binding on both parties, subject only to such appeals on the record as provided by Article 25A. For disputes involving less than ten thousand dollars (\$10,000), the decision of the administrative hearing officer shall be final and binding on both parties.

GP - SECTION 6 CONTROL OF MATERIAL

GP-6.01 GENERAL

All Materials shall meet all quality requirements of the Contract. In order to expedite the inspection and testing of the Materials, the Contractor shall notify the Engineer in writing of the sources from which the Contractor proposes to obtain all Materials requiring approval, testing, inspection, or Certification prior to incorporation into the Work as soon as possible after receipt of notification of Award of the Contract.

To expedite the approval of this notice a list of Approved Sources of Supply is available through the Department's Division of Construction Contracts Administration. If all Materials are to be supplied from the sources on the Approved Sources of Supply list, no written notification to that effect is required unless specifically requested by the Engineer or required by the Contract. If other sources are to be used, they shall be submitted for approval to the Engineer. It shall be the Contractor's responsibility to insure that all Materials are supplied from approved sources. Once the source of concrete or bituminous concrete for exposed final surfaces has been selected, that source is to provide Material for all Construction of continuous surfaces on all of the Contract Work. Submittal of all sources of supply will still be required for contracts involving State or federal funding. The Engineer will inform the Contractor as to source acceptability as soon as possible.

GP-6.02 STORAGE AND HANDLING OF MATERIALS

Materials shall be stored so as to assure the preservation of their quality and acceptability for the Work. Stored Materials shall, at the discretion of the Engineer, be again inspected prior to their use in any Work even if approved before storage. Stored Materials shall be located so as to facilitate their prompt inspection. Approved portions of the Right-of-Way or Work site may be used for storage purposes and for the placing of the Contractor's plant and Equipment; such

storage areas must be restored to their original condition by the Contractor prior to Final Acceptance for Maintenance of the Work at Contractor's sole cost and expense. Any additional space required must be provided by the Contractor at Contractor's sole cost and expense.

Materials shall be handled in such a manner as to preserve their quality and acceptability for the Work.

GP-6.03 UNACCEPTABLE MATERIALS

(a) Materials represented by samples taken and tested in accordance with the County-specified tests and failing to meet required values shall be considered to be defective regardless of prior tests or approvals.

(b) Unless otherwise allowed by the Engineer as set forth below, defective Materials shall be removed from the Work site and any tags, stamps or other markings implying conformance with Contract Work removed for those Materials and returned to the Engineer or obliterated if located on the Materials.

(c) Where defects can be corrected, the Contractor may propose such corrective action as the Contractor deems appropriate to the Engineer. The Engineer may approve the corrective action but in so doing does not assume responsibility for the success thereof. Retests will be made to determine the acceptability of the Material after corrective measures have been taken by the Contractor.

(d) The cost of replacing, correcting and/or removal of defective Material will be the sole responsibility of the Contractor.

(e) The cost of Repairing or replacing Materials damaged by the installation, correction and/or removal of defective Materials will be the sole responsibility of the Contractor.

GP-6.04 ADMINISTRATION FURNISHED MATERIAL

The Contractor shall furnish all Materials required for Full and Final Completion of the Work, except those specified to be furnished by the Administration. Materials furnished by the Administration will be delivered or made available to the Contractor at the point or points specified in the Special Provisions. The cost of handling and placing all Materials, after they are delivered to the Contractor, shall be considered as included in the Contract price for the Contract Item in connection with which they are used.

The Contractor shall be held responsible for all Material delivered to Contractor, and deductions will be made from any monies due or to become due to the Contractor to make good any shortages and deficiencies, from any cause whatsoever, and for any damage which may occur after such delivery, and for any demurrage charges.

In cases where Materials are supplied by the Administration and incorporated in the Contract Work by the Contractor, Materials inspection and acceptance will not be prerequisite for Final Acceptance for Maintenance as the Work pertains to these Contract Items.

GP-6.05 MATERIALS

Materials include all manufactured products and all processed and unprocessed natural substances required for the Full and Final Completion of the Contract. The Contractor in accepting the Contract is assumed to be thoroughly familiar with the Materials required and their limitations as to use and requirements for connections, setting, maintenance and operation.

Materials testing shall be performed by an independent testing firm, paid for by the Contractor, which has previously been approved by the County and the Architect and/or Design Engineer. Certified copies of all such test reports shall be submitted to the Engineer for approval.

Whenever an article, Material or Equipment is specified and a fastening, furring, connection (including utility connections), bed or accessory is normally considered essential to its installation in good quality Construction, such shall be included as if fully specified. Nothing in the Contract shall be interpreted as authorizing any Work in any manner contrary to applicable law, codes or regulations. (See GP-7.01).

(a) Approval

All Materials are subject to the Engineer's and the Architect's and/or Design Engineer's approval as to conformity with the Contract Documents, quality, design, color, etc. No Work for which approval is necessary shall be contracted for, or used, until written approval is given by the Engineer and the Architect and/or Design Engineer. Approval of a Subcontractor, as such, does not constitute approval of a Material which is other than that included in the Contract Documents.

(b) New Materials

Unless otherwise specified, all Materials shall be new.

(c) Quality

Unless otherwise specified, all Material shall be of the best quality of the respective kinds.

(d) Samples

The Contractor shall furnish for approval all samples of the Materials as directed. The Work shall be the same as the approved samples.

(e) Painting and Color

The Architect and/or Design Engineer and the Contractor shall jointly prepare the paint and color schedules. The Architect and/or Design Engineer shall direct the exact color, texture and finish.

(f) Proof of Quality

The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of Materials either before or after installation. The Contractor shall pay for any tests as may be deemed necessary in relation to “Substitutions” as specified in GP-6.05(i).

(g) Contractor’s Option

When several products or manufacturers are named in the Contract Documents for the same purpose or use, then the Contractor shall select any of those so named. However, all of the units of a thing required for a Contract must be the same in material and manufacture.

(h) “Or Equal”, “Equal”, “Approved Equal”

The above terms are used as synonyms throughout the Contract Documents. They are implied in reference to all named manufacturers. Only Materials that, in the opinion of the Engineer, are fully equal in all details of Construction, methods of assembly, finish and design quality will be considered. (See (a), (c), (e) and (i) of this General Provision)

(i) Substitutions

Should the Contractor desire to substitute another Material for one or more specified by name, the Contractor shall apply, in writing, for such permission from the Engineer and state the credit or Extra Work involved by the use of such Material. The Engineer will not consider the substitution of any Material different in type or Construction methods unless such substitution effects a benefit to the County. (See (a) and (d) of this General Provision.)

The Contractor shall not submit for approval Materials other than those specified, unless the Contractor concurrently submits a written statement explaining why such a substitution of Materials is proposed. Approval of a “substitute” material by the Architect and/or Design Engineer when the Contractor has not designated such Material as a “substitute,” shall not be binding on the County nor release the Contractor from any obligations of the Contract, unless the Engineer and the Architect and/or Design Engineer approves such “substitutions” in writing.

(j) Storage

The Contractor shall confine apparatus and storage of Materials to the “off-Road” area delineated as the “limit of contract” or “limit of disturbance”, as applicable. The Contractor shall not load or permit any part of any Structure to be loaded with a weight that will endanger the safety of any Structure or any part thereof.

GP-6.06 SALVAGE MATERIALS

For Contract Work that involves the renovation, repair, and/or improvement of an existing Structure, the County has the right to claim as salvage any equipment and/or materials removed under the Work of the Contract. Should such right of salvage be exercised by the County, through verbal notification to the Contractor, the Contractor shall be responsible for the removal, protection, and transport, intact, of all salvaged equipment and/or materials to one or more government locations as directed by the Engineer. The Contractor shall provide the County with five (5) days advance notice prior to delivery of any salvage item to the designated government location. Until such time that items claimed as salvage by the County are provided to the County, the Contractor shall move and neatly store said items in a dry, secure location at the Contract Work site approved by the Engineer. Any and all costs associated with salvage materials, including, but not limited to, removal, protection, transportation and storage, shall be included by the Contractor in its Bid and Bid Package, and there will be no additional payment of any kind by the County for salvage operations or salvage materials.

GP - SECTION 7 LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

GP-7.01 COMPLIANCE WITH LAWS

The Contractor hereby represents and warrants that:

- (a) It is qualified to do business in the State of Maryland and that it will take such action as, from time to time hereafter, may be necessary to remain so qualified;
- (b) It is not in arrears with respect to the payment of any monies due and owing the State or the County, or any department or unit thereof, including, but not limited to the payment of taxes and employee benefits, and that it shall not become so in arrears during the term of this Contract;
- (c) It shall comply with all federal, State and local laws, regulations, codes, executive orders, and ordinances applicable to its activities and obligations under this Contract; and
- (d) All requirements set forth in federal assistance instruments applicable to this Contract shall be satisfied. The Contractor understands and agrees that it is possible federal and/or State funds may be used in connection with the Contract. Accordingly, prior to commencing any and all Work under the Contract, the Contractor shall ascertain and verify if federal and/or State funds are to be used by the County. It is the Contractor's obligation to ascertain if the County will use any federal and/or State funds in connection with the Contract or any portion thereof. Further, it is the obligation of the Contractor and the Contractor understands and agrees that should any federal and/or State funds be used by the County in connection with the Contract, the Contractor shall adhere to and comply with all applicable federal and/or State laws, regulations, circulars, executive orders, procedures and guidelines, as and if applicable, as amended from time to time, at no additional cost or expense to the County.

GP-7.02 PERMITS AND LICENSES

Revised
October 11, 2013

(a) The Contractor shall procure at Contractor's sole cost and own expense such permits, licenses, insurances and governmental approval as may be necessary in order to comply with federal, State and local laws, ordinances, codes, executive orders and regulations in performance of the Contract. The Contractor shall further give any notices necessary and incidental to the due and lawful prosecution of the Contract.

(b) The cost incurred in compliance with all permits shall be incidental to and included in the Bid. Any required permits, licenses and governmental approvals desired by the Contractor for temporary Structures such as docks, piers, anchorages, etc. must be applied for and obtained by the Contractor at Contractor's sole cost and expense.

(c) Fire hydrant permits must be obtained if water is required from a hydrant. No water is to be drawn from a public fire hydrant except through a meter. Applications shall be made through the County Department of Permits, Approvals and Inspections (PAI), or any successor County department. All costs are considered incidental to the Bid, with the following exceptions:

The Department will issue a meter for fire hydrant utilization for performance of the Contract. At the request of the Contractor within five (5) Days of charging the lines the Engineer will issue the meter application to the Contractor without cost and there will be no charge for Contractor's water use recorded on the meter provided. Failure to return the meter in good condition, or utilization of the meter provided for any other purpose, will be grounds for assessment of replacement costs thereof and/or liquidated damages.

(d) A backflow valve must be used in drawing water from the metropolitan system for charging and testing new utilities.

(e) This General Provision only applies, in its entirety, to building Contracts. GP-7.02(e)(8), "Miscellaneous Permits" applies to all types of Contracts.

(1) **BUILDING PERMIT** – The County will obtain the building permit at no cost to the Contractor.

(2) **PERMANENT WATER AND/OR SEWER SERVICE** – The County will apply for the permanent water and/or sewer service and pay all related charges; i.e., water meter, water systems connection charge, water distribution charge and sewer systems connection charge. Total installation of the permanent water and/or sewer service is part of this Contract. Water and/or sewer service shall be installed by a County prequalified utility contractor.

(3) **PLUMBING PERMIT** – The Contractor shall apply for the plumbing permit; however, the County will pay all related charges and fees.

(4) **PERMANENT ELECTRIC SERVICE** – The Contractor shall apply for and pay for the electrical permit. The County shall obtain permanent gas and electric service from the applicable Utility Companies for the Work site at no cost to the Contractor.

The Contractor shall coordinate the installation of permanent gas and electric service with the applicable Utility Companies. Both the gas and electric services shall be activated at the same time under one account number showing the County as owner. The Contractor shall be responsible for payment of consumption charges for the use of gas and electric energy obtained through the permanent gas and/or electric service until Final Acceptance for Maintenance of the Contract Work or until agreed upon by the County in direct coordination with the Department's Building Services Division. Charges from the Utility Companies for removal of existing electric service will be paid by the County.

(5) PERMANENT TELEPHONE SERVICE – The County shall pay for the permanent telephone service and systems to and in any Contract building. The Contractor is responsible for supplying and installing all conduit, cables and junction boxes as shown on the Contract Drawings or as described in the Contract Documents.

(6) CABLE – The County shall pay for any permanent cable television service into any Contract building. The Contractor is responsible for supplying and installing the remaining Work as shown on the Contract Drawings or as described in the Contract Documents.

(7) TEMPORARY SERVICES – All temporary services, such as water, electric, telephone, etc., shall be the Contractor's entire responsibility.

The Contractor shall arrange for and pay for the installation of temporary connection to the County's water mains, including all incidental fees and expenses for water supply during Construction of the Contract Work, and shall pay for all water used. Wasting of County water will not be permitted.

The Contractor shall arrange for and pay for temporary electric light and power service required during Construction of the Contract Work, and shall pay for all electricity used. Gasoline or other torches for lighting will not be permitted.

The Contractor shall provide and pay for any other temporary services that may be required for the Full and Final Completion of the Contract Work.

The Contractor shall provide, at Contractor's sole cost and expense, all cold weather protection, temporary heat and fuel as necessary to carry on the Work expeditiously during inclement weather, to protect Work and Materials against injury from dampness and cold, to dry out the building, and to provide suitable Working conditions. Refer to other portions of these Standard Specifications and/or the Contract Documents for temperatures required for Work under the various trades.

The methods of heating and type of fuel and Equipment used shall be subject to approval by Engineer.

With special permission, obtained from the Engineer in writing, a permanent heating system may be used to dry out any Contract building and provide suitable working conditions in all or various parts thereof as soon as practicable. If used, the Contractor shall be

responsible for use of the permanent heating system for the purpose described and all costs of fuel, attendance, etc. in connection therewith shall be borne by the Contractor. Such use shall not relieve the Contractor of its responsibility to turn over the permanent heating system to County on the date of Final Acceptance for Maintenance in perfect condition, including the removal of all dust of Construction from air handling units, etc., the replacing of all filters, etc., nor shall it shorten the stipulated guarantee period which will commence upon the date of Final Acceptance for Maintenance by the County of the Work.

(8) MISCELLANEOUS PERMITS - The Contractor shall procure any and all necessary permits not previously mentioned and pay any and all related charges and fees required and incidental to the due and lawful prosecution of the Work.

(f) The Contractor shall give all notices and comply with all State and federal laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified.

GP-7.03 INTELLECTUAL PROPERTY AND PATENTED DEVICES, MATERIALS AND PROCESSES

If the Contractor is required or desires to use any intellectual property right, design, device, propriety information, material, or process covered by letters of patent or copyright or any other intellectual property right, the Contractor shall provide for such use by suitable legal agreement with the patentee, license holder, or owner and a copy of such agreement shall be filed with the Administration. The Contractor and the Surety shall indemnify, protect and save harmless (and defend upon request) the County and its officials, employees, agents and any affected third party, or political subdivision from any and all claims, suits, demands, liabilities, actions, costs, and/or judgments including, but not limited to, attorneys fees, by reason of the use of any such patented design, proprietary information, device, trade secret, patent right or intellectual property right or design, device, material, or process, or any trademark or copyright.

GP-7.04 FEDERAL OR STATE PARTICIPATION

When the United States Government and/or the State pays all or any portion of the cost of a project, the Work shall be subject to the inspection of the appropriate federal or State agency. Such inspection shall in no sense make the federal or State government a party to this Contract, and will not interfere in any way with the rights of either party hereinunder.

GP-7.05 CONSTRUCTION SAFETY AND HEALTH STANDARDS

(a) It is a condition of this Contract, and shall be made a condition of each Subcontract entered into pursuant to this Contract, that the Contractor and any Subcontractor shall not require any laborer or mechanic employed in performance of the Contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under Construction safety and health laws, standards and regulations (Title 29,

Code of Federal Regulations, Part 1926, formerly Part 1518, as revised from time to time) promulgated by the United States Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standard Act, (83 Stat. 96) and under any Construction safety and health standards and regulations promulgated by the Commissioner of Labor and Industry in accordance with the Maryland Occupational Safety and Health Act and/or the Maryland General Assembly (as the same may be amended from time to time).

The Contractor and each Subcontractor shall permit inspection without delay and at any reasonable time on any premises where the Work is being performed by a federal or State inspector authorized to investigate compliance with the above mentioned federal and State statutes and regulations.

The Contractor further agrees to correct any violations found to exist during such inspection within a reasonable time after the issuance of any citation, unless the Contractor contests the validity thereof through the appropriate administrative and judicial process.

(b) The Contractor shall be responsible for gas detection in and ventilation of confined spaces.

When procedures require workers to enter confined spaces such as steel or concrete box section type Superstructures, the Contractor shall be cognizant of the potential health hazards, particularly when the interior is closed off at both ends.

It shall be the Contractor's responsibility to adhere to all applicable MOSHA regulations. The Contractor shall have available approved detecting devices and shall conduct tests for oxygen content and presence of gases, such as combustible gas, carbon dioxide, methane, carbon monoxide, and hydrogen sulfide whenever any fabrication, erection or inspection operations are to be performed within the confined spaces. The Contractor shall apply mechanical ventilation continuously to the confined space during occupancy to maintain the proper oxygen content. The Contractor shall conduct air tests periodically during the occupancy.

(c) The Contractor shall arrange for the erection and maintenance of temporary toilets equipped with running water and a drain connection for use of the Contractor's employees, Subcontractors, and/or agents, and County employees. These conveniences shall be erected and kept clean, neat and in good sanitary condition, as required by applicable law and/or regulation, until ordered removed by the Engineer.

In lieu of temporary toilets, the Contractor may install a portable chemical toilet at a location as approved by the Engineer.

The permanent plumbing fixtures to be constructed under the Contract shall not be used by any Person, under any circumstances, before Final Acceptance for Maintenance of the Contract by the County.

(d) The Contractor shall erect and properly maintain at all times as required by the conditions and progress of the Work, all necessary safeguards for the protection of workers and the public

and shall post danger signs warning against the hazards created by such features of Construction as protruding nails, hod hoists, well holes, elevator hatchways, scaffolding, window openings, stairways and falling material.

In an emergency affecting the safety of life, or of the Work, or of the adjoining property, the Contractor, without special instruction or authorization is hereby permitted to act, at the Contractor's discretion, to prevent such threatened loss or injury, and the Contractor shall so act, without appeal, if so instructed or authorized by the Engineer. Any compensation claimed by the Contractor on account of emergency Work shall be determined as outlined in GP-4.07.

GP-7.06 PUBLIC CONVENIENCE AND SAFETY

The Contractor at all times shall conduct the Work in such a manner as to ensure the least practicable obstruction to all forms of traffic. The convenience of the general public, tenants, and of the residents along and/or adjacent to the Work site shall be provided for as follows and as further directed by the Engineer:

- (a) Equipment and/or Materials stored upon or about the Work site shall be placed so as to cause a minimum of obstruction to the public.
- (b) Sprinkling shall be performed at the direction of the Engineer.
- (c) The Contractor shall, unless otherwise specified, provide and maintain in passable condition such temporary access, Roads and Bridges as may be necessary to accommodate traffic diverted from the Work site under Construction, or using the project under Construction and shall provide and maintain in a safe condition temporary approaches to and crossings of the Work site.
- (d) Existing facilities planned to be removed, but which might be of service to the public during Construction are not to be disturbed until other and adequate provisions are made.
- (e) Existing mailboxes shall be maintained or reset in positions accessible to the public and to mail deliveries during Construction and subsequent to Construction in their final locations in a satisfactory condition.
- (f) On facilities occupied by railroad or light rail stations, temporary platforms for the entrance and exit of passengers and/or freight to and from the railway cars shall be provided and maintained in an approved manner by the Contractor and the applicable railroad/agency.
- (g) Fire hydrants on or adjacent to the Contract Work site shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within fifteen (15) feet of any such hydrant. Work closed down for the winter or at any other times shall be left entirely accessible at all points to fire apparatus.

(h) All footways, gutters, storm drainage and portions of the Contract Work site adjoining the Work under Construction shall not be obstructed more than is absolutely necessary. The Engineer, in cooperation with the Sediment Control Inspector, shall specify that drainage inlets in sumps where there is potential for localized flooding shall have flow restrictions removed in the event of a predicted significant rainfall event.

GP-7.07 DETOURS

Detours may be indicated in the Contract Documents, or at the Contractor's request traffic may be detoured over County-approved routes along existing Roads, as determined acceptable by the Department's Bureau of Traffic Engineering and Transportation Planning. Detours over existing Roads will be designated, marked and maintained by the Contractor.

GP-7.08 BARRICADES AND WARNING SIGNS

The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the Work and safety of the public. All Highways and other County facilities closed to vehicular traffic shall be protected by effective barricades, and obstructions shall be illuminated during hours of darkness with electric lights. The Contractor shall erect warning signs in advance of any place on the Work site where operations may interfere with the use of the facility by vehicular traffic, and at all other points where the new Work crosses or coincides with an existing Roadway or traffic lane(s). Such warning signs shall be constructed and erected in accordance with the MUTCD for Street and Highways, or as directed by the Engineer.

The Contractor shall furnish, erect and maintain warning and direction signs in the number required by the Engineer and at locations designated by the Engineer throughout the limits of the Contract Work site.

For street and Highway type traffic, the signs shall conform in every respect to the requirements of the MUTCD for Streets and Highways. Signs must be freshly painted and adequately reflectorized before being placed on any Contract Work site. No Work may be performed or begun unless an adequate number of signs of the proper category are in place.

In cases where the Contractor's sequence of operations results in grade differentials that would be hazardous to vehicular traffic the Contractor shall, at the direction of the Engineer, provide suitable substantial traffic barriers to the extent determined by the Engineer.

GP-7.09 FLAGGING OF MOTOR VEHICLE TRAFFIC

For all Construction Contracts requiring the flagging of motor vehicles licensed for operation on the Highways of the State, said flagging shall be conducted as specified in the MUTCD for Streets and Highways.

GP-7.10 MAINTENANCE OF TRAFFIC

Unless otherwise noted in the Special Provisions, it shall be the Contractor's responsibility to maintain pedestrian and vehicular traffic safely, adequately and continuously on all portions of existing facilities affected by the Contractor's Work. In addition to existing facilities undergoing improvement, this also applies to crossroads, approaches, crossovers and entrances affected or made necessary by the Contractor's Work.

GP-7.11 PRESERVATION AND RESTORATION OF PROPERTY OUTSIDE OF RIGHT-OF-WAY

(a) The Contractor shall not enter upon public or private property (outside of the Right-of-Way or Contract Work area as shown on the Contract Drawings) for any purpose without obtaining prior written permission from any applicable property owners. The Contractor shall be responsible for the preservation of all public and private property, trees, property pipes, monuments, signs and markers and fences thereon, and shall use every precaution necessary to prevent damage or injury thereto. The Contractor shall take suitable precaution to prevent damage to underground or overhead public utility structures. The Contractor shall carefully protect all survey land monuments and property marks located on the Contract Drawings or found in the Work site from disturbance. No alteration or damage thereto shall occur until survey references are established by a licensed surveyor at Contractor's sole cost and expense. If any land monuments and/or property marks are damaged or disturbed, they shall be reset by a licensed surveyor at the Contractor's sole cost and expense.

(b) The Contractor shall be responsible for all damage or injury to property of any character during the prosecution of the Work, resulting from any act, omission, neglect or misconduct in the Contractor's manner or method of executing said Work, or at any time due to defective Work or Materials, and said responsibility shall not be released until Final Acceptance for Maintenance of the Work is achieved. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect or misconduct in the execution of the Work or in consequence of the nonexecution thereof on the part of the Contractor, the Contractor shall restore, at the Contractor's sole cost and expense, such property to a condition similar to, or equal to, that existing before such damage or injury, in an acceptable manner to the County and/or applicable property owner. In case of the failure on the part of the Contractor to restore such property or make good such damage or injury, the Engineer may, upon forty-eight (48) hours notice to the Contractor, proceed to Repair, rebuild or otherwise restore such property as may be deemed necessary, and the cost and expense thereof will be deducted from any monies due or which may become due the Contractor under this Contract. If the property damage results in a public safety issue, in the sole discretion of the County, the

Contractor shall restore immediately or the County shall do so at Contractor's sole cost and expense.

(c) The Contractor should be aware of the potential of cultural resources on the Contract Work site. During the Construction phase, whenever anything that might appear to be a cultural resource of an historical, archeological, or paleontological nature is encountered, such an object shall not be disturbed. Work shall be stopped and rescheduled in a way that shall avoid not only the objects encountered but also the area of discovery and the Engineer shall be notified in writing at once. The Engineer will arrange for the evaluation of the situation by the appropriate authorities and for the ultimate disposition of the matter, taking the evaluation of the situation by the appropriate authorities into consideration.

(d) All trees along the way of access and all trees surrounding any Contract building which are liable to injury by the moving, storing and working up of Materials shall be boxed. No permanent tree shall be used for attachment of any ropes or derricks. Every public way, catch basin, conduit, tree, fence or things injured in carrying out this Contract, shall be replaced and put in good condition by the Contractor at no cost or expense to the County, unless the same shall be permanently done away with by written order of the Engineer.

GP-7.12 LAND, AIR AND WATER POLLUTION

(a) The Contractor shall incorporate all permanent erosion control features into the Work at the earliest practicable time as required by the Contract Documents. Temporary pollution control measures will be used to correct conditions that develop during Construction that were not foreseen during design; that are needed prior to installation of permanent pollution control features; or that are needed temporarily to control erosion that develops during normal Construction practices, but are not associated with permanent control features on the Contract.

(b) The Contractor's attention is directed to the fact that temporary pollution control may include control measures outside the Right-of-Way or Contract Work site where such Work is necessary as a direct result of Contract-required Construction. The Engineer shall be kept advised of all such off-site control measures taken by the Contractor. This shall not relieve the Contractor of the basic responsibilities for such Work.

(c) In case of failure on the part of the Contractor to control erosion, pollution or siltation, the Engineer reserves the right to employ outside assistance or to use County forces to provide the necessary corrective measures. All costs and expenses incurred by the Engineer in the performance of such duties for the Contractor shall be withheld from monies due or becoming due to the Contractor.

(d) The Contractor and the Contractor's suppliers must submit evidence to the Administration that the governing federal, State and local air pollution laws, regulations and criteria will be met. This evidence and related documents will be retained by the Administration for on-site evaluation.

GP-7.13 RESPONSIBILITY FOR DAMAGE CLAIMS

(a) The Contractor shall indemnify and save harmless the County and all of its officials, agents, employees and representatives from all suits, actions, or claims of any character, including, but not limited to, all the costs of defense, brought on account of any injuries or damages sustained by any person or property in consequence of any neglect in safeguarding the Work, and/or through the use of unacceptable Materials in the Construction of the Contract Work, and/or on account of any act or omission by the said Contractor in the performance of the Contract, and/or as a result of faulty, inadequate or improper temporary drainage during Construction, and/or on account of the use, misuse, storage or handling of explosives, and/or on account of any claims or amounts recovered for any infringement of intellectual property, patent, trade secret, proprietary information, trademark, or copyright, and/or from any claims or amounts arising or recovered under the workers' compensation laws, and/or any other State or local law, executive order, charter, bylaw, code, ordinance, regulation, order or decree whether caused by or resulting from the act, omission, neglect, or misconduct of the Contractor, or its employees, agents, or Subcontractors, at any tier. The Contractor shall be responsible for any and all damage or injury to property of any character during the prosecution of the Work resulting from any act, omission, neglect or misconduct, in the manner or method of executing said Work satisfactorily or due to the nonexecution of said Work or at any time due to defective Work or Materials and said responsibility shall continue until Full and Final Completion of the Contract. The obligation of the Contractor to the County and all of its officials, agents, employees and representatives to indemnify, defend, and save harmless shall not apply if resulting from the sole negligence of the County.

(b) The Contractor shall conduct its operations upon the right-of-way of any applicable railroad company fully within the rules, regulations and requirements of the railroad company including, but not limited to, any additional flagging, insurance, inspection, and/or permit requirements. The Contractor shall be responsible for acquainting itself with such requirements as the railroad company may demand.

(c) The Contractor shall be held solely responsible for any accidents that may happen to the railroad company as a result of its operations.

(d) In accordance with GP-7.15, the Contractor shall not be held responsible for any claims arising from accidents incurred because of any traffic or general use permitted during the time the Construction Work site or any section thereof is open to traffic except from accidents which are attributable to the Contractor's, or the Contractor's employee's, Subcontractor's or agent's, acts or omissions or negligence.

GP-7.14 LIABILITY INSURANCE

Prior to the start of the Work on the Contract, or prior to the execution of the Contract if permitted by the County, the Contractor shall submit to the Department's Division of

Construction Contracts Administration, an evidence of insurance certificate indicating that the following insurance is carried:

“Comprehensive general public liability and property damage insurance” in the amounts of at least five hundred thousand dollars (\$500,000) for the death of or injury to any person, each occurrence. Such insurance shall protect the Contractor from claims which may arise out of, or result from, the Contractor’s operations under the Contract, whether such operations be by the Contractor, any Subcontractor, or anyone directly or indirectly employed by the Contractor or Subcontractor, or anyone for those acts any of the above may be liable. Minimum coverages to be included: “independent contractor’s coverage”; “completed operations and products liability coverage”; and “contractual liability coverage”. “Damages not to be excluded insurance” shall contain no exclusions applying to operations by the Contractor or any Subcontractor in the performance of the Contract pertaining to: (1) collapse of, or structural injury to, any Contract building or Structure; (2) damage to underground property; or (3) damage arising out of blasting or explosion and, where applicable, (4) removal of asbestos/lead or debris and building products containing asbestos/lead, transportation and disposal of asbestos/lead and contaminated materials.

“Automobile liability insurance” shall include “bodily injury liability” and “property damage liability” for a combined single limit of five hundred thousand dollars (\$500,000) any one accident. Such insurance shall provide coverage for all Contractor owned, non-owned and hired automobiles.

“Workers’ compensation and employers’ liability insurance” must contain statutory coverage, including “employers’ liability insurance” with limits of at least for “bodily injury by accident” – two hundred fifty thousand dollars (\$250,000) each accident; “bodily injury by disease” – two hundred fifty thousand dollars (\$250,000) each employee; and “bodily injury by disease” – five hundred thousand dollars (\$500,000) policy limit.

Any policy exclusions must be shown on the face of the evidence of insurance.

When specified in the Contract Documents, the Contractor shall carry the type and amounts of insurance in addition to any other forms of insurance or bonds required under the terms of the Contract and the Contract Documents.

The cost of the insurance will be incidental to the Contract lump sum price for mobilization, or if that is not identified, to the other Contract Items specified in the Contract Documents.

Contractor shall procure **“railroad public liability and property damaged insurance”** and this insurance shall be provided by the Contractor as specified in TC-6.03.

The Contractor and its insurer shall immediately notify in writing the Department’s Division of Construction Contracts Administration in the event that the Contractor’s insurance coverage lapses for any reason.

Unless previously waived in writing by the Engineer, the Contractor shall, at the Contractor's sole expense and cost, insure the Work and keep it insured at all times during the Contract term and period of Construction, and until Final Acceptance for Maintenance of all Contract Work by the County, against loss or damage covered by an "all risk" builders risk type of policy. The amount of insurance shall be the one hundred percent (100%) estimated replacement cost of the Work.

The policies shall name the County and the Contractor as certificate holder and shall name the County as an additional insured in accordance with the requirements of the Contract Documents, as their interest may appear, and the policies shall be left in the possession of the Engineer, prior to the start of Construction.

GP-7.15 USE AND POSSESSION PRIOR TO FULL AND FINAL COMPLETION

(a) The Administration shall have the right to take possession of or use any completed or partially completed part of the Work. Such possession of or use shall not be deemed Partial Acceptance for Maintenance and/or Final Acceptance for Maintenance of any Work not completed in accordance with the Contract. While the Administration is in such possession, the Contractor shall be relieved of the responsibility for loss or damage to that portion of the Work in possession of the Administration, other than that resulting from the Contractor's fault, omission, act, or negligence. If such prior possession or use by the Administration delays the progress of the Work or causes additional expense to the Contractor, the Contractor shall provide the Administration with immediate Written Notice thereof to allow possible equitable adjustment in the Contract price or the time of completion. If necessary, an equitable adjustment will be made and the Contract shall be modified pursuant to a Contract Modification accordingly.

(b) Under this GP-7.15, only upon the prior written authorization of the Engineer may the Contractor be relieved of maintenance during the time the County has taken possession. Any portion of the Work that may be disturbed or damaged shall be restored at respective Contract prices for Contract Items involved, or on the basis of a predetermined arrangement entered into by the Contractor and Engineer before the performance of the restoration Work.

GP-7.16 CONTRACTOR'S RESPONSIBILITY FOR WORK

(a) Except as herein elsewhere provided, until Final Acceptance for Maintenance of the Work by the Administration, the Contractor shall have the charge and care thereof and shall take every reasonable precaution against injury or damage to any part thereof by the action of the elements, or from any other cause, whether rising from the execution or from the nonexecution of the Work. The Contractor, except as herein elsewhere provided, shall rebuild, Repair, restore, and make good all injuries or damages to any portion of the Work occasioned by any of the above causes before the Final Acceptance for Maintenance and shall bear the expense thereof. Material lost or Structures damaged as a result of faulty temporary drainage during Construction or the action of the elements shall be replaced or Repaired by the Contractor at no cost, expense, or delay to the Administration. The Contractor shall make good or replace at the Contractor's

cost and expense, and as otherwise required, any Administration-furnished Material which may be broken, lost through fire, theft, or otherwise damaged, or in any way made useless for the purpose and use intended subsequent to delivery to the Contractor by the Administration and prior to Final Acceptance for Maintenance of the Work by the County even though such breakage, damage, loss or uselessness may result from causes beyond the control of the Contractor.

(b) In case of suspension of Work for any cause whatever, the Contractor shall be responsible for the Contract Work and Work site and shall take such precautions as may be necessary to prevent damage to the Work and the Work site, provide for normal drainage, and shall erect any necessary temporary Structures, signs, or other facilities at the Contractor's cost and expense. During such period of suspension of Work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished under this Contract, and shall take adequate precautions to protect new growth and other important vegetative growth against injury.

GP-7.17 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES

At points where the Contractor's operations are adjacent to properties of railway, telegraph, telephone, power companies, and/or Utility Companies or are adjacent to other property, damage to which might result in expense, loss or inconvenience, Work shall not be commenced until all arrangements necessary for the protection thereof have been made between the Contractor and the property owner and/or affected Person.

The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication or rearrangement Work may be reduced to a minimum and that services rendered by those parties will not be unnecessarily interrupted.

In the event of interruption to utility services as a result of accidental breakage or as a result of being exposed or unsupported, the Contractor shall promptly notify the proper authority and shall cooperate with the said authority in the restoration of service. No Work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.

GP-7.18 PERSONAL LIABILITY OF PUBLIC OFFICIALS

In carrying out any of the provisions of the Contract, or in exercising any power or authority granted to them by or within the scope of the Contract, there shall be no liability upon the Administrator, Engineer or other County officials, employees, agents and/or authorized representatives, either personally or as officials, employees, or agents of the County, it being understood that in all such matters they act solely as agents and representatives of the County.

In addition, the Engineer and all of Engineer's representatives shall be held harmless, free of liability and duress, in the exercise of their duties and obligations as Inspector, administrator, witness, referee, mediator, and arbiter by both parties in their mutual best interest.

GP-7.19 NO WAIVER OF LEGAL RIGHTS

The Administration shall not be precluded or estopped by any measurement, estimate, or Certificate made either before or after the Partial Acceptance for Maintenance and/or Final Acceptance for Maintenance of any Work and payment therefore by the County, from showing the true amount and character of the Work performed and Materials furnished by the Contractor, nor from showing that any such measurement, estimate or Certificate is untrue or is incorrectly made, nor from showing that the Work or Materials do not in fact conform to the Contract. The Administration shall not be precluded or estopped, notwithstanding any such measurement, estimate or Certificate and payment in accordance therewith, from recovering from the Contractor or its Sureties, or both, such damage as it may sustain by reason of Contractor's failure to comply with the terms of the Contract. Neither the acceptance by the Administration, or any representative of the Administration, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by the Administration, shall operate as a waiver of any portion of the Contract or of any power herein reserved, or of any right to damages.

No failure or delay by the County to insist upon the strict performance of any term, condition or covenant within the Contract, or to exercise any right, power, or remedy consequent upon a breach thereof, shall constitute a waiver of any such term, condition, or covenant or of any such breach, or preclude the County from exercising any such right, power, or remedy at any later time or times. Further, the express written waiver of any breach of the Contract shall not be a waiver of any other or subsequent breach of the Contract.

GP-7.20 NONDISCRIMINATION IN EMPLOYMENT

(a) The Contractor shall agree to the following conditions during the performance of its Contract with the County:

(1) To comply with all applicable federal, State, and County laws, regulations, codes, circulars, and executive orders;

(2) Not to discriminate in any manner against an employee or applicant for employment because of race, color, religion, creed, age, sex, marital status, national origin, ancestry, or physical or mental handicap unrelated in nature and extent so as reasonably to preclude the performance of such employment;

(3) To include a provision similar to that contained in GP-7.20 (a)(2), above, in any Subcontract except a Subcontract for standard commercial supplies or raw Materials;

(4) To post and to cause Subcontractors to post in conspicuous places available to employees and applicants for employment, notices setting forth the substance of this GP-7.20;

(5) In all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that all qualified applicants will receive consideration for employment without regard to sex, race, creed, color or national origin;

(6) If requested by the County to furnish a compliance report concerning its employment practices and policies in order for the County to ascertain compliance with the provisions of this Contract concerning nondiscrimination in employment; and

(7) To include the provisions outlined in this GP-7.20 pertaining to nondiscrimination in employment in every Subcontract or purchase order it uses in order to carry out the terms and conditions of the Contract so that such nondiscrimination in employment provisions are binding on each Subcontractor or vendor.

(b) In the event of the Contractor's noncompliance with the nondiscrimination provisions of this GP-7.20 and/or the Contract, the County shall impose such sanctions as it may determine to be appropriate, including but not limited to:

(1) Withholding of payment to the Contractor under the Contract until the Contractor complies; and/or

(2) Cancellation, termination or suspension of the Contract in whole or in part.

(c) Contractors providing Materials, Equipment, supplies, or services to the County under this Contract herewith assure the County that they are conforming to the provisions of the Civil Rights Act of 1964 and Section 202 of the Executive Order 11246 of the President of the United States of America as amended by Executive Order 11375, as applicable and as may be amended from time to time.

GP-7.21 SANCTIONS UPON IMPROPER ACTS – Reserved.

GP-7.22 NONHIRING OF EMPLOYEES

No official or employee of the County or any unit, department or agency of the County, whose duties as such official or employee include matters relating to or affecting the subject matter of this Contract, shall, while so appointed and/or employed, and during the pendency and/or term of the Contract, become or be an officer or employee of the Contractor.

GP-7.23 CHOICE OF LAW

The Parties hereby agree that:

(a) This Contract was made and entered into in Maryland, and under the laws, regulations, codes, and executive orders of the County and the State, as applicable.

(b) The laws, regulations, codes and executive orders of the County and the State shall govern the resolution of any issue arising in connection with this Contract including, but not limited to, all questions concerning the validity of this Contract; the capacity of the parties to enter therein; any modification or amendment thereto; and the rights and obligations of the parties hereunder.

GP-7.24 CONTINGENT FEE PROHIBITION

(a) The Contractor warrants that it has not employed or retained any Person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Contractor, to solicit or secure this Contract, and that it has not paid or agreed to pay any Person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or any other consideration contingent on the making of this Contract.

(b) For a breach or violation of this warranty, the Administration shall have the right to terminate this Contract without liability, or, in its discretion, to deduct from the Contract price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

GP-7.25 MULTI-YEAR CONTRACTS CONTINGENT UPON APPROPRIATIONS

– Reserved.

GP-7.26 COST AND PRICE CERTIFICATION – Reserved.

GP-7.27 CORPORATE REGISTRATION AND TAX PAYMENT CERTIFICATION

– Reserved.

GP-7.28 BUY AMERICAN STEEL ACT

The Provisions of COMAR 21.11.02 pertaining to implementation of the “Buy American Steel” Act (Subtitle 3 of Title 17 of the State Finance and Procurement Article of the Annotated Code of Maryland), as amended from time to time, are incorporated in this Contract by reference.

GP-7.29 MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE

It is the policy of the County that MBE and WBE, as defined by the most recent County Executive Order, and as further described in the Contract Documents, shall have the maximum opportunity to participate in the performance of capital improvement contracts financed by County capital funds and/or County operating funds in accordance with the most recent County Executive Order. The Contractor shall comply with all MBE/WBE requirements as set forth in the Contract Documents.

GP-7.30 PREVAILING WAGE CONTRACTS FOR PUBLIC WORKS

(a) The Provisions of Subtitle 2 of Title 17 of the State Finance and Procurement Article of the Annotated Code of Maryland, as amended, and COMAR 21.11.11, as amended, pertaining to the Prevailing Wage for Public Works are incorporated in construction contracts of five hundred thousand dollars (\$500,000) or more by reference, if and as applicable.

(b) When all or a portion of the cost of a contract is funded by the U.S. Government, and the cost of the contract exceeds two thousand dollars (\$2,000), among other legal requirements, the minimum wage rates and benefits paid to workmen under the contract shall be those prevailing in the locality, as predetermined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 USC 276a to a-7), as amended from time to time, and regulations (29 CFR, Part 5) promulgated thereunder, as amended from time to time. Davis-Bacon rates applicable to this Contract, if any, may be specified elsewhere in the Contract Documents.

GP-7.31 SMALL BUSINESS PROCUREMENTS – Reserved.

GP-7.32 FINANCIAL DISCLOSURE – Reserved.

GP-7.33 POLITICAL CONTRIBUTION DISCLOSURE

The Contractor affirms that it is aware of, and will comply with, the provisions of Sections 14-101 through 14-108 of the Election Law Article of the Annotated Code of Maryland, as amended from time to time, which requires every Person who makes, during any 12-month period, one or more contracts, with one or more State governmental entities involving cumulative consideration, of a least two hundred thousand dollars (\$200,000.00), to file with the State Board of Elections certain specified information to include disclosure of attributable political contributions in excess of five hundred dollars (\$500.00), during defined reporting periods.

GP-7.34 CONFLICT OF INTEREST LAW

It is unlawful for any County official, employee, or agent to participate personally in his/her official capacity through decision, approval, disapproval, recommendation, advice, or investigation in any contract or other matter in which he or she, his or her spouse, or his or her dependent child has a financial interest or to which any firm, corporation, association, or other organization in which he or she has a financial interest or in which he or she is serving as an officer, director, trustee, partner, or employee is a party, or to which any person with whom he or she is negotiating or has any arrangement concerning prospective employment, is a party, unless such official, employee, or agent has previously complied with the provisions of Article 7 of the Baltimore County Code, 2003, as amended.

GP-7.35 PRE-EXISTING REGULATIONS – Reserved.

GP-7.36 RETENTION OF RECORDS

(a) Except as otherwise expressly stated in this General Provision and the Contract Documents, the Contractor shall retain and maintain all records and documents including, but not limited to, cost or pricing data, relating to this Contract for three (3) years after final payment by the County under the Contract or any applicable statute of limitations, whichever is longer, and shall make them available for inspection and audit by authorized representatives of the County, including the Engineer or his designee at all reasonable times. Should the Contract involve use of State or federal funds, the Contractor shall retain and maintain, all records and documents including, but not limited to, cost or pricing data, relating to this Contract for not less than ten (10) years after final payment by the County under the Contract or any applicable statute of limitations, whichever is longer.

(b) The Contractor shall include the provisions of GP-7.36(a) in every Subcontract.

GP-7.37 RESPONSIBILITY FOR RIGHT OF WAY

(a) The Right-of-Way (or Work site) as shown on the Contract Drawings has been, or will be, secured by the County.

(b) The Contractor shall not move any Equipment or Material in or on the Right-of-Way until authorized to do so by the Engineer. The Contractor shall confine its operations strictly within the limits of the Rights-of-Way shown in the Contract Documents unless the Contractor obtains the prior written permission of any applicable property owner of such additional lands as Contractor proposes to occupy. A copy of the written permission will be furnished to the Engineer before Contractor enters said property.

(c) Unless otherwise provided in the Contract Documents, trees with a butt diameter in excess of three inches (3"), measured three feet (3') above the ground, shall not be felled or damaged by the Contractor in a Right-of-Way identified as a Construction Strip. Should the Contractor obtain written permission of any applicable property owner to fell a tree or trees with

a diameter greater than three inches (3") from a Construction Strip, Contractor shall provide a copy of the written permission to the Engineer before Contractor enters said property and/or fells such tree(s).

(d) Unless otherwise provided in the Contract Documents, all trees may be felled with the permission of the Engineer in those Rights-of-Way identified as a Highway Right-of-Way or a slope, utility or drainage Easement.

(e) Unless otherwise provided in the Contract Documents, the Contractor is to preserve and protect, remove and replace, or restore fences, mail boxes, Sidewalks, driveways, shrubs, perennial plants, or other private improvements in Rights-of-Way identified as Construction Strips or Easements of any kind.

(f) The Contractor shall not enter upon public or private property (outside of the Right-of-Way or Contract Work area as shown on the Contractor Drawing) for any purpose without obtaining prior written permission from any applicable property owners and shall be responsible for the preservation of all public and private property, trees, property pipes, monuments, signs and markers and fences thereon, and shall use every precaution necessary to prevent damage or injury thereto. The Contractor shall take suitable precaution to prevent damage to underground or overhead public and private utility structures. The Contractor shall carefully protect from disturbance all survey land monuments and property marks located on the Contract Drawings or found in on, or at the Work site. No alteration or damage thereto shall occur until survey references are established by a licensed surveyor at Contractor's sole cost and expense. If any land monuments and/or property marks are damaged or disturbed, they shall be reset by a licensed surveyor at the Contractor's sole cost and expense.

(g) Upon Final Acceptance for Maintenance of the Work by the County, the Contractor shall restore the Rights-of-Way provided to a condition equivalent to that originally encountered, unless improved by the Work completed or as specified by the Contract. Property used by the Contractor under letter of permission or property that has been damaged shall be restored pursuant to GP-7.11 and the applicable letter of permission or to the satisfaction of the property owner without any cost or expense to the County.

(h) No arrangements will be made by the County for rights-of-way or rights of access beyond those shown in the Contract Documents. Any and all expense or costs relative to additional rights-of-way, rights of ingress and egress, or any other supplemental property rights beyond those described in the Contract Documents are considered to have been accounted for in the Bid.

GP-SECTION 8 PROSECUTION AND PROGRESS

GP-8.01 SUBCONTRACTING

(a) Utilities and/or Highways Contracts. Except as may be provided elsewhere in the Contract, the Contractor to whom a utilities and/or Highways Contract is Awarded shall perform with its own organization and with the assistance of workmen under the Contractor's immediate supervision, Work of a value of not less than fifty percent (50%) of the total Bid value of the Contract. The Director may permit the Contractor to sublet or Subcontract Work in excess of the fifty percent (50%) limitation where it is determined by the Engineer that the best interest of the County will be promoted thereby. The execution of Work by a subsidiary of the Contractor is not considered to be Work performed by the Contractor under this GP-8.01(a). The Contractor shall not assign any monies due or to become due to the Contractor hereunder, without the previous written consent of the County.

The Engineer's consent to Subcontract shall not be construed to relieve the Contractor or its Surety of any responsibility for the fulfillment of all the requirements of the Contract.

Unless required by the County pursuant to GP-8.01(e) or unless specified in the Contract Documents, Subcontractors undertaking a portion of Work under a utilities or Highways Contract in accordance with GP-8.01(a) (less than fifty percent (50%) of the Bid value) do not require Department approval.

When required, the Contractor shall give assurance that the minimum wage for labor, as specified in the Contract Documents, shall apply to labor performed on all Work sublet, subcontracted, assigned or otherwise disposed of in any way under a utilities or Highway Contract.

(b) Buildings Contracts. Except as may be provided elsewhere in the Contract, the contractor to whom a buildings Contract is Awarded shall perform with its own organization, and with the assistance of workmen under the Contractor's immediate supervision and with Materials directly purchased and paid for by the Contractor, Work of a value of not less than ten percent (10%) of the total Bid value of the Contract. Costs for insurance, overhead, and supervisions may not be claimed as a portion of the ten percent (10%) or more of the Work. The execution of Work by a subsidiary of the Contractor is not considered to be Work performed by the Contractor under this GP-8.01(b). The Contractor shall not assign any monies due or to become due to the Contractor hereunder, without the previous written consent of the County.

The Engineer's consent to Subcontract shall not be construed to relieve the Contractor or its Surety of any responsibility for the fulfillment of all the requirements of the Contract.

Unless required by the County pursuant to GP-8.01(e) or unless specified in the Contract Documents, Subcontractors undertaking a portion of Work under a building Contract in accordance with GP-8.01(b) (less than ten percent (10%) of the Bid value) do not require Department approval.

When required, the Contractor shall give assurance that the minimum wage for labor, as specified in the Contract Documents, shall apply to labor performed on all Work sublet, subcontracted, assigned or otherwise disposed of in any way under a building Contract.

(c) **All Contracts.** The Contractor shall not assign any of its obligations, responsibilities, or liabilities under any portion of the Contract except with the express prior written consent of the Engineer. Any assignment of any of the Contractor's obligations responsibilities, or liabilities under any part of the Contract without the express prior written consent of the Engineer shall be null and void. Along with any applicable legal documentation to be signed by all applicable parties, any approved assignee must provide the County with (1) an executed Contract specifying the Contract Items and dollar volume of the Work to be performed by the assignee, (2) a Payment Bond and a Performance Bond as required pursuant to GP-3.03, and (3) a certificate of insurance as required pursuant to GP-7.14.

(d) **All Contracts.** For purposes of documentation and the County's file, the Contractor shall provide the County with Written Notice of all Subcontractors' names, and the amount or percent of the Bid value of the Contract and/or the Contract to be performed by each named Subcontractor, at or before time of Notice to Proceed.

(e) **All Contracts.** At any time after the County's issuance of the Bid Package, the County expressly reserves the right, for purposes of County approval and/or rejection, to require the Contractor to provide the County with Written Notice of all Subcontractors' names, and the amount or percent of the Contract to be performed by each named Subcontractor, and the names for such material men, suppliers, and others as the Engineer may direct, within ten (10) Business Days upon request by the County therefore. The Engineer shall review the Contractor's Written Notice under this GP-8.01(e) in a timely manner and inform the Contractor in writing of those Subcontractors approved by the Engineer for use on the Contract. If any Subcontractor is rejected in writing by the Engineer, such Subcontractor shall not work on the Contract Work. Prior to any Engineer approval, the Engineer may request the Contractor and any Subcontractor to meet additional criteria as specified by the Engineer in writing or in a Contract Modification. If the County requests Written Notice under this GP-8.01(e), the Contractor shall employ only those Subcontractors as may be approved in writing by the Engineer. No substitutions or further Subcontracting shall be employed by the Contractor without prior written approval from the Engineer. Approved Subcontractors shall not Subcontract principal or important parts of their Work, as determined in the County's sole discretion, without the Engineer's prior written approval.

The Engineer's approval of a Subcontractor under this GP-8.01(e) is only for Work to be prosecuted under the Contract and said approval is not applicable to any other contract with the County.

The Engineer reserves the express right to revoke approval of any Subcontractor for that Subcontractor's breach of any Contract provision, including, but not limited to, GP-8.06.

The Contractor agrees to be fully responsible to the County for the acts and omissions of its employees, Subcontractors and, of Persons either directly or indirectly employed by Contractor, and their respective employees and agents. The Contractor shall not assign this responsibility to any Person, except as provided in GP-8.01(c).

The Contractor shall incorporate by reference or otherwise include these General Provisions in every Subcontract issued pursuant to or under this Contract, and shall require that the same reference or inclusion be contained in every Subcontract entered into by any of its Subcontractors, at any tier.

(f) All Contracts. The Contractor agrees to bind every Subcontractor and every Subcontractor agrees to be bound by the terms of the Contract, the Standard Specifications, the Standard Details, the Special Provisions, the Contract Drawings and the Contract Documents, as far as applicable, to the Work.

The Subcontractor agrees to be bound to the Contractor by the terms of the Contract, the Standard Specifications, the Standard Details, the Special Provisions, the Contract Drawings and the Contract Documents and to assume towards the Contractor all obligations and responsibilities that the Contractor, by those documents, assumes towards the County.

The Contractor agrees to be bound to the Subcontractor by all the obligations the County assumes to the Contractor under the Contracts, the Standard Specifications, the Standard Details, the Special Provisions, the Contract Drawings, and the Contract Documents and by all the provisions thereof affording remedies and redress to the Contractor from the County.

(g) All Contracts. The Contractor shall pay its Subcontractors:

(1) Upon receipt of payment, as described in Section GP-9.03, the amount allowed to the Contractor on account of that Subcontractor's Work, to the extent of that Subcontractor's interest herein.

(2) Upon the receipt of payment, if issued otherwise than as described in Section GP-9.03, so that at all times the total payments shall be as large in proportion to the value of the Work done by the Contractor as the total amount certified to the Contractor is to the value of the Work done by that Subcontractor.

(3) To such extent as may be provided by the Contract Documents or any related Subcontracting documents, if either of these provides for earlier or larger payments than described in GP-8.01(g)(1) and (2).

(4) On demand for that Subcontractor's Work or Materials as far as executed and fixed in place, less the retained percentage, at the time the payment is requested, even though the Engineer fails to approve it for any cause not the fault of that Subcontractor.

(5) To give that Subcontractor an opportunity to be present and to submit evidence in any manner involving that Subcontractor's rights under the Contract.

The Contractor and the Subcontractor agree that nothing in this GP-8.01(g) shall create any obligation on the part of the County to pay any Subcontractor or to see to the payment of any sums to any Subcontractor. County has no obligation or liability of any kind, nature or amount to any Subcontractor. Nothing contained in the Contract, or any related Subcontracting

documents, shall create any contractual relationship between any Subcontractor, materialman, supplier, and/or other party and the County.

GP-8.02 NOTICE TO PROCEED

(a) Unless otherwise stated in the Contract Documents, upon execution of the Contract and within ninety (90) Calendar Days from the date of Award, the Department's Division of Construction Contracts Administration will issue to the Contractor a "Notice to Proceed" and this notice will stipulate when the Contractor is expected to begin Work. The specified Contract Time shall begin on the date stipulated in the Notice to Proceed or, if an earlier start is authorized in the Notice to Proceed, on the Day Work (other than the erection of the inspection office, Construction stakeouts and mobilization) actually starts. Work done prior to receipt of the Notice to Proceed is unauthorized and will not be measured or paid for.

(b) If the County is unable to issue the Notice to Proceed within ninety (90) Calendar Days from the Award of the Contract, and the County has not yet executed the Contract, the Contractor may request that the County rescind the Notice to Proceed, it being mutually understood that in such instance and upon such rescission, the County shall have no further obligation or liability to Contractor of any nature, kind or amount. If the County is unable to issue the Notice to Proceed within ninety (90) Calendar Days from the Award of the Contract, and the Contract was executed by the Contractor and the County, the Contractor may request that the County rescind the Contract, it being mutually understood that in such instance and upon such rescission, the County's obligations and liabilities shall be limited to the net documented cost of Materials actually fabricated and/or delivered to the Work site of the Contract preauthorized in writing by the Engineer. The County's remedies shall be in accordance with the Contract Documents, at law and/or in equity.

(c) The County has no obligation or duty to remit payment for any Materials prior to the County's execution of the Contract. Any Material paid for by the County after a notice of Award will become the property of the County.

(d) **Emergency Roster.** Each successful Contractor must furnish the Engineer with the names, addresses and telephone numbers of at least two (2) members of the Contractor's organization who may be contacted in an emergency.

GP-8.03 PROSECUTION OF THE WORK/DETERMINATION & EXTENSION OF CONTRACT TIME

(a) The Contractor shall begin Work promptly within the time specified by the Engineer in the Notice to Proceed and shall notify the Engineer at least forty-eight (48) hours before starting Work. The Contractor shall complete the Work and achieve Full and Final Completion within the number of Working Days, Calendar Days or Calendar Date, as specified in the Contract.

The Engineer will make available to the Contractor each week a record showing the number of Days charged to the Contract for the preceding week. The Contractor will be allowed one week in which to protest and thirty (30) Days in which to file a written statement, setting forth in what respects time charges are incorrect.

(b) If Full and Final Completion of the Contract, including all extensions and increases authorized under GP-4.04 and changes specified in the General Provisions and Interim Supplemental Specifications, requires the performance of Work in greater quantities than specified in the Contract, as determined by the Engineer, the Contract Time allowed for Contract performance may be adjusted based on the quantities, cost and the nature of the Work involved.

(c) The Contractor, under certain conditions, may be granted permission or ordered to suspend operations as defined in GP-8.07 "Suspension of Work". On a Working Day Contract, if the Contractor elects and is permitted by the Engineer to do any Work during a suspension period, the Working Days charged shall be based on the "daily value" of the Contract, which shall be calculated as the Bid price of the Contract divided by the number of Working Days allowed by the Contract Time. At the end of each month during any suspension period, the amount of money earned for that month will be divided by the "daily value" (as defined above) to determine the number of Working Days to be charged for that month (number of Working Days to be rounded down). However, the resultant number of Working Days to be charged for any particular month will never exceed the number of Calendar Days for that month, excluding Saturdays, Sundays or Holidays on which no Work was performed by the Contractor on a Pay Item and/or a Controlling Operation.

Time used in performing Work of an emergency nature ordered by the Engineer for the convenience of the traveling public or for the production or delivery of Materials for storage, if performed during the period of suspension, will not be charged against the Contract Time.

(d) Following the date on which Partial Acceptance for Maintenance has been achieved for all Work, except those landscaping Contract Items on which Work is restricted to specified seasons and when inspection and Final Acceptance for Maintenance is being deferred pending completion of those landscaping Contract Items because such Work is currently out of season, and for no other reason, no time will be charged against the Contractor until such time as it is again permissible to proceed with such landscaping Work. However, time will be charged during any extensions of the specified season documented by the County and which may be granted the Contractor.

(e) **Prosecution of the Work shall not be discontinued without the prior written approval of the Engineer.** After the Work has started, the Contractor shall prosecute the Work continuously within the Contract Time without stoppage until Final Acceptance for Maintenance of all Contract Work is achieved and the Contractor achieves Full and Final Completion.

(f) Should the prosecution of the Work for any reason be discontinued without the prior written approval of the Engineer, the Contractor shall immediately notify the Engineer in writing of Contractor's intention to stop and the County may exercise any and all rights pursuant to the Contract, at law and/or equity.

GP-8.04 PROGRESS SCHEDULE REQUIREMENTS

(a) General.

(1) Scheduling of Construction is the responsibility of the Contractor. The Contractor must take all reasonable action to avoid or to mitigate the effects of delays including, but not limited to, rescheduling or resequencing the Work, accepting other work, and reassigning personnel. When the Contractor is responsible for any delays, the County may order the Contractor to accelerate Construction, work overtime, add additional shifts or manpower, work on weekends, or to do anything else reasonably necessary to achieve Full and Final Completion of the Work within the Contract Time, at no additional cost to the County.

(2) The Contractor shall submit to the County for review and approval a baseline schedule, monthly progress schedules, and any required recovery schedules as outlined in this GP-8.04.

(3) Failure of the Contractor to comply with the requirements of this GP-8.04 shall be grounds for determination by the County that the Contractor is not prosecuting the Work with due diligence as to ensure Full and Final Completion of the Work within the Contract Time specified in the Contract Documents or as agreed upon with the County after execution of the Contract. Based on this determination, the County may terminate the Contractor's right to proceed with the Work, or any separable part thereof, in accordance with GP-8.08 of these Standard Specifications.

(4) The Contractor does not have the unilateral right to complete the Work late and to then pay liquidated or other damages as a proposed remedy to this lateness.

(b) Baseline Schedule.

(1) Within thirty (30) Days after the Award of the Contract, the Contractor shall submit to the Department a detailed baseline schedule indicating the time allocated by the Contractor for performance of each portion of the Work. The baseline schedule shall show commencement of Work from the date the Notice to Proceed is issued. The baseline schedule shall show Full and Final Completion of the Work within the Contract Time as specified in the Contract or as mutually agreed upon with the County in writing pursuant to a Contract Modification after execution of the Contract.

(2) The submitted baseline schedule shall be properly and reasonably sequenced to show the order of performing the various tasks of Work. The baseline schedule shall clearly identify the sequencing restraints and the critical activities necessary to complete the Work and achieve Full and Final Completion of the Work within the Contract Time, and shall list proposed Work Days, Holidays and any special non-Work Days.

(3) The submitted baseline schedule shall list the dollar value for each Contract Item and shall show the Contractor's labor requirements for achieving each Contract Item. The baseline schedule shall also include a list of submittals related to Material and Equipment fabrication orders, permits, Easements and any other Work tasks requiring submittals. Each necessary submittal shall be shown on the baseline schedule as a separate Work activity with necessary dates of submittal, anticipated review and response time, anticipated dates of re-submittal if necessary, and anticipated dates for final review and approval.

(4) Within fourteen (14) Calendar Days after the Engineer reviews and rejects or conditionally approves the submitted baseline schedule, the Contractor shall make all necessary corrections and resubmit the corrected baseline schedule. The County may decline to issue a Notice to Proceed until the Contractor submits the required baseline schedule in form and content acceptable to the County in the County's sole discretion.

(c) Monthly Progress Schedules.

(1) Within thirty (30) Days after the County issues Notice to Proceed, and on a monthly basis thereafter, the Contractor shall submit a monthly progress schedule accurately updated to reflect Contract Work performed to date since the previously submitted monthly progress schedule including, but not limited to, actual commencement dates of listed Work activities, actual Work activities completed to date, and any sequence changes made or planned for the order of Work activities and their effect on the critical path for Full and Final Completion of the Contract. The sequencing changes shall show extension of times granted in a Contract Modification by the County and any delays or early completion of Work activities.

(2) The Contractor shall, and it is the Contractor's obligation to, meet with the Engineer, or his designee, at least once a month to discuss in detail the Contractor's updating of the monthly progress schedule and the necessity for revision or correction in the monthly progress schedule.

(3) Within ten (10) Calendar Days after the County reviews and rejects or conditionally approves the submitted monthly progress schedule, the Contractor shall make all necessary corrections and resubmit the corrected monthly progress schedule in form and content acceptable to the County in the County's sole discretion.

(4) The Contractor shall submit the required monthly progress schedule whether or not the Contractor submits an application for payment each month. The County may decline to process any pending payment requests under the Contract unless and until the Contractor submits the required monthly progress schedule in form and content acceptable to the County, in the County's sole discretion, and the Engineer approves such schedule in writing.

(d) Recovery Schedules.

(1) At all times during the Contract term, within ten (10) Calendar Days after the Contractor falls behind a baseline schedule or a monthly progress schedule, or is alleged by the County to be behind a baseline schedule or a monthly progress schedule, the Contractor shall

furnish to the County, at no additional cost, a recovery schedule. The recovery schedule shall show how the Contractor will finish the Contract Work and achieve Full and Final Completion by the Contract Date.

(2) The recovery schedule shall include all of the information required under GP-8.04(c).

(e) **Logical Sequencing and Layout of the Submitted Schedules (CPM Schedules).**

(1) Unless the Contract Documents expressly permit the Contractor to use a type of schedule other than a Critical Path Method (CPM) schedule, the submitted baseline schedule, the monthly progress schedules, and any required recovery schedules shall all be CPM schedules.

(2) CPM schedules are required to assure and to monitor the Contractor's adequate planning and execution of the Work and to assist in the County's evaluation of the Contractor's progress of the Work and the impact on the Completion Date.

(3) The submitted CPM schedules shall clearly designate the dates of Final Acceptance for Maintenance and Full and Final Completion of the Contract Work. **THE CONTRACTOR'S ACHIEVEMENT OF FINAL ACCEPTANCE FOR MAINTENANCE DOES NOT RELIEVE THE CONTRACTOR OF ANY OBLIGATION OR RESPONSIBILITY TO ACHIEVE FULL AND FINAL COMPLETION OF ALL CONTRACT WORK BY THE COMPLETION DATE.**

(4) As part of the CPM schedule format, the Contractor shall include logic or network diagrams showing the order and interdependence of activities and the sequence in which Work is to be accomplished as planned by the Contractor. These diagrams must show how the start of a given activity is dependent on preceding activities and how its completion restricts the start of the following activities.

(5) At a minimum, the following information shall be furnished for each Work activity in any and all schedules provided under this GP-8.04:

- i. Activity number
- ii. Description of activity
- iii. Activity numbers for any predecessor and successor activities
- iv. Relationships with preceding activities
- v. Activity duration in calendar days
- vi. Percent of activity completed
- vii. Early start date (by Calendar Date)
- viii. Early finish date (by Calendar Date)
- ix. Actual start date (by Calendar Date)
- x. Actual finish date (by Calendar Date)
- xi. Float or slack (by Calendar Date)

(6) The Contractor's monthly progress schedules and any required recovery schedules shall show the activities or portion of the activities completed during the reporting period and their total dollar value as basis for the Contractor's periodic request for payment. For each activity, the update shall state the percentage of Work actually completed and the progress along the critical path in terms of Days ahead or behind the allowable dates.

(7) The Contractor's monthly progress schedules and any required recovery schedules shall include a comments section summarizing the updated analysis for the Contract Work as a whole, describing any and all problems with Work activities, and explaining proposed corrective actions.

(8) Approved Change Orders shall be reflected as new activities or as change in logic and/or time framing of existing activities. Approved Change Orders shall be shown on the Contractor's applicable updated schedule that immediately follows the Contractor's receipt of a Change Order approval from the County.

(9) The Contractor shall hold bi-weekly progress meetings, or more frequently if required by Engineer, at the Work site, at a time suitable to the Engineer, at which the progress of the Work shall be reported upon in detail with reference to all applicable schedules. Each interested Subcontractor shall be required to have present a competent representative to report the condition of the Subcontractor's portion of the Work and to receive instructions. Minutes of these progress meetings shall be taken by the Contractor who shall type them for distribution to members of the meeting, the Department's Division of Construction Contracts Administration, the Department's Bureau of Engineering and Construction, and other interested persons. These minutes shall be received by all parties prior to the next scheduled progress meeting and will be revised by the Contractor if not accurately describing events to date.

ANY AND ALL MINUTES FROM ANY PROGRESS MEETING ARE FOR INFORMATIONAL PURPOSES ONLY. THESE MINUTES ARE NOT INCORPORATED INTO THE CONTRACT DOCUMENTS AND ARE NOT LEGALLY BINDING UPON THE DEPARTMENT OR THE COUNTY.

(f) Form of Schedule Submittal.

All schedules including, but not limited to, the baseline schedule, the monthly progress schedules, and any required recovery schedules shall be submitted by the Contractor to the County in three (3) paper copies and one (1) copy on CD.

GP-8.05 LIMITATIONS OF OPERATION

The Contractor shall conduct the Work at all times in such a manner and in such sequence as will assure the least interference with the public.

Except as otherwise stated in the Contract Documents, no Work shall be done on Saturdays, Sundays, or Holidays without the prior written approval of the Engineer. Except for

emergencies, approval to Work on Saturdays, Sundays and Holidays shall be obtained forty-eight (48) hours in advance.

GP-8.06 CHARACTER OF WORKMEN, METHODS AND EQUIPMENT

(a) The Contractor shall employ sufficient labor and Equipment for prosecuting the several and all classes of Work to achieve Full and Final Completion in the manner and time required by the Contract.

Workmen must have sufficient skill and experience to properly perform the Work assigned to them. All workmen engaged in special Work or skilled Work shall have sufficient experience in such Work and in the operation of the Equipment required to perform the Work properly and satisfactorily.

(b) Any person employed by the Contractor or by any Subcontractor who, in the opinion of the Engineer, does not perform his Work in a proper manner or is intemperate or disorderly shall, at the written request of the Engineer, be removed forthwith by the Contractor or Subcontractor employing such person, and shall not be employed again in any portion of the Work without the prior written approval of the Engineer.

Should the Contractor fail to remove such person or persons as required in this GP-8.06(b), or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work, the Engineer may withhold estimates and/or monies which are or may become due on the Contract until a satisfactory understanding and resolution is reached in the County's sole discretion.

(c) Only persons thoroughly trained and skilled in the task assigned them may be employed on any portion of the Work, or they shall be removed by the Contractor.

When County, State or federal laws require that certain persons (such as, by way of example, electricians, plumbers, etc.) be licensed, then all such persons employed on the Work shall be so licensed.

(d) The Contractor shall confine the operations of Contractor's employees and agents to the limits as provided by law, regulations, executive orders, ordinance, permits or directions of the Department. Generally, the "off-Road" area will be the same as the "limit of Contract" line.

(e) All workmanship shall be of good quality. Whenever the method or manner of the Work or manner of procedure is not specifically stated or shown in the Contract Documents, then it is intended and understood that the best standard practice shall be adhered to by the Contractor. Recommendations of the manufacturers of approved Materials shall be considered as a part of and incorporated into the Standard Specifications and all Materials shall be applied, installed, connected, erected, used, cleaned and conditioned as so called for thereby. This, however, does not remove any requirement in Contract to add to the manufacturer's recommendations.

All Materials shall be accurately assembled, set, etc., and when so required in good Construction, shall be true to line, even, square, plumb, level and regularly spaced, coursed, etc. Under no circumstances, either in new or old Work, shall any Material be applied over another which has not been thoroughly cleaned, sanded or otherwise treated so as not to impair the finish, adhesion, or efficiency of the next applied item.

(f) Equipment to be used on the Work shall meet the requirements of the Work and produce a satisfactory quality of Work in accordance with the Contract. The Engineer may order the removal and require replacement of any unsatisfactory Equipment at the Engineer's sole discretion. When the methods and Equipment to be used by the Contractor in accomplishing the Construction are not prescribed in the Contract, the Contractor is free to use any methods or Equipment that Contractor demonstrates in advance to the satisfaction and written approval of the Engineer will accomplish the Contract Work in conformity with the requirements of the Contract.

When the Contract specifies that the Construction be performed by the use of certain methods and Equipment, such methods and Equipment shall be used unless others are pre-authorized by the Engineer in writing. If the Contractor desires to use a method or type of Equipment other than those specified in the Contract, the Contractor shall request authority from the Engineer to do so. The request shall be in writing and shall include a full description of the methods and Equipment proposed for use and an explanation of the reasons for Contractor desiring to make the change. If written pre-approval of the Engineer is given, it will be on the condition that the Contractor will be fully responsible for producing Construction Work in conformity with Contract requirements. If, after trial use of the substituted methods or Equipment, the Engineer determines that the Work produced does not meet Contract requirements, the Contractor shall promptly discontinue the use of the substituted method or Equipment and shall complete the remaining Construction with the specified methods and Equipment in accordance with the Contract. The Contractor shall remove the deficient Work and replace it with Work of specified quality, or take such other corrective action as the Engineer may direct. Any Change Order issued, if any, in accordance with this GP-8.06(f) shall not result in an increase in Contract price or Contract Time.

(g) All methods, procedures and results are subject to the Engineer's approval as to the finished result to be obtained. However, this is not to be interpreted as placing upon the Engineer any responsibility for the Work management that is solely the responsibility of the Contractor.

The Contractor shall at all times enforce strict discipline and good order among Contractor's employees and agents. The Contractor shall neither employ any unfit person nor shall the Contractor permit an unfit person to remain on the Work site. The Contractor shall enforce all instructions relative to use of water, heat, power, smoking, and shall control any use of fires, as required by law, regulation, and the Contract and by the Department. Employees and agents of the Contractor shall not loiter on, near or about the Work site before or after work.

GP-8.07 SUSPENSION OF WORK

Revised
October 11, 2013

(a) The Engineer may unilaterally order the Contractor in writing to suspend the Work, wholly or in part, for such period or periods as Engineer may deem necessary, in the Engineer's sole discretion, for reasons including, but not limited to, unsuitable weather or such other conditions as are considered unfavorable for the proper prosecution of the Work, or for such time as is necessary because the Contractor has failed to carry out orders given or to perform any and all provisions of the Contract. If it should become necessary to stop Work for an indefinite period, the Contractor shall store all Materials in such manner that they will not obstruct or impede the traveling public unnecessarily or become damaged in any way, and the Contractor shall take every precaution to prevent damage or deterioration of the Work performed, provide suitable drainage by opening ditches, Shoulder drains, etc., and erect temporary Structures where necessary.

(b) If the performance of all or any part of the Work is for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Engineer in the administration of this Contract, or by Engineer's failure to act within the time specified in this Contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this Contract (excluding profit) necessarily caused by an unreasonable suspension, delay, or interruption and a Contract Modification executed accordingly. However, no adjustment shall be made under this GP-8.07 for any suspension, delay, or interruption of the Work to the extent that performance would have been so suspended, delayed or interrupted by any other cause, including, but not limited to, the fault or negligence of the Contractor, including, but not limited to, GP-8.07(a) and (c), or for which an equitable adjustment is provided for or excluded under any other provisions of this Contract.

(c) The Engineer shall have the unilateral authority to suspend the Work, wholly or in part, due to the failure of the Contractor to correct conditions unsafe for the workers or the general public; for Contractor's failure to carry out the requirements of the Contract Documents; or as directed in conformance with the Contract Documents for conditions considered unsuitable for the prosecution of the Work.

(d) No claim under this General Provision shall be allowed:

(1) For any costs incurred more than twenty (20) Days before the Contractor shall have notified the Engineer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension ordered by Engineer); and

(2) Unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of a suspension, delay, or interruption, but not later than the date of final payment under the Contract.

(e) If the Contractor should neglect to prosecute the Work properly or fail to perform any provision of this Contract, the County after three (3) Days' Written Notice to the Contractor may, without prejudice to any other remedy, make good such deficiencies and/or perform the Contract or any portion thereof, as deemed applicable and appropriate by the County in its sole

discretion, and may deduct the cost thereof from the payment then or thereafter due the Contractor.

GP-8.08 TERMINATION FOR DEFAULT - DAMAGES FOR DELAY - TIME EXTENSIONS.

(a) If the Contractor refuses or fails to timely and properly prosecute the Work, in whole or in part, with such diligence as shall insure Full and Final Completion within the Contract Time, or breaches the terms of the Contract, termination for default, in whole or in part, shall be evidenced and the Department may, by Written Notice to the Contractor, terminate the Contract and the Contractor's right to proceed with the Work, in whole or in part, in accordance with this GP-8.08.

(b) The Department, upon proof that sufficient cause exists to satisfy such action, in the County's discretion, may without prejudice to any other right or remedy, terminate the Contract for default, in whole or in part. Termination for default, in whole or in part shall be evidenced and documented by Written Notice by the County to the Contractor and said termination for default shall be effective seven (7) days after Contractor's receipt of such Written Notice. Upon a termination for default the County may take over the Work and take possession of the Work and of all Materials, tools, Equipment and plant thereon and prosecute the same to completion, by contract, by whatever method may be deemed expedient, or otherwise, and may take possession of and utilize in completing the Work, the Materials, Equipment, and plant as may be on the site of the Work and necessary therefore. Whether or not the Contractor's right to proceed with the Work is terminated for default, the Contractor and its Sureties shall be liable for any damage to the County resulting from the Contractor's refusal or failure to achieve Full and Final Completion of the Work within the Contract Time and/or the Contractor's breach of the Contract Documents.

The County may appropriate or use any or all Materials and Equipment intended to be incorporated in the Contract as may be suitable and acceptable and may enter into an agreement for the completion of said Contract according to the terms and provisions thereof, or use such other methods as in the County's determination shall be required for the completion of said Contract in a manner acceptable to the County.

(c) Examples of sufficient cause to terminate for default include, but are not limited to, cases where the Contractor should:

- (1) Be adjudged a bankrupt or make a general assignment for the benefit of creditors,
- (2) Have a receiver appointed on account of insolvency,
- (3) Fail to or refuse to supply properly skilled persons or proper Materials, Equipment except in cases for which extension of time is provided by the County,

(4) Fail to make payment to a Subcontractor, materialmen, supplier, and/or other persons.

(5) Fail to comply with any law, regulation, executive order, ordinance, or persistently disregarded the instructions of the Engineer, or

(6) Breach any material representation, warranty, covenant, condition, obligation, or provision of the Contract.

(d) If the County terminates for default of the Contract under this GP-8.08, the Contractor shall not be entitled to receive any further payment until the Contract Work is finished and, even then, only if the unpaid balance of the Contract price shall exceed the expenses of finishing the Work, including compensation for additional managerial and administrative services, shall such excess be paid to the Contractor. If such expenses shall exceed such unpaid balance, the Contractor shall pay the difference to the County. The expenses incurred by the County as herein provided, and the damage incurred by the County as herein provided, and the damage incurred through the Contractor's default, shall be itemized by the Engineer and a certified copy supplied to the Contractor.

(e) The Contractor's right to proceed may not be terminated for default and the Contractor shall not be charged with resulting damages if:

(1) The delay in the completion of the Work arises solely from unforeseeable causes beyond the control and without the act, omission, fault or negligence of the Contractor including, but not restricted to, acts of God, acts of the public enemy, acts of the County in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the County, fires, floods, epidemics, quarantine, restrictions, strikes, freight embargoes, unusually severe weather, or delays of Subcontractors or supplies arising solely from unforeseeable causes beyond the control and without the act, omission, fault or negligence of either the Contractor and/or the Subcontractors, suppliers or materialmen; and

(2) The Contractor, within ten (10) Days from the beginning of any such delay (unless the Engineer grants a further period of time before the date of final payment under the Contract), notifies the Engineer in writing of the causes of delay. The Engineer shall ascertain the facts and the extent of the delay and extend the Contract Time for completing the Work when, in the Engineer's judgment, the findings of fact justify such an extension, and the Engineer's findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in the GP-5.15 "Disputes".

(f) If, after notice of termination for default of the Contract and the Contractor's right to proceed under these General Provisions, it is determined for any reason that the Contractor was not in default under the provisions of the Contract, or that the delay was excusable under the provisions of the Contract, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to GP-8.10.

(g) The rights and remedies of the County provided in this GP 8.08 are in addition to any other rights and remedies provided by law, equity and/or under this Contract.

(h) As used in GP 8-08, the term Subcontractors, materialmen, or suppliers means Subcontractors, materialmen or suppliers at any tier.

GP-8.09 LIQUIDATED DAMAGES

TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT AND IT IS IMPORTANT THAT THE WORK BE VIGOROUSLY PROSECUTED UNTIL FULL AND FINAL COMPLETION OF THE CONTRACT.

FOR EACH DAY THAT FULL AND FINAL COMPLETION REMAINS UNACHIEVED BEYOND THE CONTRACT TIME, THE CONTRACTOR AND/OR ITS SURETY SHALL BE LIABLE FOR LIQUIDATED DAMAGES IN THE AMOUNT PROVIDED FOR IN THE CONTRACT.

(a) ALL ADDITIONAL COSTS AND CHARGES INCURRED BY THE COUNTY, INCLUDING, BUT NOT LIMITED TO, ANY AND ALL DAMAGE TO PERSONS OR PROPERTY, THE COST OF COMPLETING THE WORK UNDER THE CONTRACT, SHALL BE DEDUCTED FROM ANY MONIES DUE OR WHICH MAY BECOME DUE TO CONTRACTOR. IF THE EXPENSE SO INCURRED BY THE COUNTY IS LESS THAN THE SUM WHICH WOULD HAVE BEEN PAYABLE UNDER THE CONTRACT IF IT HAD BEEN COMPLETED BY SAID CONTRACTOR, THE SAID CONTRACTOR SHALL BE ENTITLED TO RECEIVE THE DIFFERENCE, AND IF SUCH EXPENSE EXCEEDS THE SUM WHICH WOULD HAVE BEEN PAYABLE UNDER THE CONTRACT, THE CONTRACTOR AND THE SURETY SHALL BE LIABLE AND SHALL PAY TO THE COUNTY THE AMOUNT OF SAID EXCESS.

(b) IF FIXED AND AGREED LIQUIDATED DAMAGES ARE PROVIDED IN THE CONTRACT AND IF THE COUNTY SO TERMINATES THE CONTRACT, AND ACCORDINGLY THE CONTRACTOR'S RIGHT TO PROCEED, THE RESULTING DAMAGE SHALL CONSIST OF SUCH LIQUIDATED DAMAGES FOR THE REASONABLE TIME REQUIRED FOR FULL AND FINAL COMPLETION OF THE WORK TOGETHER WITH ANY INCREASED COSTS AND EXPENSES INCURRED BY THE COUNTY IN COMPLETING THE WORK.

(c) IF FIXED AND AGREED LIQUIDATED DAMAGES ARE PROVIDED IN THE CONTRACT AND IF THE COUNTY DOES NOT SO TERMINATE THE CONTRACTOR'S RIGHT TO PROCEED, THE RESULTING DAMAGE SHALL CONSIST OF THESE LIQUIDATED DAMAGES UNTIL FULL AND FINAL COMPLETION IS ACHIEVED.

(d) Interest shall accrue upon all damages, liquidated or otherwise, at the statutory rate of interest provided pursuant to the Maryland Constitution and the Maryland Code, as applicable and as amended.

GP-8.10 TERMINATION FOR CONVENIENCE OF THE COUNTY

(a) The performance of Work under this Contract may be terminated for convenience by the County, in whole, or in part, whenever the Engineer shall determine that such termination for convenience is in the best interest of the County. Any such termination for convenience shall be effected by Engineer's delivery to the Contractor of a Written Notice of termination for convenience specifying the extent to which performance of Work under the Contract is terminated, and the date upon which such termination becomes effective.

(b) After receipt of notice of termination for convenience, and except as otherwise directed by the Engineer, the Contractor shall:

(1) Stop Work under the Contract on the date and to the extent specified in the Written Notice of termination for convenience;

(2) Place no further orders or Subcontracts for Materials, supplies, Equipment, services or facilities, except as may be necessary for completion of the portion of the Work under the Contract that is not terminated for convenience;

(3) Terminate all orders and Subcontracts to the extent that they relate to the performance of Work terminated by notice of termination for convenience;

(4) Assign to the County in the manner, at the times, and to the extent directed by the Engineer, all of the right, title, and interest of the Contractor under the orders and Subcontracts, in which case the County shall have the right, in its discretion, to settle or pay any or all claims arising out of such orders and Subcontracts, or assume said orders and subcontracts, or do otherwise, as deemed appropriate in the sole discretion of the County;

(5) Settle all outstanding liabilities and all claims arising out of the termination of orders and Subcontracts, with the approval or ratification of the Engineer, to the extent he may require, which approval or ratification shall be final for all the purposes of this GP-8.10;

(6) Transfer title and deliver to the County, in the manner, at the times and to the extent, if any, directed by the Engineer, (a) the fabricated or unfabricated parts, Work in process, completed Work, supplies, and other Material produced as a part of, or acquired in connection with the performance of the Work terminated for convenience by the Written Notice of termination for convenience, and (b) as applicable, the completed or partially completed Plans, Contract Drawings, As-Built Drawings, operation and maintenance manuals, warranty certificates, information, and other property which, if the Contract had been completed, would have been required to be furnished to the County;

(7) Use its best effort to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Engineer, any property of the types referred to in (6) above; provided, however, that the Contractor (a) may not be required to extend credit to any

purchaser, and (b) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Engineer; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the County to the Contractor under this Contract or shall otherwise be credited to the price or cost of the Work covered by this Contract or paid in such other manner as the Engineer may direct;

(8) Complete performance of such part of the Work as may not have been terminated by the Written Notice of termination for convenience; and

(9) Take any action that may be necessary, or as the Engineer may direct, for the protection and preservation of the property related to this Contract which is in the possession of the Contractor and in which the County has or may acquire an interest. The Contractor shall submit to the Engineer a list, with Certification as to quantity and quality, of any or all items of inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Engineer, and may request the County to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) Days thereafter, the County shall accept title to such items and remove them or enter into a storage agreement covering the same; provided, that the list submitted shall be subject to verification by the Engineer upon removal of the items, or if the items are stored, within forty-five (45) Days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

(c) After receipt of a Written Notice of termination for convenience, the Contractor shall submit to the Engineer his termination for convenience claim, in the written form and with Certification prescribed by the Engineer. This claim shall be submitted promptly in accordance with GP-5.14 and GP-5.15 of these Standard Specifications, unless an extension is granted in writing by the Engineer, upon timely request of the Contractor in writing.

(d) Subject to this GP-8.10 (c), the Contractor and the Engineer may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination for convenience of Work pursuant to this GP 8-10, which amount or amounts may include a reasonable allowance for profit on Work done; provided, that such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total Contract price as reduced by the amount of payments otherwise made and as further reduced by the Contract price of Work not terminated for convenience. If the parties so agree, the Contract shall be amended with a Contract Modification, and the Contractor shall be paid the amount specified therein.

(e) In the event of the failure of the Contractor and the Engineer to agree as provided in GP-8.10 (d), upon any amount to be paid to the Contractor by reason of the termination for convenience of Work pursuant to this General Provision, the Engineer shall pay to the Contractor the amounts determined by the Engineer as follows, but without duplication of any amounts agreed upon in accordance with GP-8.10 (d):

(1) For completed supplies or services accepted by the County (or sold or acquired as provided in GP-8.10 (b)(7) above) and for which payment has not theretofore been made, a sum equivalent to the aggregate price for the supplies or services computed in accordance with the

price or prices specified in the Contract, appropriately adjusted for any saving of freight or other charges;

(2) The total of:

(a) The costs incurred in the performance of the Work terminated for convenience, including initial costs and preparatory expense allocable thereto, but exclusive of any costs attributable to supplies or services paid or to be paid for under GP-8.10 (e)(1) hereof; and

(b) The cost of settling and paying claims arising out of the termination of Work under Subcontracts or orders, as provided in GP-8.10 (b)(5) above, which are properly chargeable to the termination for convenience portion of the Contract (exclusive of amounts paid or payable on account of supplies or Materials delivered or services furnished by Subcontractors or vendors before the effective date of the Written Notice of termination for convenience, which amounts shall be included in the costs payable under GP-8.10 (e)(2)(a); and

(c) A sum, as profit on GP-8.10 (e)(2)(a), determined by the Engineer to be fair and reasonable; provided, however, that if it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, no profit shall be included or allowed under this GP-8.10 (e)(2)(c) and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss; and

(d) The reasonable cost of settlement accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the terminated portion of the Contract and for the termination and settlement of Subcontracts thereunder, together with reasonable storage, transportation, and other costs incurred in connection with the protection or disposition of property allocable to this Contract.

The total sum to be paid to the Contractor under this GP-8.10 (e) shall not exceed the total Contract price as reduced by the amount of payments otherwise made and as further reduced by any Contract price of Work not terminated for convenience. Except for normal spoilage, and except to the extent that the County shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor as provided in GP-8.10 (e), the fair value, as determined by the Engineer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the County or to a buyer pursuant to GP-8.10 (b)(7).

(f) The Contractor shall have the right of appeal, under GP-5.15 "Disputes", from any determination made by the Engineer under this GP-8.10, except that if the Contractor has failed to timely submit its claim within the time provided in this GP-8.10, and has failed to request extension of such time, Contractor shall have no such right of appeal. In any case where the Engineer has made a determination of the amount due under this GP-8.10, the County shall pay to the Contractor the following:

(1) If there is no right of appeal hereunder and/or if no timely appeal has been taken, the amount so determined by the Engineer; or,

- (2) If an appeal has been taken, the amount finally determined on such appeal.
- (g) In arriving at the amount due the Contractor under this GP-8.10 there shall be deducted:
- (1) All unliquidated advance or other payments or account theretofore made to the Contractor, applicable to the terminated for convenience portion of this Contract;
- (2) Any claim which the County may have against the Contractor in connection with this Contract; and
- (3) The agreed price for, or the proceeds of sale of, any Materials, supplies, or other things acquired by the Contractor or sold, pursuant to the provisions of this GP-8.10, and not otherwise recovered by or credited to the County.
- (h) If the termination for convenience hereunder be partial, the Contractor may file with the Engineer a written claim for an equitable adjustment in accordance with GP-5.14 and GP-5.15 of the price or prices specified in the Contract relating to the continued portion of the Contract (the portion not terminated by the Written Notice of termination for convenience), and such equitable adjustment as may be agreed upon shall be made in such price or prices in a Contract Modification.
- (i) The County may, from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated for convenience portion of this Contract whenever, in the opinion of the Engineer, the aggregate of such payments shall be within the amount to which the Contractor shall be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this General Provision 8.10, such excess shall be payable by the Contractor to the County upon demand, together with interest at the legal rate as prescribed by State law for the period from the date such excess payment is received by the Contractor to the date on which the excess is repaid to the County.
- (j) Unless otherwise provided for in this Contract, or by applicable statute, the Contractor shall, from the effective date of termination for convenience until the expiration of three (3) years after final settlement under this Contract, preserve and make available to the County at all reasonable times at the office of the Contractor but without direct charge to the County, all Contractor's books, records, documents and other evidence bearing on the costs and expenses of the Contractor under this Contract and relating to the Work terminated for convenience hereunder, or, to the extent approved by the Engineer, photographs, microphotographs, or other authentic reproductions thereof. If the Contract involves the use of federal or State funds, Contractor shall retain records and documentation as required by GP-7.36.

GP-8.11 SUCCESSFUL TERMINATION OF CONTRACTOR'S RESPONSIBILITY

Full and Final Completion is the date upon which the County acknowledges in writing that the Contractor fully and finally completed all aspects of the Contract and the Contract Work, and met all terms, conditions and obligations of the Contract, as further described herein. Full and Final Completion of a Contract includes Final Acceptance for Maintenance of all Contract Work; the authorization of final payment by the County; the Contractor's and its Surety's compliance with all obligations under the Contract; the submission of all Plans, Contract Drawings, As-Built Drawings (as described below), operation and maintenance manuals, and warranty certificates; the completion of all punch list Work; and final payment by the County to the Contractor.

The Contractor shall, as the Work progresses, neatly record on a set of final signed and sealed As-Built Drawings the Work as actually constructed by the Contractor and reflecting all Working Drawings including, but not limited to, any changes and all revisions to the Work made during the course of the Contract wherever it differs from the Contract Documents. Upon Final Acceptance for Maintenance of the Work, the Contractor shall turn over the As-Built Drawings to the County. No Full and Final Completion of the Contract by the County may occur until these As-Built Drawings are submitted to and approved by the County.

GP-SECTION 9 PAYMENT

GP-9.01 SCOPE OF PAYMENT

(a) Payments to the Contractor will be made for the actual quantities of Contract Items performed in accordance with the Plans and Contract Documents and if, upon completion of the Construction and the Work, these actual quantities show either an increase or decrease from the quantities given in any Contract schedule, the Contract unit prices will still prevail, except as provided in GP-4.04 "Variations in Estimated Quantities", or in a Contract Modification.

(b) Except as may otherwise be provided herein, the Contractor shall accept the compensation as provided by the Engineer under this GP-Section 9:

(1) In full payment for furnishing all Materials, lab, tools, and Equipment and any incidentals necessary to the completed Work and for performing all Work contemplated and embraced under the Contract;

(2) For all loss or damage arising from the nature of the Work, or from the action of the elements, or from any other unforeseen difficulties which may be encountered during the prosecution of the Work until Full and Final Completion of the Contract;

(3) For all risks of every description connected with the prosecution of the Work; and

(4) For all expenses incurred in consequence of suspension of the Work, if any, as herein authorized by the County.

(c) Where provisions in the Contract Documents relating to any unit price for a Contract Item require that the said unit price cover, and be considered, compensation for certain Work or Material essential to that Contract Item, this same Work or Material shall not also be measured or paid for under any other Contract Item which may appear elsewhere in the Contract Documents.

(d) The payment of any partial estimate or of any retained percentage by the County, in no way shall affect the obligation of the Contractor to Repair or renew any defective parts of the Construction and/or Work or to be responsible for all damages due to such defects.

(e) Payment to the Contractor under this section for Materials on hand in no way will be construed as acceptance by the Administration of title to the Material. Title shall remain with the Contractor until Final Acceptance for Maintenance of the Contract Work in accordance with GP-5.13.

The Contractor shall indicate its federal tax identification or social security number on the face of each invoice billed to the County.

(f) If the Contract is in excess of twenty-five thousand dollars (\$25,000), the Contractor and any Subcontractor with a lower tier Subcontract, in accepting each Contract payment from the County is making a Certification and representing and warranting to the County, prior to receiving a progress or final payment under this Contract, that the Contractor or Subcontractor has made payment from proceeds of prior payments, and that the Contractor or Subcontractor will make timely payments, from the proceeds of the progress or final payment then due it, to its Subcontractors, materialmen, and suppliers in accordance with Contractor or Subcontractor contractual arrangements with them and pursuant to State Finance and Procurement Article of the Maryland Annotated Code, as amended. This Certification may be required by the Engineer even if the Contract is for twenty-five thousand dollars (\$25,000) or less.

If the Contract is in excess of twenty-five thousand dollars (\$25,000), the Contractor further represents and warrants that it shall also obtain from each Subcontractor a Certification that payment from proceeds of prior payments have been made to any lower tier Subcontractors and that timely payments will be made to the lower tier Subcontractors and suppliers in conformance with contractual arrangements with those lower tier Persons. This Certification is not required from Subcontractors who have no lower tier Subcontracts. These Certifications may be required by the Engineer for contract of twenty-five thousand dollars (\$25,000) or less.

(g) For all Contract Items of Work, other than those to be paid by lump sum, after Final Acceptance for Maintenance of the Work and before final payment is made, the Engineer will make final measurements to determine the quantities of various Contract Items of Work performed as the basis for final settlement. The Contractor in case of unit price Contract Items will be paid for the actual amount of Work performed and for the actual amount of Materials in place, in conformance with the Contract Documents as shown by the final measurements made by the Engineer. All Work completed under the Contract will be measured by the Engineer in conformance with the standards of weights and measures recognized by the NBS and NIST.

The term lump sum when used as a Contact Item will mean complete payment for the unit of Work described and will be construed to include all necessary fittings and accessories for that Contract Item of Work.

(1) All longitudinal measurements for area will be made along the actual surface and not horizontally, and no deductions will be made for individual fixtures in the pavement having an area of nine (9) square feet or less. For all transverse measurements for area of Base Course and pavements, the dimensions to be used in calculating the pay area will be the neat dimensions shown on the Plans or as ordered in writing by the Engineer.

(2) Structure measurements will conform to the neat lines shown on the Plans or as ordered in writing by the Engineer, unless otherwise provided for elsewhere in the Contract Documents.

(3) Volumes of excavation, tamped fill and borrow pits will be calculated per cubic yard from the cross section and the use of average end area formulas. Volumes of other Work including, but not limited to, masonry and removal of masonry will be calculated by using arithmetical formulas. Where the volume is bounded by varying dimensions and there are no simple volumetric formulas applicable, frequent cross sections will be taken and the cubic yard volume computed from average end area formulas.

(4) Cement will be measured by weight.

(5) All items which are measured by the linear foot, including, but not limited to, pipe culverts, traffic barriers, underdrains, will be measured parallel to the base or foundation upon which such Structures are placed unless otherwise specified in the Contract Documents.

(6) The term gauge when used in connection with the measurement of uncoated steel sheet and light plates shall mean the USSG, except that when reference is made to the measurements of galvanized or aluminum sheets used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing, the term gauge shall mean that specified in M 36, M 167, M 196 or M 197.

(7) When the term gauge refers to the measurement of wire, it shall mean the Washburn & Moen wire gauge as referenced in the New Departure Handbook. A tolerance of plus or minus 0.003 inch shall apply.

(8) The term ton shall mean the short ton consisting of two thousand (2,000) pounds avoirdupois. All Materials which are specified for measurement by the ton shall be weighed on accurate, approved scales conforming to the requirements of the NBS Handbook 44. A digital recorder and printout shall be required on all truck scales. The digital recorder shall produce a printed record of the gross, tare, net weights, the time, date, truck identification and Contract Number. Provisions shall be made so that the scales may not be manually manipulated during the printing process. The system shall be interlocked to allow printing only when the scale has come to rest.

(9) Except for computer operated scales, all weights shall be certified by a bonded weigh Person supplied by the Contractor, producer or supplier. The security bond shall be one hundred thousand dollars (\$100,000.00).

(10) If the Material is shipped by rail, the car weight may be accepted but the payment will be limited to the actual weight of Material. Car weights will not be acceptable for Material to be passed through mixing plants.

(11) All Materials for which measurements are obtained by the cubic yard shall be hauled in approved vehicles and measured at the point of delivery. No allowance will be made for the settlement of Material in transit. Approved vehicles for this purpose shall be of any size or type acceptable to the Engineer, provided that the body is of such shape that the actual contents may be readily and accurately determined. Unless all approved vehicles are of uniform capacity, each approved vehicle must bear a plainly legible identification mark indicating the specific approved capacity. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.

(12) When requested by the Contractor and approved by the Engineer in writing, Material specified to be measured by the cubic yard may be weighed, and such weights will be converted to cubic yards for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by a qualified laboratory and shall be agreed to by the Contractor before such method of measurement of pay quantities will be approved by the Engineer.

(13) Liquid asphalt Material delivered for the project will be measured by volume in each railroad tank car, tank truck, distributor tank or drums in which it is delivered. The measurements will be taken when the asphalt Material is of a uniform temperature and free from air bubbles, and the temperature of the Material will be recorded at that time by the Contractor.

The volumetric measurement of the asphalt material will be based upon a temperature of sixty degrees Fahrenheit (60° F). Only the quantity of asphalt Material actually placed in the Work and accepted will be considered in determining the amount due the Contractor.

Reference is hereby made to D 1250, Petroleum Measurement Tables.

(14) Timber will be measured by the thousand feet board measure (MBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

(15) Rental of Equipment will be measured in hours of actual Work time by the Contractor, moving-in and moving-out costs, if any, and necessary traveling time of the Equipment within the limits of the Contract, except when special conditions make some other method of measurement desirable as determined by the Engineer.

(h) Payment will not be allowed for stored Materials except in specific instances approved in writing by the Engineer involving specially manufactured Contract Items or Contract Items

requiring a long lead time for delivery and as further described in GP-9.01(i), (j) and (k). No payment for stored Material will be made if it is anticipated that the Material will be incorporated into the Work within thirty (30) Days of the delivery of said Material to the Contractor or Work site.

(i) When the Contractor requests payment allowance for stored Materials and the Engineer gives written approval of those Materials stored, the following terms and conditions shall apply:

(1) For Superstructure members delivered and stored on the Work site, an allowance of one hundred percent (100%) of the Material cost plus freight charges as invoiced may be made provided the cost does not exceed ninety percent (90%) of the Contract price of the applicable Contract Item. The allowance will be based upon validated invoices or bills for Material including freight charges, and a copy thereof shall be made a part of the documented records for the Contract.

(2) For reinforcement steel, piling, pipe, traffic barrier, signs and sign assemblies, and other nonperishable Material in storage on the Contract, but excluding aggregates, cement, seed, plants, fertilizer or other perishable Contract Items, an allowance of one hundred percent (100%) of the invoiced cost of the Material plus freight charges to the Contractor may be made provided the cost does not exceed ninety percent (90%) of the Contract price of the applicable Contract Item. Such Material shall be delivered and stockpiled at the Contract Work site, and shall be tested by the Administration and found to conform with the Contract Documents or have been accepted under a County-approved Certification program prior to the allowance.

(3) No payment allowance will be made for fuels, form lumber, falsework, temporary Structures or other Materials of any kind which will not become an integral part of the finished Work.

(4) Only end product manufactured Material or fully fabricated products that are awaiting installation or incorporation into the finished Work are eligible for prepayment. Components, elements, or ingredients of a finished product are not eligible for prepayment or payment allowance.

(5) Stored Material for which a payment allowance is requested shall be stored in an approved manner in areas within the County where damage is not likely to occur. If any of the stored Materials are lost or become damaged in any manner, the Contractor shall be responsible for Repairing or replacing the damaged Materials. The value of the lost or damaged Material will be deducted from the Contractor's subsequent estimates until replacement has been accomplished. The request for payments allowances for any Materials stored on private property within the County shall be accompanied by a release from the applicable owner and/or tenant of such property agreeing to permit the removal of the Materials from the property without cost to the County.

When it is considered impractical to store Materials on the Work site, the Engineer may approve storage areas in the vicinity of the Work site which will be considered as the Work site for purposes of those stored Materials.

When storage of the Materials within the County is not practical, written approval shall be obtained from the Engineer for storage elsewhere. Storage of Materials outside the County will be subject to the conditions set forth in this GP-9.01 and limited to Materials exceeding twenty-five thousand dollars (\$25,000), which are designed and fabricated exclusively for use on the Contract.

(6) Stored Material for which payment has been made, either wholly or partially by the County, shall not be removed from the approved location or Work site until such time that it is to be incorporated into the Work, unless authorized by the Engineer in writing.

(j) The following items shall accompany any written request by the Contractor for payment allowance for stored Materials:

(1) Consent of the Contractor's Surety specifying the Material type and the Contract Item(s) in which the Material is to be used.

(2) Validated invoices with the signature of an officer of the company supplying the Material showing actual cost.

(3) A notarized statement from the Contractor attesting that the invoices as submitted from the supplier do not include charges or fees for placing, handling, erecting or any other charges or markups other than the actual Material cost, sales tax(es), if applicable, and freight charges.

(4) Bills of lading showing delivery of the Material.

(5) The request for allowances for any Materials stored on property outside the County shall be accompanied by a release from the owner or tenant of such property agreeing to permit verification by the Department's Division of Construction Contracts Administration that the Material is stored at the approved location, and to permit the removal of the Materials from the property without cost to the County.

(6) Inspection test reports, Certifications and/or a written statement from the Department's Division of Construction Contracts Administration attesting to the inspection and approval of the Material.

Upon receipt of the above by the Engineer and verification by the Department's Division of Construction Contracts Administration that the Material is stored at the approved location, the Engineer will authorize payment.

The Contractor shall pay the Material supplier the amount shown on the invoice within seven (7) Calendar Days of receipt of payment from the Administration. Failure to make invoice payments as specified will be cause for the County to deduct the monies from future estimates to the Contractor.

Copies of all pertinent data relating to any stored Materials shall be made by the Contractor and distributed to the Department's Division of Construction Contracts Administration for retention as part of the documented records for the Contract.

(k) The Engineer may withhold, or on account of subsequently discovered evidence, nullify the whole or a part of any payment for stored Materials to such extent as may be necessary to protect the County from loss on account of:

(1) Defective Work not remedied.

(2) Claims filed, or reasonable evidence indicating probable filing of claims, by parties other than the Contractor.

(3) Failure of the Contractor to make payments properly to Subcontractors or for material or labor.

(4) A reasonable doubt that Full and Final Completion of the Contract can be achieved for the balance then unpaid.

(5) Damage to another contractor.

(6) Failure of the Contractor to submit data required within the time limits stated in the Contract Documents.

Upon removal of the Engineer's hold and resolution of all related issues, payment shall be made for any amounts withheld.

GP-9.02 FORCE ACCOUNT WORK

When the Contractor is required to perform Extra Work as a result of a Change Order or Contract Modification to the Contract for which there are no applicable unit prices in the Contract, the Engineer and the Contractor shall make every effort to come to an agreed price for the performance of such Extra Work. If an agreement cannot be reached by the parties prior to the time that Extra Work must commence, the Engineer may, in writing, order the Extra Work done on a force account basis by the Contractor, to be compensated in accordance with the following:

(a) **Labor.** For all labor and for foremen in direct charge of the specific operations of the Work, the Contractor shall receive the rate of wage agreed upon in writing by the County and the Contractor in either the Contract or a Contract Modification before the Contractor begins such Extra Work for each and every hour that said labor and foremen are actually engaged in such Extra Work, to which cost shall be added an amount equal to the percentage of the sum shown below. No additional allowance will be considered for Contract Bond, insurance, taxes or other fringe benefits, except as permitted in the County's discretion in a Written Notice or a Contract Modification. The number of laborers and foremen engaged in the Extra Work will be subject to

regulation by the Engineer and shall not exceed the number the Engineer deems most practical and economical for the Extra Work. The Contractor shall submit certified payrolls in conformance with the Contract Documents and pursuant to GP-9.02(g) signed by a legally authorized officer of the Contractor. Superintendent's time will not be allowed.

Highway Contracts65%
Utility Contracts.....75%
Building Contracts65%

(b) Materials. For Materials accepted by the Engineer and used for the Extra Work, the Contractor shall receive the actual cost of such Materials delivered to the Work site. This cost includes transportation charges paid by Contractor (exclusive of machinery rentals as specified in GP-9.02(d)), to which cost shall be added an amount equal to twenty percent (20%) plus prevailing State sales tax.

To substantiate Materials and transportation cost, original receipted invoices shall be submitted to the County by the Contractor, as further specified in GP-9.02(g).

If the Materials used in the force account Extra Work are not specifically purchased for the Extra Work but are taken from the Contractor's stock, then in lieu of the original invoices, the statements shall contain or be accompanied by an affidavit and Certification from the Contractor that shall certify that the Materials were taken from the Contractor's stock, that the quantity claimed was actually used, and that the price and transportation cost of the Material as claimed represents the actual cost.

The Administration reserves the right to furnish Materials as it deems appropriate, and the Contractor shall have no claim for any costs, overhead, or profit on these Materials.

(c) Subcontractor's Works.

(1) When a Contract Item of Extra Work is performed on a force account basis by a Subcontractor who is approved for this Extra Work by the Engineer, as may be required under GP-8.01, an amount equal to ten percent (10%) of the total cost shall be added to the final payment under GP-9.04 for such force account Extra Work and such amount of compensation shall be full and final compensation to the Contractor for the administration of the Extra Work performed by the Subcontractor under the force account basis.

(2) This additional ten percent (10%) compensation to the Contractor for administration shall only be allowed if the Extra Work requires particular trades or specialty work for which the Contractor is not prequalified, and not for Extra Work assigned to a Subcontractor for the convenience of the Contractor.

(d) Equipment. For any machinery or special Equipment approved by the Engineer for use on Extra Work (expressly excepting all small tools), including fuel and lubricants, the Contractor shall receive the rental rates and operating costs agreed upon in writing by the County and the Contractor in either the Contract or a Contract Modification before such Extra Work is begun by the Contractor for the actual time such Equipment is authorized on the Extra Work.

(1) Rental rate shall be based on the weekly rate converted into hours. To compute hourly rate use forty (40) hours per week.

(2) The rental rates and operating costs, including fuel and lubricant but excluding operators, for Extra Work shall be the current rates from the "Rental Rate Blue Book for Construction Equipment," published by the Equipment Guide Book Company and/or the "Rental Rate Blue Book for Older Construction Equipment." Both rental rate and operating rate will be subject to area adjustment per the "Rental Rate Blue Book for Construction Equipment." No other allowances or additions will be paid to the Contractor by the County.

(3) In the Engineer's discretion, rental rates will be applied to both idle time and actual operating time authorized by the Engineer, and operating rates will be applied to operating time only. Or, if the Engineer determines it to be in the County's best interest, standby rates shall apply when a piece of Equipment is required to remain on the Work site on standby status as authorized by the Engineer. For purposes of standby rates, when a unit of Equipment works for a portion of a day and is on standby for a portion, the total time allowed for rental rates shall not exceed eight (8) hours for that day and will be allowed for Working Days only. Standby rates shall be half of the normal hourly base rental rates without the operating expenses.

(4) Transportation costs of the Equipment directly attributable to force account Extra Work will be allowed. When it is necessary to obtain Equipment exclusively for force account Extra Work from sources beyond the Contract limits, the cost of transferring the Equipment to the Work site and return, including the use of any hauling unit, will only be allowed as an additional expense if the Contractor receives prior written approval from the Engineer.

(c) Superintendence/Use of Small Tools. No additional allowance shall be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided. For the purpose of definition under this GP-9.02, Equipment with a new cost of one thousand dollars (\$1,000) or less will be considered small tools.

(f) Compensation. The compensation provided for in this GP-9.02 shall be received by the Contractor as full and final payment, including, but not limited to, overhead and profit, for Extra Work, Change Order Work, and/or Contract Modification Work done on a force account basis. The Contractor may request partial payment for force account Extra Work prior to submitting final documentation under GP-9.02(g). Partial payment will be limited to fifty percent (50%) of the amount for the Extra Work fully and finally accomplished until all documentation has been received and approved by the County. The final force account payment request from the Contractor for any Extra Work will be subject to audit as specified in GP-7.36 "Retention of Records".

At the end of each applicable Day, the Contractor and the Engineer shall compare records of the cost of all Extra Work as ordered on a force account basis and mutually agree on a final record of the costs of Extra Work for that Day. This record must be signed by both the Engineer and the Contractor on a daily basis. Daily force account records for Extra Work performed and signed by a Subcontractor, must also be signed by the Contractor and the Engineer. Each party shall

retain a copy of these records as substantiation of all labor, Equipment, and Materials used by the Contractor and any of its Subcontractors in the performance of the force account Extra Work.

(g) Statements. No payment will be made by the County for Extra Work performed on a force account basis until the Contractor furnishes the Engineer with duplicate itemized statements of the cost of such force account Extra Work detailed as to the following:

(1) Name, classification, date, daily hours, total hours, rate, and extension for such laborer, or foreman.

(2) Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and Equipment.

(3) Quantities of Materials, prices and extensions.

(4) Transportation of Materials.

(5) Payments of items under this GP-9.02(g)(1) shall be accomplished by copies of certified payrolls. Under this GP-9.02(g)(2), original receipted invoices for rentals must be provided. GP-9.02(g)(3) and GP-9.02(g)(4) shall be accompanied by original receipted invoices for Materials used and related transportation charges. Any request for payment for force account Extra Work shall be submitted by the Contractor in strict compliance with this Section GP-9.02.

GP-9.03 PROGRESS PAYMENTS

(a) Current Estimates.

(1) **Lump Sum Contracts.** If requested by the Administration, the Contractor shall furnish an acceptable breakdown of the lump sum Contract price showing the amount included therein for each Pay Item of the Work. Said breakdown shall be in such detail so as to provide a basis for estimating monthly progress payments in connection with the Contract.

(2) **Monthly Estimates.** Except as otherwise stated in the Contract, each month the Administration will pay the Contractor for the Contract Work satisfactorily performed during the preceding calendar month, including Extra Work less five percent (5%). The five percent (5%) of the total Contract value retained by the Administration will not be released until final payment pursuant to GP-9.04 (unless partially released in a semi-final payment in the County's sole discretion). Current estimates will be based upon the Engineer's estimate of quantity (including Materials and/or Equipment complete in place) satisfactorily performed. In the instance of lump sum Contract Items, the Engineer's estimate shall be the proper fraction of the lump sum Contract Items satisfactorily performed during the preceding month. All quantities, estimates and fractions will be reasonably accurate approximations and are subject to correction (a) in subsequent current estimates, (b) in any semi-final estimate and, (c) in final payment. Any and/or all partial payments or monthly payments may be withheld in the event current requirements of the Contract Documents have not been complied with by the Contractor. Should

either the Engineer or the Contractor be of the opinion that any estimates, quantities and/or fractions (either as to an individual current estimate or accumulations thereof) do not represent a reasonably accurate approximation of actual Work satisfactorily performed, then details questioned shall be reviewed by the Engineer and then any corrections adjusted by the Engineer for in the next current estimate.

Deferred Monthly Payment. Should the amount(s) due the Contractor for any one month be less than five hundred dollars (\$500.00), payment will be deferred until such time as the amount(s) due the Contractor under subsequent estimates, combined with that month for which the amount(s) due was less than five hundred dollars (\$500.00), shall equal five hundred dollars (\$500.00) or more.

(b) Semi-Final Estimate Payments and Partial Semi-Final Estimate Payments.

(1) Semi-Final Estimate Payments. Upon Final Acceptance for Maintenance by the Administration of the Contract Work, pursuant to GP-5.13(b), the Administration, at the Contractor's request and with consent of the Contractor's Surety, will pay the Contractor, within forty-five (45) Calendar Days of said request, what is hereby known as a semi-final estimate payment. Such a semi-final estimate payment will be based upon (a) quantities the Administration has computed and set up as proposed final quantities and (b) a reasonably accurate estimate for those quantities for which the Administration has not yet completed computations. The quantities which the Administration sets forth as proposed final quantities shall be so designated. To arrive at the amount of semi-final estimate payment there shall be deducted from the apparent estimated value of the Contract (a) total of all amounts previously paid to the Contractor as current estimates and (b) sums deemed chargeable against the Contractor properly deductible, including liquidated damages, and as a retainage, an amount equal to two percent (2%) of the total Contract value or two thousand dollars (\$2,000), whichever is greater.

(2) Partial Semi-Final Estimate Payments. In cases where there has been Partial Acceptance for Maintenance for a majority of the Contract Work as determined in the County's sole discretion and there are remaining only inconsequential or minor Contract Items such as painting, seeding, mulching, or planting to be completed and such Contract Items cannot be completed for an extended period of time because of seasonal or weather conditions, the Administration, within forty-five (45) Days from the most recent Partial Acceptance for Maintenance, upon request of the Contractor and with consent of Surety, shall pay to the Contractor, what is hereby known as a partial semi-final estimate payment. Such a partial semi-final estimate payment will be based upon (a) quantities the Administration has computed and set up as proposed final quantities and (b) a reasonably accurate estimate for those quantities for which the Administration has not yet completed computations. The quantities which the Administration sets forth as proposed final quantities shall be so designated. To arrive at the amount of the partial semi-final estimate payment, there shall be deducted from the apparent estimated value of the Contract (a) total of all amounts previously paid to the Contractor as current estimates, and (b) sums deemed chargeable against the Contractor properly deductible, including liquidated damages, and as a retainage, a sum equal to two percent (2%) of the total value of the Contractor or two thousand dollars (\$2,000), whichever is greater.

GP-9.04 FINAL ACCEPTANCE AND FINAL PAYMENT

(a) When the Contractor believes it has completed a Contract, and there has been a Final Acceptance for Maintenance in accordance with the provisions of GP-5.13(b), the Engineer will promptly proceed:

- (1) To make any necessary final surveys;
- (2) To complete any necessary computation of quantities; and

(3) To submit to the Contractor, within sixty (60) Calendar Days after Final Acceptance for Maintenance of the Work by the Engineer, for the Contractor's consideration, a written tabulation of the proposed final quantities. This written tabulation shall be accompanied by a written statement setting forth, as applicable: (a) the Additional Work performed under Change Orders and/or Contract Modifications; (b) the County-authorized extension of Contract Time; (c) the number of Days which have been charged against the Contractor as having been used to complete the Contract; and/or (d) any deductions, charges or liquidated damages which have been made or imposed against the Contractor by the County.

(b) The Contractor shall then have a period of twenty (20) Calendar Days, dating from the date upon which it received the written tabulation from the Engineer under Section GP-9.04(a), in which:

(1) To decide whether or not the Contractor will accept final payment based upon the Engineer's written tabulation; and

(2) To notify the Engineer, in writing, of the Contractor's decision. The Contractor may request an additional period up to ten (10) Calendar Days in which to notify the Engineer of its decision. In the event the Contractor notifies the Engineer that it protests final payment based on the Engineer's written tabulation, that notification shall outline the reason(s) for said protest.

(c) Upon receipt of a notification of acceptance as provided for in GP-9.04(b)(1) above (or in the event of no response), the County shall prepare the final estimate and final payment forms and submit the final payment check to the Contractor. Such action by the County shall be deemed to constitute final payment for all Work under the Contract.

(d) If, under the provisions of GP-9.04(b)(2) above, the Contractor notifies the Engineer of its protest and nonacceptance of the Engineer's written tabulation, the Engineer shall pay the Contractor a semi-final estimate, or an additional semi-final estimate in the event a semi-final estimate has already been paid, based upon the Engineer's written tabulation, with deductions for all prior payments. A retainage equal to one and one-half percent (1.5%) of the total value of the Contract shall be withheld by the Engineer. The acceptance of such semi-final estimate, or additional semi-final estimate, shall not be considered as a waiver on the part of the Contractor of its right to pursue its protest and press for Full and Final Completion and final payment.

(e) In the event the Contractor does not accept the Engineer's tabulation from GP-9.04(a) above and/or has outstanding a claim filed in accordance with GP-5.14, the Engineer and the Contractor shall confer at mutually convenient times and endeavor to reconcile all points of disagreement expeditiously. If such reconciliation is accomplished, the Engineer will promptly proceed with final payment on the reconciled basis and in accordance with the provisions of GP-9.04(c) above. If reconciliation is not accomplished within thirty (30) Days, the decision of the Engineer shall be submitted to the Director with a copy to the County Office of Law, Attention: County Attorney, as a dispute in accordance with GP-5.15 "Disputes". The Contractor's failure to timely comply with the provisions of GP-5.15 shall constitute a waiver by the Contractor of its right under GP-5.15, and final payment may be made by the County based on the Engineer's recommendation.

(f) All prior partial estimates and payments shall be subject to correction by the Engineer at the time of final payment and if the Contractor has been previously overpaid, as determined by the Engineer, the amount of such overpayment shall be set forth in the final payment forms and the Contractor hereby agrees that it will reimburse the Administration for such overpayment within six (6) months of receipt of such notice by the Engineer, and the Contractor's Surety will not be granted release from obligations under the terms of the Contract until reimbursement has been made in full by the Contractor. It is further agreed that the County can withhold any overpayment from any other accounts due and payable to the Contractor under any County contract.

(g) Payment for the full apparent value of the Contract thus determined shall become due and payable to the Contractor within ninety (90) Days after Full and Final Completion of the Contract, as provided in GP-8.11. Contractor's acceptance of final payment shall be considered a general release of any, all, and every claim and/or dispute against the County arising out of, or in any way connected with, this Contract and the Work.

(h) Neither Full and Final Completion nor final payment nor any provision in the Contract shall relieve the Contractor of responsibility for faulty Materials and workmanship. Unless otherwise specified, the Contractor shall remedy any defects and pay for any damage to other Work resulting therefrom that appears within the applicable warranty period. The County shall give notice of observed defects to the Contractor with reasonable promptness.

GP-9.05 LATE PAYMENTS – Reserved.

GP-9.06 INTEREST

Notwithstanding any other provision in the Contract, the Contractor hereby waives the right to predecisional interest. For purposes of this GP-9.06 and the Contract, "predecisional" means a decision by any Engineer or the County Administrative Officer, or his designee, or a decision by any Person including but not limited to an administrative hearing officer. The Contractor shall only be entitled to postdecisional interest, and for purposes of this GP-9.06 and the Contract,

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“postdecisional” interest shall only begin to accrue, after the exhaustion of all administrative remedies and the rendering of a judgment by a court of competent jurisdiction.

GP-SECTION 10 PRIVATE CONTRACTS

GP-10.01 PRIVATE CONTRACTS

(a) A Private Contract is used in land development projects when, with the permission of the Director of the County Department of Permits, Approvals and Inspections, the Construction Contract is let by a developer and processed through the County. The applicable developer shall obtain the Bid privately and the cost estimates will be processed using County contract forms provided by the Department’s Division of Construction Contracts Administration or as approved by County for use with a UA and/or RA. No public funds may be used in a Private Contract. UA and RA are not governed by those provisions of these Standard Specifications which involve payment by developers to contractors.

(b) The following sections, as amended by the County, apply to Private Contracts:

- 107.03.02 (4)
- 204.03.07 B
- 1001.03.01(b)(2)
- 501.03.14
- 501.04.05
- 504.03.03 B
- 504.04

For Private Contracts, all references to the County (including Administration) in this GP-10.01 shall be construed to mean the developer as defined in the governing UA and/or RA in the Standard Specifications and in all references to making payments under the contract.

(c) IN ALL OTHER PORTIONS OF THESE STANDARD SPECIFICATIONS, REFERENCES TO THE COUNTY SHALL REMAIN UNCHANGED, WHETHER THE CONTRACT IS PUBLIC OR PRIVATE.

(d) Private Contracts may include fixed price Contingent Items to provide for certain contingencies encountered during Highway and utility Construction. If included in the Bid, unit prices shall be those established by the County.

- (1) Fixed Price Highway Contingent Items - Private Contract Only
See Section 109 of Category 100 “Preliminary”.
- (2) Fixed Price Utility Contingent Items - Private Contract Only
See Section 109 of Category 100 “Preliminary”.

- (3) Award and Execution of Contract - Private Contract Only [GP-3.03 Performance Bond and Payment Bond Requirements].

In GP-3.03(b) delete the words “twenty-five thousand dollars (\$25,000)” and substitute “two thousand dollars (\$2,000)”.

- (4) Unauthorized Work - Private Contracts Only [GP-4.08 Unauthorized Work].

Add the following new paragraph:

Any Work performed in excess of one hundred ten (110%) percent of the Private Contract Bid, or one hundred ten (110%) percent of the Private Contract Bid plus any Contract Modifications, between the developer and the Contractor, shall be considered unauthorized Work and shall not be paid for. The Contractor is advised to bring to the attention of the developer and the County, in writing, any impending overrun of the one hundred ten (110%) percent upset limitation at least two (2) weeks before having to stop work due to this limitation.

- (5) Interest - Private Contracts Only [GP-9.06 Interest].

Payment by the developer under GP-9.03(b)(1) “Semi- Final Estimate Payments” and GP-9.04 “Final Acceptance and Final Payment”, shall be due on receipt of the monthly estimates, semi-final estimates, and final estimates prepared by the Department and submitted to both parties in the amount shown as payable on this estimate. Any monies not paid within fifteen (15) Days of the date of such estimates shall bear interest at the rate of eighteen percent (18%) per annum. Interest shall be computed and invoiced by the Contractor and shall not be subject to a review or approval by the Department. However, the Department will not consider the developer’s Public Works Agreement obligations complete as long as the Contractor reports an outstanding indebtedness under the Private Contract.

- (6) Interim Acceptance - Development Bonds - Private Contract Only GP-9.03(b).

Add the following new paragraph:

When the Contractor postpones Road surfacing (during the course of completing a two-phased, 4-inch, paving section) its retainage shall be 2.0 percent after the bituminous Base Course has been accepted. Following a satisfactory re-inspection one (1) year after that acceptance, the retainage may be reduced to 0.0 percent.

GP 10.02 UTILITY/ROAD AGREEMENTS

These UA and/or RA are for projects wherein the applicant (developer, Persons, or property owners) constructs and installs improvements to utilities or Roads all at no cost to the County. The County Department of Permits, Approvals and Inspections (PAI), or any successor County department, in accordance with the applicable provisions of the County Code, as amended from

time to time, and the PAI Construction Policy Manual, approves the cost estimates and Construction Drawings and collects, except for County departments and agencies, the security and all fees. An applicant must provide to PAI, in writing, the name, address and phone number of an authorized Work site representative. The applicant must use a County prequalified Contractor who provides a certificate of insurance and performs the work in accordance with the Department's Standard Specifications and Standard Details in effect on the date of the Notice to Proceed. It is the applicant's responsibility to schedule an on-site pre-Construction meeting with the Department, the Department of Environmental Protection and Sustainability, or any successor County department, and the County prequalified Contractor. No Construction is to be performed prior to receiving a written Notice to Proceed from the Department.

**TC - SECTION 1
REFERENCES AND DEFINITIONS**

TC-1.03 **METRIC SYSTEM** – Reserved.

TC-1.04 **LANGUAGE** – Reserved.

**TC - SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS**

TC-2.01 **PROJECT CLASSIFICATION.**

The Administration will estimate the cost of the Contract and classify it within one cost group and letter designation as follows:

COST GROUP ESTIMATE	COST GROUP LETTER CLASS
Up to \$ 100 000	A
\$ 100 001 to \$ 500 000	B
\$ 500 001 to \$ 1 000 000	C
\$ 1 000 001 to \$ 2 500 000	D
\$ 2 500 001 to \$ 5 000 000	E
\$ 5 000 001 to \$ 10 000 000	F
\$ 10 000 001 to \$ 15 000 000	G
\$ 15 000 001 to \$ 30 000 000	H
\$ 30 000 001 to \$ 50 000 000	I
\$ 50 000 001 to \$ 75 000 000	J
\$ 75 000 001 to \$ 100 000 000	K
Over \$ 100 000 000	L

The letter designation will be published as part of the Bid Package.

TC-2.02 **IN-STATE PREFERENCE** – Reserved.

TC-2.03 **VALUE ENGINEERING CHANGE PROPOSALS.**

The Contractor may submit to the Engineer, in writing, value engineering change proposals (VECP) for modifying the Contract Documents for the purpose of reducing the total cost of Construction without reducing design capacity or quality of the finished product. The Engineer will then forward the VECP to the Department’s Chief of the Bureau of Engineering and

Construction with recommended action. The decision to accept or deny the VECP will be made by the Department's Chief of the Bureau of Engineering and Construction. The Department's Chief of the Bureau of Engineering and Construction will be the sole and final judge of the acceptability of a VECP. The County will not consider appeals once this final decision is made. If a VECP is accepted by the County, net savings resulting from that VECP will be equally divided by the County and the Contractor. The Contractor may elect to pursue one of the following options when submitting a VECP:

Option 1 - Submit revised Plans, Contract Documents and estimate of savings to reflect the VECP; or

Option 2 - Submit a written concept of the VECP for tentative approval and if accepted, submit the detailed Plans, Contract Documents, and estimate for final approval at a later date.

Each VECP shall result in a net savings to the Contract cost without impairing essential functions and characteristics of the Contract Items or of any other part of the Work, including but not limited to service life, reliability, economy of operation, ease of maintenance, desired aesthetics and safety.

As a minimum, the Contractor shall submit the following information before final approval of a VECP may be given:

- (a) A statement that the revised Plans, Contract Documents, and estimate of savings are submitted as a VECP.
- (b) A statement concerning the basis for the VECP and benefits to the County together with an itemization of the Contract Items and requirements affected by the VECP.
- (c) A statement describing in detail any and all potential impacts to public convenience and/or safety.
- (d) A detailed estimate of the cost under the existing Contract and under the VECP.
- (e) Plans, Contract Documents and recommendations as to how the VECP changes shall be accomplished.
- (f) A statement as to the time by which an Extra Work Order adopting the VECP must be issued so as to obtain the maximum cost effectiveness. Typically, the County will require at least four (4) weeks to review and approve a VECP.
- (g) A revised Baseline schedule showing the impact of the VECP, and including in that revised Baseline schedule a four (4) week allowance for the County's review of such VECP.
- (h) The Contractor's engineering cost for the VECP.

The County will process the VECP in the same manner as prescribed for any other Contract Modification which would necessitate issuance of an Extra Work Order. The County may accept in whole or in part any VECP by issuing an Extra Work Order which will identify the VECP on which it is based. The County will not be liable to the Contractor for failure to accept or act upon any VECP submitted pursuant to these requirements nor for any delays to the Work attributable to any VECP. Until a VECP is effected by a Contract Modification, the Contractor shall remain obligated to the terms and conditions of the existing Contract. If an executed Extra Work Order has not been issued by the date upon which the Contractor's VECP specifies that a decision thereon should be made, or any other date as the Contractor may subsequently have specified in writing, the VECP shall be deemed rejected. The Extra Work Order effecting the necessary Contract Modification will establish the net savings agreed upon, will provide for adjustment in the Contract prices and/or Contract Time and will indicate the net savings to be equally divided between the Contractor and the County. The Contractor's costs for preparation of the VECP and the County's costs to review and administer the VECP will be deducted from the gross savings. The County reserves the right to include in the Contract any conditions it deems appropriate for consideration, approval and implementation of the VECP. The Contractor's fifty (50%) percent share of the net savings shall constitute full compensation for effecting all changes pursuant to the Contract. Acceptance of the VECP and performance of the Work thereunder will not change the Contract Time, unless specifically provided for in the Contract Modification authorizing the VECP.

The County expressly reserves the right to adopt a VECP for general use in contracts administered by the County when it determines that the VECP is suitable for application to other contracts. VECPs identical or similar to previously submitted VECPs will be eligible for consideration and compensation under these provisions if such VECPs were not previously adopted for general application to other contracts administered by the County. When a VECP is adopted for general use, compensation pursuant to these requirements will be applied only to those contracts Awarded and for which the subject VECP has been submitted prior to the date of adoption of the specific VECP.

Proposed changes in the basic design of a Bridge or pavement type, or requiring modification to the Right-of-Way limits, will not normally be considered as an acceptable VECP. Quantity decreases or elimination of any Contract Items as a result of changing field conditions, errors, etc. will not be considered as an acceptable VECP. If a VECP is based upon or similar to a change in the Plans, Contract Documents or Special Provisions adopted by the County prior to submission of the VECP, the County will not accept the VECP.

These requirements apply to all VECPs initiated and developed by the Contractor and which are identified as such by the Contractor at the time of its submission to the Engineer; however, nothing herein shall be construed as requiring the Engineer to consider or approve a VECP submitted by the Contractor.

Subject to the provisions contained herein, the County or any other public agency shall have the right to use all or part of any accepted VECP on other contracts without obligation or compensation of any kind to the Contractor.

In the event a VECP is accepted by the County, the provisions of the Contract Documents which pertain to adjustment of Contract unit prices due to alterations of Contract quantities will not apply to the items adjusted or deleted as a result of effecting the VECP by Contract Modification.

TC-2.04 OWNER/OPERATOR.

For the purpose of labor compliance, the term "Owner/Operator" shall be defined as being the individual who owns and operates his/her own vehicle.

The prevailing wage rates shall not apply to a "Owner/Operator". However, they shall appear on the payroll of the Contractor or Subcontractor with the notation "Owner/Operator".

Employees of an "Owner/Operator" shall be subject to prevailing wage rates and shall appear on a certified payroll.

TC-2.05 DEBARMENT/SUSPENSION.

Pursuant to the emergency regulations which were approved by the AELR Committee of the State General Assembly on July 27, 1982, and which went into effect on July 28, 1982, the State Department of Transportation, State Highway Administration, pursuant to applicable laws and regulation, established a list of "Debarred or Suspended Contractors."

The current list of "Debarred or Suspended Contractors or Suppliers" is available at the Baltimore County Department of Public Works, 111 West Chesapeake Avenue, Room 300, Towson, Maryland 21204, for inspection by all interested parties.

**TC - SECTION 3
SCOPE OF WORK**

TC-3.01 GOVERNING ORDER OF CONTRACT – Reserved.

TC-3.02 CONSTRUCTION DOCUMENTS TO SUCCESSFUL BIDDER – Reserved.

TC-3.03 CONTINGENT ITEMS – Reserved.

TC-3.04 WARRANTY OF CONSTRUCTION – Reserved.

TC-3.05 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK SITE.

The Contractor may use on the Contract any excavated stone, gravel, sand or other Material found on the Work site that conforms to the requirements of the Contract Documents and are approved by the Engineer.

When these Materials are used for select, capping, modified, or common borrow and conform to the pertinent Contract provisions and Contract Documents, payment will only be made at the Contract unit price for the class of excavation from which the Materials are obtained.

In the event these Materials are processed through a crushing, screening, washing or sorting plant for use as another Pay Item, the Contractor will be paid both for the excavation of such Materials at the Contract unit price and at the Contract unit price for which the Material is used. The Contractor shall replace at its own expense with other acceptable Material all of the portion of the excavated Material removed and used which was needed for use in the embankments, backfills, approaches or otherwise.

If, however, these Materials are not processed and paid for as described in the preceding paragraph, and their use creates a shortage of embankment or other Material, the Contractor shall provide acceptable replacement Material for all Material needed for embankment, backfill, approaches or otherwise.

The replacement Material shall be paid for at the Contract unit price Bid for the Contract Item that the Class I Excavation is used for, or the Contract unit price Bid for Class I Excavation, whichever is the lowest Contract unit price Bid.

The Contractor shall not excavate nor remove any Material which is not within the limits of excavation, as indicated by the Slope and grade lines, without written authorization from the Engineer.

TC-3.06 SAFETY HAZARDS IN CONFINED SPACES – Reserved.

TC - SECTION 4 CONTROL OF WORK

TC-4.01 WORKING DRAWINGS.

(a) **General.** The Plans will be supplemented by Working Drawings as necessary to adequately control the Work. All alterations affecting the requirements and information given on the Working Drawings shall be authorized in writing to the Engineer. When at any time reference is made to the Working Drawings, the interpretation shall be the Working Drawings as affected by all authorized alterations then in effect.

Working Drawings will show details of all Structures, lines, grades, typical cross section of Roadway, general cross sections, location and designation of all units and elements.

The Contractor shall provide, at the Contractor's expense, all required Working Drawings and shall have them adequately checked, after which they shall be submitted to the Engineer for review. The Engineer may reject Working Drawings and return them for revisions, in which case the Contractor shall submit revised Working Drawings as required. No Contract Items involving the Working Drawings shall be incorporated into the Work until those Working Drawings have been accepted for use by the Engineer; however, acceptance shall not relieve the Contractor of any responsibility in connection therewith. All Working Drawings shall be furnished in duplicate for preliminary examination for Contracts prepared by the Administration and in triplicate for Contracts prepared by consultant engineering firms for the Administration. After Working Drawings have been accepted for use by the Engineer, the Contractor shall furnish additional copies as requested.

All Working Drawings shall be on sheets measuring twenty-two inches (22") by thirty-six inches (36") or as required by the Engineer and shall have a standard title block at the lower right corner approximately four inches (4") by eight inches (8") (two inches (2") for the revision column on the left side and the remaining six inches (6") for the title) indicating the following information in the order named:

- Name of Contractor (and Subcontractor, if applicable)
- Address of Contractor (and Subcontractor, if applicable)
- Sheet Title (Reinforcement Details, etc.)
- Name of Structure Crossing
- For (Baltimore County)
- By (Indicate name of Contractor's official or engineer, or other parties authorized to sign official documents.)

All Working Drawings shall list all County Contract Numbers, complete federal aid number, if any, and the date the Working Drawing was completed. The left portion of the title block shall be headed "Revisions" and the space used as needed.

Working Drawings for standard scuppers are not required. A sketch or statement specifying the type and number of standard scuppers required and the length of the downspout is acceptable.

(b) Working Drawings for Falsework Systems. Falsework systems Plans (design and Construction) shall be the responsibility of the Contractor, including submitting and obtaining written acceptance of the design and Plans by the Engineer before erection. The Contractor shall utilize a professional engineer (P.E.) registered in the State who has a minimum of five (5) years experience in falsework design for Bridge Construction and Repair. The falsework design calculations and Plans shall be signed by the P.E. and bear the seal of the P.E. The submittal of the design and falsework Plans shall include the P.E.'s resume showing evidence of the required experience.

The P.E.'s Plans and design calculations shall evaluate and qualify all products and components including manufactured products and proprietary items for their intended service. Acceptance by the Engineer of falsework systems shall not in any way relieve the Contractor of the responsibility for the safety and adequacy of the design and Construction for the falsework

systems and operations, including all components. Every Structure in the Contract will require a separate falsework design analysis, separate Plans, and separate design submittals as set forth above. This applies even though Structures may appear to be identical.

Each falsework system shall be designed to have the capacity to support all vertical and horizontal loading with enough redundancy to prevent progressive failure. Vertical loading, differential settlement forces, live load where applicable and all horizontal lateral and longitudinal forces shall be taken into account. Unbalanced temporary loading caused by placement sequence shall also be provided for in the design. Adequate diagonal bracing in all planes shall be employed.

All falsework systems designs and Plans shall provide for adequate foundations with bearings below the frost line or on rock or on piling and for possible settlement. If additional subsurface data is necessary, it shall be obtained and analyzed by the Contractor for proper design of the Plans and performance of Construction.

Falsework designs and Plans shall include protection against impact from uncontrolled Highway vehicles, accidental collision of a crane boom or other Construction Equipment and vehicles, traffic vibration, flood waters, high winds and any other envisioned contingent situations.

TC-4.02 FAILURE TO ADEQUATELY MAINTAIN PROJECT – Reserved.

TC-4.03 USE PRIOR TO COMPLETION – Reserved.

TC-4.04 WORK SUSPENSION – Reserved.

TC - SECTION 5 LEGAL RELATIONS AND PROGRESS

TC-5.01 INSURANCE – Reserved.

TC-5.02 NOTICE TO PROCEED – Reserved.

TC-5.03 SUBCONTRACTORS – Reserved.

TC-5.04 CULTURAL RESOURCES – Reserved.

TC-5.05 DETERMINATION AND EXTENSION OF CONTRACT TIME – Reserved.

**TC - SECTION 6
RESTRICTIONS AND PERMITS**

TC-6.01 MOVING OF EQUIPMENT.

(a) The Contractor will not be permitted to move over or operate on any Road (except on the Road under Construction) any power shovels, rollers, concrete mixers, cranes, tractors or any other heavy Equipment of weight or dimensions in excess of State Motor Vehicle Law or Administration's regulations without first obtaining the applicable permit. In case of permits for oversize and overweight vehicle movements, attention is directed to State Motor Vehicle Laws requiring the Administration to collect a fee on every such vehicle movement using Highways of the State. The payment of and securing of such permit is required irrespective of whether the movement is in connection with a subject Contract or for other purposes.

(b) The Contractor shall adhere to all State and local laws and regulations including but not limited to all State Motor Vehicle Laws and safety regulations.

TC-6.02 RESTORATION OF SURFACES OPENED BY PERMIT.

The right to construct or reconstruct any utility in a County Highway or to grant permits for same at any time is reserved by the Administration.

Upon the presentation of a duly authorized and satisfactory permit which provides that all necessary Repair Work shall be paid for by the party to whom such permit is issued, the Contractor shall allow parties bearing such permits to make openings in a County Highway.

The Contractor shall, when ordered by the Engineer, make in an acceptable manner all necessary Repairs due to such openings, and such necessary Work will be paid for as Extra Work, as provided in these Standard Specifications, and will be subject to the same conditions as original Work performed.

TC-6.03 RAILROAD HIGHWAY GRADE CROSSINGS AND SEPARATIONS.

When the Contractor is required to haul Materials across the tracks of any railroad, or elects to do so, the Contractor shall coordinate with and make arrangements with that railroad for any new private crossings or for the use of any existing private crossing in accordance with the terms and conditions of any permit issued by the applicable railroad.

All Work to be performed by the Contractor in the Construction of railroad-Highway separation Structures on the railroad right-of-way shall be done in a manner satisfactory to the railroad company and shall be performed at such times and in such manner as not to unnecessarily interfere with the movement of trains or traffic upon the tracks of the railroad company. The Contractor shall use care and precaution in order to avoid accidents, damage, or unnecessary delay or interference with the railroad company's trains or other property. In addition to the insurance specified in GP-7.14 and when Work covered under the Contract is to be performed on

or about the rails of a railroad's tracks, the Contractor shall be required to carry Contractor and railroad public liability and property damage insurance as specified in the Contract Documents and/or required by the applicable railroad.

Prospective Bidders on Contracts crossing railroad right-of-way are advised that the railroad company will require the Contractor to obtain, pay for and have approved by the railroad, certain railroad forms of public liability and property damage insurance policies before entering upon the railroad property. Details of such policies may be set forth in the Contract Documents; but in case of omission from the Contract Documents, the Contractor shall and is required to communicate with the railroad to ascertain the type of insurance required, if any, and make provisions for same in its Bid.

Unless otherwise specified, cost for the insurance policies whether described in the Contract Documents or ascertained by the Contractor will not be paid for by the County. The cost for any and all insurance related to a railroad company will be incidental to the other Contract Items specified in the Contract Documents and be the sole responsibility of the Contractor.

All Work on portions of Structures over railroad right-of-way shall conform to all rules and regulations of the owners of the right-of-way, including, but not limited to, any applicable railroad company. The Contractor is responsible for acquiring full knowledge of these rules and regulations and complying therewith to the satisfaction of the owners of the railroad right-of-way, including, but not limited to, any applicable railroad company.

TC-6.04 BRIDGES AND OTHER WORK IN OR OVER WATERS OF THE STATE.

All Work in, on or over waters under control of the United States Department of the Army and the Environmental Protection Agency of the United States shall conform to all applicable federal permits, rules and regulations. All such rules and regulations are hereby part of and incorporated into the Contract. The Contractor is cautioned and charged with the responsibility of obtaining complete knowledge thereof and compliance therewith.

The Contractor shall also comply with the provisions of all other applicable federal, State and local laws, permits, rules and regulations, and shall be knowledgeable of any and all pertinent laws and regulations of the State Department of Natural Resources and Maryland Department of Environment. All such laws, permits, rules and regulations are also hereby part of the Contract.

TC-6.05 USE OF EXPLOSIVES.

All blasting operations, including the storage and handling of explosives and blasting agents, shall be performed in conformance with the applicable provisions of the Standard Specifications and all other pertinent federal, State, and local laws and regulations. Whenever explosives are used, they shall be of such character and in such amount as is permitted by the State and local laws and ordinances and all respective agencies having jurisdiction over them.

The Engineer will at all times have the authority to prohibit or halt the Contractor's blasting operations if it is apparent that, through the methods being employed, the required results are not

being obtained, an unstable condition exists, or the safety and convenience of the public is being jeopardized. The Contractor shall not damage any adjacent property or Structures. A pre-blasting and post-blasting survey inspection is required to be performed by the Contractor.

(a) **Blasting Plan Required.** Not less than two (2) weeks prior to commencing drilling and blasting operations, or at any time the Contractor proposes to change the drilling and blasting methods, the Contractor shall submit a blasting plan to the Engineer for review. The blasting plan shall contain the full details of the drilling and blasting patterns and controls the Contractor proposes to use. The blasting plan submittal is for quality control and record keeping purposes.

Review of the blasting plan by the Engineer shall not relieve the Contractor of the responsibility for the accuracy and adequacy of the plan when implemented in the field. If at any time during the progress of the Work the method of drilling and blasting does not produce the desired result, the Contractor shall submit a revised blasting plan until a technique is arrived at that shall produce the desired results.

(b) **Responsibility.** Control of blasting is a major responsibility of the Contractor. The Contractor shall execute vibration control and shall at all times be responsible for damage caused by vibrations due to blasting or any of the Contractor's other operations.

(c) **Extraordinary care.** When the use of explosives is necessary for the prosecution of the Work, the Contractor shall use extraordinary care so as not to endanger life or property. Before the firing of any blast in areas where flying rock may result in personal injury or unacceptable damage to property or the Work, the rock to be blasted shall be covered with approved blasting mats, soil, or other equally serviceable material, to prevent flyrock.

(d) **Safeguard of Public.** The Contractor must safeguard the traveling public during dynamiting operations. The Contractor shall use enough watchmen, flagmen, signs, etc. to warn the public including, but not limited to, motorists and pedestrians during blasting.

(e) **Storage.** The Contractor shall store all explosives in a secure manner and shall clearly mark storage places "DANGEROUS - EXPLOSIVES". The storage places must be in the care of competent watchmen at all times and all explosives shall be stored and handled according to the provisions of the statutes of the State and local laws and ordinances.

(f) **Permits & Insurance.** Before any blasting is done, the Contractor shall apply for and obtain a blasting permit from the applicable governing authority. Insurance shall be maintained and certified as specified in GP-7.14.

(g) **Protection of Underground Utilities.**

(1) The Contractor shall ensure the protection of underground utilities. The Contractor shall notify each public utility company and those applicable Utility Companies having Structures close to the site of Work of the Contractor's intentions to use explosives. The notice must be given far enough in advance to enable all Persons and the Utility Companies to take such steps as they deem necessary to protect their property from injury. Such notice does

not relieve the Contractor of responsibility for any damage resulting from Contractor's blasting operations.

(2) At and below the elevation of the top of the buried utility line, the vertical depth of blast holes shall be restricted to one-half the horizontal distance to the closest portion of the utility. The blast hole shall be restricted to a maximum of three inches (3"), with no more than one hole per delay.

(h) **Peak Particle Velocity.** When blasting has to be done next to a Structure, the Contractor shall ensure that the "Peak Particle Velocity" at the Structure does not exceed 0.50 inches/second for frequencies less than 40 Hz. The "Peak Particle Velocity" is the maximum of the three-velocity components measured at a point with a three-component vibration recording instrument capable of producing a permanent record.

(i) **Maximum charge weight.** If a scaled distance, as defined below, of seventy (70) or greater is used with minimum delays of ten (10) milliseconds, the following formula may be used to determine the maximum charge weight per delay which can be used without seismic instrumentation:

$$\text{Scaled Distance} = \text{Actual Distance to Damage Point in Feet} (\text{Charge Weight in Pounds per delay})^{1/2}$$

$$\text{Charge Weight in} = (\text{Actual Distance to Damage Point in feet})^2 \text{ pounds per Delay} (\text{Scaled Distance})^2$$

(j) **Blast holes.** Blast holes are to be limited to three inches (3") in diameter. Prepackaged material only shall be used with no free flowing explosive permitted.

(k) **Use of Explosives Within State Road Right-of-Way.**

(1) The use of explosives is not permitted within rights-of-way of the State Highway Administration (SHA) except when specifically allowed under a SHA permit or by amendment of the same. The Contractor shall conduct and perform all blasting operations according to the permit and/or any addenda issued.

(2) Before using any explosives, notify the following office:

Utility Division
Maryland State Highway Administration
District No. 4
320 West Warren Road
Hunt Valley, Maryland 21030
Telephone (410) 229-2300

(l) Each blasting shall be seismographically recorded by the Contractor and the Contractor shall send a copy of the report to the SHA Highway District Utility Engineer at the above

address.

(m) Use of explosives. The use of explosives is not permitted within railroad rights-of-ways except when specifically allowed under a railroad permit or by amendment of the same. All blasting operations shall be conducted and performed according to the permit and/or any addenda issued.

(n) Payment for blasting. Payment of all blasting operations, control measures and monitoring systems shall be included in the unit price Bid for each Contract Item for which blasting is required.

TC-6.06 AERIAL ELECTRIC LINES (750 VOLTS OR MORE).

The Contractor shall be aware that State law requires that a ten foot (10') radial clearance shall be maintained for all Construction Equipment and Materials in relation to electric lines carrying seven hundred fifty (750) volts or more. Because the State law is more stringent than the federal laws, the State law shall be considered the minimal distance.

The Contractor shall also be aware of, and comply with, all other federal, State, County and local laws, utility company requirements and regulations, as specified in GP-7.01 "Compliance With Laws".

TC-6.07 LOAD AND SPEED LIMITATIONS – Reserved.

TC-6.08 HAZARDOUS MATERIAL.

If the Contractor encounters or exposes during Construction any abnormal conditions which indicate the presence of a hazardous material or toxic waste, Work in the area shall immediately be suspended and the Engineer notified in writing. The Contractor's operations in this area shall not resume until permitted in writing by the Engineer; however, the Contractor may continue working in other areas of the Work site, unless directed otherwise.

Abnormal conditions shall include, but not be limited to, the presence of barrels, obnoxious or unusual odors, excessively hot earth, smoke, or any other condition which could be a possible indicator of hazardous material or toxic waste.

Disposition of the hazardous material or toxic waste shall be made in conformance with all applicable laws, requirements and regulations. Where the Contractor performs necessary Work required to dispose of these Materials and no Contract Items have been identified in the Contract Documents, the Work shall be performed under an Extra Work Order.

For any Material furnished in connection with the Contract and/or on the Work site by the Contractor that is suspected to be hazardous or toxic, the Engineer may require the Contractor to have it tested and certified to be in conformance with all applicable requirements and regulations. Material found to be hazardous or toxic shall not be incorporated into the Work.

The required testing will be determined by the Engineer and may include, but not be limited to, the EPA Toxicity Characteristic Leaching Procedure (TCLP) or its successor. The evaluation and interpretation of the test data will be made by the Engineer. Testing and Certification shall be at the Contractor's sole expense.

TC-6.09 RECYCLED OR REHANDLED MATERIALS.

For recycled or rehandled Material furnished on the Work site by the Contractor for use in embankment, base, Subbase or drainage media, the Engineer may require the Contractor to have the Material tested and certified to be in conformance with all applicable environmental requirements. The required testing will be determined by the Engineer and may include, but not be limited to, the EPA Toxicity Characteristic Leaching Procedure (TCLP) or its successor. The evaluation and interpretation of the test data will be made by the Engineer and be based on the Work site environment. Testing and Certification shall be at the Contractor's sole expense.

TC-6.10 CONSTRUCTION AND WASTE MATERIAL.

All wood, trash, debris, and other foreign matter shall be removed from within the Right-of-Way limits and disposed of by the Contractor. The Contractor shall make all necessary arrangements to obtain suitable disposal locations at the Contractor's sole expense. Disposal shall be in conformance with all federal, State and local ordinances.

**TC - SECTION 7
PAYMENT**

TC-7.01 MEASUREMENT OF QUANTITIES – Reserved.

TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS – Reserved.

TC-7.03 FORCE ACCOUNT WORK – Reserved.

TC-7.04 PROGRESS PAYMENTS – Reserved.

TC-7.05 FINAL ACCEPTANCE AND FINAL PAYMENT– Reserved.

TC-7.06 LATE PAYMENTS – Reserved.

351.03.10 Chlorination, Bacteriological, Hydrostatic and Leakage Tests.

(b) Water Samples. Baltimore City Bureau of Water and Wastewater will perform bacteriological testing for the disinfection of water mains and storage facilities according to ANSI/AWWA C651, Section 5.1.1, 5.1.2, 5.1.4, and 5.2. It is required that two consecutive sets of samples be taken at least 24 hours apart and deemed acceptable by bacteriological standards before a water main or storage facility can be placed into service.

The engineer will collect water samples and provide for their analysis for bacteriological quality. Samples must arrive at the Water Quality Lab no later than 6 hours after being taken. Because bacteriological analysis will be run on samples received in the lab by 1:00 pm, all field sampling must be completed by 12:00 noon. Results will be available after 3:00 pm the following day, as the results require a full 24 hour incubation period.

MAINTENANCE BOND

Per the Baltimore County Department of Public Works Standard Specifications for Construction and Materials, Section GP -4 .10 (C) of the Errata Addenda states, the contractor is required to post a maintenance bond in the amount of five (5) percent of the total cost of the contract or withhold five (5) percent retainage for two (2) years from the date of Final Acceptance. Maintenance Bond forms are located within this Errata Addenda.

BALTIMORE COUNTY, MARYLAND

BOND NO. _____

CONTRACT NO. _____

MAINTENANCE BOND

THIS MAINTENANCE BOND is entered into on this _____ day of _____, 20____, by and between _____ as principal ("Principal") and _____, a business entity that is authorized to transact business in the State of Maryland and is organized and existing under the laws of the State of _____, as surety ("Surety"), are held and firmly bound unto Baltimore County, Maryland, a body corporate and politic of the State of Maryland ("County"), as Obligee.

WHEREAS, the above-named Principal has entered into a written contract known as _____ No. _____ dated _____, 20__ with Obligee for _____ (the "Agreement"), the terms of which are hereby incorporated by reference; and

WHEREAS, Principal has completed construction under the Agreement; and

WHEREAS, the Agreement includes a warranty on the quality of the Work performed that runs for a period of two (2) years from the date of the County's final acceptance and that runs for two (2) additional years beyond the repair date if any repair is done during the warranty period; and

WHEREAS, Principal is required to cause this instrument to be executed and delivered to Obligee as security for maintenance during the warranty period in an amount equal to 5% of the total value of the Contract.

NOW, THEREFORE, the Principal and Surety are held and firmly bound unto the Obligee in the sum of \$_____ Dollars (\$ _____), lawful money of the United States of America, for the payment of which sum of money the Principal and Surety do bind themselves and their personal representatives, legal representatives, successors, and assigns, jointly and severally, firmly by this maintenance bond.

The conditions of this bond are as follows:

1. The Principal shall, for a period of two (2) years from and after the date of completion and acceptance of same by Obligee, replace all defects arising in the Work, whether resulting from defective materials, equipment, design furnished or workmanship. After such period, this obligation shall be null and void; otherwise it shall remain in full force and effect.

2. In the event of a default on the part of the Principal that may be the subject of a claim under this bond, Obligee shall mail, by certified mail, to Surety at the address listed below, a written statement that a claim is being made under the bond and, with substantial accuracy, the amount of the claim. Surety shall have no obligation to Obligee under this bond until the notice of claim is mailed.
3. When the Obligee has satisfied the condition of Paragraph 2 that a notice of claim be mailed, the Surety shall promptly and at the Surety's expense send an answer to Obligee within 30 days after the date of the claim. The answer shall state the amounts that are undisputed and the basis for challenging any amounts that are disputed. The answer shall be accompanied by payment (or arrangements for immediate payment) of any undisputed amounts.
4. Surety expressly waives any right to receive notice of extensions of time or alterations or modifications to the Agreement that may be granted by Obligee and agreed upon by Principal, and any such extensions, alterations, or modifications shall not affect the obligation of the Surety under this bond.
5. This bond is a specialty governed by the twelve-year statute of limitations period set forth in the Annotated Code of Maryland Courts and Judicial Proceedings §5-102.

WITNESS OR ATTEST:

(Principal – Contractor Name)

By: _____

Type Name: _____

Type Title: _____

Date: _____

(Surety)

By: _____

Type Name: _____

Type Title: _____

Type Address: _____

Date: _____

**SPECIAL PROVISIONS
BIDDER PROTEST AND APPEAL
DPW CONSTRUCTION CONTRACTS**

STEP 1A – Bidder Protest of Award

Bidder must file a written bid protest pursuant to Section GP-2.23 of the Standard Specifications – see below. *A bid protest must be in writing and filed with the Engineer.*

Oral objections, whether or not acted on, are not protests.

(a) Time for Filing.

(1) A bid protest shall be filed not later than three (3) business days after the date of award.

(2) A protest based on alleged improprieties in the solicitation which are apparent before the bid opening or the closing date for receipt of initial proposals shall be filed not later than five (5) business days before the opening date.

(b) Content of Written Protest.

(1) Name and address of protestor.

(2) Bid or Contract number.

(3) Reasons for protest.

(4) Supporting exhibits, evidence or documents to support claim.

STEP 1B – Bidder Protest of Bid Rejection

Bidder must file a written bid protest with the Engineer not later than three (3) business days from the date of the bid rejection. Oral objections, whether or not acted on, are not protests. The written bid protest must comply with Section GP-2.23(b) of the Standard Specifications.

STEP 2 – DPW Response to Bidder Protest

The Department of Public Works (DPW), Chief of Division of Construction Contracts Administration will review the bidder's protest and respond to the bidder in writing within ten (10) working days of receipt of protest.

STEP 3 – Bidder Appeal

Bidder may appeal the decision by the Chief of Division of Construction Contracts Administration (a) to the Director of the Office of Budget & Finance for all MBE/WBE-related protests or (b) to the Director of Public Works for all other protests.

Bidder must file a written appeal with the relevant Director not later than three (3) business days from the date of the DPW Response in Step 2. Oral objections, whether or not acted on, are not appeals. The appeal must comply with Section GP-2.23(b) of the Standard Specifications, but may include any additional documentation as deemed necessary and appropriate by the bidder.

STEP 4 – Director Response to Bidder Appeal

The Director of the Office of Budget & Finance or the Director of Public Works will review the bidder's appeal and respond to the bidder in writing within fifteen (15) working days of receipt of appeal.

STEP 5 – Second Bidder Appeal

Bidder may appeal the decision by the Director of the Office of Budget & Finance or the Director of Public Works to the County Administrative Officer (CAO).

Bidder must file a written appeal with the CAO not later than three (3) business days from the date of the Director Response in Step 4. Oral objections, whether or not acted on, are not appeals. The appeal must comply with Section GP-2.23(b) of the Standard Specifications, but may include any additional documentation as deemed necessary and appropriate by the bidder.

STEP 6 – CAO Response to Bidder Appeal

The CAO, or his duly authorized designee, will review the bidder's appeal and respond to the bidder in writing within Twenty (20) Working days of receipt of appeal. The CAO's, or his duly authorized designee's, written decision is final and binding.

SPECIAL PROVISIONS

**Stemmers Run Sewage Pumping Station Electrical Upgrades
Baltimore County, Maryland
J.O. 231-201-0090-9149**

FOR

**BALTIMORE COUNTY
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION**



A handwritten signature in blue ink that reads "John D. Morsberger". The signature is written over a horizontal line.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 31024 Expiration Date: 10/17/2024

MAY 2023

Prepared By:



700 East Pratt Street, Suite 500
Baltimore, Maryland 21202

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SECTION 01000

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. These Special Provisions are hereby made a part of the Contract. In case of any conflict with the 2000 edition of Baltimore County's Standard Specifications for Construction and Materials, General Provisions, or other sections of the Contract, these Special Provisions shall govern.
- B. All work to be performed under this Contract shall be done in strict compliance with the 2000 edition of Baltimore County's Standard Specifications for Construction and Materials and Standard Details for Construction as amended, of either Baltimore County or the State Highway Administration, insofar as the same may be applicable except as modified herein.

1.02 DESCRIPTION OF WORK

A. WORK COVERED BY CONTRACT DOCUMENTS

- 1. The work to be done under this Contract includes furnishing all labor, materials and equipment and performing all work required for the construction of the Stemmers Run Sewage Pumping Station Electrical Upgrades complete in place, and ready to operate.
- 2. The work under this Contract for the Stemmers Run SPS includes, but is not limited to, cast-in-place concrete, painting, replacement of the pump control actuators and associated controls with hydro-electric actuators and main control panels, retrofit switchgear, replace switchgear main-tie-main, transfer control PLC, remove existing switchgear section containing single breaker feeding VFD bus system and replace with a two-high section with two individual drawout VFD feeder breakers for two of the pumps, remove existing switchgear section containing I-Line power distribution panel and replace with a two-high section with two individual drawout VFD feeder breakers for the other two pumps, add switchgear sections to both ends of the existing lineup for 480V power distribution, provide a breaker on each side of the bus tie in the new distribution sections to feed the existing MCC, provide an ATS to select and auto-transfer between the redundant feeds from the switchgear for the existing MCC, replace switchgear surge protective devices, provide all required temporary power, remove and replace four existing VFDs (each including RVSS bypass), remove existing distribution bus above VFDs and replace with individual feeders from switchgear to each VFD, replace all monitoring, alarming and control I/O wiring in new conduit from each VFD to valve control panels and PCP,

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remove existing temperature monitoring panel and provide temperature monitoring in new VFDs, and all other work required to complete the sewage pumping station electrical upgrades. The work includes all requirements to provide a fully finished and operable pumping station facility including miscellaneous items and operations as shall be indicated, shown, specified or required to complete the work in strict conformity with the Contract Documents. The work also includes all specified, indicated and shown mechanical and electrical equipment, appliances, appurtenances, furnishings, instrumentation and controls, accessories, tests and sundry parts and material as shall be necessary and required for a completely operable installation satisfactory to the Engineer.

3. The Drawings and written Contract Documents are intended to indicate as clearly as practicable the work to be done. The Contractor must realize, however, that construction details cannot always be accurately anticipated and that in executing the work, field conditions may require reasonable modifications in the details of the Drawings and the work involved. Work under the Contract shall be carried out to meet these field conditions to the satisfaction of the Engineer and in strict conformance with his instructions, the Drawings, the Special Provisions, conditions and covenants of the Contract Documents in accordance with their true intent and full meaning.

1.03 FAILURE TO COMPLETE WORK ON TIME

- A. Should the Contractor fail to complete fully and to all intents and purposes the work as specified in the proposal and Contract on or before the time specified, the said Contractor shall pay the County such sum as is specified in the proposal.

1.04 FORCE MAJEURE

- A. "Force Majeure" means, for the purposes of this Contract, an event arising from causes beyond the control of the Contractor and County which delays or prevents the performance of any obligation under this contract. Unanticipated or changed financial circumstances of the Contractor shall not, in any event, be considered a Force Majeure event.
- B. The Contractor shall file written notice to the County within fifteen (15) calendar days after the Force Majeure event is known or should have been known to the Contractor, whichever is earlier. The Contractor's written notice shall include, but not be limited to, a description of the event and an explanation of the reasons for the delay, the anticipated duration of the delay, all actions taken or to be taken to prevent or mitigate the delay or the effect of the delay, the timetable by which those measures will be implemented, whether the Contractor claims that the delay should be excused as a Force Majeure event, and the Contractor's rationale for attributing such delay to a Force Majeure event if the Contractor intends to assert such a claim. Furthermore, the Contractor is required to state what steps are being taken to ensure completion and shall supply any and all documentation available to show

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what steps have already been taken. Contractor shall also comply with all other County statutes, regulations and requirements in connection with any such matter.

- C. If a delay of performance is, or was, caused, in the sole discretion of the County, by a Force Majeure event, the time for performance of the construction shall be extended for a period to compensate for the delay resulting from such event. Extensions of a completion date based on a particular event shall not automatically extend any other completion date under this Contract. The Contractor will make a showing of proof by a preponderance of the evidence that the Force Majeure event was the cause of the delay in performance for each requirement or completion date for which an extension is sought. In the event of a dispute regarding application of this Special Provision to a delay in performance, the Contractor shall comply with all County statutes, regulations, and requirements and shall have the burden of proving by preponderance of the evidence that the delay is, or was, caused by a Force Majeure event, and that the amount of additional time requested is necessary to compensate for that event.
- D. The Contractor is also notified that copies of any reports, plans, permits, and documents related to this Contract shall be maintained for a period of 5 years from the date of Notice of Award.

1.05 DAMAGES

- A. The Contractor understands that TIME IS OF THE ESSENCE UNDER THIS CONTRACT. In the event the Contractor fails to achieve Final Completion and Final Acceptance (as defined in the Specifications) as required by this Contract then the Contractor shall pay the County the sum of One Thousand Five Hundred Dollars (\$1,500.00) for each Calendar Day (Day 1-30) after the expiration of the Contract Period and Two Thousand Dollars (\$2,000.00) for each Calendar Day (Day 31 through 60) after the expiration of the Contract Period and Two Thousand Seven Hundred and Fifty Dollars (\$2,750.00) for each Calendar Day (Day 61 and thereafter) thereafter until the Contractor achieves Final Completion and Final Acceptance of the Project. The Contractor agrees that:
 - 1. These Liquidated Damages are a reasonable estimate of the County's damages solely due to the public's loss of use of the Project during the delay period and are not a penalty.
 - 2. It is very difficult, if not impossible, to accurately measure the damages to the County due to the public loss of use of the Project during the delay period.
 - 3. Notwithstanding GP 8.09 of the Baltimore County Standard Specification for Construction, in addition to the damages due to the public's loss of use of the Project during the delay period, the County is likely to incur additional direct costs during the delay period, including but not limited to, costs for construction management, consultants, architectural services, office trailer and supplies, utilities, County employees' time, County vehicles, and such

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other costs that the County will incur to continue administration of the construction and the Contract during the delay period, all which will be monitored by the County, and if so required by the County, the Contractor shall pay such actual damages incurred during the delay period. THE PARTIES HERETO UNDERSTAND AND AGREE THAT CONTRACTOR'S OBLIGATION TO PAY THE COUNTY FOR ACTUAL DAMAGES DURING THE DELAY PERIOD SHALL BE IN ADDITION TO THE CONTRACTOR'S OBLIGATION TO PAY THE LIQUIDATED DAMAGES DUE TO THE PUBLIC'S LOSS OF USE OF THE PROJECT.

4. The County shall have the right, but not the obligation, to deduct the Liquidated Damages due to the public's loss of use of the Project, and the County's actual costs and costs to continue administration of the construction and the Contract, from any monies due or any monies that may become due to the Contractor.

1.06 TEMPORARY SERVICES

- A. The Contractor shall provide, subject to the approval of the Engineer, and pay for the acquisition, maintenance and removal of such temporary water, heat, light, power, telephone, high speed internet, fence around excavated area or enclosed storage, watchman and all other temporary services as may be required in the prosecution of this Contract.
- B. The Contractor shall provide and maintain one temporary portable chemical toilet on the site for the full term of the Contract for the Contractor's personnel and subcontractors to use.
- C. The Contractor shall provide for the sole use by the resident Inspectors, an equipped, air conditioned, ventilated, lighted and heated field office. The equipped field office shall include telephone service comprised of two phone lines; one dedicated to voice and the other dedicated to a fax machine. The equipped field office shall also include a laptop computer and high-speed internet access through a cable, DSL, satellite or wireless internet provider. The laptop computer shall meet the performance requirements as obtained from the County prior to purchasing the computer. The Contractor shall coordinate the type and supplier of the high-speed internet service with the County prior to ordering the service. The type of field office to be provided shall be Office Type Number 3 as specified in Section 103 of the Standard Specifications and further subject to the approval of the Engineer. The Inspector's field office shall be a separate entity from any field office the Contractor intends to supply for his own use. The Inspector's field office shall be set up, furnished and functional within 30 days of receipt of notice to proceed and shall remain so for the entire duration of the contract. Upon completion of the work, the Inspector's field office shall be removed from the site by the Contractor and the site cleaned up and left in a neat, acceptable condition. If there is insufficient space to locate the Inspector's field office on the County's property at the project site, the Contractor shall be responsible for securing offsite office space equal to or greater than that offered by a Type 3 trailer that is suitable to the County.

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- D. The cost of any temporary electric, telephone, and internet service installation or use for the construction of this Contract, and the testing of all electrical and mechanical equipment and other related work shall be borne by the Contractor up to and including the date of final acceptance.

1.07 BID BREAKDOWN

- A. In order to estimate the amount of the monthly progress payments, the Contractor shall furnish a complete detailed cost breakdown of the lump sum contract price bid. The breakdown shall be in sufficient detail to provide a basis for estimating the monthly progress payments. The Contractor shall submit the bid breakdown within five (5) days after receiving Notice to Proceed. The bid breakdown shall, in general, follow the outline of the specification items.

1.08 PROGRESS SCHEDULE

- A. General:

1. Scheduling of construction is the responsibility of the Contractor. The Contractor must take all reasonable action to avoid or to mitigate the effects of delays including, but not limited to, rescheduling or resequencing the work, accepting other work, and reassigning personnel. When the Contractor is responsible for any delays, the County may order the Contractor to accelerate construction, work overtime, add additional shifts or manpower, work on weekends, or to do anything else reasonably necessary to complete the work on time, at no additional cost to the County.
2. The Contractor shall submit to the County for review and approval a Baseline Schedule, Monthly Progress Schedules, and any required Recovery Schedules, as outlined in Paragraphs B through F of this section.
3. Failure of the Contractor to comply with the requirements of this section shall be grounds for determination by the County that the Contractor is not prosecuting the work with due diligence as to ensure completion of the work within the time specified in the Contract Documents or as agreed upon with the County after execution of the Contract. The County may terminate the Contractor's right to proceed with the work, or any separable part thereof, in accordance with Section GP-8.08 of the Standard Specifications.
4. The Contractor does not have the unilateral right to complete the work late and pay liquidated or other damages.

- B. Baseline Schedule:

1. Within 30 days after the award of the Contract, the Contractor shall submit to the County a detailed Baseline Schedule indicating the time allocated by the Contractor for performance of each portion of the work. The schedule shall show commencement of work from the date the Notice to Proceed is issued.

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The schedule shall show completion of the work within the Contract time as specified in the Contract Documents or as agreed upon with the County after execution of the Contract.

2. The submitted Baseline Schedule shall be properly and reasonably sequenced to show the order of performing the various tasks of work. The schedule shall clearly identify the sequencing restraints and the critical activities necessary to complete the work on time and shall list proposed workdays, holidays and any special non-work days.
3. The submitted Baseline Schedule shall list the dollar value for each work item and shall show the Contractor's labor requirements for achieving each work item. The schedule shall also include a list of submittals related to material and equipment fabrication orders, permits, easements and any other work tasks requiring submittals. Each necessary submittal shall be shown on the schedule as a separate work activity with necessary dates of submittal, anticipated review and response time, anticipated dates of re-submittal if necessary, and anticipated dates for final review and approval. Submittal review and response time shall be a minimum of 21 working days. A longer review and response time may be required for large or complex submittals, at the Engineer's discretion.
4. Within 14 calendar days after the County reviews and rejects or conditionally approves the submitted Baseline Schedule, the Contractor shall make all necessary corrections and resubmit the corrected schedule. Baltimore County may decline to issue Notice to Proceed until the Contractor submits the required schedule and the County approves it.

C. Monthly Progress Schedules:

1. Within 30 days after the County issues Notice to Proceed, and on monthly basis thereafter, the Contractor shall submit a revised Monthly Progress Schedule accurately updated to reflect all revisions to the previously submitted schedule including actual commencement dates of listed work activities, actual work activities completed to date, and any sequence changes made or planned for the order of work activities and their effect on the critical path for completion of the whole project. The sequencing changes shall show extension of times granted by the County and any delays or early completion of work activities.
2. The Contractor shall meet with the County, or its designated attendee, at least once a month to discuss in detail the Contractor's updating of the Monthly Progress Schedule and the necessity for revision or correction in the schedule.
3. Within 10 calendar days after the County reviews and rejects or conditionally approves the submitted Monthly Progress Schedule, the Contractor shall make all necessary corrections and resubmit the corrected schedule.

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4. The Contractor shall submit the required Monthly Progress Schedule whether or not the Contractor submits an application for payment each month. Baltimore County may decline to process any pending payment requests for this project until the Contractor submits the required schedule and the County approves it.

D. Recovery Schedules:

1. Within 10 calendar days after the project falls behind schedule or is alleged by either party to be behind schedule, the Contractor shall furnish to the County, at no additional cost, a revised schedule hereinafter called a "Recovery Schedule". The Recovery Schedule shall show how the Contractor will finish the project by the Contract completion date.
2. The Recovery Schedule shall include all of the information required under Paragraphs B, C and E of this section.

E. Logical Sequencing and Layout of the Submitted Schedules (CPM Schedules):

1. Unless the Contract Documents expressly permit the Contractor to use a schedule other than a Critical Path Method (CPM) schedule, the submitted Baseline Schedule, the subsequent Monthly Progress Schedules, and any required Recovery Schedules shall all be CPM schedules.
2. CPM schedules are required to assure adequate planning and execution of the work and in evaluating the progress of the work and the impact on the schedule events, which could affect the completion date.
3. The submitted CPM schedules shall clearly designate the Substantial Completion Date of the project. This is the date when the construction project or specified part thereof is sufficiently completed, in accordance with the Contract Documents, such that the project or specified part thereof can be used to accomplish the purposes for which it was intended.
4. Logic or network diagrams shall show the order and interdependence of activities and the sequence in which work is to be accomplished as planned by the Contractor. These diagrams must show how the start of a given activity is dependent on preceding activities and how its completion restricts the start of the following activities.
5. At a minimum, the following information shall be furnished for each work activity:
 - a. Activity number
 - b. Description of activity
 - c. Activity numbers for any predecessor and successor activities

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- d. Relationships with preceding activities
 - e. Activity duration in calendar days
 - f. Percent of activity completed
 - g. Early start date (by calendar date)
 - h. Early finish date (by calendar date)
 - i. Actual start date (by calendar date)
 - j. Actual finish date (by calendar date)
 - k. Float or slack
6. The Monthly Progress Schedules and any required Recovery Schedules shall show the activities or portion of the activities completed during the reporting period and their total dollar value as basis for the Contractor's periodic request for payment. For each activity, the update shall state the percentage of work actually completed and the progress along the critical path in terms of days ahead or behind the allowable dates.
 7. The Monthly Progress Schedules and any required Recovery Schedules shall include a comments section summarizing the updated analysis for the project as a whole, describing problems with work activities, and explaining proposed corrective actions.
 8. Approved change orders shall be reflected as new activities or as change in logic and/or time framing of existing activities. They shall be shown on the updated schedule that immediately follows a receipt of a Change Order Approval from the County.

F. Form of Schedule Submittal:

1. All schedules, including the Baseline Schedule, the Monthly Progress Schedules, and any required Recovery Schedules shall be submitted in three paper copies and one copy on CD.

1.09 SEMI-FINAL PAYMENT

- A. If within sixty (60) calendar days from the date of conditional acceptance of the Contract, the County does not present the final quantities to the Contractor, the County will at the Contractor's request, within 15 calendar days after the aforesaid 60 calendar day period, partially pay the Contractor (without consent of surety) what is known as a semi-final payment.

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1.10 CODES-RULES-PERMITS-FEES

- A. General: The Contractor shall give all necessary notices, obtain all permits, and pay all governmental taxes, charges, fees and other costs necessary and incidental to the due and lawful prosecution of the work; file all necessary plans, prepare all Documents and obtain all necessary approvals of all governmental departments having jurisdiction; obtain all required Certificates of Inspection and Approval for the work, deliver same to the Engineer, and pay all expenses associated with them.
- B. Compliance: All materials furnished, and all work installed shall comply with the rules and regulations of the National Fire Protection Association, with all requirements of local utility companies, with the recommendations of the fire insurance rating organization having jurisdiction and with the requirements of all governmental departments having jurisdiction. Any items or requirements specified or indicated on the drawings in excess of minimum code requirements and permitted under the code shall be provided, unless special permission is obtained from the Engineer to the contrary.

1.11 ENGINEERING SERVICES BY CONTRACTOR

- A. Baltimore County will or has established the property corners and benchmarks for the Contractor.
- B. The Contractor shall provide competent engineering services as necessary to do all other work necessary to lay out the work in accordance with the dimensions and elevations shown on the Drawings. The Contractor shall employ properly qualified personnel to perform the work herein described. The Contractor shall furnish and set all templates and batter boards. The Engineer reserves the right to check any or all layouts established by the Contractor prior to placing concrete or other materials or installing equipment and all errors discovered by the Engineer during such checks shall be remedied by the Contractor at no additional cost to the County before work on that item proceeds.
- C. The Contractor shall furnish, at no additional cost to the County, all technical personnel, labor, instruments, and materials, including grade stakes, necessary for establishing, marking, and maintaining lines, grades, and measurements necessary to the prosecution of the work.
- D. All finished surfaces shall conform with the lines and grades shown on the Drawings.

1.12 PHOTOGRAPHIC REPORTS

- A. The Contractor shall submit each month during construction not less than ten (10) 8" x 10" digital photographs (color prints and electronic files) to the County, as outlined and stipulated hereinafter. All color prints shall have a 2" x 3" label in the lower right corner with the contract number, job name, Owner's name, Engineer's name, date and a short description.

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- B. The County, or its representative, will designate the origin points of the photographs and the desired scope or perception of the photographs which are intended to give a complete picture of the status of the project. The photographs shall be taken by a person or firm experienced in such work and approved by the Engineer.
- C. The cost of the aforementioned will not be a pay item but shall be included in the lump sum price bid and no additional compensation to the Contractor will be considered.

1.13 BORINGS AND TEST PITS

- A. No soil borings have been made in the project area. Neither Baltimore County nor the Engineer warrants or guarantees the conditions and/or materials that will be encountered in the prosecution of the work and/or any part thereof.
- B. Bidders are urged to make their own subsurface exploration upon approval of written application. The cost of this exploration shall be included in the lump sum price bid; no additional compensation to the Contractor will be considered.
- C. Soil borings or test pits for soil determination in improved roads are not to be excavated by the Contractor unless application is made by the Contractor prior to, and permit is issued by the Baltimore County Bureau of Highways.
- D. All known subsurface lines, pipes, conduits and structures are shown on the plans and profiles. These lines are shown based upon the best available plans and maps. The locations have not been verified by test pits and Baltimore County assumes no responsibility for the accuracy of the Drawings. In any area where the Contractor must make connections to or cross existing lines, it shall be his responsibility to test pit the lines and verify the locations to his satisfaction. In the event that lines are not found located as shown on the plans, the Contractor shall notify the Engineer so that an evaluation can be made as to the magnitude and methods of any adjustments in the plans.
- E. The Contractor shall be solely responsible for all damage to underground or aboveground lines encountered in any manner during construction. When crossing and working in the vicinity of existing lines, it shall be the Contractor's responsibility to properly support and maintain the operation of the lines. Extreme care must be exercised in excavation and backfill operations. The Contractor shall correct at his own expense all damage caused to existing lines.

1.14 STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. The Contractor shall maintain a neat and orderly construction site at all times.
- B. The Contractor shall define the limits of a storage area(s) within the property boundaries of the pumping station. The Contractor shall be fully responsible for the security of this area(s), including fencing, watchman, and other means of security.

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Under no circumstances will the County be responsible for the security of any property belonging to the Contractor, his subcontractors, or any of his work forces.

- C. All equipment and materials provided, and work performed under this Contract shall be protected from the elements and physical damage before and after installation. The Contractor shall be responsible for work, equipment, and materials until inspected, tested and finally accepted.
- D. The Contractor shall adhere to the Manufacturer's recommended storage procedures for all equipment furnished under this Contract. At no time shall the Contractor store material in a manner that contradicts these procedures. Specific types of equipment require storage procedures in addition to the minimum procedures defined by the Manufacturer. The Contractor shall refer to the various sections of these Specifications for these requirements.
- E. During construction, the open ends of work shall be effectively closed with temporary covers or plugs to prevent the entry of foreign material.
- F. Where permanent equipment called for under this Contract is installed before the erection of adequate protective structures, the Contractor, without additional compensation therefore, shall provide approved effective and durable covers for fully protecting such equipment against damage from the elements or from any other cause.
- G. All electrical equipment shall be carefully and effectively covered with waterproofing material such as plastic wrap (6 mil minimum) and rigid barriers for protection at all times from the elements, and/or dust, moisture and impacts resulting from construction activities. All existing electrical equipment to remain shall be provided with a temporary heat source to prevent condensation for the duration of construction.
- H. All structures, machinery, equipment, piping, electric conduit, wiring and accessories and appurtenances shall be adequately supported and safeguarded against all damage or injury during performance of work under this Contract. The Contractor shall be responsible for all damage or injury resulting from his operations and shall repair such damage immediately and to the satisfaction of the Engineer.
- I. The Contractor shall make all arrangements and provisions necessary for the storage of materials and equipment. All excavated material, construction equipment, and materials and equipment to be incorporated into the work shall be placed so as not to injure any part of the work or existing facilities, and so that free access can be achieved at all times to all parts of the work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly and compactly stored in locations that will cause a minimum of inconvenience to other Contractors, public travel, adjoining owners, tenants, occupants and County personnel.

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- J. No delivery of materials and equipment will be accepted by the County, and all expenses incurred by the County in handling materials or equipment which have been consigned or directed to the County will be charged to the Contractor.
- K. Following completion of the work, but before final payment, the Contractor shall remove all trailers, paving, stockpiled soil, stone, fencing, and other items used by him/her during the construction of the project and/or contained in his storage areas(s). The Contractor shall be responsible for placing topsoil, seeding and mulching disturbed areas in accordance with the Contract Drawings.

1.15 INTENT

- A. It is the intent of the Drawings and Specifications to provide the Contractor with such information and instructions as may be necessary to complete this contract and to provide a complete and workable installation. The Contractor shall perform all work in accordance with the lines, grades, cross sections and dimensions shown on the plans. The Contractor shall furnish, unless otherwise provided in these plans and specifications, all materials, implements, machinery, equipment, tools, supplies, transportation and labor necessary for the prosecution and completion of the work. All materials and equipment installed as part of the permanent installation shall be new. It is intended that the Drawings and Specifications shall supplement each other. However, where variances occur between the Drawings and the Specifications or within the Document itself, the item or arrangement of better quality, greater quantity or higher cost shall be included in the Contract price. The Engineer will decide on the item and manner in which the work shall be installed.
- B. Completeness: Any apparatus, appliance, material or work not shown on the drawings but mentioned in the specifications, or vice-versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be provided by the Contractor without additional expense to the County.
- C. Schematics may not be shown to scale on drawings, but the work shown on the schematic shall be provided by the Contractor without additional cost to the County.
- D. Adequacy: With submission of bid, the Contractor shall give written notice to the Engineer of any materials or apparatus believed inadequate or unsuitable; in violation of laws, ordinances, rules or regulations of Authorities having jurisdiction; and any necessary items of work omitted. In the absence of such written notice, it shall be understood that the Contractor has included the cost of all required items in his/her proposal and that he/she will be responsible for the approved satisfactory functioning of the entire system without extra compensation.

1.16 SUBMITTALS

- A. Ten days after notice to proceed, the Contractor shall submit a submittal schedule listing as near as practicable by specification section number, all submittals required, and approximate date submittal will be forwarded. No submittals will be

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reviewed by the Engineer until the submittal schedule has been submitted and approved.

- B. Submittals are generally defined as all drawings, diagrams, illustrations, catalog cut sheets, product data sheets, brochures, schedules, bills of material, and other data, certified correct for construction, which are prepared by the Contractor, his subcontractors, suppliers or distributors, or equipment fabricators or manufacturers, and which illustrate the manufacture, fabrication, construction, installation of the work, or a portion thereof.
- C. The Contractor's attention is specifically directed to the fact that working drawings are required, and shall be submitted, for each and every element of the work including, but not limited to, reinforced concrete formwork systems, reinforcing steel details, concrete pours, construction joints, each and every item of mechanical and electrical equipment, electrical conduit systems showing proposed field assembly, piping regardless of size or whether fabricated on or off the project site, and all other shop drawings which may be necessary, in the opinion of the Engineer, to comply with the all-inclusive intent of this requirement. Each submittal shall be assigned a sequential number; Submittal No. 1, 2, 3, 4, etc. for purposes of easy identification, and shall retain its assigned number, with appropriate subscript, on all required resubmissions. Changing manufacturers or models during the course of the submittal process shall not be cause for assigning a new submittal number. Once an item of work has been assigned a submittal number, that item of work shall retain the same number, for the duration of the project.

The following stamp shall be affixed to each submittal and appropriately completed.

CHECKED AND APPROVED FOR SUBMISSION	
(CONTRACTOR'S NAME)	
JOB	_____
CONTRACT NO.	_____
DATE	_____ BY _____
SUBMITTAL NUMBER	_____
ITEM	_____
CONTRACT REFERENCES:	
SPECIFICATION	_____
DRAWING	_____

Resubmittals shall be labeled with the letter "R" followed by the number of the resubmission. Example: The Contractor's tenth submittal, being resubmitted for the first time shall be numbered Submittal No. 10R1, resubmitted for the second time shall be numbered Submittal No. 10R2, etc. If a submittal is "approved as noted" and/or additional or supplemental information is requested, the additional information should be labeled with the original submittal number followed by the

letter "A" and then sequential lettering for subsequent supplemental information submittals. Example: A resubmittal of Submittal 12 is submitted as Submittal No. 12R1, which is "approved as noted" with a comment to provide a color chart. The color chart shall be submitted as Submittal No. 12R1A.

- D. All shop drawings shall be in conformity with the Contract Drawings and Special Provisions. All shop drawings except diagrams, illustrations, brochures and schedules shall be to appropriate scale, but in no case smaller than $\frac{1}{4}" = 1'-0"$, and shall give all dimensions required for manufacture, fabrication, assembly, installation and incorporation in the work. All shop drawings shall be complete, accurate and distinct, and shall show outline and section views, details, kinds of materials to be used, the kind of machine work and finish to be applied, and the installed locations of the said materials, equipment, accessories, appurtenances and related items. Shop drawings showing field assembly of piping and/or conduit systems shall incorporate sufficient views, sections, plans and elevations to show each and every fitting, specialty, and item of equipment, including locations and spacing of hangers and supports. Piping and/or conduit systems 2-inches in diameter and smaller may be shown as a single line. Equipment and specialties installed within and/or connected to piping and conduit systems shall be cross referenced to equipment and specialty shop drawings by submittal identification number, manufacturer name, and catalog or model number. Such cross-reference data may be shown at each individual equipment or specialty item on the system assembly drawing or, at the Contractor's option, may be incorporated in a coded bill of materials prepared integral with, and as a part of, the applicable shop drawing.
- E. Electrical shop drawings include, but are not necessarily limited to, complete terminal identification diagrams and schedules, complete point-to-point interconnection diagrams, and complete single line and elementary wiring diagrams for all power, signal, control and lighting systems, together with panel layout drawings. Diagrams shall be oriented to display the general arrangement and location of wiring and equipment which is seen when facing the appropriate panels for maintenance and adjustment purposes, i.e.; for panels wired and serviced from the front, diagrams shall depict a front view, and for panels wired and serviced from the rear, diagrams shall depict a rear view. Mirror image diagrams are prohibited. Terminal point and wire identification on all shop drawings shall be identical to related terminal point and wire identification on equipment and panels, and absolutely no deviation from this requirement will be permitted.
- F. Panel shop drawings shall contain the following:
1. Top and base plan, showing location of equipment and all conduits to and from equipment, supports, doors and clearances.
 2. Front and rear elevations, showing general arrangement, complete with dimensions.
 3. Elevation sections (right and left sides minimum; others as required).

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4. Mounting details of all principal equipment.
5. All panel and accessory drawings shall be drawn to a scale not less than 1-inch equals 12 inches.
6. All principal items shall be identified with an encircled number, which will correspond to an individual item in a "List of Principal Equipment". The List of Principal Equipment shall be arranged in columnar form, reading from left to right as follows:

Item Number
 Quantity
 Description
 Make
 Size
 Material
 Form
 Type
 Bulletin or Catalog Number
 Rating in Volts, Amperes, and Horsepower or KVA
 Remarks

Under "remarks" column shall be other pertinent information not covered by the above column headings.

The panel information shall be printed on the electrical shop drawings; separate submission of anything other than the electrical shop drawings, or in any other form than hereinbefore described, will not be acceptable.

7. A complete wiring diagram showing all electrical apparatus, both within the equipment and connections to external equipment, shall be submitted. All wires shall be shown continuous from end to end and identified by numbers. A wire connected to one side of a contact, such as pushbuttons, relays, or selector switches shall change its identifying number when leaving the opposite side of such contacts. Any and all wires passing from panel to panel across the panel joints, which must be disassembled for shipping, must have matched terminal blocks at these joints. The terminal blocks shall be identified with the respective wire numbers.

All wires entering and/or leaving the equipment shall be brought to the terminal blocks and identified. Motor terminals shall be identified individually, that is Pump "1" terminals can be designated P1-1, P1-2, P1-3 and Pump "2", P2-1, P2-2, P2-3, and so on.

Wireless or numbered type diagrams will not be accepted, nor will blank blocks with separate drawing reference numbers be considered. It shall be the responsibility of the equipment manufacturer or assembler to obtain internal wiring diagrams of all foreign equipment and coordinate or

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reproduce these diagrams into a single complete wiring diagram outlining all separate parts. The physical relationship of all controls shall be identical to the finally developed general arrangement drawing hereinbefore described.

8. A complete schematic, elementary drawing with all wiring numbers corresponding to the wire diagram shall also be submitted. There shall be printed on this drawing, adjacent to the schematic diagram, a complete "Sequence of Operations," stating what must be done to put the facility in operation for the first time, starting from the main incoming service. The sequence of operations shall start with a general heading under which the normal starting sequence will be described, along with any special functions of the individual parts or combinations of control devices, including all interlocking. The next heading shall be "Operations Normal-Automatic," under which shall be described the complete normal-automatic sequence of the controls, making reference to the schematic control diagram, reading from left to right, indicating wire numbers, coils, relay contacts, etc. Following shall be the heading "Operation Normal-Hand Control," under which will be described the complete hand operation of the facility, when bypassing the automatic sequence. Finally, the heading "Power Failure", under which will be described precisely what can and will happen upon the failure of power and on restoration of power after a power failure in both the "Hand" and "Automatic" sequences. This drawing shall be of a scale such that; all symbols, lines and notes can easily be read by maintenance forces under emergency conditions.
 9. All electrical information described herein shall be shown on the electrical shop drawings. Separate submission of electrical information on anything other than these electrical shop drawings or in any other form than hereinbefore described will not be acceptable, except that manufacturers' printed bulletins shall be submitted in addition to the information on the electrical shop drawings where necessary to provide complete understanding of the construction, maintenance, repair and operation of any basic component.
 10. Panel shop drawings shall be provided for motor control centers, instrument panels, telemetry panels, valve terminal panels, switch gear panels and VFD panels.
- G. All shop drawings shall be 11-inches by 17-inches in size with a 1½-inch binding margin on left hand side of sheet. Diagrams, illustrations, brochures, schedules, and other data may be prepared and executed, complete, on sheets measuring 8½-inches by 11-inches. Shop drawings submitted other than as specified herein will be returned for resubmittal without being reviewed.
- H. After checking and verifying all field measurements, the Contractor shall submit to the Engineer, for approval, a minimum of ten (10) copies of all submittals, which shall have been checked by and stamped with the approval of the Contractor and identified as shown herein. The information shown on the submittals shall be

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complete with respect to dimensions, design criteria, materials of construction and other requirements as specified or shown in the Contract Documents to enable the Engineer to review the information as required. Machinery outline drawings alone are not acceptable. All submittals covering related items of equipment or integrated systems of equipment shall be submitted at the same time in order that their complete operation can be adequately reviewed. Partial submissions will not be reviewed but will be retained for subsequent review after related submittals have been submitted. At the time of each submission, the Contractor shall call to the Engineer's attention, in writing, any deviations that the submittals may have from the requirements of the Contract Documents.

- I. The Engineer will check submittals with reasonable promptness, but his checking and approval shall be only for conformance with the design concept of the project and for compliance with the information given in the Contract Documents. The approval of a separate item as such shall not indicate approval of the assembly in which the item functions. The Contractor shall make any corrections required by the Engineer and shall resubmit the required number of corrected copies of each submittal until approved. The Contractor shall direct specific attention to revisions called for by the Engineer on previous submissions.
- J. A maximum of two submissions of each submittal will be reviewed, checked, and approved or commented upon without charge to the Contractor. Any additional submissions which are ordered by the Engineer to fulfill the stipulations of the Contract Documents, and which are required by virtue of the Contractor's neglect or failure to comply with the requirements of the Contract Documents or to make those modifications and/or corrections ordered by the Engineer in the review of the first two submissions of each submittal, will be reviewed and checked as deemed necessary by the Engineer, and the cost of such review and checking, as determined by the County, and based upon a maximum rate of \$191.00 per hour will be deducted from the Contractor's monthly invoices or from monies retained under the provisions of the Contract Documents. It is therefore incumbent upon the Contractor to make all modifications and/or corrections, and/or to cause such modifications and/or corrections to be made by his subcontractors, suppliers, distributors, equipment fabricators and/or manufacturers, as may be required by the Engineer in an accurate, complete, and timely fashion.
- K. The Engineer's approval of submittals shall not relieve the Contractor from his responsibility for any deviations from the requirements of the Contract Documents unless the Contractor has in writing called the Engineer's attention to such deviations at the time of submission and the Engineer has given written approval to the specific deviation, nor shall any approval by the Engineer relieve the Contractor from responsibility for errors or omissions in the submittals. Submittals shall be submitted with sufficient time provided for checking, return to the Contractor, and/or resubmission as required. The words "APPROVED" or "APPROVED AS NOTED" or words of similar import placed by the Engineer on a submittal means that all items and details of the submittal are fully approved with the exception of those items or details that are specifically marked for further action. When the submission is marked "EXCEPTIONS NOTED" it means that the material or product can probably

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fulfill the intent of the plans and specifications but that enough questions or comments have arisen to require a corrected or updated submission. If the material submitted represents a product that is totally unsatisfactory and probably will not under any circumstances meet contract requirements, it will be marked "REJECTED" and will not be reconsidered by the Engineer. The withholding of an approval by the Engineer of any submittal in its entirety, including required certifications, shall under no circumstances constitute a basis for delay in arranging for and proceeding with the manufacturing, fabricating, delivering and installing, in accordance with the Contract, of those items or details in such submittals which may have been approved.

- L. Upon receipt of submittal approval, the Contractor shall provide two (2) hard copies of the final, approved submittal; one (1) copy to the County and one (1) copy to the Engineer. In addition, the Contractor shall provide an electronic copy of all approved submittals to the County and Engineer in Portable Document Format (PDF). Final hard copies and PDFs shall be submitted within 20 calendar days of Contractor receiving approval.
- M. The Contractor's attention is specifically directed to the fact that no work shall be fabricated, nor equipment or materials ordered, nor any construction performed, prior to approval by the Engineer of submittals applicable thereto.

Construction performed in violation of this requirement will be neither approved nor certified for payment until applicable submittals have been approved. If the Engineer so directs, the Contractor shall disassemble, raze, and remove any such construction performed prior to approval by the Engineer of submittals applicable thereto, and the Contractor will be allowed neither additional compensation nor extension of Contract time thereto.

If the Contractor orders or causes to be ordered or delivered any equipment, machinery or materials in violations of this requirement, he/she does so at his/her own risk, and such equipment, machinery or materials shall neither be installed in the work nor stored on the site of the work. If, after submission and review of applicable submittals, the Engineer determines that any such equipment, machinery or materials do not meet the requirements of the Contract Documents, such equipment, machinery or materials will be rejected, and the Contractor will be allowed neither additional compensation nor extension of time therefore.

The Contractor's attention is specifically and especially directed to the fact that because manufacturer's standards and procedures are subject to unilateral changes over which the County has no control, the stipulations herein are applicable, and will be enforced, even for those elements of equipment, machinery, and/or materials which may be specified by manufacturer and model or catalog number in these Contract Documents.

- C. The Contractor shall also furnish one copy of all final as-built shop drawings, conduit routing plans, and wiring diagrams and electrical schematics for the Motor Control Center, and Pump Control Panel. All shop drawings, diagrams, and schematics shall be 22-inches by 34-inches in size.

1.19 EQUAL OR APPROVED EQUAL

- A. Where any article is specified by a proprietary name, trade name, and/or name of manufacturer, with or without the addition of such expressions as "or equal", it is to be understood that the article named or the equal thereof, is intended, subject to the approval of the Engineer as to the quality thereof, and it is distinctly understood that (1) the Engineer is to use his own judgment in determining, from time to time, whether or not any article proposed to be substituted is the equal of any article so specified; (2) that the decision of the Engineer on all such questions of equality shall be final, and (3) that in the event of any adverse decision by the Engineer, no claim of any sort shall be made or allowed against the Engineer or the County.
- B. An offer of any article or material by the Contractor for an article or material specified, will raise the presumption that it is for the purpose of saving money. If, in such a case, the article or material is approved, the County shall be given a credit as follows: The difference in the net cost to the Contractor of the article or material submitted and the price at which the Contractor could have obtained the lowest priced article or material specified. For convenience in checking the credit, if any, the Contractor shall submit these figures in writing when the offer is made, and no article or materials will be considered without such figures.
- C. If the County approves a substituted item, the Contractor will not be entitled to any additional compensation.
- D. The use of brand names is not intended to unduly restrict competition or to be exclusionary or discriminatory as to requirements other than those based upon performance or other salient requirements of procurement, and when so used, the specified features of the named brand, which must be met, are clearly specified.
- E. The Contractor shall submit a point by point comparison list comparing the named product with the proposed substitution product to determine whether or not the proposed product is "equal".

1.20 VIBRATION

- A. It shall be the responsibility of the Contractor to protect and isolate from the existing structures all vibrations resulting from equipment operation. Insofar as practical, all mechanical and electrical equipment and its installation shall be vibration free. Under no circumstances shall any vibration be transmitted to the structures. Vibration isolators used in the installation shall be subject to the Engineer's approval.

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1.21 WARRANTY OF CONSTRUCTION

- A. The Contractor hereby guarantees all of the new work and systems including all new components completed under this contract, for a period of at least two (2) years after the date of Substantial Completion thereof by the County, as follows:
 - 1. Against all faulty or imperfect materials and against all imperfect, careless and/or unskilled workmanship.
 - 2. That the equipment and each and every part thereof shall operate with proper care and attention in a satisfactory and efficient manner, and in accordance with the requirements of these Contract Documents.
 - 3. That the structure, above and below grade, shall be entirely watertight and leak-proof at every joint and point of penetration for pipes, hatches, doors, etc.
 - 4. The Contractor agrees to replace with proper workmanship and materials, and to re-execute, correct, or repair, without cost to the County, any new work and systems which may be found to be improper and/or which does not operate in a satisfactory manner or fails to perform as specified.
 - 5. The guarantee obligations assumed by the Contractor under these Contract Documents shall not be held or taken to be in any way impaired because of the specifications, indication or approval by or on behalf of the County of any articles, materials, means, combinations or things used or to be used in the construction, performance and completion of the new work and systems, or any part thereof.
 - 6. No use or acceptance by the County of the new work or any part thereof, nor any failure to use the same, nor any repairs, adjustments, replacements or corrections made by the County due to the Contractor's failure to comply with any of his obligations under the Contract Documents, shall impair in any way the guarantee obligations assumed by the Contractor under these Contract Documents.
 - 7. The Contractor shall also, during this two-year guarantee period, be responsible for the proper operation and adjustment of all new work and systems, new equipment, and new apparatus or devices installed by him.
 - 8. During the guarantee period, the Contractor shall respond to the site for required repair or replacement to new work and systems within 48 hours of notification.

1.22 FACILITY START-UP, DEMONSTRATION PERIOD AND OPERATOR TRAINING

- A. When specified in individual sections of these Specifications, upon completion of all new work for a particular section, the Contractor shall furnish at no extra cost to the

County, the necessary manufacturer's engineers, representatives, technicians, skilled labor and helpers and shall perform all startup activities as required. During startup, the manufacturer's designated personnel shall fully inspect, test, calibrate, lubricate, operate and certify the new equipment for which they are responsible.

- B. When a manufacturer's representative is not required to perform startup activities for a particular new piece of equipment, the Contractor shall perform any required startup activities in strict accordance with the manufacturer's instructions.
- C. If the Operation and Maintenance Manuals specified hereinafter are not available at the time of the startup, the Contractor shall provide one copy of the manufacturer's operating literature for each new system or item of equipment. Installation and operating sheets or booklets normally shipped with new equipment may be used for this purpose.
- D. Prior to starting up and operating any and all new equipment installed in the pumping station, the Contractor shall notify the Bureau of Utilities. All lubrication and starting up of the new equipment shall be done in the presence of and to the complete satisfaction of authorized representatives of the Bureau of Utilities, and in accordance with all manufacturer's recommendations. All temporary measures, utilities, resources, and equipment, including all associated permits and approvals, necessary for start-up and demonstration of equipment, including the use of fire hydrants, shall be the Contractor's responsibility and available prior to start-up activities.
- E. The Contractor shall schedule the startup for a time mutually agreeable with the Engineer and the County and shall provide a minimum of one week notice prior to the desired date. The Contractor shall submit a start-up and testing schedule for review and approval by the Engineer and the County. Start-up and testing activities shall not commence until the schedule is approved.
- F. After all startup activities have been completed, the Contractor shall be responsible for the operation of the completed pumping station on a demonstrational basis for a period of thirty (30) days.
- G. Prior to beginning the 30-day demonstration period, the Contractor shall complete the following:
 - 1. All shop drawings for new equipment and systems shall be submitted and approved.
 - 2. All Equipment Warranty and Certification Forms and manufacturer's certifications for new equipment and systems shall be completed and submitted, and all witness testing conducted and completed as required.
 - 3. All startup activities for new equipment and systems shall be completed.

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4. All test reports for new equipment and systems shall be submitted and approved.
 5. All project photographs of new equipment and systems shall be submitted.
 6. All Operation and Maintenance Manuals for new equipment and systems shall be submitted and approved. A final walk-through of the facility shall be conducted by the Contractor with the County and Engineer in order to generate the punchlist for the project. Provide the County and Engineer two weeks notice prior to the desired date.
 7. Any items on the punchlist that are designated as requiring completion prior to the 30-day demonstration period shall be completed.
 8. Any item on the punchlist not designated as requiring completion prior to the 30-day demonstration period shall be completed prior to the end of the 30-day demonstration period.
 9. All SCADA and Mission Wireless RTU communications between the station and the Fullerton Facilities Complex shall be installed, tested and fully operational.
 10. The facility shall be thoroughly cleaned, and any finishes requiring touchup shall be completed.
- H. After all of the above items have been successfully completed, the Contractor shall receive notice from the County that he may begin the 30-day demonstration period.
- I. During the 30-day demonstration period, the Contractor shall maintain all temporary measures in place and operational in the event that there is a problem with the new equipment and systems installed or the existing equipment as a result of the work.
- J. During the 30-day demonstration period, the Contractor shall respond to all station control system alarms and rectify the situation, as necessary.
- K. During the 30-day demonstration period, the Contractor shall conduct all required training for the newly installed equipment. Training activities shall be performed separately from manufacturer's startup activities and shall be held on separate days unless approved otherwise. Training sessions shall occur on Wednesdays at 9:00 a.m. and again at 3:00 p.m. Coordinate schedule of training with County and provide a minimum of two weeks notice.
- L. If problems occur during the 30-day demonstration period that are designated by the County and Engineer to be of significant magnitude, the problems shall be satisfactorily corrected, and the 30-day demonstration period shall restart from the beginning.

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- M. After successful completion of the 30-day demonstration period, all required training, all punchlist work, and all final cleanup, the Contractor shall schedule a follow up walk-through with the County and Engineer to verify compliance with all requirements.
- N. After compliance has been demonstrated for all requirements, the County shall approve the removal of temporary measures and associated Contractor demobilization.

1.23 OPERATION AND MAINTENANCE MANUALS

- A. Upon completion of the work, the Contractor shall furnish for the Engineer's review, four sets of Operation and Maintenance Manuals for the pumping station. Manuals shall include operating and maintenance information on all systems and items of equipment per the following table:

SECTION	DESCRIPTION
15130	Electro-Hydraulic Actuators
16395	Short Circuit and Protective Device Evaluation and Coordination Study
16396	Arc Flash Hazard Study
16400	Service and Distribution
16410	Switchgear Retrofill Modifications
16420	Low Voltage Power Circuit Breakers
16710	Automatic Transfer Switch – Delayed Transition
17110	Variable Frequency Controllers and Reduced Voltage Solid-State Soft Starters
17200	Control Panels
17300	Instrumentation
17400	Programmable Controller System

- B. The data shall consist of catalogs, brochures, bulletins, charts, schedules, shop drawings corrected to as-built conditions and assembly drawings and wiring diagrams describing location, operation, maintenance, lubrication, operating weight, and other information necessary for the Engineer to establish an effective operating and maintenance program. All information provided shall be of the most current publications and literature supplied by the Manufacturers. Outdated or irrelevant information will not be accepted. Multiple items listed on a single page, which are not relevant, will be clearly crossed out. The following data shall also be included:
 1. Title page and table of contents shall be printed on the Contractor's company letterhead and shall state the name and address of the station with the project number. These pages shall be inserted inside clear plastic sleeves.
 2. Four 8-inch by 10-inch color photographs of the facility, views as directed by the County. Each Photograph shall be provided on photo quality paper and

inserted into clear plastic sleeve. Photos shall be taken near the completion of the project, when all temporary measures and Contractor Equipment are removed, and final site restoration is completed.

3. Two unique 8-inch by 10-inch color photographs of each piece of equipment in place. Each photograph shall be provided on photo quality paper and inserted into a clear plastic sleeve. Photos of equipment shall be taken at an orientation such that the permanent equipment marker is visible. When this is not practical, a temporary identification marker shall be provided and included in the photo for each piece of equipment. Equipment photos shall be taken after equipment is permanently installed, with associated piping and appurtenances.
4. "Equipment Warranty" section, to be inserted in the first volume (following station photos), shall include a master log sheet stating equipment type, manufacturer's name, supplier's name, warranty length, and start and end dates. Copies of all warranties shall be included in this section for quick reference. This section shall also include materials not required for inclusion for the O&M Manuals that provide extended warranties, e.g., roofing system, FRP doors, wetwell liner system, etc.
5. Literature and cutsheets for inclusion shall be printed double sided. Only prints, schematics or diagrams shall be single sided.
6. "Name Plate" data of all equipment.
7. Performance curves and performance data for the equipment installed.
8. Initial parameter settings for all equipment, as well as corresponding factory default settings. Initial parameter settings for equipment that differ from factory default settings shall be emphasized.
9. Approved shop drawings, including required certifications.
10. Manufacturers' cut sheets and dimension drawings of each piece of equipment, and details of all replacement parts.
11. Manufacturers' erection and operation instructions for all equipment and apparatus.
12. Complete as-built wiring diagrams of all individual pieces of equipment and systems including one-line diagram; schematic or elementary diagrams; complete point-to-point interconnection diagrams; and interconnection and terminal board identification diagrams.
13. Manufacturer's certifications for specified equipment.
14. A list of all local manufacturers' representatives.

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15. Complete parts list with parts assembly drawing (by exploded view), names and addresses of spare parts suppliers, recommended list of spare parts to be kept "in stock" and sample order forms for ordering spare parts. Lead time required for ordering parts shall be estimated and provided.
 16. Instructions with easily understood schematics or diagrams for disassembling and assembling the equipment for overhaul or repair.
 17. The manual shall also include detailed written procedures to be used for all modes of operation including any precautions for personal safety or for prevention of damage to the equipment (mechanical or electrical). This includes initial start-up, interim operation when necessary, normal operation, emergency operation, shutdown and restarting. Required operating checks, calibration and field performance measurements shall be described.
 18. Preventive maintenance measures and their frequency shall be listed in tabular form. A troubleshooting chart containing symptoms, probable cause, and remedies shall be included. A lubricating schedule listing equipment (parts), frequency and lubricant (including equivalent major brand lubricants) shall be provided. In addition, a lubrication schedule shall be included for periods when the equipment is in standby or in storage.
 19. Section dividers shall be provided, with labels that are non-removable.
- C. Operation and Maintenance information shall be bound in loose leaf 3-ring binders with black plastic-coated covers. Binders shall be 4-inch thick maximum, high quality, turned edge construction with piano metal hinges and rings that stay closed and not allow pages to fall out. Binders shall be Binder Tek Model ARCH3 for 3-inch binders, ARCH4 for 4-inch binders, or approved equal. Binders shall be organized sequentially with section dividers for each applicable specification section as listed in the Special Provisions table of contents.
- D. Shop drawings 11-inches by 17-inches in size shall be folded to approximately 11-inches by 8½ inches with drawing title box exposed along either edge. Drawings descriptive of a single item of equipment shall be grouped together. These pages shall be inserted inside clear plastic sleeves.
- E. All shop drawings included in the binders shall be those copies previously submitted for review and approval and shall bear the Engineer's stamp of approval and comments as originally noted thereon. These pages shall be inserted inside clear plastic sleeves.
- F. Subsequent to the Engineer's approval of the Operation and Maintenance Manuals, the Contractor shall submit four complete sets of manuals for distribution by the Engineer. In addition, the Contractor shall submit two (2) CD's, each containing an electronic copy of the entire Operation and Maintenance Manuals as a Portable Document Format (PDF) file. CD's shall contain individual files for each specification section, matching the section dividers of the Operation and Maintenance Manuals.

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Operation and Maintenance Manuals shall be delivered to the Engineer in white binder boxes suitable for storing the specified binders. Each binder storage box shall have an interior measurement of 12-inches by 12¼-inches by 18½-inches and shall include a lift off lid. Binder storage boxes shall be Model No. 0073301 as manufactured by Bankers Box® or approved equal.

- G. Final inspection and/or beneficial occupancy will positively not be undertaken until approved Operation and Maintenance Manuals have been submitted and approved. Partial approvals will not be made.
- H. Contractor shall furnish a two (2) drawer file cabinet for O&M Manuals and flow charts, HON 510 Series for legal size documents with high side drawers to accommodate hanging files, Model No. 512C or approved equal.

1.24 WORKING HOURS

- A. Work hours shall be 7 a.m. to 3:30 p.m., Monday through Friday, unless otherwise permitted, in writing, by the County. Weekend and holiday work is not permitted.

1.25 LABOR STANDARDS AND ANTI-KICKBACK REGULATIONS

- A. The Contractor and all subcontractors will be required to comply with:
 - 1. The regulations of the Secretary of Labor made pursuant to the Davis-Bacon Act of May 3, 1931 (if applicable), and the Anti-Kickback Act of June 13, 1934.
 - 2. The stipulations and provisions issued by the Secretary of Health, Education and Welfare in Labor Standards (Federal Water Pollution Control Act Amendment of 1961).
 - 3. The Contract Work Hours Standard Act, Title 1, of the Work Hours Act of 1962 (72 Stat. 357-60).

1.26 O.S.H.A. STANDARDS AND SAFETY

- A. The Contractor shall comply with the U.S. Department of Labor, Safety, and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 (Public Law 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (Public Law 91-54).
- B. Nothing in the Occupational Safety and Health Act of 1970 shall be constructed to supersede or in any manner affect any workmen's compensation law or to enlarge or diminish or affect in any manner the common law or statutory rights, duties, or liabilities of employers and employees arising out of or in the course of employment.
- C. The Contractor shall comply with all regulations and requirements of the Maryland Occupational Safety and Health Administration (MOSHA).

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- D. Precaution shall be exercised at all times for the protection of persons (including employees) and property. The safety provisions of applicable laws and building and construction codes shall be observed.

1.27 DEMOLITION

- A. Exterior Dust Control: To prevent unnecessary spread of dust during performance of exterior demolition work, thoroughly moisten surfaces and debris as required to prevent dust from being a nuisance to the public, neighbors and concurrent performance of other work on the site. Water for use in dust control shall be obtained from the Contractor's own source.
- B. Protection: Exercise care during demolition work to confine demolition operations to those as indicated on the Drawings. The physical means and methods used for protection are at the Contractor's option.
 - 1. Additionally, if public safety is endangered during the progress of the demolition work, provide adequate protective measures to protect public pedestrian and vehicular traffic on streets and walkways.
 - 2. Signs, signals and barricades used shall conform to requirements of Federal, State and local laws, rules, regulations, precautions, orders and decrees.
- C. Materials needed or required for temporary protection in the form of barricades, fences, enclosures, etc., may be pre-used construction materials of sound condition and reasonably clean. However, the condition of same materials shall meet or exceed the requirements of governing agencies or approving bodies as may be involved with the work.
- D. The means and methods of performing demolition (and removal) operations are the sole responsibility of the Contractor. However, equipment used and methods of demolition (and removal) will be subject to approval of the Engineer.

1.28 CONSTRUCTION SITE SIGN

- A. The Contractor shall provide and erect a Baltimore County Construction Site Sign at the construction site in a location approved by the County. The sign shall conform to the sketch provided in Appendix A. The construction sign shall include the official project name, "RK&K" as the Engineer, and the contract number and Contractor's name, as applicable.

1.29 NAMEPLATES

- A. The Contractor shall provide and install corrosion-resistant metal nameplates, with data engraved or stamped, for permanent attachment on all equipment. The data shall include the manufacturer, product name, model number, serial number, capacity, size, operating and power characteristics, and other essential data, as

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applicable for the particular equipment. The nameplates shall be permanently fastened to the equipment in a location that is accessible and visible, in a manner suitable for the particular equipment.

- B. In addition to the manufacturer's nameplates, all equipment shall be permanently identified by name and number corresponding to the as-built drawings with nameplates which shall be engraved and laminated black-on-white finish phenolic nameplates. Data and installation shall be approved by the Engineer. Nameplate letters shall be minimum 2-inch high etched white letters and beveled white trim. Nameplates for control center, and control and metering or instrument panels shall be provided with 1/2-inch high letters. Motors shall be identified by the same number as the driven unit. Identifying characters shall be not less than 2-inches high and shall be painted. Decals, Rotex, or Dymo field applied labels will not be acceptable. All nameplate data shall be reproduced in the Operating and Maintenance Manuals.

1.30 PROGRESS MEETINGS

- A. Project progress meetings will be held monthly to review the progress and schedule of the work. The Contractor shall make his field superintendent available for said progress meetings and to meet the Engineer on-site.

1.31 MEASUREMENT AND PAYMENT

A. General

1. Payment for the work completed under this Contract will be made at the lump sum and unit prices bid, which lump sum and unit prices shall include the furnishing of all labor, tools, equipment and materials and the performance of all work required to complete the project as indicated and specified in accordance with all requirements of the Contract Documents and to the entire satisfaction of the Engineer.
2. When the term "as ordered by the Engineer" is used in describing the method of measurement or basis of payment for an item of the Proposal, it shall be understood that the order from the Engineer to the Contractor will be either (1) a written direction, or (2) a verbal directive to be followed by written confirmation of it from both the Contractor to the Engineer and from the Engineer to the Contractor to minimize the possibility of a misunderstanding between the two.

B. Contingent Items

Items in the Proposal designated as "Contingent" are for work not included in any of the other lump sum or unit price items of the Proposal and is work that may not be ordered by the Engineer to be used in the project depending on the Engineer's evaluation of the actual field conditions encountered. The Engineer may order that contingent items be used in smaller or larger quantities than is indicated in the Proposal. Such work shall be performed only as, and when, ordered by the Engineer

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and the Contractor shall be aware that payment will be made under these items only for the quantities actually ordered by the Engineer to be used. The Contractor shall not have any right to demand payment for loss of profit and overhead due to the fact that these items were not used in the work or used in smaller quantities than that indicated in the Proposal. Quantities ordered by the Engineer to be used greater or longer than that indicated in the Proposal will be paid for at the Contract unit price bid therein.

C. Payment

The method of measurement and payment for the various pay items under this Contract are listed in the "Schedule of Prices" in the Bid Proposal.

D. Payment Items

Item 1 – Stemmers Run Sewage Pumping Station Electrical Upgrades

The lump sum price bid for Item 1 shall include full compensation for all labor, materials, equipment, tools and incidentals necessary to complete all upgrades to the Stemmers Run sewage pumping station, together with the associated mobilization, testing, cleanup, restoration of disturbed areas, and all related work as shown, specified or directed.

Item 2 – Contingent Allowance for Field PLC Reprogramming and Pump Control Panel/System Modifications

The lump sum allowance for Item 2 shall be included to provide certain additional work, as may be requested by the County, in accordance with Specification Section 01020.

Item 3 – Contingent Allowance for Spare Parts

The lump sum allowance for Item 3 shall be included to cover miscellaneous parts and items, as may be requested by the County, in accordance with Specification Section 01020.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

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SECTION 01020

ALLOWANCES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings, General Provisions, including general and supplementary conditions, and Special Provisions of the contract, apply to the work of this section.
- B. Coordinate allowance work with related work to ensure that each section is completely integrated and interfaced with related work.

1.02 DESCRIPTION OF REQUIREMENTS

- A. Definitions and Explanations: Certain requirements of the work related to each allowance are shown and specified in contract documents. The allowance has been established in lieu of additional requirements for that work and further requirements thereof will be issued by change order.
- B. Types of allowances scheduled herein for the work including the following:
 - 1. Lump sum allowances.
- C. Submit proposals and recommendations for purchase of products or systems of allowances in form specified for change orders.
- D. Change Order Data: Where applicable, include in each change proposal both the quantities of products being purchased and unit costs along with total amount of purchases to be made. Where requested, furnish survey of requirements data to substantiate quantities. Indicate applicable taxes, delivery charges, and amounts of applicable trade discounts.
- E. Prepare and submit substantiation of a change in the scope of work (if any) claimed in the change orders relate to unit-cost type allowances.
- F. The County reserves the right to establish the actual quantity of work in place by an independent quantity survey, measure, or count.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Furnish materials required to accommodate the work requested by the Allowances.

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2.02 ALLOWANCES

- A. Included in the Contract Proposal bid items is a lump sum contingent allowance of \$100,000 to be included in the total cost for contract to provide:
 - 1. Electrical/Instrumentation & Control related additions or changes determined to be necessary in the field during construction.
 - 2. Additions, changes or enhancements to the pump control system including, but not necessarily limited to, hardware, software, programming, conduit and wiring.
 - 3. Additions, changes or enhancements to the SCADA system including, but not necessarily limited to, hardware, software, programming and integration at the pumping station, conduit and wiring, and any associated work at the County's Fullerton facility.
 - 4. Any additional electrical, instrumentation & control, pump control, or SCADA system adjusting, calibration, integration, programming, testing, or training deemed to be necessary by the County during the contract period.
- B. Included in the Contract Proposal bid items is a lump sum contingent allowance of \$50,000 to be included in the total cost for contract to provide:
 - 1. Miscellaneous parts and items as deemed necessary by the County to supplement equipment reliability and to restock diminishing spare parts inventory.
- C. All allowances shall include material cost, receiving, handling, installation, and Contractor's overhead and profit.

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

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SECTION 03301

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The work of this section includes, but is not limited to:
 - 1. Concrete Reinforcement
 - 2. Concrete Formwork
 - 3. Cast-In-Place Concrete
 - 4. Concrete Accessories
 - 5. Concrete Curbing and Gutters
- B. Work on this Project shall conform to all requirements of ACI 117-10, "Specification for Tolerances for Concrete Construction and Materials", published by the American Concrete Institute, Farmington Hills, Michigan, except as modified by these Contract Documents.
- C. Work on this Project shall conform to all requirements of ACI 301-16, "Specifications for Structural Concrete", published by the American Concrete Institute, Farmington Hills, Michigan, except as modified by these Contract Documents.

1.02 REFERENCED STANDARDS AND SPECIFICATIONS

- A. American Concrete Institute (ACI)
 - 1. 117 Standard Specifications for Tolerances for Concrete Construction and Materials
 - 2. 301 Specifications for Structural Concrete for Buildings
 - 3. 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete
 - 4. 305R Guide to Hot Weather Concreting
 - 5. 305.1 Specification for Hot Weather Concreting
 - 6. 306R Guide to Cold Weather Concreting

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7. 306.1 Specification for Cold Weather Concreting
8. 308.1 Specification for Curing Concrete
9. 309R Guide for Consolidation of Concrete
10. 315 Details and Detailing of Concrete Reinforcement
11. 318 Building Code Requirements for Structural Concrete
12. 347.R Guide to Formwork for Concrete

B. American Society for Testing and Materials (ASTM)

1. A615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
2. A775 Standard Specification for Epoxy-Coated Steel Reinforcing Bars
3. A1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
4. C31 Standard Practice for Making and Coring Concrete Test Specimens in the Field
5. C33 Standard Specification for Concrete Aggregate
6. C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
7. C42 Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
8. C94 Specification for Ready-Mixed Concrete
9. C138 Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
10. C143 Standard Test Method for Slump of Hydraulic Cement Concrete
11. C150 Specification for Portland Cement
12. C171 Specification for Sheet Materials for Curing Concrete
13. C172 Standard Practice for Sampling Freshly Mixed Concrete
14. C173 Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

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15. C231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
16. C260 Specification for Air-Entraining Admixtures for Concrete
17. C309 Specification for Liquid Membrane-forming Compounds for Curing Concrete
18. C494 Specification for Chemical Admixtures for Concrete
19. C881 Specification for Epoxy-Resin-Base Bonding Systems for Concrete
20. C1064 Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
21. C1077 Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
22. C1116 Standard Specification for Fiber-Reinforced Concrete
23. D226 Standard Specification for Asphalt-Saturated Organic Felt used in Roofing and Waterproofing
24. D227 Standard Specification for Coal-Tar-Saturated Organic Felt used in Roofing and Waterproofing
25. D448 Standard Classification for Sizes of Aggregates for Road and Bridge Construction
26. D994 Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
27. D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
28. D1752 Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
29. E154 Standard Test Methods for Water Vapor Retarders used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
30. E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

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- 31. E1643 Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
- 32. E1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
- C. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. M182 Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats
- D. Concrete Reinforcing Steel Institute (CRSI)
 - 1. Manual of Standard Practice

1.03 QUALITY ASSURANCE

- A. Design Criteria:
 - 1. Design each required concrete group to meet the physical properties specified in this Section.
- B. Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- C. Testing Agency Qualifications: An independent agency, acceptable to the Engineer, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician – Level I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician – Level II.

Testing Agency: Concrete testing for slump, compressive strength, and air content shall be performed by a testing laboratory engaged and paid by the Contractor and approved by the Engineer. No concrete shall be poured unless the testing agency is on-site.
- D. Mix Designer: Person responsible for developing concrete mixture proportions certified as NRMCA Concrete Technologist Level 2 or DOT certified mix designer in the jurisdiction of the work.

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- E. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- F. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

1.04 SUBMITTALS

- A. Shop Drawings: Submit detailed reinforcing drawings prepared in accordance with ACI 315, including bar schedule with bar marks and bends indicated. Indicate all openings, including additional reinforcing at openings and corner bar arrangements at intersecting beams, walls and footings indicated in the typical details and structural drawings, indicate proposed construction joint layout.
- B. Design Mix:
 - 1. Prior to start of placing concrete, submit for review design mix for each type of concrete, indicating that the concrete ingredients and proportions will result in a concrete mix meeting the physical requirements for each concrete specified in this Section.
 - 2. When a water reducing admixture is to be used, the Contractor shall furnish mix designs for concrete both with and without the admixture.

Each concrete mix submittal shall contain the following information, as applicable:

- a. Documentation of average strength for each proposed mix design in accordance with ACI 301.
- b. Location and purpose of the mix.
- c. Slump on which the design is based.
- d. Total gallons of water per cubic yard, and the water/cement ratio.
- e. Brand, type, composition and quantity of cement.
- f. Brand, type, composition and quantity of fly ash.
- g. Specific Gravity, source and gradation of each aggregate.
- h. Ratio of fine to total aggregate per cubic yard.
- i. Weight (surface dry) of each aggregate per cubic yard.

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- j. Brand, type, and ASTM designation, active chemical ingredients and quantity of each admixture.
 - k. Air content.
 - l. Certificate of Compliance for Cement.
 - m. Letter of Certification that concrete producer has verified compatibility of constituent materials in design mix.
 - 3. Submit field or laboratory test records used to document that proposed mixture will achieve the required average compressive strength and other specified requirements, for each class and mix of concrete.
- C. Comply with submittal requirements in ACI 301.
- D. Product Data: For each type of product indicated.
- E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified Professional Engineer registered in the State of Maryland.
 - 1. Indicate detailing, fabrication, assembly, and support of formwork.
 - 2. Joints in forms shall not leak water, cement and fines, or concrete mortar during placing and vibrating of concrete.
 - 3. Limit panel deflections to $l/240$ of each panel span to meet required tolerances.
- F. Proposed curing methods.
- G. Detailed plan for cold weather curing and protection of concrete placed and cured in weather below 40 degrees F or near 40 degrees F and falling. The details shall include, but not be limited to, the following:
 - 1. Procedures for protecting the subgrade from frost and the accumulation of ice or snow on reinforcement and other metallic embedments or forms prior to concrete placement.
 - 2. Methods for temperature protection during placement.
 - 3. Types of covering, insulation, housing, or heating to be provided.
 - 4. Curing methods to be used during and following the protection period.
 - 5. Use of strength accelerating admixtures.
 - 6. Methods for verification of in-place strength.

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7. Documentation of embedments that must be at a temperature above freezing prior to placement of concrete.
 8. Procedures for measuring and recording concrete temperatures.
 9. Procedures for preventing drying during dry, windy conditions.
- H. Detailed plan for hot weather placements, including curing and protection for concrete placed in ambient temperatures over 80 degrees F.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Reinforcing Steel:

1. For reinforcing steel fabricated off-site, deliver in bundles identified as to structure and shop drawing number. Identify each individual bar with a waterproof tag showing the grade, size and bar mark from the approved bar schedule.
2. Deliver, store, and handle steel reinforcement to prevent bending and damage, and in accordance with CRSI publication "Placing Reinforcing Bars." Avoid damaging coatings on reinforcing steel.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products shall be in accordance with requirements of ACI 301 unless otherwise noted.

2.02 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces.
1. Use plywood complying with US Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better.
 2. Form Ties: Factory-fabricated, adjustable-length, removable or snap off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1½-inch to surface.
 3. Provide ties which, when removed, will leave holes not larger than 1-inch diameter in concrete surface.

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- B. Earth cuts shall not be used as forms for vertical surfaces unless written approval is received by the Engineer.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, ($\frac{3}{4}$ -inch by $\frac{3}{4}$ -inch), minimum, unless noted otherwise.
- D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.03 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A615, Grade 60, deformed, epoxy coated in accordance with ASTM A775.
- B. Welded Wire Reinforcement: ASTM A1064, fabricated and furnished in flat sheets.
- C. Epoxy Repair Coating: Liquid, two-part, epoxy repair coatings; compatible with epoxy coating on reinforcement and complying with ASTM A775.

2.04 CONCRETE MATERIALS

- A. Materials: Unless otherwise specified, materials shall be in accordance with ACI 301.
- B. Portland Cement: ASTM C150, Type I or Type II:
 - 1. Use one brand of cement from one manufacturing source and mill throughout project, unless written approval is received by the Engineer.
- C. Normal Weight Aggregates: ASTM C33, and as herein specified. Provide aggregates from a single source.
 - 1. Fine Aggregate shall be clean, sharp, natural or manufactured sand, free from loam, clay lumps, or other deleterious substance within allowable standards.
 - 2. Coarse Aggregate shall be clean, uncoated, graded aggregate, containing no clay, mud, loam or foreign matter and free of excessively flat or elongated pieces.
 - a. Maximum size of course aggregate shall not exceed:
 - (1) 0.2 narrowest dimension between forms.
 - (2) $\frac{3}{4}$ minimum clear spacing between reinforcing.
 - (3) thickness of slab.

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- D. Water: ASTM C94 and Potable
- E. Admixtures:
 - 1. General: Total Chloride ions from admixtures and other measures shall be no greater than 0.1 percent by weight of cement in the concrete mix immediately prior to service exposure.
 - 2. Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
- F. Air-Entraining Admixture: ASTM C260.
- G. Water-Reducing Admixture: ASTM C494, Type A.
- H. High Range Water Reducing Admixture (Super Plasticizer): ASTM C494, Type F or Type G.
- I. Water Reducing, Non-Chloride Accelerator Admixture: ASTM C494, Type E.
- J. Water Reducing, Retarding Admixture: ASTM C494, Type D.
- K. Prohibited Admixtures: Calcium chloride thycyanates or admixtures containing more than 0.1 percent chloride ions are not permitted.
- L. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd. Use Fibermesh 150 only 100 percent virgin polypropylene multifilament fibers containing no reprocessed olefin materials and specifically engineered and manufactured in an ISO 9001:2000 certified facility for use as concrete secondary reinforcement. Application per cubic yard shall equal a minimum of 1.5 lb per cubic yard. Fibers are for the control of cracking due to plastic shrinkage, plastic settlement and thermal expansion/contraction, lowered permeability, increased impact, abrasion and shatter resistance. Fiber manufacturer shall document evidence of ten-year satisfactory performance history, ISO 9001:2000 certification of manufacturing facility, compliance with applicable building codes and ASTM C1116, Type III fiber reinforced concrete. Fibrous concrete reinforcement shall be manufactured by Propex Concrete Systems, Euclid Chemical Company, or approved equal. Synthetic fiber shall only be used at locations indicated on the contract drawings.

2.05 RELATED MATERIALS

- A. Vapor Retarder:
 - 1. Plastic Vapor Retarder: ASTM E1745, Class A, provide sheet vapor retarder cover over prepared base material where indicated below slabs on

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grade. Use only materials, which are resistant to decay when tested in accordance with ASTM E154, as follows:

2. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D448, Size 57, with 100 percent passing a 1½-inch sieve and 0 to 5 percent passing a No. 8 sieve.
 3. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D448, Size No. 10, with 100 percent passing a -inch sieve, and 10 to 30 percent passing a No. 100 sieve. Material shall have a uniform distribution of particle sizes ranging from No. 4 to the No. 200 sieve. Refer to ASTM C33, Table 1, for limitation of deleterious substance limits for fine aggregates.
- B. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per square yard, complying with AASHTO M182, Class 2.
- C. Moisture Retaining Cover: One of the following, complying with ASTM C171.
1. Polyethylene film, or
 2. White burlap-polyethylene sheet.
- D. Liquid Membrane Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C309, Type I, Class A or Class B. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.
- E. Bonding Compound: Polyvinyl acetate or acrylic base.
- F. Epoxy Adhesive: ASTM C881, two-component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to suit project requirements. Types III, IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- G. Pre-molded Joint Fillers:
1. Pre-molded Joint Fillers and Bond Breakers: Unless otherwise noted on the Drawings, the materials shall conform to the following:
 - a. Pre-formed Non-extruding Filler: ASTM D994, ASTM D1751, asphalt-saturated cellulosic fiber, or ASTM D1752 self-expanding cork.
 - b. Manufactured clear adhesive tape to break bond between sealant and joint filler.
- H. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

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- I. Bond Breaker: Non-staining liquid product which imparts a waterproof film to prevent adhesion of concrete and will not leave a paint-impeding coating on the face of the concrete.
- J. Roofing Felt: ASTM D226, Type II, #30 asphalt-saturated or approved equal weight of ASTM D227 coal-tar saturated felt.
- K. Granular Base Subgrade: Provide layer of AASHTO No. 57 stone with thicknesses as shown on the Contract Drawings.

2.06 FLOOR AND SLAB TREATMENTS

- A. Unpigmented Mineral Dry-Shake Floor Hardener: Factory packaged dry combination of Portland cement, graded quartz aggregate, and plasticizing admixture.

2.07 PROPORTIONING AND DESIGN OF MIXES

- A. General: Concrete shall be composed of cement, admixtures, aggregates and water. These materials shall be of the qualities specified. The exact proportions in which these materials are to be used for different parts of the work will be determined during the trial batch/mix design. In general, the mix shall be designed to produce a concrete capable of being deposited so as to obtain maximum density and minimum shrinkage and, where deposited in forms, to have good consolidation properties and maximum smoothness of surface. Mix designs with more than 41 percent of sand of the total weight of fine and course aggregate shall not be used. The aggregate gradations shall be formulated to provide fresh concrete that will not promote rock pockets around reinforcing steel or embedded items. The proportions shall be changed whenever necessary or desirable to meet the required results at no additional cost to the County. All changes shall be subject to review by the Engineer.
- B. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use an independent testing facility acceptable to Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing. Prepare design mixes for the following minimum 28-day compressive strengths and applications:
 - 1. 3,500 psi air entrained use for all pipe encasements, reaction backings, Fill Concrete and Structural Foundation Backfill.
 - 2. 4,500 psi use for all structural concrete unless otherwise noted. Submit separate mixes for each condition i.e., air entrained, non-air entrained, pumped.
- C. Submit design mixes and proof of performances for each type and strength of concrete in accordance with ACI 301 and ACI 318.

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D. Admixtures:

1. Use water-reducing admixture or high range water-reducing admixture (superplasticizer) in concrete as required for placement and workability.
2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F.
3. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
4. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
5. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1½ percent within following limits:
 - a. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure.
 - (1) 4.5 percent (moderate exposure); 5.5 percent (severe exposure) 1½-inch max. aggregate.
 - (2) 4.5 percent (moderate exposure); 6.0 percent (severe exposure) 1-inch max. aggregate.
 - (3) 5.0 percent (moderate exposure); 6.0 percent (severe exposure) ¾-inch max. aggregate.
 - b. Other concrete (not exposed to freezing, thawing, or hydraulic pressure) or to receive a surface hardener: 2 percent to 4 percent air.
 - c. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.

E. Cement Content: Provide concrete for following conditions with maximum water-cement (W/C) ratios, by weight, as follows:

1. All 4,500 psi concrete mixes shall have a max: W/C 0.45.
2. All other concrete mixes shall have a max W/C 0.42.
3. The cement factor shall not be less than:

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- a. 515 lb/yd³ of concrete with 1½-inch max. aggregate.
 - b. 535 lb/yd³ of concrete with 1-inch max. aggregate.
 - c. 560 lb/yd³ of concrete with ¾-inch max. aggregate.
- F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
- 1. Maximum slump.
 - a. Reinforced concrete foundation slabs and substructure walls - 3-inch.
 - b. Reinforced concrete, slabs, beams, walls, columns - 4-inch.
 - c. Pipe encasements - 4-inch.
 - d. Structural foundation backfills - 6-inch.
 - e. Concrete containing HRWR admixture (super-plasticizer): Not more than 8-inch after addition of HRWR to site-verified 2-inch - 3-inch slump concrete.
 - 2. Minimum slump for all concrete shall be 1-inch.
 - 3. Use admixtures for water-reducing and set control in strict compliance with manufacturer's directions.
 - 4. Slump may be increased for workability by adding High Range water reducing admixture.

2.08 CONCRETE MIXING

- A. Job Site Mixing: Mix materials for concrete in appropriate drum type batch machine mixer. For mixers of one cubic yard, or smaller capacity, continue mixing at least 1½ minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cubic yard, increase minimum 1½ minutes of mixing time by 15 seconds for each additional cubic yard, or fraction thereof. Job site mixing is limited to small quantities with approval of the Engineer.
- B. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.
- C. Ready Mix Concrete: Comply with requirements and recommended practices of ASTM C94, ACI 304R, and as specified.

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1. When air temperature is between 85 degrees F. and 90 degrees F., reduce mixing and delivery time from 1½ hours to 75 minutes, and when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.
2. Plant Equipment and facilities shall conform to the "Checklist for Certification of Ready Mixed Concrete Production Facilities" of the National Ready-Mixed Concrete Association.
3. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required.

PART 3 - EXECUTION

3.01 GENERAL

- A. Execution shall be in accordance with requirements of ACI 301 unless otherwise noted.
- B. Unless otherwise specified, conform to ACI 304R, 305R, and 306R for concrete installation requirements, such as preparation, mixing, conveying, depositing, curing, and cold and hot weather requirements. Consolidate concrete in accordance with ACI 309R.
- C. Concrete not placed within 90 minutes or 300 revolutions, whichever occurs first, after the first mixing of the cement and aggregates will be rejected.

3.02 REINFORCEMENT

- A. Unless otherwise specified, place reinforcing steel in accordance with CRSI Recommended Practice for Placing Reinforcing Bars.
- B. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- C. The Contractor shall not cut embedded reinforcing steel that is cast into structural concrete without prior written approval by the Engineer.
- D. Cleaning and Replacing Existing Reinforcing Steel:

Existing reinforcing steel that is to be incorporated into the proposed work as shown in the Contract Drawings shall be cleaned until free of all concrete, scale, rust and dust. If reinforcing bar has lost more than 20% of its original cross-sectional area, provide a new bar with size that matches the bar under repair, lapping the existing reinforcing steel per chart shown in Contract Drawings. Where

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the required bar lap is not available or limits of concrete removal to achieve bar lap are too great, use an approved mechanical splice.

E. Cutting New Openings in Existing Concrete:

Where existing reinforcing has been cut when cutting new openings in existing concrete walls or slabs, reinforcing shall be chipped a minimum of 2 inches below proposed finished surface and covered with minimum 10,000 psi non-shrink grout.

3.03 FORMWORK

A. Responsibility:

1. The design and construction of formwork are the sole responsibility of the Contractor.
2. The Contractor shall remove and replace forms which no longer have smooth surfaces and/or are weak resulting in intrusions or extrusions in the concrete face.

B. Design Criteria:

1. Design formwork system which is adequately braced and has strength and stability to ensure finished concrete within the tolerances specified in ACI 347.R, and construct in accordance with ACI 301.
 - a. Class A, $\frac{1}{8}$ -inch for smooth-formed finished surfaces.
 - b. Class B, $\frac{1}{4}$ -inch for rough-formed finished surfaces.
2. Provide formwork sufficiently tight to prevent leakage of mortar.
3. Chamfer external corners $\frac{3}{4}$ -inch, unless noted otherwise in the Contract Documents.
4. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
5. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
6. Portions of ties to be removed from the concrete shall be coated with a clear lubricant or other approved material to facilitate removal. Care shall be exercised during removal of form ties to avoid spalling the concrete on the exposed surface. Cutting back from the face is prohibited.

7. All formwork shall be temporary and removed by the Contractor as part of this Work, unless written approval is given by the Engineer; or unless noted otherwise in the Contract Drawings.
 8. Brace formwork as required to prevent distortion during concrete placement.
 9. Prior to form removal, provide thermal protection for concrete being placed under the requirements of cold weather concreting.
- C. Coating Forms:
1. Coat forms with bond breaker prior to the placement of reinforcing steel.
 2. Do not allow excess form coating material to stand in puddles in the forms or to come in contact with concrete against which fresh concrete is to be placed.
 3. Clean reinforcing steel that has become contaminated with bond breaker to the satisfaction of the Engineer prior to placing concrete.
- D. Joints:
1. Make contraction, expansion, and construction joints where indicated on the Contract Drawings. Additional construction joints are subject to prior approval of the Engineer. Locate additional construction joints to least impair the strength of the structure.
 2. Continue reinforcing steel and welded wire reinforcement across construction joints.
 3. Install premolded joint filler at locations indicated. Extend filler from bottom of concrete.
 4. The surface of the concrete at all joints shall be thoroughly cleaned and all latency removed prior to placing adjoining concrete.
 5. The hardened concrete of construction joints and of joints between footings and walls or columns, between walls or columns and beams or floors they support, joints in unexposed walls and all others not mentioned below shall be dampened (but not saturated) immediately prior to placing of fresh concrete.

3.04 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E1643 and manufacturer's written instruction.

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1. Lap joints 12 inches, unless otherwise specified by the manufacturer, and seal with manufacturer's recommended tape.
- B. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0-inch or minus $\frac{3}{4}$ - inch. Place and compact a $\frac{1}{2}$ -inch thick layer of fine-graded granular material over granular fill.

3.05 MIXING

- A. Mix and deliver ready-mixed concrete in accordance with ASTM C94. Plant equipment and facilities shall conform to "Certification of Ready-Mixed Concrete Production Facilities (Checklist with Instructions)" of the National Ready-Mixed Concrete Association.
- B. Do not over-mix. Do not use concrete which is retained in mixers so long as to require additional water in excess of design mix water to permit satisfactory placing.
- C. Use preparation methods capable of producing concrete with a temperature not more than 85 degrees F, and not less than 55 degrees F, at the time of placement.
- D. Do not heat concrete ingredients to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, within the specified temperatures.
- E. Do not heat water in excess of 140 degrees F.
- F. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C94. Mix concrete materials in appropriate drum-type batch machine mixer.
 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1½ minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

3.06 CONVEYING

Convey concrete from the mixer to the final deposit by methods that will prevent segregation or loss of materials.

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A. Preparation Before Placing:

1. Hardened concrete and foreign materials shall be removed from the inner surfaces of the conveying equipment.
2. Formwork shall be completed; snow, ice and water shall be removed; reinforcement shall be secured in place; expansion joint material, anchors, waterstops and other embedded items shall be positioned; and the entire preparation shall be accepted.
3. Concrete shall not be placed on frozen ground.

B. Conveying:

1. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner, which will assure that the required quality of the concrete is maintained.
2. Conveying equipment shall be of a size and design such that detectable setting of concrete shall not occur before adjacent concrete is placed. Conveying equipment shall be cleaned at the end of each operation or workday. Conveying equipment and operations shall conform to the following additional requirements:
 - a. Truck mixers, agitators and non-agitating units and their manner of operation shall conform to the applicable requirements of ASTM C94.
 - b. Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature. An acceptable arrangement shall be used at the discharge end to prevent segregation. Mortar shall not be allowed to adhere to the return length of the belt. Long runs shall be discharged into a hopper or through a baffle.
 - c. Chutes shall be metal, or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.
 - d. Pumping or pneumatic conveying equipment shall be capable of pumping the specified mix with adequate pumping capacity. Pneumatic placement shall be controlled so that segregation is not apparent in the discharged concrete. The loss of slump in pumping or pneumatic conveying equipment shall not exceed 2 inches.

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Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy.

3.07 CONSOLIDATION

- A. All concrete shall be consolidated by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness.
- B. Form vibrators may not be used.
- C. Take care not to over-vibrate air entrained concrete. Place vibrator to eliminate honeycombing but avoid excess vibrating that bleeds all entrapped air from the mix.
- D. Do not use vibrators to transport concrete.

3.08 CONCRETE PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperature and mechanical injury. Maintain with minimum moisture loss and relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete.
- B. After the concrete has hardened, loosen forms as soon as possible without damage to the concrete, and run curing water continuously down inside the form.
- C. The temperature of the concrete as placed shall not be so high as to cause difficulty from loss of slump, flash set, or cold joints and should not exceed 90 degrees F. When the temperature of the steel is greater than 120 degrees F, steel forms and reinforcement shall be sprayed with water just prior to placing the concrete.
- D. Protection from Mechanical Injury - During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials or methods, by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.
- E. Loads shall not be applied to the concrete structure until the Contractor has completed curing, removing forms and placed concrete has reached the 28-day compressive strength, f'_c .

3.09 REMOVAL OF FORMS

- A. Form removal shall be in accordance with the requirements of ACI 301.

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- B. In cold weather, all forms must remain in place for 5 days.
- C. An accurate record shall be maintained by the Contractor of the dates of concrete placements and the exact location thereof and the dates and times of removal of forms, including any form loosening. These records shall be available for inspection at all times at the site, and two copies shall be furnished to the Engineer upon completion of the concrete work.

3.10 REPAIR OF SURFACE DEFECTS

- A. Repair immediately after form removal.
- B. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.
- C. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregates passing a No. 16 Sieve, using only enough water for handling and placing.
- D. Repair of Defective Areas: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. All honeycombed and other defective concrete shall be removed down to sound concrete. If chipping is necessary, the edges shall be perpendicular to the surface or slightly undercut. No feathered edges will be permitted. The area to be patched and an area at least 6 inches wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared using a mix of approximately 1 part cement to 1 part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream, and then well brushed into the surface.
 - 2. The patching mixture shall be made of the same materials and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted, and the mortar shall consist of not more than 1 part cement to 2½ parts sand by damp loose volume. White Portland cement shall be substituted for a part of the gray Portland cement on exposed concrete in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall be no more than necessary for handling and placing. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.
 - 3. After surface water has evaporated from the area to be patched, the bond coat shall be well brushed into the surface. When the bond coat begins to

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lose the water sheen, the pre-mixed patching mortar shall be applied. The mortar shall be thoroughly consolidated into place and struck off so as to leave the patch slightly higher than the surrounding surface. To permit initial shrinkage, it shall be left undisturbed for at least 1 hour before being finally finished. The patched area shall be kept damp for 7 days. Metal tools shall not be used in finishing a patch in a formed wall, which will be exposed.

- E. Tie Holes - After being cleaned and thoroughly dampened, the tie holes shall be filled solid with patching mortar.
- F. Proprietary Materials - if approved by the Engineer, proprietary compounds for adhesion or as patching ingredients may be used in lieu of or in addition to the foregoing patching procedures. Such compounds shall be used in accordance with the manufacturer's recommendations.
- G. Perform patching before curing compound is applied.
- H. Cure patched areas in the same way as adjacent concrete.
- I. Make repairs uniform in color and finish with surrounding concrete.
- J. Crack Repair: Where cracks in existing or new concrete are deemed by Engineer as requiring repair, repair the cracks using epoxy injection or polyurethane grout injection.
- K. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- L. Repair materials and installation not specified above may be used, subject to Engineer's approval.

3.11 CURING

- A. Keep concrete moist for at least 7 curing days after placement.
- B. A curing day is defined as 24-hour day when the concrete surfaces are kept moist and the uniform temperature of the concrete mass is between 55 degrees F and 75 degrees F.
- C. Curing may be achieved by water curing or application of a liquid membrane-forming curing compound. Curing compounds may not be used on surfaces that are to receive additional concrete, paint, sealers, hardeners, tile, or other special coatings.
- D. Water curing is the preferred method of protection. Cover exposed surfaces with a saturated material (burlap or cotton mats) and keep wet continuously with a soil

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soaker hose for 7 days. Leave covering in place, without wetting, for an additional 3 days.

- E. The use of curing compound (ASTM C309) is permissible. Keep surfaces moist after the forms are removed and the form tie holes repaired. After the surfaces are finished, apply the curing compound according to the manufacturer's recommendations. Do not remove too much forming at one time.
- F. Slabs: Immediately following slab finishing, apply liquid membrane-forming curing compound or begin water curing before the surface becomes dry.
- G. Vertical Surfaces: When the forms are removed entirely, spray the surface with water and allow to reach a uniform damp appearance with no free water on the surface. Apply curing compound or begin water curing.
- H. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- I. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- J. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- K. Curing shall start as soon as the concrete has set sufficiently. Cure concrete according to ACI 308.1, or one or a combination of the following methods:
- L. Curing Methods
 - 1. Flooding. Units of structures that will be below water in the completed structure, i.e., bottom slabs of culverts, footings, struts, etc., may be gradually flooded when approved by the Engineer after the concrete is twelve (12) hours old, provided the curing water conforms to the aforementioned. The temperature of this water shall be maintained at thirty-five degrees (35°) F or above for the specified curing time.
 - 2. Burlap. Two (2) layers of burlap shall be used. Successive strips of burlap shall be overlapped a minimum of six inches (6"). The second burlap layer shall be placed not less than forty-five degrees (45°) to the first layer, or in lieu of this, the six inches (6") overlap of the second layer may be placed midway between the first layer. This material shall be thoroughly saturated by immersion in curing water for at least twenty-four (24) hours prior to

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placement and shall be kept saturated throughout the time specified for curing.

3. White Opaque Polyethylene Backed Nonwoven Fabric. One (1) layer of white opaque polyethylene backed fabric shall be used. Successive strips shall be overlapped a minimum of six inches (6"). This material shall be thoroughly saturated by immersion in curing water for at least twenty-four (24) hours prior to placement and shall be kept saturated throughout the time specified for curing.
4. Cotton Mats. One (1) layer of cotton mat material shall be used and shall be kept thoroughly saturated with curing water prior to placement and throughout the time specified for curing. The material shall be kept in tight contact with the concrete.
5. White Opaque Burlap Polyethylene or White Opaque Polyethylene Film. The white opaque burlap polyethylene sheeting shall be placed on no less than one (1) layer of wet burlap with the burlap side of the sheeting facing down. White opaque polyethylene film, if used, shall be placed on no less than two (2) layers of wet burlap. Only one (1) layer of cotton mats is required in any usage. These materials may only be used atop the wet burlap or cotton mats on unobstructed flat and reasonably level surfaces.
 - a. Adjacent mats or sheets shall be lapped no less than one foot (1'). The ends shall be brought down around the sides of the concrete being cured and securely fastened to make an airtight seal.
 - b. The white opaque burlap polyethylene sheeting or the white opaque polyethylene film shall remain in place for the same length of time as required for burlap or cotton mats. These protective coverings need not be wetted down; however, the covered burlap or cotton mats shall be kept wet for the time interval specified.
6. Liquid Membrane. Liquid membrane forming compounds shall be applied in conformance with manufacturer's recommendations or as directed by the Engineer. The material shall be applied by sprayers and shall be thoroughly agitated before and during use.

3.12 FINISHING FORMED SURFACES

- A. Concrete faces shall be finished with one of the following types. All concrete Work shall have a Smooth-Formed Finish as described below unless otherwise specified.
 1. Rough-Formed Finish (RFF): As-cast concrete texture imparted by form - facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

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2. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish (SFF): As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish (SRF): Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Grout-Cleaned Finish (GCF): Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
 3. Cork-Floated Finish (CFF): Wet concrete surfaces and apply a stiff grout. Mix one part Portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.13 CONCRETE SLAB FINISHING

- A. Complete screeding and darbying slabs before excess moisture or bleeding water is present on the surface.
- B. Do not begin subsequent finishing operations until surface water has disappeared and the concrete will sustain foot pressure with only approximately $\frac{1}{4}$ " indentation.

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- C. Scratch Finish (SF): While still plastic, texture concrete surface that has been screeded and bull-floated or darbies. Use stiff brushes, brooms, or rakes to produce a profile amplitude of ¼-inch in one direction.
- D. Float Finish (FF):
1. Use for base slabs of wetwells, tanks and other structures that contain liquid.
 2. Consolidate concrete with a power-drive disc-type float or a combination floating-troweling machine with metal float shoes attached.
 3. Machines which have a water attachment for wetting the concrete during the finishing operation are prohibited.
 4. Check and level surface plane to a tolerance not exceeding ¼" in 10 feet when tested with a 10-foot straightedge. Cut down high spots and fill low spots. Immediately after re-leveling, refloat surface to a uniform, smooth, granular texture.
 5. Where slab drainage is indicated, take care to maintain accurate slopes for drainage.
- E. Steel Troweling: After float finishing, steel trowel surface as specified to increase compaction of fines and to provide maximum density and wear resistance. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
1. Apply a trowel finish to surfaces indicated, exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft long straightedge resting on two high spots and placed anywhere on the surface does not exceed ¼-inch.
- F. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated or where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.
- G. Non-slip Broom Finish: In addition to floating and troweling, provide walks, ramps, steps, and exposed floor areas subject to foot traffic and likely to be wet with a final non-slip broom finish. Draw broom over previously finished finish.

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H. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instruction and as follows:

1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. unless greater amount is recommended by manufacture.
2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

I. Abrasive Aggregate Non-Slip Finish:

1. Screed and float concrete to the required finish level with no coarse aggregate visible.
2. Uniformly sprinkle abrasive aggregate over the floated surface at a rate of not less than ¼ pound per square foot.
3. Steel trowel surface to a smooth even finish.
4. Immediately after curing, remove cement coating covering the abrasive aggregate by steel brushing, rubbing with an abrasive stone or sandblasting to expose abrasive particles.

Concrete Finish Schedule	
Interior slabs	Dry-Shake Floor Hardener
Interior elevated walkway slabs	Broom Finish
Interior and exterior walls not receiving formliner finish and exposed to public view (1)	Smooth-Rubbed Finish
Exterior walkways/slabs, ramps, stairs, slabs on grade and slabs exposed to weather.	Broom Finish
Beams and columns	Smooth-Formed Finish
Concrete surfaces not exposed to public view	Rough-Formed Finish
Concrete not listed above and exposed to public view (1)	Smooth-Formed Finish
Base slabs of wet tanks/structures	Float Finish

(1) All concrete surfaces that are visible to any person walking through the treatment plant, pumping station, vault, facility buildings, galleries, rooms, platforms, etc. is "exposed to public view".

3.14 HOT WEATHER REQUIREMENTS

- A. Conform to ACI 305R and ACI 305.1 when concreting during hot weather.
- B. Hot weather conditions are deemed to exist when the temperature in the forms is 75 degrees F or above, or a combination of high air temperature, low relative humidity and wind velocity impairs the quality of fresh or hardened concrete. Take protective measures for mixing, transporting and placing concrete in accordance with ACI 305.1.
- C. The temperature of the concrete at the place of discharge may not exceed 85 degrees F.
 - 1. If ice is used to lower temperature, place crushed, shaved or chipped ice directly into the mixer as part or all of the mixing water. Mix until ice is completely melted.
 - 2. Record the concrete temperature at the time of discharge.
- D. Do not add water that will cause the proportions to exceed the maximum water-cement ratio.
 - 1. Notify the resident project representative before adding any water to the concrete mix.
 - 2. Record the amount of water added to the concrete at the jobsite.
- E. Discharge concrete within 45 minutes or 100 revolutions, whichever occurs first, after the first mixing of cement and aggregates.

3.15 COLD WEATHER REQUIREMENTS

- A. Conform to ACI 306R and ACI 306.1 when concreting during cold weather.
- B. Cold weather is defined any time when the daily temperature is 40 degrees F or lower during placement and the protection period.
- C. Protect concrete surfaces from freezing for at least 24 hours after placement.
- D. All surfaces in contact with newly-placed concrete including formwork, reinforcement and subgrade must be above 35 degrees F.
- E. Place concrete at a temperature of not less than 55 degrees F. Mix concrete at a temperature between:
 - 1. 60 degrees F and 70 degrees F when outside air temperature is above 30 degrees F.

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2. 65 degrees F and 75 degrees F when outside air temperature is between 0 degrees F and 30 degrees F.
 3. 70 degrees F and 80 degrees F when outside air temperature is below 0 degrees F.
- F. Follow concrete placement with tarpaulins or other readily movable coverings, so only a few feet of concrete are exposed to the outside air at any time.
 - G. Maintain the temperature and moisture conditions specified in all parts of the newly-placed concrete by covering, insulating, housing or heating. Arrange for protection methods in advance of placement.
 - H. Maintain concrete at a temperature of not less than 50 degrees F or more than 70 degrees F for a period of 3 days after placement. Maintain concrete at a temperature of not less than 50 deg F nor more than 70 deg F for a period of 7 days after placement. At the end of the heating period, the concrete surfaces shall be cooled to the temperature of the outside air by slowly reducing the artificial heat at a uniform rate until the temperature of the outside air is reached within a twenty-four (24) hour period.
 - I. Do not remove forms during the initial protection period.
 - J. Protect insulation against wetting that will impair its insulating value using moisture-proof cover material. Keep insulation in close contact with concrete.
 - K. Construct enclosure to withstand wind and snow loads and be reasonably air-tight. Provide sufficient space between the concrete and enclosure to permit free circulation of heated air.
 - L. Use vented heaters. Do not permit heaters to heat or dry concrete locally.
 - M. Maintain relative humidity above 40% within heated enclosures before construction supports are removed.
 - N. Monitor temperature to ensure concrete is kept within specified limits recording time and concrete temperature every 8 hours.
 - O. Assure concrete has developed necessary strength before removing forms. Provide additional test cylinders with the same protection as the structure they represent to verify concrete strength before construction supports are removed.
 - P. If water curing is used, terminate at least 12 hours before end of temperature protection period. Permit concrete to dry.
 - Q. After the required protection period, gradually reduce the concrete temperature within an enclosure or insulation at a rate not to exceed 20 degrees per day until the outside temperature has been reached.

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- R. Apply membrane-forming curing compound to concrete surfaces during the first period of above-freezing temperatures after forms are stripped and before air temperature rises to 50 degrees. Apply membrane-forming curing compound to slabs as soon as finishing operations are completed, except where live steam curing is used.
- S. The Contractor shall have tarpaulins, insulating devices, and other suitable materials at the site to enclose or protect all portions of the concrete requiring protection. Materials shall be installed as close as possible to keep exposure to cold weather to a minimum. Where heating is required, the spaces to be heated shall be completely enclosed and the temperature kept at required levels by the use of heaters approved by the Engineer.
- T. The Contractor shall provide a sufficient number of maximum/minimum recording thermometers to record temperature in each concrete placement undergoing cold weather protection.
- U. The curing period for all structure concrete requiring cold weather protection shall conform to the cold weather protection period except when the normal curing period is longer.

3.16 CURBING AND SIDEWALKS

- A. Shall be installed using materials and practices set forth in these specifications.
- B. Shall be as detailed on the contract documents.

3.17 TESTING AND FIELD QUALITY CONTROL

- A. General - Concrete materials and operations will be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection when either such defect is discovered, nor shall it obligate the Owner for final acceptance.
- B. Testing Services - The following testing services shall be performed by the designated testing agency:
 - 1. Perform compressive strength, slump and air content tests of the concrete during construction in accordance with the following procedures:
 - a. Secure composite samples in accordance with ASTM C172. Each sample shall be obtained from a different batch of concrete on a random basis, avoiding any selection of the test batch other than by a number selected at random before commencement of concrete placement.
 - b. Mold and cure one set of ten-cylinder specimens from each sample in accordance with ASTM C31. Any deviations from the

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requirements of this standard shall be recorded in the test report. Specimens shall be 6-inch diameter by 12-inch high cylinders.

- c. Of each set of ten cylinders, laboratory cure five cylinders and field cure five cylinders. Test field and laboratory cylinder specimens in accordance with ASTM C39. Test 2 of each cylinder at 7 days; test 2 of each cylinder at 28 days. Hold the remaining cylinder for testing in the event that any of the other cylinders are damaged prior to testing. The acceptance test results shall be the average of the strengths of the two cylinders tested at 28 days. If one cylinder in a test manifests evidence of improper sampling, molding or testing, it shall be discarded, and the strength of the remaining cylinder shall be considered the test result. Should both cylinders in a test show any of the above defects, the entire test shall be discarded.
 - d. Make at least one strength test for each 50-cu. yd., or fraction thereof, of each mixture design of concrete placed in any 1 day. When the total quantity of concrete with a given mix design is less than 20 cu. yd., the strength tests may be waived by the Engineer if, in the Engineer's judgment, adequate evidence of satisfactory strength is provided, such as strength test results for the same kind of concrete supplied on the same day and under comparable conditions to other work or other projects.
2. Determine slump of the concrete at point of placement for each composite sample for each strength test and whenever consistency of concrete appears to vary, using ASTM C143.
 3. Determine air content of the concrete sample for each strength test in accordance with ASTM C231, ASTM C173, or ASTM C138. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform a minimum of one test per 50 CY of concrete placed.
 4. Determine temperature of the concrete sample for each strength test. ASTM C1064: one test hourly when air temp is 40 deg F and below and when 80 deg F and above.
 5. High Range Water Reducer (Superplasticizer) Admixture Segregation Test: Test each truck prior to use on job.
 - a. Segregation Test Objective: Concrete with 4-inch to 8-inch slump must stay together when slumped. Segregation is assumed to cause mortar to flow out of mix even though aggregate may stay piled enough to meet slump test.

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- b. Test Procedure: Make slump test and check for excessive slump and observe to see if mortar or moisture flows from slumped concrete.
 - c. Reject concrete if mortar or moisture separates and flows out of mix.
- C. Additional Services When Required - The following services shall be performed by the testing agency when required by the Owner at the Contractor's expense:
 - 1. Inspect concrete batching, mixing and delivery operations to the extent deemed necessary by the Owner.
 - 2. Sample concrete at point of placement and perform required tests.
 - 3. Review the manufacturer's report for each shipment of cement and reinforcing steel and conduct laboratory tests or spot checks of the materials as received for compliance with specifications.
- D. Other Services as Needed - The following services shall be performed by the testing agency at the Contractor's expense:
 - 1. Additional testing and inspection required because of changes in materials or proportions requested by the Contractor.
 - 2. Additional testing of materials or concrete occasioned by their failure by test or inspection to meet specification requirements.
- E. Duties and Authorities of Designated Testing Agency:
 - 1. Representatives of the agency shall inspect, sample and test the materials and the production of concrete as required by the Owner. When it appears that any material furnished, or work performed by the Contractor fails to fulfill specification requirements, the testing agency shall report such deficiency to the Owner and the Contractor.
 - 2. The agency shall report all test and inspection results to the Owner, Engineer and Contractor immediately after they are performed. All test reports shall include the exact location in the work at which the batch represented by a test was deposited. Reports of strength tests shall include detailed information on storage and curing of specimens prior to testing.
 - 3. The testing agency and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the Contract Documents, nor to approve or accept any portion of the work.

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F. Responsibilities and Duties of Contractor:

1. The Contractor shall provide the necessary testing services for the following:
 - a. Qualification of proposed materials and the establishment of mixture designs.
 - b. Other testing services needed or required by the Contractor.
2. The use of testing services shall in no way relieve the Contractor of the responsibility to furnish materials and construction in full compliance with the Contract Documents.
3. The Contractor shall submit to the Engineer the concrete materials and the concrete mix designs proposed for use with a written request for acceptance. This submittal shall include the results of all testing performed to qualify the materials and to establish the mix designs. No concrete shall be placed in the work until the Contractor has received such acceptance in writing.
4. To facilitate testing and inspection, the Contractor shall:
 - a. Furnish any necessary labor to assist the testing agency in obtaining and handling samples at the project or other sources of materials.
 - b. Advise the testing agency sufficiently in advance of operations to allow for completion of quality tests and for the assignment of personnel.
 - c. Provide and maintain for the sole use of the testing agency adequate facilities for safe storage and proper curing of concrete test specimens on the project site for the first 24 hours as required by ASTM C31.

3.18 EVALUATION AND ACCEPTANCE OF CONCRETE

A. Evaluation of Test Results:

1. Test results for standard molded and standard cured test cylinders shall be evaluated separately for each specified concrete mixture design. Such evaluation shall be valid only if tests have been conducted in accordance with procedures specified.
2. For evaluation, each specified mixture design shall be represented by at least five tests.

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B. Acceptance of Concrete:

1. Strength - Concrete shall meet the minimum requirements of ACI 301. The strength level of the concrete will be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength f'_c , and no individual strength test result falls below the specified strength f'_c by more than 500 psi.
2. Durability - The durability level of the concrete will be considered satisfactory so long as the requirements of ACI 301 are met.
3. Dimensional Tolerances - The concrete will be considered satisfactory so long as the requirements of ACI 301 are met.
4. Finishes and Appearance - The concrete will be considered satisfactory so long as the requirements of ACI 301 are met.

C. Testing of Concrete in Place:

1. Testing by impact hammer, sonoscope, or other nondestructive device may be permitted by the Owner to determine relative strengths at various locations in the structure as an aid in evaluating concrete strength in place or for selecting areas to be cored. Such tests, unless properly calibrated and correlated with other test data, shall not be used as a basis for acceptance or rejection.
2. Core tests:
 - a. Where required, cores at least 2-inch in diameter shall be obtained and tested in accordance with ASTM C42. If the concrete in the structure will be dry under service conditions, the cores shall be air dried (temperature 60 degrees F to 80 degrees F, relative humidity less than 60 percent) for 7 days before testing and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be tested after moisture conditioning in accordance with ASTM C42.
 - b. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores shall be determined by the Engineer to least impair the strength of the structure. If, before testing, one or more of the cores shows evidence of having been damaged subsequent to or during removal from the structure, it shall be replaced with a new core.
 - c. The strength level of concrete in the area represented by a core test will be considered adequate if the average strength of the cores is

equal to at least 85 percent of specified strength f'_c and if no single core is less than 75 percent of the specified strength f'_c .

- d. Core holes shall be filled with low slump concrete or mortar. See Section 3.10, Repair of Surface Defects.

3.19 ACCEPTANCE OF STRUCTURE

A. General:

1. Completed concrete work shall meet all requirements of ACI 301, unless otherwise specified.
2. Completed concrete work which meets all applicable requirements will be accepted without qualification.
3. Completed concrete work, which fails to meet one or more requirements, but which has been repaired to bring it into compliance will be accepted without qualification.
4. Completed concrete work which fails to meet one or more requirements, and which cannot be brought into compliance may be accepted or rejected as provided in these Specifications or in the Contract Documents. In this event, modifications may be required to assure that the work complies with the design intent.

B. Dimensional Tolerances:

1. Formed surfaces resulting in concrete outlines smaller than permitted by the tolerances of ACI 117 shall be considered potentially deficient in strength and subject to the provisions of Section 3.18.
2. Formed surfaces resulting in concrete outlines larger than permitted by the tolerances of ACI 117 may be rejected and the excess material shall be subject to removal. If removal of the excess material is permitted, it shall be accomplished in such a manner as to maintain the strength of the section and to meet all other applicable requirements of function and appearance.
3. Concrete members cast in the wrong location may be rejected if the strength, appearance or function of the structure is adversely affected or misplaced items interfere with other construction.
4. Inaccurately formed concrete surfaces exceeding the limits of ACI 117, and which are exposed to view, may be rejected and shall be repaired or removed and replaced if required.

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5. Finished slabs exceeding the tolerances of ACI 117 may be repaired provided that strength or appearance is not adversely affected. High spots may be removed with terrazzo grinder, low spots filled with a patching compound, or other remedial measures performed as permitted.
- C. Appearance:
1. Other concrete exposed to view with defects which adversely affect the appearance of the specified finish may be repaired only by acceptable methods.
 2. Concrete not exposed to view is not subject to rejection for defective appearance.
- D. Strength of Structure:
1. The strength of the structure in place will be considered potentially deficient if it fails to comply with any requirements, which control the strength of the structure, including but not necessarily limited to the following conditions:
 - a. Low concrete strength as designated in Section 3.18.
 - b. Reinforcing steel size, quantity, strength, position, or arrangement at variance with the requirements of Section 3.02, Reinforcement, or the Contact Drawings.
 - c. Concrete, which differs from the required dimensions or location in such a manner as to reduce the strength.
 - d. Curing less than that specified.
 - e. Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.
 - f. Mechanical injury (as defined in Section 3.08.D), construction fires, accidents or premature removal of formwork likely to result in deficient strength.
 - g. Poor workmanship likely to result in deficient strength.
 2. Structural analysis and/or additional testing may be required when the strength of the structure is considered potentially deficient.
 3. Core tests in accordance with Section 3.18.C.2 may be required when the strength of the concrete in place is considered potentially deficient.

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4. If core tests are inconclusive or impractical to obtain or if structural analysis does not confirm the safety of the structure, load tests may be required, and the results evaluated in accordance with ACI 318.
5. Concrete work judged inadequate by structural analysis or by results of a load test shall be reinforced with additional construction if so directed by the County, or shall be replaced, at the Contractor's expense.
6. The Contractor shall pay all costs incurred in providing the additional testing, analysis and/or engineering services required by this section.

E. Durability of Structure:

The durability level of the structure will be considered satisfactory so long as the requirements of ACI 301 are met.

END OF SECTION

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SECTION 03600

GROUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The work of this section includes grouting as indicated on the drawings or specified in other sections. Unless otherwise specified, all grouting shall be done with non-shrinking grout.
- B. This section also covers epoxy grouting of anchor bolts and threaded rod anchors to be installed in hardened concrete.

1.02 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 308, Recommended Practice for Curing Concrete.
- B. American Society for Testing and Materials:
 - 1. ASTM C33; Concrete Aggregates.
 - 2. ASTM C109; Test Method for Compressive Strength of Hydraulic Cement Mortars (Using two inch or 50-mm Cube Specimens).
 - 3. ASTM C150; Specification for Portland Cement.
 - 4. ASTM C191; Test Method for Time of Setting of Hydraulic Cement by Vicat Needle.
 - 5. ASTM C596; Test Method for Drying Shrinkage of Mortar Containing Portland Cement.
 - 6. ASTM C827; Test Method for Early Volume Change of Cementitious Mixtures.
 - 7. ASTM C1107; Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink).

1.03 SUBMITTALS

- A. Submit a statement of compliance, together with supporting data, from the materials suppliers attesting to the conformance of products and ingredients with these specifications.

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- B. Submit manufacturer's instructions for mixing, handling, surface preparation, and placing the epoxy type and the non-shrink, non-metallic type grouts.

1.04 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Grout manufacturer shall furnish copies of current independent laboratory test results showing the non-shrink, non-metallic grout as non-shrink from time of placement according to the following:
 1. The grout indicates no expansion after final set according to ASTM C827.
 2. The grout indicates 4,000-psi strength developed with a trowelable mix within 24 hours according to ASTM C109.
 3. The grout indicates placement time limitation based on initial set of not less than 60 minutes according to ASTM C191.
 4. Test results, as supplied by the grout manufacturer, shall indicate that in projects of similar scope and size, the effective bearing area was between 95 and 100 percent.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Provide protection for the products to prevent moisture damage and contamination of the grout materials.
- B. Store the grout in undamaged condition with seals and labels intact as packaged by the manufacturer.

1.06 PROJECT CONDITIONS

- A. Protect freshly poured grout against high and low temperatures and unfavorable environmental conditions in accordance with ACI Standards 308.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement: ASTM C150, Type II.
- B. Water: Potable; containing no impurities, suspended particles, algae, organic substances, acids, alkalis, or dissolved natural salts in quantities that will cause:
 1. Corrosion of steel,
 2. Volume change that will increase shrinkage cracking,

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- 3. Efflorescence, or
 - 4. Excess air entraining.
- C. Fine Aggregate:
- 1. Washed natural sand.
 - 2. Gradation in accordance with ASTM C33 and represented by a smooth granulometric curve within the required limits.
 - 3. Free from injurious amounts of organic impurities as determined by ASTM C40.

2.02 RAPID-CURING EPOXY GROUT

- A. High strength, three-component epoxy grout formulated with thermosetting resins and inert fillers.
- B. Grout shall be rapid curing, have high adhesion, and be resistant to ordinary chemicals, acids and alkalis.

C. Physical Properties		Reference Spec.
Compressive Strength	12,000 psi (7-day)	ASTM C579
Tensile Strength	2,000 psi minimum	ASTM C307
Coefficient of Expansion	3×10^{-6} in/in/°F	ASTM C531
Shrinkage	None	ASTM C827

2.03 NON-SHRINK, NON-METALLIC CEMENTITIOUS GROUT

- A. Pre-mixed ready for use formulation requiring only the addition of water; non-shrink, non-corrosive, non-metallic, non-gas forming, no chlorides. No more water shall be used than is necessary to produce a flowable grout, and ASTM C1107.
- B. Certified to maintain initial placement volume or expand after set and meet the following minimum properties when tested in accordance with Corps of Engineers Specification CRD-C621, for Type D non-shrink grout:

Setting Time: Initial 2 hours (Approx.)
 ASTM C191 Final 3 hours (Approx.)
 Expansion: 0.4% Maximum

Compressive Strength:

Time	Consistency		
	Plastic (PSI)	Flowable (PSI)	Fluid (PSI)
1 Day	4,000	3,000	2,500
7 Day	7,000	6,000	5,000
28 Day	10,000	8,500	7,500

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PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Remove defective concrete, laitance, dirt, oil, grease and other foreign material from concrete surfaces by brushing, hammering, chipping or other similar means until a sound, clean concrete surface is achieved. Perform additional surface preparation in accordance with non-shrink, non-metallic grout manufacturer's instructions.
- B. Lightly roughen the concrete, but not enough to interfere with the proper placement of grout.
- C. Remove foreign materials from metal surfaces in contact with grout.
- D. Align, level and maintain final positioning of components to be grouted.
- E. Take special precautions during periods of extreme weather conditions in accordance with the manufacturer's written instructions.
- F. Saturate concrete surfaces with clean water; remove excess water, leave none standing.

3.02 FORMWORK

- A. Construct leakproof forms anchored and shored to withstand grout pressures, so that no movement is possible.
- B. Provide clearance between the formwork and the area to be grouted to permit proper placement of grout.
- C. Forms shall be provided where structural components of baseplates or bedplates will not confine the grout.
- D. Pre-treat wood forms with forming oils so that they do not absorb moisture.
- E. Remove supports only after grout has hardened.

3.03 MIXING

- A. Portland Cement Grout:
 - 1. Prepare grout composed of Portland cement, sand and water; do not use ferrous aggregate or staining ingredients in grout mix.
 - 2. Use proportions of 2 parts sand and 1 part cement, measured by volume.
 - 3. Prepare grout with sufficient water to obtain consistency to permit placing and packing.

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4. Mix water and grout in two steps; pre-mix using approximately $\frac{2}{3}$ of the water; after partial mixing, add the remaining amount of water to bring mix to the desired placement consistency and continue mixing 2-3 minutes.
 5. Mix only that quantity of grout that can be placed within 30 minutes after mixing.
 6. After the grout has been mixed, do not add more water for any reason.
- B. Epoxy Grout & Non-Shrink Cementitious Grout: Mix and prepare epoxy grout and non-shrink cementitious grout in strict accordance with the manufacturer's instructions.
- C. Mix grout components as close to the work area as possible and transport the mixture quickly and in a manner that does not permit segregation of materials.

3.04 PLACING

- A. Unless otherwise specified or indicated on the drawings, the thickness of grout under baseplates shall be 1½ inches. Grout shall be placed in strict accordance with the directions of the manufacturer so that all spaces and cavities below the top of baseplates and bedplates are completely filled, without voids.
- B. Place grout material quickly and continuously.
- C. Do not use pneumatic-pressure or dry-packing methods (Plastic Consistency).
- D. Apply grout from one side only to avoid entrapping air. The final installation shall be thoroughly compacted and free of air pockets.
- E. Do not vibrate the placed grout mixture or permit it to be placed if the area is being vibrated by nearby equipment.
- F. In all locations where the edge of the grout will be exposed to view, the grout shall be finished smooth after it has reached its initial set. Except where shown to be finished on a slope, the edges of grout shall be cut off flush at the baseplate, bedplate, member, or piece of equipment.
- G. Do not remove leveling shims for at least 48 hours after grout has been placed.
- H. Unless otherwise noted in the drawings, anchor bolts and threaded rod anchors shall be epoxy grouted in holes drilled into hardened concrete. Diameters of holes shall be as follows:

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<u>Item</u>	<u>Diameter of Hole</u>
Threaded Rod Anchors Anchor Bolts	1/8-inch larger than the bar or rod outside diameter Per manufacturer's instructions

- I. The embedment depth for epoxy grouted anchor bolts and threaded rod anchors, shall be not less than 15 bolt or rod diameters, unless otherwise indicated on the drawings. Holes shall be prepared for grouting as recommended by the grout manufacturer.
- J. Anchor bolts and threaded rod anchors shall be clean, dry, and free of grease and other foreign matter at time of installation. The bolts, rods, and bars shall be set and positioned, and the epoxy grout shall be placed and finished in accordance with the recommendations of the grout manufacturer. Particular care shall be taken to ensure that all space and cavities are filled with epoxy grout, without voids.
- K. During assembly of all threaded stainless steel components, anti-seize thread lubricant shall be liberally applied to the threaded portion not embedded in concrete.

3.05 CURING

- A. After grout has attained its initial set, keep damp for a minimum of 3 days.
- B. Prevent rapid loss of water from the grout during the first 48 hours by the use of an approved membrane-curing compound or with the use of the wet burlap method.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Related Work Specified Elsewhere:

1. Pre-finishing or shop priming requirements as specified in various other Sections of these Specifications.

1.02 QUALITY ASSURANCE

A. Applicator Qualifications: Painting applicator shall show evidence of acceptability as a qualified applicator by the manufacturer of products specified herein. Submit such evidence with Submittals as specified herein.

B. Referenced Standards:

1. Steel Structures Painting Council Surface Preparation Specifications:
 - a. SSPC-SP1, Solvent Cleaning.
 - b. SSPC-SP2, Hand Tool Cleaning.
 - c. SSPC-SP 3, Power Tool Cleaning.
 - d. SSPC-SP6, Commercial Blast Cleaning.
 - e. SSPC-SP7, Brush-Off Blast Cleaning.
 - f. SSPC-SP8, Pickling.
 - g. SSPC-SP10, Near-White Blast Cleaning.
 - h. SSPC-SP12, Water Jet Cleaning.
 - i. SSPC-SP13/NACE #6 Surface Preparation of Concrete.
 - j. SSPC-SP16 "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-ferrous Metals".
2. ASTM D6386, Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

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1.03 SUBMITTALS

- A. Paint Schedule and Shop Drawings as specified in Section 01000.
- B. Samples: Submit sample color chips of standard colors and samples of any intermixes required.
- C. Schedule and Product Data: Submit paint schedule in same format as the paint schedule herein and indicate which of the selected manufacturer's products are intended for use. Do not perform painting or coating work without Owner's Representative's approval of submitted paint schedule.
- D. Certificates: Paint manufacturer's direct factory representative shall certify in writing to the Owner's Representative painting and coating compliance with the following:
 - 1. Factory representative's initial site inspection of conditions pertinent to painting and coating work with Contractor or his authorized painting representative.
 - 2. Factory representative's second site inspection at completion of painting and coating work to check proper application and actual mil thickness compliance with these Specifications.
 - 3. Certification issued to Owner's Representative only following unacceptable painting and coating work being rectified to Owner Representative's satisfaction.
 - 4. Factory representative shall make his services available to the Owner's Representative for immediate consultation in regard to the painting and coating work and shall make above stated inspections in the Owner Representative's presence.
- E. Operation and Maintenance Data: Upon approval of painting schedule, submit five copies of detailed maintenance manuals, including the following information:
 - 1. Name, address and telephone number of manufacturer and local distributor.
 - 2. Product name, number and technical data sheet for each type of paint.
 - 3. Detailed procedures for routine maintenance and cleaning.
 - 4. Detailed procedure for light repairs such as dents, scratches and staining.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver paint materials to job site in their original unopened containers with labels intact and legible at time of use.

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- B. Store approved materials at the job site in a suitable and designated area restricted to storage of paint and coating materials and related equipment.
- C. Use all means necessary to ensure safe storage and use of paint and coating materials and the prompt and safe disposal of waste. Store paint and coating products protected from weather when such products may be affected by freezing.

1.05 JOB CONDITIONS

- A. Field and Shop Coat Compatibility: To ensure satisfactory paint and coating performance, it is a Contract requirement that products applied in the shop and field be mutually compatible.
 - 1. Contractor shall require fabricators and equipment manufacturers to apply shop coats that are compatible with field coats specified herein.
 - 2. Above requirement does not apply to full factory-finished items, that is, items having both primer and final finish coatings, except as specified in the following paragraphs.
- B. Painting Factory-Finished Equipment: Equipment, such as motors, pumps and other such items, which when installed become an integral part of a system and which may be delivered fully factory-finished (that is, having finish coatings in addition to the prime coating) shall not require repainting in the field unless:
 - 1. Factory finish is unacceptable to the Owner's Representative, that is, not having generic type of paint or proper mil thickness to withstand corrosive atmosphere of wastewater facilities; or,
 - 2. Factory finish is damaged.

On factory-finished items requiring repainting, first sand existing paint to a dull finish and then repaint with scheduled finish system for the installed location of such factory-finished items.
- C. Painting Caulking Compound: Do not apply paint over caulking compound until integral solvents have been released from the compound; usually two weeks for butyl-rubber based caulking and one day for acrylic latex caulking.
- D. Color:
 - 1. As directed by the Owner's Representative.
 - 2. Paint equipment not furnished with a factory finish, or not finished with an acceptable factory finish, and piping and conduits the same color as adjacent surface.

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3. Final work shall match Owner's Representative approved samples. Owner's Representative shall select colors where not indicated or specified with no extra compensation allowed the Contractor for such.
- E. Placing into Service: Do not place painted items into service until paints and coatings are fully cured (dry-hard).
- F. Environmental Requirements:
1. Adhere to manufacturer's data on air and surface temperature limits and relative humidity during application and curing of coatings.
 2. Do not spray-apply paint when wind velocity is above 15 mph.
 3. Schedule coating work to avoid dust and airborne contaminants.
 4. Apply exterior finishes during daylight hours only.
 5. When painting must be done in confined spaces, or because of unfavorable ambient conditions, longer drying times will be necessary.
 6. Provide supplementary ventilation such as fans and blowers in confined or enclosed areas to carry off solvents during the evaporation stage.
- G. Protection:
1. Protect paint materials before, during and after application, and protect other work and materials with drop cloths or other impervious material.
 2. Clean up or otherwise remedy without additional cost, damage by paint and coatings to public or private property.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Paint: As specified in the PAINT SCHEDULE included herein.
- B. Thinners: Only those thinners recommended for that purpose by the manufacturer of material to be thinned.

2.02 MATERIALS

- A. Paint: As specified in the PAINT SCHEDULE included herein.
- B. Thinners: Only those thinners recommended for that purpose by the manufacturer of material to be thinned.

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PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Ferrous Metal:

1. Shop Primed:
 - a. Immediately before paint application, clean sand, dust, mud, dirt and other foreign matter from shop coat.
 - b. Touch-up damaged or destroyed shop paint.
 - c. Surface preparation of surfaces to be touched-up must be as effective as those specified for shop painting.
2. Not Shop Primed and Submerged or Intermittently Submerged in Liquid:
 - a. Grind smooth to a rounded contour sharp edges and welds and remove weld splatter.
 - b. Except for insides of pipes, sandblast in accordance with SSPC-SP10 or pickle in accordance with SSPC-SP8.
 - c. After sandblasting, remove dust and spent sand from surface by brushing or vacuum cleaning.
 - d. Apply prime coat before surface starts to rust.
 - e. Do not allow sandblasted surface to stand overnight before coating.
3. Not Shop Primed and Non-Submerged:
 - a. Grind smooth to a rounded contour sharp edges and welds and remove weld splatter.
 - b. Sandblast in accordance with SSPC-SP6.
 - c. After sandblasting, remove dust and spent sand from surface by brushing or vacuum cleaning.
 - d. Apply prime coat before surface starts to rust.
 - e. Do not allow sandblasted surface to stand overnight before coating.

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B. Existing Concrete:

1. Remove all existing coatings, contaminants, laitance, and weak concrete using impact or power tool methods per ASTM D4259 or SSPC-SP13/NACE #6 Surface Preparation of Concrete. Staining over existing paint will not be permitted.
2. After removal of all existing paint, clean bare concrete surfaces free of dirt, oil, grease, dust, etc. using a cleaner recommended by the new concrete stain manufacturer. Rinse surfaces and allow them to dry thoroughly.
3. Repair all cracked, damaged, and spalled concrete in accordance with the International Concrete Repair Institute (ICRI) Guideline No. 03732.
4. Prepare a surface profile in accordance with the new stain manufacturer's recommendations. Apply new stain only on clean and dry concrete surfaces.

C. New Concrete: Clean in accordance with ASTM D4258 or SSPC-SP13

1. Remove oil, grease, dirt, etc. by steam cleaning or scrubbing with a strong commercial type detergent and flushing with water.
2. Neutralize and flush clean chemical contamination.
3. Fill exposed aggregate or deep pits and air holes with cement grout and trowel to a uniform surface texture.
4. Perform work only on cured, clean and dry concrete surfaces.

D. Mechanical and Electrical Systems:

1. Clean free of dust, mud, dirt, sand and other foreign matter.
2. Solvent clean or otherwise degrease surfaces; exercise care not to damage surfaces.
3. Do not paint factory painted surfaces of mechanical and electrical components in such systems; does not include galvanized surfaces.
4. Do not paint light fixtures.

3.02 APPLICATION

A. General:

1. Strictly follow paint manufacturer's label instructions for mixing, thinning, proper spreading rate and drying time. In no case shall film thickness be less

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than manufacturer's recommendations nor shall area coverage per gallon exceed manufacturer's recommendations.

2. If material has thickened or must be diluted for application, the coating shall be built up to the same film thickness achieved with undiluted material. Do not use thinner to extend coverage of the paint.
3. Regardless of the surface, it shall be the painter's responsibility to achieve a protective and decorative finish either by decreasing the coverage or by applying additional coats of paint.

B. Method of Application:

1. Workmanship: In general, finished surface regardless of method of paint application shall show no evidence of improper application according to accepted trade practice. Do not use paint rollers having nap exceeding $\frac{3}{8}$ -inch.
2. Multi-coat Application:
 - a. Succeeding coats of paint shall show visual difference from preceding coats. Each coat shall have a uniform appearance and be tinted to the final coat. The final coat shall present solid hiding with edges of paint adjoining other paint or materials made clean with and sharp without overlap. Wipe or otherwise render undercoats dust free just prior to application of succeeding coatings.
 - b. Do not apply additional coats of paint until the film to be recoated is sufficiently cured to receive the next coat.
 - c. If the time limit is exceeded for coatings that have a maximum recoat time, consult paint manufacturer before proceeding with next coat.

C. Painting Exposed/Concealed Surfaces:

1. In interior exposed areas of structures, paint mechanical and electrical systems, except for full factory finished items as defined previously.
2. Paint above stated exposed mechanical and electrical systems the same color as adjacent wall and/or ceiling color. Paint materials as scheduled herein.
3. Do not paint exposed aluminum surfaces or rubber components.

3.03 CLEANING

- A. Upon completion of work, remove paint and coating spots, oil and grease stains from floors, walls, fixtures, hardware and equipment, leaving their finishes in a

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satisfactory condition. Remove materials and debris from the site of work and leave in a clean condition so far as this work is concerned.

- B. Keep site free from accumulation of paint containers, solvents, and thinner and used cleaning cloths and legally dispose of same off premises daily.

3.04 INSPECTION & TESTING

- A. Upon completion of work, Contractor shall notify the Engineer that the work is ready to be inspected and tested. Engineer will conduct visual examination and dry film thickness (DFT) testing.
- B. If Engineer's inspection/testing determines that there are any coating holidays or DFTs less than specified, Contractor shall be required to have the coating manufacturer provide a specific action plan to correct the deficiencies, and the deficient areas shall be abraded, solvent wiped and corrected per the manufacturer's recommendations at no cost to the County.

3.05 PAINT SCHEDULE

- A. General: The paint systems specified are acceptable options. The following paint systems are intended to include items to be painted at the job site. Any item not specifically named herein but obviously required to be painted, shall be painted in accordance with the system selected by the Owner's Representative, or otherwise painted as directed by the Owner's Representative.
- B. Schedule: Refer to Finish Paint Schedule Table following this Section: Only new items under this contract and those existing features that these new items connect to shall be painted to match existing colors unless directed otherwise by the Owner's Representative.

FINISH PAINT SCHEDULE TABLE				
Item No.	Items to Be Painted	TNEMEC	CARBOLINE	FINISH COLOR (Remarks)
1	Misc. Ferrous Metals: structural steel, misc. metal fabrications, valve handwheels, extension stems, etc.	One coat Series 27 WB Typoxy @ 3.0-3.5 mils DFT. Two coats Series V69 Epoxoline II @ 6-8 mils DFT/coat.	One coat Carboguard 635VOC @ 4-6 mils DFT. Two coats Carboguard 690 @ 6-8 mils DFT/coat.	Aluminum or Gray Valve handwheels and extension stems shall be OSHA Safety Red.
2	Electrical Conduit (Non-metallic and PVC coated conduit shall not be painted)	One coat Series 1026 Enduratone @ 2.0-2.5 mils DFT. Two coats Series 1029 Enduratone @ 2.0-2.5 mils DFT/coat.	One coat Carbocrylic/Sanitile 120 @ 2 mils DFT. Two coats Carbocrylic 3359 @ 2-3 mils DFT/coat.	Black
3	Concrete Surfaces: equipment bases	See Note 1.	See Note 1.	Gray

- Notes:
1. Equipment bases shall receive two coats Sherwin Williams H & C Heavy Shield Water-Based Solid Color Concrete & Driveway Enamel/Stain @ 200-250 ft²/gal per coat. H & C Shark Grip Slip Resistant Additive shall be added to the second coat @ 3.2 ounces/gal.
 2. Listed DFT mils per coat applies for spray-on application. Application of paint by roller or brush shall be in accordance with manufacturer's requirements. Additional coats required by the manufacturer to achieve overall listed DFT shall be completed by the Contractor.

END OF SECTION

SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes requirements for basic mechanical materials and methods. It applies to all sections of Division 15 and to other sections that include mechanical equipment requirements except when, in these individual sections, requirements are otherwise specified. Mechanical systems shall be complete including all miscellaneous materials, and ready for operation as indicated in accordance with the Contract Documents.

1.02 QUALITY ASSURANCE

- A. Unless otherwise indicated, provide materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturer's latest standard design that conforms to these Specifications. When two or more units of the same class of equipment are required, these units shall be the products of the same manufacturer.
- B. Where materials and equipment are specified to meet requirements of standards or organizations such as Underwriters Laboratories (UL), American Society for Mechanical Engineers (ASME), American Gear Manufacturer's Association (AGMA), American Gas Association (AGA), Air Refrigeration Institute (ARI), etc., that use a label or listing as a method of indicating compliance, such label or listing shall be attached to the material or equipment when delivered to the job site.
- C. Each major component of equipment shall have the manufacturer's name, address and model number on a metal nameplate attached to the item of equipment.
- D. Comply with requirements of the National Fire Protection Association, Air Moving and Conditioning Association, Underwriter's Laboratories, American Society of Heating, Refrigeration, and Air Conditioning Engineers, American National Standards Institute, and Sheet Metal and Air Conditioning Contractors National Association as directly related to material and workmanship.
- E. Welding shall be performed by certified welders in accordance with AWS D1.1 for the types of welding required on the work.
- F. Except where otherwise specified, structural and miscellaneous fabricated steel used in equipment shall conform to AISC standards and structural members shall be designed for appropriate shock and vibratory loads. Unless otherwise specified, steel which will be all or partially submerged during operation of equipment shall be at least ¼-inch thick.

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1.03 SUBMITTALS

- A. Equipment data and information, including descriptive and published details concerning performance, capacity and noise ratings for each piece of equipment. For electrical motor driven equipment, include schematic drawings showing coordination with electrical system and provide rated horsepower, full load current requirements, and for electric motors $\frac{3}{4}$ horsepower and larger, provide temperature rating, locked rotor current, power factor at full and $\frac{3}{4}$ load, efficiency at full load and rated operation condition, type of bearings, lubrication requirements and net weight.
- B. Catalog data for materials, other than equipment, that are manufacturer's standard products.
- C. Shop drawings, including scaled mechanical layout drawings showing dimensioned plan views and elevations of mechanical equipment, equipment mounting and foundations including space requirements, coordination with building features, and other work.
- D. Submit manufacturer's instructions and recommendations for installation, handling and storage, and cleaning and maintenance of equipment and materials prior to initial energizing.
- E. Complete drawings showing identification of wire, wire numbers, terminal numbers and equipment termination for all instrumentation and electrical equipment in accordance with the control wiring identification requirements in Division 16. These control numbers shall be used in all instrumentation and electrical equipment and shall be so indicated on the shop drawings.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Materials and equipment shall be boxed, crated or otherwise completely enclosed and protected during shipment, handling, and storage. Such boxes, crates or protection shall be clearly labeled with manufacturer's name, brand or model designation, type or grade, and color. Complete packing lists and bills of materials shall be included with each shipment. Each item of equipment shall be tagged or marked with the same identification number or mark as shown on the packing lists and bills of materials.
- B. Protect materials and equipment from exposure to the elements and keep dry at all times. Handle and store to prevent damage and in accordance with manufacturer's recommendations.
- C. Motors and other equipment with antifriction or sleeve bearings shall be stored in weather-tight areas maintained at a temperature above 60 degrees F.
- D. Material and equipment damaged by handling and storage shall be repaired or replaced by the Contractor as directed by the Engineer.

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1.05 JOB CONDITIONS

- A. The drawings indicate the extent and general arrangement of equipment and piping. Equipment shall fit into the space allotted and shall allow adequate clearance for entry, installation, replacement, servicing and maintenance. Actual and final arrangement, location, grade and elevations of equipment, appurtenances and piping shall be verified by the Contractor before ordering material and equipment. If adjustments and modifications are deemed necessary by the Contractor, details of such adjustments and modifications and the reasons therefore shall be submitted to the Engineer for approval as soon as practicable but not later than with the submittal of the scaled mechanical layout drawings. No adjustments or modifications shall be made without the Engineer's written approval.
- B. Coordinate the work so equipment may be moved in place without altering building components, other equipment or installations. Drops, rises or offsets not shown on the drawings but required for proper installation of the work shall be provided.

1.06 SAFETY REQUIREMENTS

- A. Enclose or provide guards for belts, pulleys, chains, gears and other rotating parts to protect operating personnel.
- B. Guard or cover high temperature equipment and piping with insulation to protect personnel and prevent a fire hazard.
- C. Provide items such as catwalks, ladders and guardrails, where required, for safe operation and maintenance of equipment.

1.07 SEQUENCING AND SCHEDULING

- A. Sequencing and scheduling of mechanical work shall be coordinated with other parts of the work including verification that all structures, piping, wiring, conduits and equipment components are compatible.

1.08 MAINTENANCE MATERIALS

- A. Spare parts listed to be furnished shall be packed in wooden boxes, labeled with the manufacturer's name, address and telephone number; local representative's name, address and telephone number; name of equipment the parts are for and list of parts contained therein, including the quantity of each part.
- B. Extra material shall be packed in strong cartons, labeled with manufacturer's name, material name, type, color and location where material was installed.
- C. Store maintenance materials in a location directed by the County.

1.09 MANUFACTURER'S SERVICES

- A. Manufacturers of furnished equipment shall provide qualified field representatives to provide services as required during installation, start-up, inspections/tests, and to instruct County personnel on operation and maintenance of the equipment. Field representatives shall be available to observe, instruct, guide and direct the Contractor's handling, installation, start-up and adjustment procedures of the equipment. Manufacturer's services shall be provided as follows:
 - 1. Equipment shall be installed in accordance with the manufacturer's instructions but shall not be energized or operated until a field representative of the manufacturer has inspected the installation and is available on the site to supervise the equipment start-up.
 - 2. Prior to and during the required inspections/tests, a field representative shall be available to operate and adjust the equipment to perform in accordance with the Contract Documents.
 - 3. When required in the specification sections for the equipment, provide competent factory-trained service personnel to instruct County personnel in the operation and maintenance of the equipment. Instruction sessions shall be conducted at times and locations suitable to the County.

PART 2 - MATERIAL

2.01 GENERAL

- A. In the design and supply of equipment, provide for interchangeability of parts and items for equipment, piping, motors and other appurtenances.
- B. Factory assemble, coat and paint mechanical equipment as much as is permissible for shipping and handling but never less than a factory applied prime coat.

2.02 EQUIPMENT BASES

- A. Unless otherwise indicated, floor mounted equipment shall be provided with concrete bases a minimum of four inches high, and not less than 4 inches larger in both directions than supported unit, and outside, ground mounted equipment shall be provided with concrete bases with top elevation 6 inches above grade and bottom elevation 12 inches below the frost line, and not less than 6 inches larger in both directions than supported unit.
- B. Cast iron or welded steel baseplates shall be provided. Each unit and its drive assembly shall be supported on a single baseplate.

2.03 ANCHOR BOLTS

- A. Anchor bolts, nuts and washers shall be stainless steel. Unless otherwise indicated, size anchor bolts to the largest diameter that will pass through the bolt holes of the equipment base. Length of the bolts shall be long enough to permit a minimum of one inch of grout beneath the base plate and a minimum of six inches anchorage into the structural concrete.
- B. Provide anchor bolts, nuts and washers, together with template or setting drawing, sufficiently in advance to permit anchor bolts to be set either prior to or during structural concrete placement.

2.04 SUPPORTS AND BRACES

- A. Provide supports and braces fabricated to meet requirements of the manufacturers and/or as indicated on the drawings.

2.05 DRIVE UNITS

- A. The nominal input horsepower rating of each gear or speed reducer shall be at least equal to the nameplate horsepower of the drive motor. Drive units shall be designed for 24 hour continuous service.
- B. Motor and drive gears shall be rated AGMA Class II and shall bear an AGMA nameplate.
- C. Gear reducers shall be totally enclosed, oil lubricated, with antifriction bearings throughout. Worm gear reducers shall have a service factor of at least 1.20. Shaft mounted gear reducers shall be rated AGMA Class II. Other helical, spiral bevel combination bevel-helical gear reducers shall have a service factor of at least 1.50. Each gear reducer shall bear an AGMA nameplate.
- D. Variable speed drives shall have a service factor of at least 1.75 at maximum speed, unless otherwise specified.
- E. V-belt drive shall include a sliding base or other suitable tension adjustment mechanism. V-belt drives shall have a service factor of at least 1.60 at maximum speed.

2.06 SAFETY GUARDS

- A. Couplings, shafts and other moving and rotating parts shall be covered on all sides by a safety guard. Safety guards shall be fabricated from 16 or heavier gauge galvanized or aluminum-clad sheet steel or ½-inch mesh galvanized expanded metal. Each guard shall be designed for easy installation and removal. Necessary supports and accessories, including bolts, shall be provided for each guard. Supports and accessories, including bolts, shall be galvanized or painted as required.

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2.07 LUBRICATION

- A. Equipment shall be lubricated by systems that require attention no more frequent than weekly during continuous operation. Lubrication facilities, oil drains and fill opening shall be accessible from normal operating area or platform. Drain ports shall allow for collection of waste oil in containers from operating area or platform without removing the unit from its installed position.
- B. Pressure grease fittings shall be Zerk Hydraulic or Alemite type. Locations of grease fittings shall be accessible for lubricating with a grease gun.

2.08 SHOP PAINTING

- A. Surface prepare and shop coat equipment, supports, piping, and appurtenances. Shop primer shall be compatible with field coat.

2.09 ELECTRICAL SERVICE

- A. All mechanical equipment requiring electrical power to operate shall be rated for electrical service as shown on the electrical drawings and shall have sufficient length of cable and all other appurtenances necessary to provide an operational and fully functional unit. If the electrical service is not shown on the electrical drawings, the Contractor shall provide the service as required by the equipment manufacturer at no additional cost to the County.

2.10 SPECIAL TOOLS AND ACCESSORIES

- A. Provide special tools, instruments and accessories required to adjust, maintain or repair equipment. Equipment requiring special devices for lifting and handling shall be furnished complete with these devices.

PART 3 - EXECUTION

3.01 MECHANICAL DEMOLITION

- A. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible material.
 - 3. Equipment to Be Removed: Disconnect and cap services and remove equipment.

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4. Equipment to Be Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- B. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.02 PREPARATION

- A. Inspect areas and surfaces to receive mechanical equipment, piping and appurtenances and verify that areas are ready for installation. Before installation, repair any defects or damaged areas, and adjust surfaces and areas so they are ready for proper installation.
- B. Field measure areas to be occupied by mechanical equipment and appurtenances and verify space is adequate and in accordance with approved shop drawings. If adjustment is required obtain approval of Engineer and adjust as approved.

3.03 INSTALLATION

- A. Equipment and appurtenances shall be installed in accordance with manufacturer's instructions. Provide complete final connections to equipment, including pipe, electric and controls.
- B. Whether shown or not, isolation valves and accessory fittings shall be provided on each side of equipment to allow the equipment to be removed and isolated for servicing. High points in piping shall be provided with manual vents and low points in fluid piping provided with drain valves fitted for hose adapters. Rises and drops as required by field conditions, whether shown or not, shall be provided. The above required items shall be provided by the Contractor at no additional cost to the County.

3.04 FOUNDATIONS, BASES AND SUPPORTS

- A. All equipment, electrical conduits and piping shall be supported by providing compatible frames, braces, hangers and anchors.
- B. Unless otherwise shown on the drawings, floor mounted equipment shall be set on reinforced concrete pads a minimum of four inches high, doweled to the floor. Provide baseplate, anchor bolts and vibratory absorption pad construction as shown on the drawings or as recommended by the equipment manufacturer. Baseplate shall be anchored to the concrete base with anchor bolts, leveled using shims or wedges and the space beneath filled with quick setting non-shrink grout. After grout has hardened, anchor bolts shall be finally tightened and cut off not more than one inch or less than ½-inch above top of the nut.
- C. Non-vibratory equipment suspended from building walls or ceilings shall be braced and supported to provide a rigid installation. Supports and hangers shall be attached

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to bearing walls, roof and floor supports or framing members. Cross bracing shall be provided, as required, to develop a rigid installation.

- D. Vibratory equipment suspended shall be braced, supported and provided with cushioning and anti-vibratory material as shown on the drawings or as recommended by the equipment manufacturer.

3.05 ACCESS PANELS

- A. Provide access panels and openings where it will be necessary for maintenance and servicing of concealed equipment and piping.

3.06 LUBRICATION

- A. Equipment shall be lubricated in accordance with manufacturer's instructions after installation and prior to initial operation. Following testing and prior to final acceptance, re-lubricate as necessary.

3.07 ADJUSTMENT AND INITIAL OPERATION OF EQUIPMENT

- A. Before systems and equipment are initially started, piping and equipment shall be cleaned. Moving parts shall be checked for freedom of movement, alignment and adjustment.
- B. Provide manufacturer's services as required herein before equipment is energized and operated. Make adjustments as required and recommended by the manufacturer's representative.

3.08 SURFACE TOUCH-UP/FIELD PAINTING

- A. Touch-up where shop coats have been damaged using paint, coatings and film thickness identical to original shop coats.
- B. Clean field installed bolts, nuts, washers and support systems.
- C. Field paint as required or directed by the Engineer.

3.09 PROTECT AND CLEAN

- A. Protect equipment during and after installation from construction dust and debris. Provide temporary protection as required until final acceptance of the project.
- B. Clean equipment, surrounding areas and piping inside and out. Replace filters on air-handling equipment.

3.10 FIELD QUALITY CONTROL

- A. Demonstrate and inspect/test the operation of the various systems and equipment in the presence of the Engineer as specified in the specific sections for the equipment.

END OF SECTION

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SECTION 15130

ELECTRO-HYDRAULIC ACTUATORS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The work to be performed under this section includes, but is not limited to, furnishing all labor, equipment, tools, materials and services necessary to install electro-hydraulic actuators on existing cone valves used for pump control, and cone valve main control panels as shown on the drawings and as specified herein.

1.02 SUBMITTALS

- A. Submit the following in accordance with Section 01000 and the following:
1. Submit shop drawings for the electro-hydraulic actuators and control panels, which indicate physical dimensions, details, control panel configuration, cut-away views of the actuators clearly identifying all component parts, and all other pertinent items of information.
 2. Submit catalog cuts for the electro-hydraulic actuators and control panels, which indicate performance and materials of construction.
 3. Submit working drawings, which indicate construction details, mounting details, location and orientation of installation, wiring diagrams (with wire and terminal numbers) for each actuator and related electrical control equipment.
 4. The Contractor shall provide calculations used for actuator sizing for each cone valve to demonstrate that the motor and hydraulic unit supplied will meet the operating conditions specified. The Contractor shall also provide sequence of operation including all time delays involved.
 5. In addition, supply all information requested by the Engineer whether it is explicitly described in these specifications or not.

B. Equipment Guarantee Certification Form

In addition to the manufacturer's warranty for the electro-hydraulic actuator equipment, the Contractor shall obtain and submit to the Engineer and Owner certification from the electro-hydraulic actuator manufacturer that they meet the requirements of the intended application and contract specifications. This certification shall be provided by way of the Equipment Guarantee Certification Form included herewith.

EQUIPMENT GUARANTEE CERTIFICATION FORM

Reference: **Stemmers Run Sewage Pumping Station Electrical Upgrades
Essex, Baltimore County, Maryland**

THE UNDERSIGNED HEREBY ATTESTS THAT HE/SHE HAS EXAMINED ALL APPLICABLE CONTRACT DRAWINGS AND SPECIFICATIONS, AND CERTIFIES THAT THE EQUIPMENT THAT HE/SHE PROPOSES TO FURNISH AND DELIVER MEETS OR EXCEEDS CONTRACT SPECIFICATIONS, IS SUITABLE FOR THE INTENDED PURPOSE STATED IN SPECIFICATION SECTION **15130**, IS SUITABLE FOR INSTALLATION AS PRESENTED IN THE CONTRACT DRAWINGS AND SPECIFICATIONS, AND WILL PROVIDE SATISFACTORY PERFORMANCE AT THE DESIGN CRITERIA SPECIFIED. THIS GUARANTEE OF SUITABILITY FOR INTENDED PURPOSE IS IN ADDITION TO AND SHALL NOT BE IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED.

EQUIPMENT: **ELECTRO-HYDRAULIC ACTUATORS**

MANUFACTURER: _____

Address: _____

By: _____
(Typed Name and Title)

_____/s/_____(SEAL)
(Signature) (Date)

Equipment Warranty and Certification must be signed by a Principal Person (President, Vice-President, etc.) of the equipment manufacturer. In the event the manufacturer is not the Supplier then a Principal Person of the Supplier must also sign this form.

SUPPLIER: _____

Address: _____

By: _____
(Typed Name and Title)

_____/s/_____(SEAL)
(Signature) (Date)

1.03 QUALITY ASSURANCE

- A. The actuators shall be shop inspected and tested for operation before shipping. The actuators shall be mated to the existing cone valves on the job site.
- B. Actuator manufacturer shall be regularly engaged in the design and manufacture of self-contained electro-hydraulic actuators and associated control systems. Manufacturer shall have furnished units of the same general design, type and comparable size specified herein, which have been used and proved satisfactory under similar test, service, and operating conditions for at least five years.

1.04 WARRANTY

- A. The Contractor shall submit to the Owner a written manufacturer's warranty covering equipment defects and workmanship and shall be responsible for repairing or replacing at his own expense, including labor and shipping, all parts defective in material or workmanship for a period of two years from the date Contractor achieves Substantial Completion for the project. The Contractor shall provide a certificate for inclusion in the O&M Manuals documenting the Manufacturer's date of warranty commencement (Contractor's Substantial Completion date) and expiration (two years hence).

PART 2 - MATERIALS

2.01 ELECTRO-HYDRAULIC ACTUATORS

- A. Each existing pump control cone valve shall be controlled with a submersible, fail-safe self-contained, electro-hydraulic actuator mounted on the cone valves, as shown on the contract drawings. The fail-safe electro-hydraulic actuators shall be the product of the Trident Actuator Company, or approved equal.
- B. Actuators shall be provided complete with control panels, supports, base plates, and appurtenances, as required for a complete installation.
- C. Equipment furnished and installed under this section shall be fabricated, assembled, and delivered in proper operating condition. Equipment shall be in full conformity with drawings, specifications, engineering data, and instructions. The Contractor shall supply all required field dimensions to the actuator manufacturer.
- D. Actuators will be used with the existing cone valves for pump control. Actuators shall be capable of operating under all conditions of the sanitary sewerage environment including total submergence during flooded conditions. The actuators shall be designed for submersible service and installation in a NEC Class 1, Division I, Group C & D environment.

- E. The electro-hydraulic fail-safe actuators shall be designed for pump control service. Nominal operating time shall be field adjustable 25 to 90 seconds. Actuators shall be furnished with a totally sealed hydraulic oil reservoir, hydraulic pump, electric motor, mounting frames, adjustable speed controls, adjustable pressure controls, no leak check valves, manual hand pump system, and main controls with control panels. Pressure switches, solenoid valves, manual and motor driven pilot-operated check valves and flow control valves shall be piped from a single hydraulic manifold. Internal piping shall have a maximum of 12 hydraulic connections. Each actuator shall be constructed as a self-contained unit and shall be designed to perform satisfactorily over an ambient air temperature range from 20°F to 100°F.
- F. The actuators shall close the valves in case of emergency or power failure in an adjustable range of 10 to 30 seconds. The fail-safe hydraulic system shall include an accumulator, three electric solenoid valves, and an electrical pressure switch. The control of the fail-safe system shall be from the actuator controller. The accumulator shall deliver fluid to the actuator to return it to its fail-safe position upon loss of electrical power. The pressure switch shall signal the controller when the accumulator has been fully charged again with fluid, wherein fluid from the reservoir cannot be delivered to the cylinder until the accumulator has been fully charged. The hydraulic system shall be designed to allow for discharge of all hydraulic fluid from the accumulator when the system is shut down for maintenance. Accumulator shall conform to Boiler and Pressure Vessel Code for Unfired Vessels, ASME Code Section 8, Division 1. Accumulators shall be made of non-welded seamless steel. Outlet shall be SAE straight thread; dry nitrogen gas shall be used.
- G. Power supply shall be as shown on the electrical drawings.
- H. The actuators shall be constructed of materials as follows:

Base plate, Enclosure & Supports:	Stainless Steel, Type 316L.
Actuator:	Linear cylinder, NFPA Tie rod cylinder.
Cylinder Rod:	Stainless Steel, Type 17-4 pH Hard Chrome Plated.
Reservoir:	Steel, ASTM A36.
Hydraulic Tubing:	Stainless Steel, Type 316.
Fittings:	Stainless Steel, Type 316, No leak SAE J1453 O-Ring Face Seal Sil-brazed.
Assembly Fasteners:	Stainless Steel, Type 316, ASTM F593 and F594. Bolts to be secure by elastic stop nuts or double nutting.

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Manual Hand Pump (Min.
Displacement of 1.17 Cu. In.)
And Directional Control Valve: Stainless Steel, Type 316.

- I. The hydraulic pump package shall consist of a gear pump, a reservoir, check valves, relief valves, flow control valves, and additional components as specified, or as required, to provide a complete packaged pump unit. The pump package shall be totally sealed from the atmosphere. Changing position of the cylinder shall not introduce air into the system.
- J. Motors provided shall be rated for continuous duty and designed in accordance with NEMA Standards to operate successfully at any voltage within ten (10) percent above or below the rated voltage. Motor bearings shall be permanently lubricated. The motor shall be mounted vertically above the hydraulic reservoir.
- K. Hydraulic cylinder shall be tie rod construction rated for a nominal 3,000 psi. Piston rod shall be Type 17-4 stainless steel, hard chrome plated. Rod cartridge retainer and hardware shall be Type 316 stainless steel. The rod cartridge bushing shall be bronze. Cylinder shall be equipped with piston seals, rod seals, a rod wiper, and tube seals. Hydraulic ports shall conform to SAE J1926 specification. Each actuator shall be equipped with a continuous position feedback linear transducer integrally mounted in the actuator cylinder.
- L. The Hydraulic Reservoir shall be a sealed reservoir. The reservoir shall be manufactured of welded steel and provided with O-Ring fittings to provide a zero-leak installation and a non-vented fill plug. Provide and submit a non-intrusive means to monitor hydraulic fluid level and loss of nitrogen in the accumulator.
- M. Actuator shall include a manual hand pump and directional control valve to allow for manual operation. Mounting shall be external to actuator base plate.
- N. The manufacturer shall certify the electro-hydraulic actuators fully operational and capable of complete submergence in water at pressures equivalent to 20 feet for a 10-day period of time. Actuator manufacturer shall pre-wire the actuator with a sufficient length of continuous submersible power and control cable to allow for power and control termination in the control panels without splicing. Cable entrances into the actuator housing and motor shall be completely sealed and capable of submergence to the specified pressures.
- O. The following spare parts shall be provided:
 - 1 set of 3 fail-safe solenoid valves
 - 1 directional control valve
 - 1 of each type pressure switch
 - 2 of each size fuse or circuit breaker

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2.02 CONTROLS

- A. The main control panels shall be type 316 stainless steel NEMA 4X panels, and shall be furnished by the actuator manufacturer to house the actuator controllers. The controls shall be designed using the Allen Bradley Micrologix 1400 programmable logic controller catalog number 1766 with built in Ethernet communications and no substitutions shall be accepted. Each main control panel will be the control system for the associated actuators listed in the actuator schedule as shown on the Contract Drawings. Each controller shall be limited to controlling a maximum of two actuators. Location of the control panels shall be as shown on the contract drawings, or as directed by the Engineer. All controls shall be supplied by the electro-hydraulic actuator manufacturer. Each main control panel shall be completely factory assembled, wired and tested with its associated actuators. The doors shall be equipped with a hasp for padlocking. All buttons, switches, and indicators shall be labeled as to function and shall carry a NEMA rating equal to the control panels. The main control panels shall include selector switches/push buttons as follows:
1. Manual-Auto Selector Switch (Each valve)
 2. Open-Stop-Close Selector Switch (Each valve) (Spring Return to Center)
 3. 10-inch HMI Color Touch Screen (One per main control panel)
- B. A self-regulating space heater element shall be continuously energized for prevention of condensation within the controller enclosures.
- C. Control panels shall have a panel mounted disconnect. Each disconnect handle shall be padlockable in the open position.
- D. User Interface: A panel mounted 10-inch Allen Bradley Panelview Plus CE catalog number 2711P-T10C6A7 (no substitutions accepted) color "touch only" interface shall be provided and programmed by the actuator manufacturer to display valve status and alarms as follows:
1. Status:
 - a. Cone Valve Closed
 - b. Cone Valve Closing
 - c. Cone Valve Opening
 - d. Cone Valve Open
 - e. Cone Valve Jammed
 - f. Actuator Fault

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- g. Cone Valve Fail-Safe Ready
- h. VFD Fault

2. Dry Remote Contacts:

- a. Signals to Remote Instrumentation
- b. Maintain Open Contact for Cone Valve
- c. Remote Permissive Contact
- d. Full Open Indication from Actuator Linear Transducer
- e. Full Close Indication from Actuator Linear Transducer
- f. Cone Valve Full Open Limit Switch
- g. Cone Valve @ 95% Limit Switch
- h. Cone Valve Full Closed Limit Switch

- E. Valve full open and full closed limit switches shall each drive relay outputs for remote annunciation of status to the pump control panel for SCADA.
- F. The control panels shall be fabricated in a UL 508A panel shop and shall bear the UL 508A label.

2.03 PUMP CONTROL SYSTEM DESCRIPTION

- A. Manual Mode: Each valve shall be able to be opened, stopped and closed at its main control panel using the Open-Stop-Close Selector Switch. The switch must be held in the position corresponding to the desired direction of travel, but the travel signal will latch in software after 10 seconds and travel to the full open or closed position accordingly, after the switch has returned to center. When returned to the Auto Mode, the valve will automatically close.
- B. Auto (Pump) Mode: Valves are opened and closed in response to a maintained signal from the VFD.
- C. Normal Pump Start: Start pump signal from pump control system or manual pump start button.
 - 1. Pump permissive supplied by actuator.
 - a. VFD will start pump if valve is fully closed and intermediate contact is closed. This is supplied by actuator PLC output from actuator close limit switch and intermediate contact.

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- b. VFD will start pump if valve actuator remote permissive is energized. The energizing of this relay requires the panel be in AUTO, the accumulator ready, the valve closed, and no alarms.
 - 2. Logic supplied by the VFD.
 - a. When pressure switch between the pump and cone valve is activated on rising pump discharge, VFD shall command valve to open. Maintained signal supplied to actuator dry contact from VFD.
 - b. If pressure switch is not activated within a preset, but adjustable number of seconds, VFD controls shall activate normal pump shutdown.
 - c. After pressure switch activation, if full open limit switch is not activated within a preset, but adjustable number of seconds, VFD controls shall activate normal pump shutdown (normal valve closure) sequence, subsequently stopping pump.
- D. Normal Pump Shutdown:
- 1. When pump control system or manual pump stop button commands a pump to stop, the following shall occur in sequence indicated:
 - a. VFD will command actuator to start closing valve while maintaining pump motor operation.
 - b. Actuator supplies dry contact to VFD for valve 95% closed. This contact shall be programmable and breaks only when the valve is closing. This contact shall cause the VFD to shut down the pump.
- E. Auto (Pump) Mode Emergency Close:
- 1. Loss of power to an actuator shall cause the valve to close immediately in emergency Fail-Safe mode. A normally open contact shall be supplied to the VFD. This contact opens on power loss and it is the pump's signal to shut down.
 - 2. Loss of power to a pump shall cause the valve to close immediately in emergency Fail-Safe mode. A normally open contact is powered closed by the VFD control circuit when control power is available and is supplied to the actuator controls. This contact opens on power loss and it is the actuator's signal to close in Fail-Safe emergency mode. As long as the contact from the VFD is indicating a loss of power to the VFD, the actuator controls shall be programmed to disable control of ALL actuators in the corresponding main control panel in ALL operational modes, including Manual.

3. After a fail-safe event, controls shall be capable of automatically recharging the accumulator of the fail-safe actuators via PLC logic if the condition of the cone valve is closed or jammed closed.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Contractor shall install the actuators, instrumentation and appurtenances in strict accordance with the manufacturer's recommendations and as approved by the County. The Contractor shall be responsible for providing, coordinating and scheduling all startup and training activities. The Contractor and Pump Control System Supplier under Division 17 shall be responsible for supervising the installation, cabling, startup, training activities, and for implementing all functions of the actuators required for the Pump Control System.

3.02 TESTING

- A. The Owner reserves the right to witness the factory tests. Any additional costs from the manufacturer associated with performance of the witness testing shall be included in the Contractor's bid. Only the costs associated with travel, lodging, and meals for the Owner and/or his representative to attend the testing shall be paid directly by the Owner. A minimum of 30 days notice shall be given prior to testing.
- B. Following completion of the actuators installations, the existing cone valves shall be operated through at least two complete open/close cycles and checked for free non-binding operation and full opening and seating. Make adjustments as necessary and repeat testing until cone valves are in proper operating condition.

3.03 STARTUP/TRAINING

- A. The actuator manufacturer shall furnish the services of a qualified, factory-trained service representative who shall inspect the complete equipment installation under the supervision of the Contractor and Pump Control System Supplier to insure that it is installed in accordance with the manufacturer's recommendations, make all adjustments necessary to place the system in trouble-free operation and instruct the operating personnel in the proper maintenance and operation of the equipment furnished. A minimum of two (2) days start-up assistance shall be provided.
- B. The County reserves the right to videotape and archive all startup and training instruction provided by the manufacturer or authorized representative.

END OF SECTION

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SECTION 16010

GENERAL ELECTRICAL PROVISIONS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Note: This work is subject to applicable special construction and mechanical sections where there is specified equipment with electrical connections. All work in other parts of Division 16 and 17 shall meet requirements of this section.
- B. This work includes all labor, materials, equipment and services for a complete electrical system. Included in this contract, but not limited to, is the following:
 - 1. Coordination of connections and providing conduits for all work required for the complete installation of electrical service to all equipment.
 - 2. Electrical equipment and building grounding systems.
 - 3. Furnish and install electrical connections complete to all equipment whether indicated on the plans or not.
 - 4. Support systems for electrical work.
 - 5. Cutting and patching for installation of work specified under Division 16.
 - 6. Variable Frequency Drives.
 - 7. Switchgear retrofit for drawout main and tie circuit breakers, new VFD feeder circuit breakers, new distribution sections and new PLC controls.
 - 8. Replace Surge Protective Devices in the existing switchgear. Devices are specified in Division 16 but installed under Division 17 by the System Supplier.
 - 9. Temporary portable trailer-mounted diesel generators to provide pump power during required outage for switchgear retrofit.
 - 10. New Pump Cone Valve Actuators and Control Panels.
 - 11. Test of electrical systems in accordance with the latest ANSI/NETA ATS.
 - 12. Coordinate all work with Control System Supplier and provide all related conduit and wiring for power and control.

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13. Demolition of electrical equipment in the existing pump station, and delivery of any requested salvageable equipment to the County's Fullerton Facilities Complex.
 14. All pump power, control and alarm wiring.
 15. All wiring, conduit, and other equipment, whether shown on the plans, or specifically mentioned in the specifications or not, to accomplish a fully functional electrical system as described herein.
- C. Under this section provide electric services for all fixtures, appliances and items of equipment requiring same and shown on any contract drawings, specified under this division, mechanical division or any other division of specifications, or specified to be furnished by County.

1.02 QUALIFICATIONS

- A. The electrical subcontractor must be active on the current Baltimore County prequalification list for Work Category "G" and Work Class "3", and licensed to work in Baltimore County, prior to the bid due date.

1.03 LOCAL CONDITIONS

- A. Examine the premises and observe the conditions under which work will be done and all other circumstances which will affect the work before submitting bid. The submittal of a bid will indicate that the Contractor has full knowledge of the problems involved in the performance of the work.
- B. Prior to installation of materials and equipment, discrepancies between plans and actual field conditions or between plans and specifications shall promptly be brought to the attention of the Engineer for a decision.

1.04 APPLICABLE CODES AND STANDARDS

- A. Unless stated otherwise in the GENERAL CONDITIONS, the currently adopted codes by the enforcing authorities shall govern.
1. National Fire Protection Association (NFPA)
 2. International Building Code (IBC)
 3. Local codes
 4. Underwriter's Laboratory (UL)

1.05 SUBMITTALS

- A. All submittals shall include sufficient data to make a thorough evaluation of features, construction and performance. Submittals shall be bound in booklet form with a cover sheet indicating each item and respective manufacturer's catalog number. Include contract number on all submittals.
- B. Materials, equipment and fixtures shall completely satisfy specification requirements and be suitable for their intended use. Items of equipment submitted shall include all accessories and options recommended by the manufacturer for satisfactory, reliable and safe operation in its designated location.
- C. Where model number or name of one manufacturer is followed in specifications by one or more other manufacturer's names, design has been based on first product named and shall be considered to be the specified product or manufacturer, named alternates may require minor deviations. Contractor shall indicate deviations in submittals/shop drawings, and bear any resulting additional costs arising from those deviations.
- D. Under base bid, furnish equipment and material specified or named alternates. Products submitted shall be equal in quality to products of the specified manufacturer and shall include the standard features of the specified product and also optional features or necessary changes specified herein. Submittal of alternates shall include all changes in building systems, piping, wiring, supports or accessories required for satisfactory and intended operation. Engineer shall be final judge of equivalence.
- E. Manufacturer's model and catalog numbers, change frequently and may not necessarily include specified or required features and may not insure compatibility with supporting systems or intended application. Contractor shall insure that material and equipment delivered to job site is suitable for the intended application and indicated connections. Review of shop drawings shall not include review and verification of submitted catalog numbers or quantities required.
- F. Review of and noted comments on Contractor's submitted shop drawings does not constitute a change order or a waiver of contract requirements. In the event of conflict between submittals or shop drawings and contract documents, the latter shall govern. If waiver of particular requirement is requested by Contractor a formal written request shall be made to County as per General Conditions.
- G. When directed, Contractor shall provide samples of material or equipment, as directed.
- H. Equipment shall be shipped or fabricated in sections of suitable size for entering building and all necessary arrangements for their installation shall be made by Contractor.

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- I. Shop drawings and submittals shall bear the General Contractor's review and approval stamp prior to submission to the Engineer.
- J. Submittals shall be bound in booklet form, include a summary cover page listing manufacturer and model number and shall indicate if the submitted item is a substitute.
- K. Submit copies of shop drawings for all electrical equipment custom-made for this Contract. Drawings shall be revised as directed and resubmitted.
- L. Manufacturer's drawings, sketches, and instructions shall supplement but not supersede contract drawings and specifications.
- M. Submittals shall show:
 - 1. Physical size and arrangement of equipment.
 - 2. Wiring diagrams for all equipment showing all circuit devices, conductor sizes, color coding, type, etc.
 - 3. Elementary control diagrams in straightline form for motor control equipment showing all control devices connected to the system.
 - 4. Specifications for all components.
- N. See Section 01000 for additional submittal requirements.

1.06 CUTTING AND PATCHING

- A. Refer to the General Conditions for cutting and patching. Patch all existing areas which were cut for installation of electrical equipment and wiring.

1.07 MATERIALS AND ACCESSORIES

- A. Materials shall be new and listed by the Underwriters Laboratories, Inc., or locally approved national testing agency as conforming to standards in every case where such a standard has been established for the particular materials in question.
- B. Equipment shall be packaged in their original containers and be limited to products regularly produced and recommended for service ratings in accordance with manufacturer's catalogs, engineering data or other comprehensive literature made available to the public, and in effect at the time of contract award and shall be turned over to the County free of all defects.
- C. All equipment or materials for any one system shall be furnished by the same manufacturer. Such items as lamps, conduit fittings, wire, electrical switchgear, wiring devices, etc., shall be the same throughout the project.

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- D. Materials installed on exterior of buildings shall be weathertight and of such design as intended for this purpose. Ferrous exterior materials shall be galvanized or stainless steel as indicated.
- E. Equipment shall be installed in strict accordance with manufacturer's instructions for type, capacity and suitability of each piece of equipment used. Use weatherproof equipment where required. Install equipment in accordance with manufacturer's recommendations and meet conditions for manufacturer's standard warranty.
- F. Contractor shall effectively protect his work, materials, or equipment which are liable to cause injury during construction period. Openings into any part of conduit system as well as associated fixtures, equipment, both before and after being set in place must be securely covered or otherwise protected to prevent obstruction of conduit or injury due to carelessness or maliciously dropped tools or materials, grit, dirt, or any foreign matter. Contractor is responsible for all damage so done until his work is installed and accepted. Conduit ends shall be covered with capped bushings.
- G. Furnish minimum 4-inch thick, or as noted, reinforced concrete housekeeping pads to extend minimum 4 inches beyond equipment footprint for all free-standing electrical distribution equipment, where designated on drawings.
- H. Provide all accessories, equipment and connections required for complete installation, ready for continuous use by County.

1.08 INSPECTION AND REGULATIONS

- A. Do not allow or cause any of this work to be covered up or enclosed until record photographs are taken of installed items, and the work has been inspected, tested and approved by the Baltimore County Bureau of Utilities and any other authorities having jurisdiction over the work. Should any of this Contractor's work be enclosed or covered before such an inspection and test, he shall, at his own expense, uncover the work and after it has been inspected, tested and approved make all repairs with such material as may be necessary to restore all of his work and that of the other contractors to its original condition.
- B. Work shall meet all requirements of Baltimore County, National Electrical Code, local regulations, and rules and construction standards of BGE. All equipment, control panels and materials shall bear label of approval of the National Board of Fire Underwriters and be UL listed for their particular application.

1.09 TESTS

- A. Give timely notice of intention to test or cover up work to permit observation. Contractor shall obtain the services of an Independent NETA Member Testing Agency to test all wiring for continuity and grounds before connecting any equipment or outlets. The Agency shall test the entire electrical system in

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accordance with current procedures stated in the latest Acceptance Testing Specifications published by the National Electric Testing Association, Inc. All equipment necessary to conduct such test shall be furnished at the Contractor's expense. **All** applicable testing shall be performed on **all** equipment provided under Divisions 16 and 17.

- B. Refer to Division 17 for testing required to be performed. The Contractor under Division 16 shall not land or connect any wire pulled until the open loop testing is performed, and he shall assist the System Supplier with the open and closed loop testing.

1.10 COOPERATION WITH OTHER TRADES

- A. Confer with all other trades whose work might affect installation and arrange work in proper relation to that of others and with architectural finishes.
- B. Where interferences occur, Contractor shall, before installing work involved, consult with Engineer and other trades to reach agreement as to exact location and level of work, and submit agreed upon layout for approval prior to starting this work.
- C. Contractor is responsible for arrangement of work, equipment and maintenance of proper clearances for installation. Should work installed require modification to avoid interference, such changes shall be made without additional cost.
- D. If work is dependent for its proper execution on contiguous work not specified in this Division. The Contractor shall examine such work and report in writing any defects therein or conditions rendering it unsuitable. Beginning of work without making of such a report shall constitute an acceptance of such work, and any subsequent defects in his work consequent shall be of his responsibility.

1.11 FIELD MEASUREMENTS

- A. Visit the site before submitting bid and check location of existing utilities, conditions, verify dimensions and locations shown on the plans and over all costs and work herein described or shown.
- B. Take measurements necessary for this work and be responsible for their accuracy. Necessary pull boxes and junction boxes as required to accomplish distribution shall be provided.

1.12 STRUCTURAL DIFFICULTIES

- A. Should structural difficulties prevent performing work, necessary deviations, as determined by Engineer, shall be performed.

1.13 DRAWINGS AND SPECIFICATIONS

- A. Drawings shall be considered schematic in nature and shall represent a completed product. Contractor is responsible for installation of equipment and methods of achieving a satisfactory and intended installation. Locations of devices are intended to show a general arrangement and intended function. Door swings and architectural features shall be checked for final condition. Coordinate with all contract documents, County provided furniture or equipment drawings, structural, and mechanical plans and specifications. Coordinate with other trades.
- B. Where there exists a conflict between drawings and specifications, the final contract document interpretation shall provide compliance with all codes. See also the General Requirements.
- C. Wiring devices shall be located uniformly with respect to building structure and other work. Locations shall be coordinated. Should there be an interference between electrical wiring and other trades, Contractor shall notify engineer so that proper location may be decided upon.
- D. Maintain a complete set of as-built prints of contract. As work is installed, carefully draw on prints, in red colored pencil, correct locations of work installed with dimensions from permanent walls, wiring diagrams and details corrected. Upon completion of project deliver as-built prints to County in good condition.

1.14 PERMITS

- A. All permits, licenses or incidental fees not otherwise identified under provisions of General Conditions of this contract specification shall be borne by the Contractor.
- B. Permit fees will not be charged by the County-on-County permits issued for County projects.
- C. Record copies of all permits submitted by the Contractor shall be provided to the County.

1.15 HAZARDOUS LOCATIONS

- A. All work installed in wetwells, manholes, grinder vaults, screen rooms, or any other area containing, or open to an adjacent area containing the presence of raw sewage, shall meet the installation requirements of the NFPA for Class I, Division I, Group D hazardous locations.

1.16 WARRANTY

- A. Unless otherwise specified, the Contractor shall provide a warranty for a warranty period as set forth in Section 01000 GENERAL REQUIREMENTS for all materials, workmanship and installation. During this period, adjust, repair or

replace at no cost to the County any item of material or workmanship found to be defective.

- B. Contractor shall be responsible for and pay for damages caused by or resulting from defects in materials or workmanship.
- C. Warranty period shall commence upon Contractor achieving Substantial Completion of the project, the date of which shall be approved by the County and documented in the project O&M Manuals.

END OF SECTION

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SECTION 16100

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Requirements of this section apply to all other parts of Division 16.

PART 2 - PRODUCTS

2.01 RACEWAYS AND FITTINGS, MINIMUM SIZE 3/4 INCH.

- A. Non-metallic conduit: Nonmetallic Schedule 40 and Schedule 80 conduits and elbows shall be manufactured to NEMA TC-2, Federal specification WC1094A and UL 651 specifications. Fittings shall be manufactured to NEMA TC-3, Federal specification WC1094A and UL 514B. Both conduit and fittings shall carry respective UL or ETL Listings and UL or ETL labels. Provide Carlon, or equal. Schedule 80 shall be provided only where shown on the plans.
- B. Liquid-tight flexible conduit: Provide Sealtite, American Brass, or equal, and conduit shall be U.L. Listed. In Class I, Division I, Group D applications, provide Cooper Crouse-Hinds, Appleton, or equal, rated for the location where installed.
- C. PVC coated galvanized rigid steel (GRS) conduit and fittings shall be U.L. Listed with both the zinc coating and the PVC coating per UL 6, shall have hot dipped galvanized threads, shall have a complete and undisturbed zinc coating under the PVC coating, and shall be UL Listed for UV resistance. Provide OCAL-BLUE as manufactured by Thomas and Betts, or equal.
- D. Aluminum conduit shall not be used.

2.02 CONDUIT FITTINGS:

- A. Plastic insulating bushings: T&B, O-Z, Gedney, Scotch, Steel City, Raco, Appleton, Efcor, Union.
- B. Metallic bushings: T&B, Gedney, Steel County, Raco, Appleton, Efcor. Use metallic bushings where bushing is exposed.
- C. Flexible liquid resistant conduit: Appleton or equal.
- D. Conduit spacers shall be used to setup conduits prior to pouring concrete. Provide Wunpeece by Underground Devices, or equal. Minimum duct separation shall be 3 inches.

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- E. Myers Hubs: Cooper Crouse-Hinds, or equal. Myers Hubs shall be 316 stainless steel to match conduit size, and shall be used for conduit terminations to all outdoor, NEMA 4X, and stainless steel boxes, cabinets or enclosures.
- F. Expansion Joints:
 - 1. Conduits, rigidly secured to building construction on opposite sides of a building expansion joint, shall be provided with expansion and deflection couplings. The couplings shall be installed in accordance with the manufacturer's recommendations.
 - 2. Expansion and deflection couplings shall also be installed where shown on the drawings.
 - 3. The expansion/deflection couplings shall be by O-Z/Gedney or equal.

2.03 GROUND SYSTEM DEVICES AND EQUIPMENT

- A. Ground rods -- 3/4" x 10' copper clad steel.
- B. Grounding electrode (rod) and grounding electrode conductor (cable) connections: Exothermic weld such as Caldwelled or Thermowelded for all types.
- C. Cable connections accessible: Burndy, Hy-press type.
- D. Ground bushings: O.Z. Type BL.
- E. Pipe connectors: O.Z. Type ABG.
- F. Enclosure connector: O.Z. Type QG or KG.
- G. Feed through lug: Burndy type Q2B.

2.04 BOXES

- A. Manufactured pull boxes shall be one piece stamped galvanized steel, machine screw fasteners with ground bond screw, UL listed.
- B. Direct burial handholes shall be constructed of reinforced fiberglass with a cover rated for "heavy duty" traffic. Size shall be as specified or as required by code, whichever one is larger. Provide Quazite or approved equal.
- C. Conduit fittings shall match conduit type. Cast fittings of Feraloy ("gray metal") shall not be acceptable. Conduit fittings shall be by Permacote, or approved equal.

- D. Outlet, junction and switch boxes shall be cast, types FS and/or FD shall be of malleable iron or aluminum. Cast boxes of Feraloy ("gray metal") shall not be acceptable. Cast boxes shall be Appleton or approved equal.
- E. Explosionproof junction boxes shall be cast aluminum, and suitable for the classification of the area where installed. Boxes shall comply with NEMA standards 3, 4X, 7 and 9. Cover bolts and hinges shall be type 316 stainless steel. Provide Akron Electric AXJ-FCS Series, or equal.
- F. Grouped surface mounted device boxes shall be in a multi-gang cast box. The size shall be governed by the intended use.
- G. Boxes on exterior wall surfaces or otherwise exposed to weather shall be cast FD boxes with threaded hubs and neoprene gaskets. U.L. Listed.
- H. Pull boxes: construct of code gauge galvanized sheet steel with screw cover.
- I. Where installed below the operating level slab, in damp or wet locations, or outdoors, all boxes shall be type 316 stainless steel, NEMA 4X.
- J. All junction boxes and enclosures shall be provided with an integral ground lug for termination of a ground wire. The ground lug shall not compromise the required NEMA rating of the box/enclosure.

2.05 CONDUCTORS:

- A. General
 - 1. Unless specifically indicated otherwise, all wiring shall be 98 percent conductivity copper conductors. Minimum wire size shall be #14 AWG for power, #14 AWG for control and #18 AWG for twisted shielded pairs, unless otherwise noted. All wire shall be stranded. Insulation shall be dual rated THWN/THHN. Manufacturers shall be Triangle, Phelps Dodge, or Royal.
- B. Wire within buildings
 - 1. Single conductor wires: 600 volt dual rated THWN/THHN, within metallic raceways.
 - 2. Refer to Division 17 of these specifications for control wiring.
- C. Exterior wiring:
 - 1. Underground: In conduit, dual rated THWN/THHN.
 - 2. Above grade: In conduit, dual rated THWN/THHN.

3. Overhead: Copper, stranded cable assembly, suitable for intended use.
4. Aluminum wiring shall not be used.

D. Wire connectors

1. Copper wire: For connections of one or more #10 AWG or smaller, solderless twist-on connectors shall be used. The connectors shall have an outer insulating shell manufactured from nylon (polyamide) material and shall be formed with "S"-shaped fins to improve the twisting action. The spring insert shall be a helical elongated coil formed from square spring steel to cause the spring to have "live action" and reduce the turning friction. The connectors shall be rated flame and heat retardant for up to 105 degrees C maximum and be Underwriter's Listed under UL 486. Connectors shall be Buchanan "B"-Caps or approved equal by Pass & Seymour, Ideal, Hyc. Conductors #8 AWG and larger shall be terminated wherever practicable with T&B "Color Keyed" Series 54000, tool applied compression connectors or approved equal.
2. Terminations: Belleville type compression washers shall be used when ambient temperature exceeds 30 degrees C, T&B Series 60800 or approved equal.
3. Compression tools: All compression connectors shall be made with manufacturer's recommended tool incorporating a ratchet release type mechanism to insure complete compression, typically Burndy Y-39 Hypress or approved equal.

E. Wire Fastening Products (Enclosure Interiors)

1. Provide wire fastening products when wiring is specified or required to be secured.
2. Wire fastening products shall include but not be limited to the following types of components: natural nylon cable ties, black (UV-resistant) cable ties, cable tie mounts, adhesive cable tie mounting pads, adhesive press clips, molded nylon clamps, molded polypropylene clamps, flat nylon clamps and adhesive-mount adjustable clamps.
3. The Contractor shall provide all accessories required for a complete and satisfactory installation.
4. Wire fastening products shall be by Brady or approved equal.

F. Wire Pulling Lubricants

1. Wire pulling lubricants shall be used on all wiring pulled into conduit raceways. Pulling lubricants shall be of a greaseless compound, non-

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corrosive, non-conductive, non-combustible, non-toxic, for use with all types of PVC or metal raceways and safe for use on all UL-listed wire insulation. The pulling lubricant shall be "Quick-Slip" by Buchanan, Ideal, or approved equal.

G. Electrical supporting devices

1. Materials secured to the structure by: inserts cast in concrete, expansion anchors in concrete block, machine screws or bolts on metal surfaces. All hardware shall be 316 stainless steel. Hangers shall be as follows:
 - a. Channel: 12-gauge, 316 stainless steel by Kindorf, Unistrut, Globe Strut, Strut by 'B-Line', or equal.
 - b. Channel fittings: to match channel, 316 stainless steel by Kindorf, Unistrut, Globe Strut, fittings by 'B-Line', or equal.
 - c. Conduit hangers: 316 stainless steel clevis type by Unistrut, Kindorf, Grinnell, or equal.
 - d. All-thread shall be 316 stainless steel.
 - e. Wall anchors: Expansion bolt, toggle bolt, or other approved structural anchor. All hardware shall be 316 stainless steel. Wood or fiber plugs or powder actuated fasteners shall not be used.
2. All electrical materials and components secured to joists shall be fastened to the top member of the joist.
3. Provide protective rubber caps on the ends of all channel and exposed ends of bolts or other similar mounting components that could cause injury if contacted.

2.06 WIRING METHODS

- A. In general, interior wiring shall be in PVC coated threaded galvanized rigid steel (GRS) conduit. Service and service entrance wiring and wiring in the wetwell or in vaults shall be in PVC coated GRS conduit. Other wiring buried below grade shall be in PVC conduit, concrete encased. Direct buried conduit shall be PVC coated GRS. Where connections are made to mechanical equipment, transformers, fixed appliances, instruments, and items requiring free movement or which are vibration producing, these connections shall be a flexible raceway with a ground wire installed within, such as Sealtite. Use flexible conduit rated for hazardous locations where required. All wire, cable or conductors of any type shall be in conduit unless approval is obtained otherwise from the Engineer.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Check door swings and clearances with equipment, cabinets, appliances and coordinate with all contract drawings prior to performing work.

3.02 INSTALLATION

- A. Exposed wiring and conduit shall be installed in a neat and workmanlike manner with runs plumb and parallel to walls. Bends and offsets shall be avoided where possible, but where necessary shall be made with an approved hickey or conduit bending machine. Conduit or tubing which has been crushed or deformed in any way or has begun to rust shall not be installed. Use expansion bolts to secure equipment, conduit or devices. Wood or dowel plugs are not acceptable. Conduits or tubing shall be supported on approved types of galvanized wall brackets, ceiling trapeze or pipe straps, secured by means of expansion bolts in concrete or brick. Nails shall not be used as a means of fastening surface boxes or conduits. Conduit or tubing shall be installed in such a manner as to insure against trouble from collection of trapped condensation and all runs on conduit shall be arranged as to be devoid of traps wherever possible.
- B. Raceways and cable shall meet requirements of National Electrical Code and local codes.
- C. Except as noted or specified otherwise, raceways shall be as follows:
 - 1. Indoors exposed on walls or ceilings: PVC coated threaded GRS conduit.
 - 2. Outdoors, exposed or in wetwell/clearwell or vaults: PVC coated threaded GRS.
 - 3. Outdoors direct buried underground: PVC coated GRS (3/4" min.), unless noted otherwise.
 - 4. Within concrete: PVC, Schedule 40 with approved fittings.
 - 5. Below concrete slabs: PVC, Schedule 40.
 - 6. Liquid-tight flexible metal conduit shall be used for connections to motors, instruments, and other electrical equipment subject to movement, vibration or noise transmission, or where approved by the Engineer. Maximum length shall be 3 feet unless specific approval is given otherwise by the Engineer. Longer lengths are acceptable where specified for use in connecting portable generators.
 - 7. Where shown: PVC, Schedule 80.

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8. No conduit shall be routed through the wet well without written approval from the Engineer, unless the instrument served is located therein.
 9. All wire and cable shall be continuous without splicing from load to source of supply. Splicing shall only be performed after obtaining written approval from the Engineer.
 10. All wire and cable shall be run in conduit unless written permission is obtained from the Engineer.
- D. Clamps shall be malleable iron. Multiple runs shall be supported on metal channel with conduit clamps. Trapezes shall be metal channel with conduit clamps.
 - E. Penetrations through concrete walls, floors and footings, both interior and exterior, shall be sleeved and caulked with grout or plastic compound to provide watertight seal. Penetrations through the concrete walls of wetwells, junction chambers, manholes, or any other water bearing structure, shall be cored and provided with modular seals, such as Link-Seal, or equal. The modular seals shall be type 316 stainless steel.
 - F. Handling and installation: Bends shall be kept in accordance with minimum recommended by manufacturer. Cables shall be paralleled on reels and be pulled directly into raceway from the coil or reels on which they are received. Cable shall not be laid on the ground.
 - G. Use pulling lubricants on all raceway wiring. Wire and cable shall be installed only after raceways are free of obstructions and clean. All wire shall be color coded. Wiring shall be tagged with Brady "Quick" labels at all terminations with each individual wire having a unique identifying number. Wiring in panelboards and terminal cabinets shall be neatly trained and served.
 - H. All empty conduits shall be installed complete with a nylon pull cord.
 - I. All transitions from PVC to PVC coated GRS conduit shall be made a minimum of 12 inches below grade.
 - J. Conduit stubs inside of pad-mounted equipment or enclosures shall be a minimum of 2 inches above surface of equipment/enclosure pads.

3.03 WARRANTY

- A. Unless otherwise specified, the Contractor shall provide a warranty for a warranty period as set forth in Section 01000 GENERAL REQUIREMENTS for all materials, workmanship and installation. During this period, adjust, repair or replace at no cost to the County any item of material or workmanship found to be defective.

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- B. Contractor shall be responsible for and pay for damages caused by or resulting from defects in materials or workmanship.
- C. Warranty period shall commence upon Contractor achieving Substantial Completion of the project, the date of which shall be approved by the County and documented in the project O&M Manuals.

END OF SECTION

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SECTION 16395

SHORT-CIRCUIT AND PROTECTIVE DEVICE EVALUATION AND COORDINATION STUDY

PART 1 - GENERAL

1.01 SCOPE

- A. The studies shall be performed by an approved member firm of the International Electrical Testing Association (NETA) and shall be submitted to the Owner prior to receiving final approval of the distribution equipment shop drawings and/or prior to release of equipment for manufacturing. If formal completion of the studies may cause delay in equipment manufacturing, approval from the Owner may be obtained for a preliminary submittal of sufficient study data to ensure that the selection of device ratings and characteristics will be satisfactory.
- B. The studies shall include all portions of the electrical distribution system from the normal power source or sources down to and including the smallest adjustable trip circuit breaker in the distribution system. Normal system connections and those which result in maximum fault conditions shall be adequately covered in the study. All studies and tests shall follow appropriate NETA guidelines. Where included in the designed system, emergency power sources shall be included in the studies.
- C. The firm shall be currently involved in high- and low-voltage power system evaluation. The study shall be performed, stamped and signed by a Professional Engineer currently registered in the State of Maryland. Credentials of the individual(s) performing the study and background of the firm shall be submitted to the Owner for approval prior to start of the work. A minimum of five (5) years experience in power system analysis is required for the individual in charge of the project. Technicians shall be NETA certified, and instruments shall be NIST calibrated.
- D. The selected firm shall also perform the NETA acceptance testing, Arc Flash Hazard Study and thermographic surveys as required elsewhere in these specifications.
- E. The firm performing the study shall demonstrate capability and experience to provide assistance during start up as required and shall provide that assistance for a minimum of two full days in addition to the time required for testing and study activities.

PART 2 - PRODUCTS

NOT USED

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PART 3 - EXECUTION

3.01 SHORT-CIRCUIT AND PROTECTIVE DEVICE EVALUATION AND COORDINATION STUDY

- A. The short-circuit study shall be performed with the aid of a digital computer program and shall be in accordance with the latest applicable NETA, IEEE and ANSI standards. The study shall be performed on all new and existing electrical equipment at the facility.
- B. In the short-circuit study, provide calculation methods and assumptions, the base per unit quantities selected, one-line diagrams, source impedance data including power company system characteristics, typical calculations, tabulations of calculation quantities and results, conclusions, and recommendations. Calculate short-circuit interrupting and momentary (when applicable) duties for an assumed 3-phase bolted fault at each supply switchgear lineup, switchboard, distribution panelboard, pertinent branch circuit panelboard, and other significant overcurrent protective device locations throughout the systems. Provide a ground fault current study for the same system areas, including the associated zero sequence impedance data. Include in tabulations fault impedance, X to R ratios, asymmetry factors, motor fault contribution, short circuit kVA, and symmetrical and asymmetrical fault currents.
- C. In the protective device coordination system, provide time-current curves graphically indicating the coordination proposed for the system, centered on conventional, full-size, log-log forms. Include with each curve sheet a complete title and one-line diagram with legend identifying the specific portion of the system covered by that particular curve sheet. Include a detailed description of each protective device identifying its type, function, manufacturer, and time-current characteristics. Tabulate recommended device tap, time dial, pickup, instantaneous, and time delay settings.
- D. Include on the curve sheets power company relay and fuse characteristics, medium-voltage equipment protective relay and fuse characteristics, low-voltage equipment circuit breaker trip device characteristics, pertinent transformer characteristics, pertinent motor and generator characteristics, and characteristics of other system load protective devices. In addition, include all devices down to the largest branch circuit and largest feeder circuit breaker in each motor control center, and main breaker in branch panelboards. Include all adjustable settings for ground fault protective devices. Include manufacturing tolerance and damage bands in plotted fuse characteristics. Show transformer full load currents, transformer magnetizing inrush, ANSI transformer withstand parameters, and significant symmetrical fault currents. Terminate device characteristic curves at a point reflecting the maximum symmetrical fault current to which the device is exposed.

- E. Select each primary protective device required for a delta-wye connected transformer so that its characteristic or operating band is within the transformer characteristics, including a point equal to 58 percent of the ANSI withstand point to provide secondary line-to-ground fault protection. Separate transformer primary protective device characteristic curves from associated secondary device characteristics by a 16 percent current margin to provide proper coordination and protection in the event of secondary line-to-line faults. Separate medium-voltage relay characteristic curves from curves for other devices by at least a 0.4-second time margin.
- F. Include complete fault calculations as specified herein for the complete distribution system.
- G. Notify the Owner in writing of circuit protective devices not properly rated for fault conditions.
- H. Study Report
 - 1. The results of the power system study shall be summarized in a final report. Six (6) bound copies of the final report shall be submitted.
 - 2. The report shall include the following sections:
 - a. Descriptions, purpose, basis, and scope of the study.
 - b. Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short-circuit duties, and commentary regarding same.
 - c. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection, and commentary regarding same.
 - d. Fault current calculations including a definition of terms and guide for interpretation of computer printout.

3.02 FIELD SETTINGS

- A. The Contractor shall perform field adjustments of the protective devices as required to place all new and existing equipment in final operating condition. The settings shall be in accordance with the approved short-circuit study, protective device evaluation study, and protective device coordination study.
- B. Necessary field settings of devices and adjustments and minor modifications to equipment to accomplish conformance with the approved short-circuit and protective device coordination study shall be carried out by the Contractor at no additional cost to the Owner.

3.03 TESTING

- A. Any existing circuit breakers used to feed new equipment shall be fully tested, adjusted and lubricated in accordance with NETA standards.

END OF SECTION

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SECTION 16396

ARC FLASH HAZARD STUDY

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Provide an Arc Flash Hazard Study for the electrical distribution system shown on the one-line drawings. The intent of the Arc Flash Hazard Study is to determine hazards that exist at each major piece of electrical equipment shown on the one-line drawings, plans and schedules. This includes, but is not limited to, switchgear, switchboards, panelboards, motor control centers, VFD's, UPS's, ATS's, control panels containing 208, 240 or 480 volts, and transformers. The study shall include creation of Arc Flash Hazard Warning Labels. These labels serve as a guide to assist technicians and others in the selection of proper Personal Protective Equipment when working around exposed and energized conductors. The electrical contractor shall install the labels.
- B. The arc flash hazard study shall include all the electrical distribution system equipment shown on the one-line drawings, plans and schedules. Perform the short circuit protective device coordination study specified under 16395 for the electrical distribution system before performing the Arc Flash Hazard Study. The arc flash hazard study shall consider operation during normal conditions alternate operations, emergency power conditions, and any other operations, which could result in maximum arc flash hazard.
- C. In addition to the Arc Flash Hazard Warning Labels, the study shall include creation of Available Fault Current Labels in accordance with the latest edition of the National Electrical Code for each piece of service entrance switchgear and/or motor control center installed on the project. The electrical contractor shall install the labels.
- D. Comply with latest code edition for all NFPA, OSHA and IEEE requirements.

1.02 QUALIFICATIONS

- A. The study shall be prepared under the supervision of and stamped and signed by a Professional Engineer currently registered in the State of Maryland.
- B. The Contractor shall have the study prepared by the same NETA listed member firm that performed the requirements listed under 16395.

1.03 SUBMITTALS

- A. The Contractor shall submit the Arc Flash Hazard Study, Arc Flash Hazard Warning Labels and Available Fault Current Labels at least 60 days prior to energizing the electrical equipment.
- B. Submit six (6) copies of the power systems study and (2) sets of each type of warning labels.

PART 2 - PRODUCTS

2.01 ARC FLASH HAZARD STUDY

- A. Perform an Arc Flash Hazard Study after the Short Circuit and Protective Device Coordination Study has been completed.
- B. The study shall be calculated by means of a computer software package. Pertinent data, rationale employed, and assumptions in developing the calculations shall be incorporated in the introductory remarks of the study.
- C. The study shall be in accordance with applicable NFPA 70E, OSHA 29-CFR, Part 1910 Sub part S and IEEE 1584 Standards.
- D. Arc Flash Hazard Warning Labels shall be based on the worst-case incident energy levels calculated for a particular bus. Protective devices in the corresponding equipment being analyzed shall be assumed to be removed or disabled if the calculated energy level is higher without its protection. The arc flash calculations shall be performed using the line side breaker or disconnect fault current for each piece of equipment, regardless of breaker open or closed status, and calculated values shall be based on the worst-case flash produced.
- E. Determine the following
 - 1. Flash Hazard Protection Boundary
 - 2. Limited Approach Boundary
 - 3. Restricted Boundary
 - 4. Minimum Rating of Clothing
 - 5. Incident Energy Level and Working Distance
 - 6. Required Personal Protective Equipment Class
- F. Produce an Arc Flash Warning Label listing items 1 – 4 and either 5 or 6 above, as a minimum, and include the date of the study on the labels as well. Also

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include any additional data in accordance with the latest edition of NFPA 70E and OSHA requirements, as well as the bus name and voltage. Labels shall be printed in color and be printed on adhesive backed weatherproof Avery labels. The same quality and type of labels shall be used for the Available Fault Current Labels.

G. Produce separate individual Bus Detail Sheets that lists the items E 1-6 from above and the following additional items:

H. Bus Name

1. Upstream Protective Device Name, Type, and Settings
2. Bus Line to Line Voltage
3. Date of study.

I. Produce Arc Flash Evaluation Summary Sheet listing the following additional items:

1. Bus Name
2. Upstream Protective Device Name, Type, and Settings
3. Bus Line to Line Voltage
4. Bus Bolted Fault
5. Protective Device Bolted Fault Current
6. Arcing Fault Current
7. Protective Device Trip / Delay Time
8. Breaker Opening Time
9. Solidly Grounded Column
10. Equipment Type
11. Gap
12. Arc Flash Boundary
13. Working Distance
14. Incident Energy

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15. Required Protective Fire Rated Clothing Type and Class
16. Date of study.

PART 3 - EXECUTION

3.01 ANALYSIS

- A. Analyze the short circuit, protective device coordination, and arc flash calculations and highlight any equipment that is determined to be underrated or causes an abnormally high incident energy calculation. Propose approaches to reduce the energy levels. Proposed major corrective modifications will be taken under advisement by the Engineer, and the Contractor will be given further instructions.

3.02 REPORT

- A. The results of the power system study shall be summarized in a final report. The report shall be bound and shall include the following sections:
 1. Introduction, executive summary, recommendations, assumptions, and a reduced size copy of the overall one-line drawing.
 2. Arc Flash Evaluations Summary Spreadsheet.
 3. Individual Bus Detail Sheets.
 4. Arc Flash Hazard Warning Labels.
 5. Available Fault Current Labels.

END OF SECTION

SECTION 16400
SERVICE AND DISTRIBUTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Work included:
 - 1. Electrical distribution system components.
 - 2. Conduits and wire as required.
 - 3. Infrared Testing of Motor Control Center, Switchgear, and VFD's.
- B. Work included elsewhere: See Section 16010 - General Provisions (Electrical).

1.02 SUBMITTALS

- A. Submit cutsheets on all items of electrical equipment. Include panelboards, switches, wiring, receptacles, motor starters, disconnections, wiring devices, cover plates, nameplates, distribution equipment and overcurrent devices.

1.03 INFRARED TESTING

- A. The Contractor shall hire an independent certified testing laboratory to inspect and test the Motor Control Center, Switchgear, and VFD's. Infrared Tests shall be made to determine that all terminations are tightened to proper torques and that no part of the equipment is overheating beyond normal operating conditions. This test shall be made twice, once at 1 week and again at 23 months after the pump station has been turned over to the County. The finding of each test shall be incorporated into a report which shall be submitted for approval, and 3 final copies shall be turned over to the County. The report shall include a listing of the equipment as well as information on measured temperatures, including color copies of the actual images obtained, which show those temperatures. If the equipment is determined to be above normal operating temperatures the Contractor shall make the necessary corrections to the equipment. All testing shall be performed without the use of IR ports in any of the furnished equipment.

PART 2 - PRODUCTS

2.01 CIRCUIT BREAKERS

- A. Thermal-magnetic type, tripping free of handle and employing design principle of arc. Handles shall assume three distinctive positions; 'OFF', 'ON' and 'TRIPPED'.

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- B. Provide solid state trip where indicated on the drawings.
- C. Refer to Specification 16420 for new switchgear circuit breakers.

2.02 SURGE PROTECTIVE DEVICES

- A. Surge protective devices shall be Ditek Model D200-277/4803Y, or equal.

2.03 WIRING METHODS

- A. In general, branch circuits shall be No. 14 AWG or No. 12 AWG THWN/THHN copper. Control wiring for discrete signaling may be No. 14 AWG THWN/THHN copper. Wiring for analog signaling shall be No. 18 AWG twisted shielded pair.
- B. Branch circuit wiring for switches, lighting and receptacles shall be in exposed conduits on walls and ceilings.
- C. All wiring shall be supported in accordance with provisions of National Electrical Code and local code requirements and shall utilize approved fasteners and clamps. Conduits secured to walls shall be fastened to wall studs where spacing permits. In all cases, conduits and clamps shall be rigidly secured and free of obstructions which may cause injuries.
- D. All conductors shall be color coded per the NEC. All No. 14, No. 12 and No. 10 branch circuit conductors shall have solid color compound or solid color coating. Refer to Division 17 specifications for color coding of alarm and control circuit wiring.
- E. No. 8 AWG and larger conductors shall have NEC required color coding as either:
 - 1. Solid color compound or solid color coating.
 - 2. Stripes, bands or hash marks of colors.
 - 3. Colored, pressure-sensitive plastic tape. Tape shall be applied in half overlapping turns for a minimum of three inches for all terminal points, and in all junction boxes, pull boxes, troughs, manholes, and handholes. Tape shall be 3/4-inch wide with colors as specified above. The last two laps of tape shall be applied with no tension to prevent possible unwinding. Tag all wires at terminal equipment, outlets, terminal cabinets, pull and junction boxes, and control center, with Brady "Quick" label tags.
 - 4. Circuit number and panel identification shall be permanently printed on the stems or junction boxes of all lighting fixtures, and the back of all device plates on all receptacles and wall switches.

2.04 WIRING DEVICES

- A. Emergency stop pushbuttons shall be snap-type maintained contact mushroom style switches. Allen Bradley 800 series, or equal.

2.05 GROUNDING

- A. Furnish, install and connect ground bond to cold water services and to auxiliary driven ground rods. Bond all non-current carrying metallic parts of equipment, mechanical systems, and building steel. Neutral conductor at main switches shall be grounded. Ground bus shall not be less than size required by National Electrical Code and local codes. Grounding system shall be complete and installed in accordance with all local jurisdictions and County's requirements. Ground rods shall be copper clad steel, driven as indicated, or to refusal. Where soil conditions are poor notify the Engineer so that supplemental grounding may be considered. Ground and bond all piping systems and building steel within building as required by the NEC.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Ground all equipment in accordance with the National Electrical Code requirements, the additional requirements of Division 16 and with local ordinances and utility company requirements.
- B. Support pull boxes and junction boxes in ceiling from structure and not from raceways or ceiling suspension systems.
- C. Use locknuts and insulating bushings at all rigid conduit ends at junction boxes, pull boxes, panel, starters, disconnections, and other boxes.
- D. Protect conduit openings and do not pull wire until work which would damage wire has been completed near ends of conduit. All empty raceways shall be furnished with nylon rope.
- E. Bend conduits with hickey or bender, where bends are necessary. Do not bend in vise or use a pipe tee for bending.
- F. When cutting conduit, square ends, thread, ream and clean.
- G. Use Sealtite conduit and fittings for pumps, motor connections, in mechanical equipment rooms or out of doors for flexible connections.
- H. Use gasketed covers and threaded raceway hubs for exterior raceway connections. Use vandal-resistant hardware at all outdoor locations.

- I. Label all safety switches, disconnections, panelboards, motor starters, and other equipment with engraved laminated plastic tags, screw attached, not smaller than 3/8 inch high, indicating function served. Letters shall not be smaller than 1/4 inch high and shall be black on white background. Submit proposed designations and sample for approval.

3.02 WARRANTY

- A. Unless otherwise specified, the Contractor shall provide a warranty for a warranty period as set forth in Section 01000 GENERAL REQUIREMENTS for all materials, workmanship and installation. During this period, adjust, repair or replace at no cost to the County any item of material or workmanship found to be defective.
- B. Contractor shall be responsible for and pay for damages caused by or resulting from defects in materials or workmanship.
- C. Warranty period shall commence upon Contractor achieving Substantial Completion of the project, the date of which shall be approved by the County and documented in the project O&M Manuals.

END OF SECTION

SECTION 16410

SWITCHGEAR RETROFILL MODIFICATIONS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This specification serves to define requirements for the retrofill of existing low voltage air circuit breaker cubicles to accept modern cells and circuit breakers of the same continuous, and the same or greater interrupting rating using current model circuit breaker and cell. The circuit breakers shall be fully compatible with the existing switchgear and new switchgear PLC controls.
- B. Work included elsewhere: See Section 16010 - General Provisions (Electrical).

1.02 SUBMITTALS

- A. Submit cutsheets on all items of electrical equipment. Include panelboards, switches, wiring, receptacles, motor starters, disconnections, wiring devices, cover plates, nameplates, distribution equipment and overcurrent devices.
- B. Schematic Diagrams and nameplate information will be submitted to Vendor within (30) days of date of purchase order. Within thirty (30) days after receipt of schematic diagram and nameplate information from Purchaser, Vendor shall submit the following ACAD reproducible drawings for approval.
 - 1. Schematic control diagrams of the retrofitted circuit breaker and cubicle.
 - 2. Verification of nameplate designations as submitted by Purchaser.

1.03 STANDARDS

- A. All supplied equipment shall conform to, and tests shall be conducted in accordance with the latest applicable standards of the American National Standards Institute (ANSI®), National Electrical Manufacturers' Association (NEMA®), and the Institute of Electrical and Electronic Engineers, Inc. (IEEE®) unless otherwise stated herein.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. The 3-pole air interrupter housing assembly (cell) shall be mounted in the existing circuit breaker cubicle. The retrofilled cubicle shall be suitable for use in the existing switchgear. Only interrupters and housing assemblies that have

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passed appropriate ANSI design tests shall be used in the retrofit. Acceptable interrupter and housing assembly manufacturers are: Square D®/Schneider Electric, Merlin Gerin, no substitutions.

- B. Main current-carrying parts, insulators, supports, and housings of the retrofilled cubicle shall have sufficient mechanical strength to withstand, without incurring damage, the effect of rated short circuit currents.

2.02 CIRCUIT BREAKERS

- A. Unless otherwise specified, the new circuit breakers shall be rated in accordance with the latest issues of ANSI C-37.04 and table 2 of ANSI C37.06.
- B. The circuit breaker shall be stored-energy closing mechanism. The mechanism shall discharge the stored energy before or during withdrawing from or inserting into the circuit breaker compartment. The mechanism shall open, and remain in a trip-free state between the test and connected position.
- C. Electrically operated mechanisms shall be designed to match the existing air breaker circuits. Closing and tripping mechanisms shall operate satisfactorily over the voltage range in accordance with ANSI C37-06, table 1 0.
- D. All primary current paths and fingers shall be silver or tin plated.
- E. Each circuit breaker mechanism shall be equipped with the following:
 - 1. Main contact position indicator or target
 - 2. Manual tripping and closing devices
 - 3. Spring charged and discharged indicator or target.
- F. Each retrofilled cubicle shall have a bolted copper bus connection.
- G. The circuit breaker shall be equipped with a new electrically operated mechanism. All springs, coils, and motors shall be new equipment.
- H. The circuit breakers and retrofilled housings shall be design and routine tested according to ANSI C37.09, C37.20.2, and C37.55. Certified test reports on the identical circuit breakers may be submitted for acceptance in lieu of performing design tests. The following additional ANSI C37.09 design tests on the circuit breaker and housing, mounted within the existing cubical frame, shall be performed:
 - 1. Rated Continuous Current-Carrying Test
 - 2. Dielectric Tests (BIL and Low-Frequency Withstand)

3. Momentary Current Test
4. Mechanical Endurance Test

** Certified test results may be submitted for acceptance in lieu of performing tests (a) through (d) above only if the vendor has performed similar retrofits on the equipment listed in the purchase order.

- I. The operating mechanisms shall be readily accessible for Owner maintenance.

2.03 CONTROL AND INDICATING DEVICES

- A. Control relays, auxiliary contacts, and small mechanisms shall be enclosed protected and accessible for maintenance.
- B. All control relays, coils, motors, and mechanisms shall be new equipment.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Qualified installation technicians shall be provided by the Vendor for installation and conformance.

3.02 TESTS AND INSPECTION

- A. Production tests shall be made in accordance with ANSI C37.09, article 5.1 and C37.20.2, article 5.3 and permanently recorded.
- B. The purchaser shall have the right to inspect at the factory all equipment covered by these specifications, at any time during manufacture and assembly, and shall have the right to be present during any tests made on the equipment.
- C. The vendor, upon request, shall furnish the purchaser with advance notice of final assembly and testing.
- D. The supplier shall have in place a dedicated Quality Assurance Department that is separate from production.

3.03 MATERIALS AND TEST REPORTS

- A. Instruction books, certified tests reports, complete parts list, and recommended spare parts lists shall be furnished with the retrofitted breakers and cubicles.

3.04 INSURANCE

- A. Qualified converters/installers shall carry the following minimum insurance with insurance carriers rated A- or better by A. M. Best Company:

<u>Description of Coverage</u>	<u>Limit of Liability</u>
Comprehensive General Liability Insurance	\$2 Million Combined Single Limit Insurance Bodily Injury and Property Damage
Automobile Liability Insurance	\$2 Million Combined Single Limit Insurance Bodily Injury and Property Damage
Workers' Compensation	Statutory
Employer's Liability	\$2 Million Comprehensive Liability Coverage

3.05 WARRANTY

- A. Unless otherwise specified, the Contractor shall provide a warranty for a warranty period as set forth in Section 01000 GENERAL REQUIREMENTS for all materials, workmanship and installation. During this period, adjust, repair or replace at no cost to the County any item of material or workmanship found to be defective.
- B. Contractor shall be responsible for and pay for damages caused by or resulting from defects in materials or workmanship.
- C. Warranty period shall commence upon Contractor achieving Substantial Completion of the project, the date of which shall be approved by the County and documented in the project O&M Manuals.

END OF SECTION

SECTION 16420

LOW VOLTAGE POWER CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Scope: Provide labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, erection, and installation for low voltage power circuit breakers (also identified as LVPCB, CB) as required for the complete performance of the work, as shown on the Drawings, as specified herein, and as specified elsewhere for the assemblies or systems comprised of the components specified herein.
- B. Related Sections: Related sections include, but shall not be limited to, the following:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
 - 2. Applicable general requirements for electrical Work specified within Division 16 Specification Sections apply to this Section.

1.02 REFERENCES

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.
 - 1. American National Standards Institute (ANSI)
 - a. ANSI C37.13, "Low-Voltage AC Power Circuit Breakers Used in Enclosures"
 - b. ANSI C37.50, "Low-Voltage AC Power Circuit Breakers Used in Enclosures Test Procedures"
 - 2. Canadian Standards Association (CSA)
 - a. C22.1, "Canadian Electrical Code, Part I" (CEC)
 - b. C22.2 No.268-16, "Power circuit breakers up to 1000 Vac/1500 Vdc"

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3. International Electrical and Electronics Engineers (IEEE):
 - a. IEEE C37.13, "IEEE Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures"
 - b. IEEE C37.14, "IEEE Standard for Low-Voltage DC Power Circuit Breakers Used in Enclosures"
4. International Electrotechnical Commission (IEC):
 - a. IEC 60068-2, "Environmental Testing"
 - b. IEC 60721, "Classification of Environmental Conditions"
 - c. IEC 60947-2, "Low-Voltage Switchgear and Control gear - Part 2: Circuit-Breakers"
 - d. IEC 61557-12, "Electrical Safety in Low Voltage Distribution Systems up to 1000 VAC and 1500 VDC"
5. International Organization for Standardization (ISO)
 - a. ISO 9001, "Quality Management Systems - Requirements"
 - b. ISO 14001, "Environmental Management Systems -- Requirements with Guidance for Use"
6. National Fire Protection Agency (NFPA)
 - a. NFPA 70, "National Electrical Code (NEC)"
7. Underwriters Laboratories, Inc. (UL)
 - a. UL 1066, "Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures"

1.03 DEFINITIONS

- A. Unless specifically defined within the Contract Documents, the words or acronyms contained within this specification shall be as defined within, or by the references listed within this specification, the Contract Documents, or, if not listed by either, by common industry practice.
 1. BLE: Bluetooth Low Energy
 2. DPWS: Device Profile Web Service
 3. HMI: Human Machine Interface

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4. IDMTL: Inverse Definite Minimum Time Lag
5. IMU: Intelligent Modular Unit
6. LVPCB: Low Voltage Power Circuit Breaker
7. LSIG = Long-time + Short-time + Instantaneous + Equipment Ground-fault Protection or a combination of these letters and types for the available adjustable protection on certain trip units.
 - a. L: Long Time (overload protection, analogous to the inverse-time thermal trip of a thermal/magnetic breaker)
 - b. S: Short Time (short circuit protection of low level faults)
 - c. I: Instantaneous (short current protection of high level faults, analogous to the instantaneous magnetic trip of a thermal/magnetic breaker)
 - d. G: Ground Fault (equipment ground fault protection)
8. NFC: Near Field Communication
9. OIT: Operator Interface Terminal is a locally mounted HMI device providing remote monitoring and functions of the connected equipment.
10. Smart Mobile Device, Phone or Tablet: Smart phone or tablet compatible with iOS or Android OS capable of running apps used for specified functionality.
11. ULP: Universal Logic Plug
12. USB-OTG: Universal Serial Bus – On the Go
13. ZSI: Zone Selective Interlocking

1.04 SUBMITTALS

- A. General: Submittals shall be in accordance with the requirements of Section 01000, in addition to those specified herein.
 1. Submit sufficient information to determine compliance with the Contract Documents. Identify submittal data with the specific equipment tags and/or service descriptions to which they pertain. Submittal data shall be clearly marked to identify the specific model numbers, options, and features of equipment and work proposed.

2. Deviations from the Contract Documents shall be indicated within the submittal. Each deviation shall reference the corresponding drawing or specification number, show the Contract Document requirement text and/or illustration, and shall be accompanied by a detailed written justification for the deviation.
 3. Submit required product data and shop drawings specific to each product and accessory proposed. When requested, manufacturer shall include the following information: 3D CAD models and time current curves.
- B. Operation & Maintenance (O&M) manuals shall be provided in accordance with the minimum requirements set forth in the Contract Specifications.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of specified products of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of ten years.
1. The manufacturer shall have a valid ISO 9001 certification and an applicable quality assurance system that is regularly reviewed and audited by a third-party registrar. Manufacturing, inspection, and testing procedures shall be developed and controlled under the guidelines of the quality assurance system.
 2. The manufacturer shall have the ISO 14001 Environment Certification and shall supply the Product Environmental Profile (P.E.P.) upon request of the Engineer.
 3. The manufacturer or their representative shall have service, repair, and technical support services available 24 hours 7 days a week basis.
- B. All work performed and all materials used shall be in accordance with the National Electrical Code, and with applicable local regulations and ordinances. Process controllers, assemblies, materials, and equipment shall be listed and labeled by Underwriter's Laboratories or by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Prior to delivery to the Project site, ensure that suitable storage space is available to store materials in a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, and corrosive atmospheres. Materials shall be protected during delivery and storage and shall not exceed the manufacturer stated storage requirements. As a minimum, store indoors in clean, dry space with uniform temperature to prevent condensation. In addition, protect electronics from all forms of electrical and magnetic energy that could reasonably cause damage.

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- B. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and equipment tag number or service name as identified within the Contract Documents.
- C. Inspect and report any concealed damage or violation of delivery storage, and handling requirements to the Engineer.

1.07 SPECIAL TOOLS AND SPARE PARTS

- A. The Contractor shall provide a recommended spare parts list with the following information provided as a minimum:
 - 1. Contact information for the closest parts stocking location to the Owner.
 - 2. Critical spare parts shall be identified as those parts being associated with long lead times and/or those being critical to the unit's operation.
 - 3. Maintenance spares shall be identified as being those parts required to regularly perform scheduled maintenance on the furnished equipment. These spares shall include, but shall not be limited to, consumable spares that are required to be exchanged during scheduled maintenance periods.
- B. Spare parts shall be provided for each type and size of unit installed. At a minimum, the following shall be provided:
 - 1. Provide the minimum spare parts recommended by the manufacturer, including but not limited to: trip coils, switches and spring charging motors.
- C. Any manufacturer specific special tool, not normally found in an electrician's toolbox, required to remove and install recommended or furnished spare parts shall be furnished. At a minimum the following shall be provided:
 - 1. If available from manufacture, provide PC-based configuration software tool and a minimum of one communication interface cable for each type of cable required to connect a PC-based computer to the devices specified herein for configuration and programming.
 - 2. Electronic configuration files, in a media format acceptable by the Owner (e.g. CD, USB stick, etc.), updated to an as-installed and commissioned state.
- D. Spare parts shall be properly marked and packaged for long term storage. Printed circuit boards shall be provided in separate anti-static containers.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Provide Masterpact circuit breakers with Micrologic trip units by Schneider Electric.
- B. Acceptable Products: Circuit Breakers specified herein shall be the product of a single manufacturer. Products and manufacturers specified are to establish a standard of quality for design, function, materials, and appearance. Products shall be modified as necessary by the manufacturer for compliance with requirements. Provide the following specified product and manufacturer without exception, unless approved as a substitute by addendum to the Contract Documents prior to the bid date:
 - 1. Masterpact Circuit Breaker with Micrologic trip units by Schneider Electric.

2.02 GENERAL REQUIREMENTS

- A. LVPCBs shall be a sealed low voltage power circuit breaker with integrally mounted electronic trip units.
- B. LVPCBs shall be drawout mounted.
 - 1. For drawout mounted circuit breakers, the racking mechanism shall be integral to the stationary circuit breaker chassis to reduce movable weight and improve serviceability. When racking mechanism is integral to the circuit breaker, spare breaker per frame shall be provided.
- C. LVPCBs shall be 100% rated. The LVPCB interrupting rating shall exceed the available fault current. The LVPCB close-and-latch rating and 30 cycle withstand rating shall meet the application requirements. See table for details by voltage. See Manufacturer for most up to date information.
- D. Circuit breakers shall have a maximum 5-cycle closing time. The closing time shall be less than or equal to 50 milliseconds for ratings <800A; 70 milliseconds for ratings <4000A; 80 milliseconds for ratings >4000A.
- E. LVPCBs shall provide long service life. The 3200 A circuit breaker frame and those of lower ratings must be certified to perform a minimum of 10,000 operations without maintenance. The circuit breaker frames greater than 3200 A must be certified to 5,000 operations without maintenance. Circuit breaker shall be equipped with a visual contact wear indicator.
- F. Operation
 - 1. All circuit breaker operating mechanisms shall be two-step, fully-stored energy devices for quick-make, quick-break operation. Open-close-open (O-C-O) cycle shall be possible without recharging. Motor operator shall

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automatically charge when circuit breaker is closed. Actuation of the operating handle or an operation cycle of the circuit breaker motor is to charge the closing springs (step one) and operation of a local CLOSE button is to close the circuit breaker contacts (step two). Closing the circuit breaker contacts shall automatically charge the opening springs.

2. Circuit breaker shall be equipped with anti-pumping function: If opening and closing commands occur simultaneously, the circuit breaker shall remain in the open position. After fault tripping or intentional opening using the manual or electrical controls, the closing order must first be discontinued, then reactivated to close the circuit breaker.
3. The front face of the circuit breaker shall have OPEN and CLOSE buttons with breaker contact and close spring status indicators. The indicator shall show "charged-not OK to close" if closing springs are charged but the circuit breaker is not ready to close. A lockable clear cover shall be provided over the OPEN and CLOSE buttons.
4. Provisions for up to two key locks and up to three padlocks shall be furnished allowing locking in the disconnected position, positively preventing unauthorized actuation of the circuit breaker contacts.
5. Circuit breaker shall provide for auxiliary status contacts for the following functions: open/close (ON/OFF), Tripped, ready to close, ready to open, spring mechanism is charged. Auxiliary contacts provide the user local or remote indications of proper breaker system functionality.
6. The circuit breaker shall be equipped with a safety interlock which keeps the circuit breaker open if the trip unit is not installed.
7. Shunt trip and shunt close coils shall be continuous-duty rated.

G. Construction

1. The case of the circuit breaker shall be a polyester thermoset material providing high dielectric strength. Current-carrying components shall be completely isolated from the accessory mounting area and double insulated from the operator with an accessory cover in place. Each phase inside the circuit breaker shall be completely isolated from other phases and from ground.
2. Circuit breakers shall be equipped with metal filters to reduce effects of an interruption on surfaces surrounding the circuit breaker.
3. Secondary wiring shall be front accessible and available in cage clamp or ring terminal connections.

4. Circuit breaker shall be compliant with REACH (Registration Evaluation and Authorization and Restriction of Chemicals) and RoHS (Restriction of Hazardous Substances).

2.03 TRIP UNITS – ADVANCED CUSTOMIZABLE OR SELECTABLE FIXED FUNCTIONALITY

- A. Advanced trip units shall be imbedded within the hardware of the circuit breaker. Trip unit functionality shall be upgradable through the uploading of digital modules without the need to replace or modify trip unit hardware. Trip unit protection functions shall be electronically managed independently of measurement functions by a dedicated ASIC (application specific integrated circuit). Digital modules shall be added to the trip unit without removing power from the circuit breaker, unless hardware is required to be added in conjunction with the digital module.
- B. Trip units shall provide local and remote trip indication and reason for trip (e.g. overload, short circuit or ground fault).
- C. Trip units shall visually indicate the operating status of the circuit breaker: normal, warnings, alarms, ERMS, through the color changing backlit display.
- D. All trip units shall be capable of setting the breaker locally, if enabled, via a smart mobile device, or remotely through communications.
- E. It shall be possible to get trip cause data out of trip unit or adjust protection settings with any portable power supply connected through the USB port, without a 24Vdc power supply or when the main circuit breaker is OFF, including the battery pack, smart mobile device (USB OTG), or laptop pc.
- F. Trip units shall incorporate “True RMS Sensing” through the 40th harmonic, and have LED long-time pickup indications.
- G. Coils shall provide status, self-diagnosis (functionality and number of coil operations) and wiring diagnostics. Standard coils shall be acceptable provided that alternate coil monitoring and alarming is communicated to the remote monitoring system.
- H. Protection Functions
 1. Provide the appropriate trip unit functionality for the required system performance.
 2. Trip unit protection functions shall consist of
 - a. Adjustable long-time pickup and delay (ANSI 49RMS/51),
 - b. Short-time pickup and delay (ANSI 50TD/51),

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- c. Instantaneous pickup (ANSI 50), the Instantaneous setting shall also have an OFF setting when short-time pick-up is provided
 - d. Ground-fault pickup and delay (ANSI 50N-TD/51N)
3. Long-time pickup (I_r) and delay shall be adjustable. Long-time pickup (I_r) shall be adjustable from 0.4 to 1 times I_n , adjustable in 1 ampere increments. Long-time delay settings shall be adjustable from 0.5 to 24 seconds at six times I_r in 0.5 second increments. If you can't adjust to 1 ampere increments, manufacturer shall supply one complete set of rating plugs per breaker to maximize future flexibility.
 4. Short-time pickup shall be adjustable from 1.5 to 10 times I_r in increments of 1%. Short-time delay shall be adjustable from 0.1–0.4 I_2t ON and 0–0.4 I_2t OFF in increments of 0.1 seconds.
 5. Instantaneous settings on the trip units with LSI protection shall be adjustable from 1.5 to 15 times I_n . The Instantaneous setting shall also have an OFF setting when short-time pick-up is provided. Instantaneous settings shall have 2 selectable breaking times; “standard” when selective coordination is required and “Fast” when limiting let-thru energy is required. “Fast” is defined as 25 to 30 mS breaking time.
 6. Ground-fault protection shall be available for solidly grounded three-phase, three-wire or three-phase, four-wire systems. Trip unit shall be capable of the following types of ground-fault protection: residual, source ground return, and modified differential.
 - a. Ground-fault settings for circuit breaker sensor sizes 1200 A or below shall be adjustable from 0.2 to 1.0 times I_n in 0.1 I_n increments. The ground-fault settings for circuit breakers above 1200 A shall be adjustable from 500 to 1200 A.
 7. An independent ground fault alarm shall provide ground fault and earth-leakage protections, having their own settings.
 8. Trip units shall provide additional protection selections, when determined through system study that more flexibility is required for coordination, by offering adjustable inverse definite minimum time lag (IDMTL). IDMTL provides optimized coordination by the adjustment of the slope of the long-time delay protection.
 9. The circuit breaker [alarms][trips] when [one phase][all three phase] voltage(s) exceeds the upper or lower limits.
 10. The circuit breaker trips when the active power is negative and exceeds the settings.

- I. Trip unit shall provide dual trip curve settings for respective protection functions (LSIG), providing separate settings for various sources; utility, generator set or grid. User may switch from one set of settings to the other to comply with conditions of operation. Trip curve selection shall be selected by one of the following means: digital input through the IO module, Ethernet, or from the local display.
- J. Trip unit shall provide a separate trip curve for arc energy-reducing maintenance setting (ERMS). The ERMS trip curve shall be selected through a smart mobile device. Trip unit shall indicate when trip unit is operating in ERMS mode.
 - 1. Trip unit shall operate in Fast Instantaneous trip mode, 25 to 30 mS, when ERMS trip curve is active.
 - 2. Engaging/disengaging the ERMS mode or making settings changes to the ERMS settings shall be restricted to authorized personnel by limiting access to such features by padlocks or passwords to ensure safety of the personnel working with the equipment.
- K. To deter unwanted changes to the protection settings, a sealable door feature blocks the use of the local display to make adjustments of the protection settings.
- L. Measurement and Analysis Functions
 - 1. Trip units shall have embedded measurement to provide real time metering. Metering accuracy by function shall be within 0.5% for current and voltage, and 1% for power and energy measurements. Metering accuracies shall be total measurement system, including CT and meter and shall be full scale over the range 10% to 120% of I_r . If not available at the circuit breaker, an external meter shall be provided for specified measurement and analysis functions.
 - 2. Metering functions, at the point of measurement, shall calculate and display the imported and exported energy on each phase of the power system network. It shall calculate and display active, reactive and apparent energy per phase, as well as the total active, reactive and apparent energy.
 - 3. Trip units shall be capable of harmonic analysis and waveform capture. Individual harmonics of voltages and currents, up to the 40th, shall be calculated every 200 ms in accordance with IEC 61000-4-30.
 - 4. Measurements shall be capable of being shown on the breaker display, a smart mobile device via Bluetooth, a connected remote OIT or a remote monitoring system via Modbus TCP/IP.
 - 5. Event management shall provide user notification of alarms and traceability. Event history to include: trips, protection setting changes, diagnostics, metering, configuration, and operation.

- a. The date and time the entry was made and the user ID associated with the change.
 - b. User shall be able to activate alarms based on measurement (I, V, F, P, Q, S, THD, CosPhi, FP, Idemand, Pdemand) or counters
 - c. All events shall be available by communication, Bluetooth and Modbus TCP/IP, or Engineering tool.
6. Provide circuit breaker internal monitored functions for maintenance purposes: Coils electrical continuity checks, Circuit breaker closing time, Gear motor charging time, Circuit breaker closing & opening counter, Circuit breaker time stamp closing & opening history log.
 7. Provide trip unit internal monitored functions for maintenance purposes: Internal Sensors (CTs) continuity, External Sensors disconnection (ENCT, ground fault sensor and I/O modules), Internal failure discrimination (ASIC, sensor plugs, internal battery, trip solenoid), Wireless communication failure (Bluetooth Low Energy [BLE] and Ethernet).
 8. Trip unit shall communicate trip cause information to a smart mobile device without requiring power to the trip unit. A smart mobile device app shall be available to provide virtual assistance in reclosing a breaker after trip event, utilizing information extracted from breaker, including wave form capture on trip event. This function shall assist the user to restore power by displaying circuit breaker event information, potential causes, a list of additional investigations needed to determine if power can be restored and recommendations for power restoration.
 9. Provide Auto-test function for monitoring and communicating the following functions: trip unit state, battery state, contact state, circuit breaker remaining life estimate (algorithm based), spring charging function, and opening/closing function, indicated by Health State LED, embedded HMI display and smart mobile device app.
 10. Trip unit shall allow for remote open / close operation of the circuit breaker either through wired communications or with a smart mobile device that provides assistance for the reclosing or opening the circuit breaker, by delivering instructions such as reset (if applicable) or charge spring (if applicable). The smart mobile device shall be capable of displaying circuit breaker status: ready-to-close, coil status or spring charging status.

M. Communications

1. Trip units shall have a communication/test port for checks on electronic and trip mechanism operation in compliance with market standards (USB and PC) avoiding requiring a specific Manufacturer's hardware tool.

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2. Trip units shall have wireless communication interface for protection settings and health checks using Near Field Communications (NFC) and BLE protocols.
3. Circuit breakers shall be provided with a communication interface with two Modbus TCP/IP 10/100 Mbps ports (dual-port, single network) for connection to a Ethernet network for real-time access to the circuit breaker device data and settings. Ethernet network accessible circuit breakers shall provide embedded web page interface using a standard PC and web browser without the need for additional hardware and software. Ethernet communication interfaces shall be compliant to Device Profile Web Service (DPWS) for auto-discovery on the local area network (LAN).
4. Ethernet interface device used on drawout circuit breakers shall be capable of reporting cradle position, viewable in the embedded Web page and over a data connection to external monitoring software.

PART 3 - EXECUTION

3.01 GENERAL

- A. In addition to the requirements specified herein, execution shall be in accordance with the requirements of Specification Section 16010 and Drawings.
- B. Examine equipment exterior and interior prior to installation. Report any damage and do not install any equipment that is structurally, moisture, or mildew damaged.
- C. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Engineer, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- D. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.
- E. Install equipment in accordance with reviewed product data, final shop drawings, manufacturer's written instructions and recommendations, and as indicated on the Drawings.
- F. Provide final protection and maintain conditions in a manner acceptable to the manufacturer that shall help ensure that the equipment is without damage at time of Substantial Completion.

3.02 TESTING

- A. Functional testing, commissioning, and first parameter adjusting shall be carried out by a factory trained manufacturer's representative field service engineer. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment. Report to the Engineer any discrepancies or issues with the installation.
- B. Methods for testing the circuit breakers shall be provided, test sets designed for verifying proper product configuration and function (specific to each manufacturer's products) shall be provided, if required for testing, but are not preferred. Testing procedures, in accordance with the National Electric Code regulations and accepted industry practice, shall be available for commissioning.
- C. A test report shall be submitted that includes the list of all the devices connected to each channel as well as a diagram describing the configuration of the system with indication of the associated Modbus addresses.

END OF SECTION

SECTION 16450

GROUNDING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Contractor shall install new grounding systems for the entire facility in accordance with current code requirements and these specifications.

1.02 DESCRIPTION

A. System Grounding

- 1. Secondary service neutrals shall be grounded at the supply side of the secondary disconnecting means and at the related transformers.

B. Equipment Grounding

- 1. All metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, fencing and other conductive items in close proximity with electrical circuits shall be grounded for personnel safety and to provide a low impedance path for possible ground fault currents.

1.03 SUBMITTALS

A. Shop Drawings

- 1. Submit catalog cuts and descriptive literature for approval in accordance with Division 1, General Requirement, Shop Drawings. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
- 2. Submittals: rods, connectors, conductors and exothermic welding systems.

PART 2 - PRODUCTS

2.01 GROUNDING WIRES

- A. Wires shall be UL and NEC approved types, copper, with insulation color identified green, except where otherwise shown on the drawings, or specified. The grounding electrode conductor shall be bare copper.

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- B. Wire size shall not be less than shown on the drawings and not less than required by the NEC.

2.02 GROUND RODS

- A. Shall be copper clad steel, 3/4-inch diameter by 10 feet long.

PART 3 - EXECUTION

3.01 SECONDARY EQUIPMENT AND CIRCUITS

- A. Main Bonding Jumper:
 - 1. Connect the secondary service neutral to the ground bus in the service equipment.
- B. Supplemental Electrodes
 - 1. Provide a ground loop with a minimum of three (3) rods and foundation ground connections and connect to the service equipment ground bus. The rods shall be equally spaced a minimum of 10 feet apart.
- C. Service Entrance, Switchgear and/or Motor Control Center
 - 1. Provide a ground bar bolted to the enclosure with lugs for connecting the various grounding conductors.
 - 2. Connect the various feeder green grounding conductors to the ground bus in the enclosure with suitable crimped pressure connectors.
 - 3. Connect the grounding electrode conductor to the ground bus.
 - 4. Connect the neutral to the ground bus (main bonding jumper).
 - 5. Connect metallic conduits, terminated without mechanical connection to the housing, by grounding bushings and ground wire to the ground bus.
- D. Conduit Systems
 - 1. Ground all metallic conduit systems.
 - 2. All conduit systems shall contain a grounding conductor.
 - 3. Metallic conduit provided for mechanical protection and containing only a grounding conductor shall be bonded to that conductor at the entrance and exit from the conduit.

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4. Use grounding bushings for feeder conduits attached through concentric knockouts, regardless of system voltage.

E. Feeders and Branch Circuits

Unless shown otherwise, install green grounding conductors with feeders and branch circuits as follows:

1. Feeders, where designated.
2. Receptacle outlets shall have a green pigtail from device to metallic box.
3. Motors and motor controllers shall have a bonding conductor to conduit system.
4. Fixed equipment and appliances shall have a bonding conductor to conduit system.
5. Items of equipment where the final connection is made with flexible conduit shall have a bonding wire.
6. Additional locations and systems as shown on the drawings.

F. Boxes, Cabinets, Enclosures and Panelboards

1. Bond the grounding wires to each pull box, junction box, outlet box, cabinets, and other enclosures through which the ground wires pass (except for special isolated grounding systems or critical circuits shown on the drawings).
2. Provide lugs in each box and enclosure for ground wire termination.
3. Provide ground bars in panelboards, bolted to the housing, with sufficient lugs for terminating the ground wires.

G. Motors and Starters

1. Provide lugs in motor terminal box and starter housing for ground wire termination.
2. Make ground wire connections to ground bus in motor control center.

H. Receptacles

1. Receptacles shall have a ground wire from green ground terminal to the outlet box ground screw, regardless of type, except for isolated ground devices.

I. Lighting Fixtures

1. Units shall be grounded with a separate ground wire provided with the circuit conductors.

J. Electrical Appliances, Pipe and Equipment

1. Fixed electrical appliances and equipment shall have a ground lug installed for termination of the green ground conductor. Bond the water main with a #6 AWG conductor.

3.02 WARRANTY

- A. Unless otherwise specified, the Contractor shall provide a warranty for a warranty period as set forth in Section 01000 GENERAL REQUIREMENTS for all materials, workmanship and installation. During this period, adjust, repair or replace at no cost to the County any item of material or workmanship found to be defective.
- B. Contractor shall be responsible for and pay for damages caused by or resulting from defects in materials or workmanship.
- C. Warranty period shall commence upon Contractor achieving Substantial Completion of the project, the date of which shall be approved by the County and documented in the project O&M Manuals.

END OF SECTION

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SECTION 16710

AUTOMATIC TRANSFER SWITCH WITH SOLID-STATE LOGIC AND DELAYED TRANSITION

PART 1 - GENERAL

1.01 SCOPE OF WORK

Provide solid-state logic automatic transfer switches. Switches shall be delayed transition type with a center-off position available between the two available source positions. Acceptable manufacturers shall be Zenith/ABB, or equivalent by Onan or Russelectric. The switch shall be standalone or MCC mounted as shown on the drawings, and shall switch between two normal sources or between a normal source and emergency source as shown. Where it is shown as part of the MCC lineup, this switch shall be provided by the Division 17 System Supplier.

1.02 SUBMITTALS

Submittals shall include specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams; dimension drawings; and interconnection diagrams identifying by terminal number each required interconnection between the generator set (where applicable) and the transfer switch.

1.03 SWITCH FEATURES

- A. The transfer switch shall be rated for the voltage and ampacity as shown on the plans and shall have 600 volt insulation on all parts in accordance with NEMA standards.
- B. The current rating shall be a continuous rating when the switch is installed in an unventilated enclosure, and shall conform to NEMA temperature rise standards.
- C. The unit shall be rated based on all classes of loads, i.e., resistive, tungsten, ballast and inductive loads. Switches rated 400 amperes or less shall be UL listed for 100% tungsten lamp load.
- D. As a precondition for approval, all transfer switches complete with accessories shall be listed by Underwriters Laboratories, under Standard UL 1008 (automatic transfer switches) and approved for use on emergency systems.
- E. The withstand current capacity of the main contacts shall not be less than 20 times the continuous duty rating when coordinated with any molded case circuit breaker established by certified test data. Refer to required withstand and close ratings as detailed in this specification.

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- F. Temperature rise tests in accordance with UL 1008 shall have been conducted after the overload and endurance tests to confirm the ability of the units to carry their rated currents within the allowable temperature limits.
- G. Transfer switches shall comply with the applicable standards of UL, cUL, CSA, ANSI, NFPA, IEEE, NEMA.
- H. The transfer switches shall be supplied with a microprocessor-based control panel as detailed further in these specifications.

1.04 SWITCH OPERATION

- A. The ATS shall incorporate adjustable three phase (or single phase as applicable) under voltage sensing on the normal source.
- B. When the voltage of any phase of the normal source is reduced to 80% of nominal voltage, for a period of 0-10 seconds (programmable) a pilot contact shall close to initiate starting of the engine generator.
- C. The ATS shall incorporate adjustable under voltage and under frequency sensing on the emergency source.
- D. When the emergency source has reached a voltage value of 90% of nominal and achieved frequency within 95% of the rated value, the load shall be transferred to the emergency source after a programmable time delay.
- E. When the normal source has been restored to not less than 90% of rated voltage on all phases, the load shall be retransferred to the normal source after a time delay of 0 to 30 minutes (programmable). The generator shall run unloaded for 5 minutes (programmable) and then automatically shut down. The generator shall be ready for automatic operation upon the next failure of the normal source.
- F. If the engine generator should fail while carrying the load, retransfer to the normal source shall be made instantaneously upon restoration of proper voltage (90%) on the normal source.
- G. Inspection and operational tests shall be conducted by the Contractor in the presence of the engineer, to indicate that the switch satisfies the specifications.
- H. The transfer switch shall be equipped with a microprocessor-based control panel. The control panel shall perform the operational and display functions of the transfer switch. The display functions of the control panel shall include ATS position, source availability, sequence indication and diagnostics.

- I. The display shall be accessible without opening the enclosure door.
- J. The control panel shall be provided with a simple user interface for transfer switch monitoring, control and field changeable functions and settings.
- K. The control panel shall be opto-isolated from electrical noise and provided with the following inherent control functions and capabilities:
 - 1. Built-in diagnostic display.
 - 2. Capability for external communication and network interface.
 - 3. Touch pad test switch with Fast Test/Load/No Load selection capability to simulate a normal source failure.
 - 4. Time delay to override momentary normal source failure prior to engine start. Field programmable 0-10 seconds, factory set at 3 seconds.
 - 5. Time delay on retransfer to normal source, programmable 0-30 minutes, factory set at 30 minutes. If the emergency source fails during the retransfer time delay, the transfer switch controls shall automatically bypass the time delay and immediately retransfer to the normal position.
 - 6. Time delay on transfer to emergency, programmable 0-15 seconds, factory set at 1 second.
 - 7. Delayed transition with center-off position. Time delay on transfer in either direction in the center-off position, programmable 1 second-10 minutes, and factory set at 5 seconds.
 - 8. An exerciser timer shall be incorporated within the microprocessor and shall be capable of starting the engine generator set and transferring the load (when selected) for exercise purposes on a weekly basis. The exerciser shall contain a battery for memory retention during an outage.
 - 9. Provide a momentary pushbutton to bypass the time delays on transfer and retransfer and programmable commit/no commit control logic.

PART 2 - PRODUCTS

2.01 EQUIPMENT

- A. The automatic transfer switch shall be of double throw construction operated by a reliable electrical mechanism momentarily energized.

- B. The transfer switch shall incorporate a timed, center-off position for motor load decay. Transfer time shall be adjustable from 0-10 seconds. A mechanical interlock shall be provided to ensure that both sets of contacts cannot be closed at the same time.
- C. For switches installed in systems having ground fault protective devices, and/or wired so as to be designated a separately derived system by the NEC, a 4th pole shall be provided. This additional pole shall isolate the normal and emergency neutrals. The neutral pole shall have the same withstand and operational ratings as the other poles and shall be arranged to break last and make first to minimize neutral switching transients. Add-on or accessory poles that are not of identical construction and withstand capability are not acceptable.
- D. The contact structure shall consist of a main current carrying contact which is a silver alloy with a minimum of 50% silver content. The current carrying contacts shall be protected by silver tungsten arcing contacts on all sizes above 400 Amps.
- E. The transfer switch manufacturer shall submit test data for each size switch, showing it can withstand fault currents of the magnitude and the duration necessary to maintain the system integrity. Minimum UL listed withstand and close into fault ratings shall be as follows:

<u>Size (Amps)</u>	<u>Coordinated Molded Case Breaker</u>
Up to 225	30,000
226 - 400	50,000
401 - 800	65,000
801 - 1200	85,000
1201 - 3000	100,000

*All values 480 volt, RMS symmetrical, less than 20% power factor.

- F. A dielectric test at the conclusion of the withstand and closing (WCR) tests shall be performed.
- G. The automatic transfer switch manufacturer shall certify sufficient arc interrupting capabilities for 50 cycles of operation between a normal and emergency source that are 120 degrees out of phase at 480 volts, 600% of rated current at 0.50 power factor. This certification is to ensure that there will be no current flow between the two isolated sources during switching.
- H. All relays shall be continuous duty industrial type with wiping contacts. Customer interface contacts shall be rated 10 amperes minimum. Coils, relays, timers and accessories shall be readily front accessible. The control panel and power section shall be interconnected with a harness and keyed disconnect plugs for maintenance.
- I. Main and arcing contacts shall be visible without major disassembly to facilitate inspection and maintenance.

- J. A manual handle shall be provided for maintenance purposes with the switch de-energized. An operator disconnect switch shall be provided to defeat automatic operation during maintenance, inspection or manual operation.
- K. The switch shall be mounted in a standalone enclosure or in the MCC, unless otherwise indicated on the plans. Standalone enclosures shall be NEMA 1 indoors and NEMA 3R stainless steel outdoors.
- L. Switches composed of molded case breakers, contactors or components thereof not specifically designed as an automatic transfer switch will not be acceptable.
- M. The automatic transfer switch must be equipped with a solenoid protection scheme that removes any attempts of operating the solenoids after (3) consecutive trials until manual intervention by an operator.
- N. The automatic transfer switch shall be Zenith/ABB ZTSD Series, or approved equal.

2.02 ACCESSORIES

- A. A plant exerciser that is (7 day) field adjustable for exercising the generator on 30 minute increments shall be provided (where applicable). Provide a selector switch for load/no load operation. The exerciser shall have the ability to be programmed for specific day of the week and time of day. Provide MEXE option package.
- B. Provide optional contacts which are actuated on a loss of the utility service (Source 1) for input input to the pump control/SCADA system for monitoring and alarm (option A1). Additional outputs shall be provided to the generator for control, and to the pump control panel for monitoring and alarm, as indicated on the drawings.
- C. Provide optional contacts which are actuated 0-60 seconds prior to transfer, after transfer, or both in either direction then reclose in timed sequence after transfer (option A62).

PART 3 - EXECUTION

3.01 TESTS

- A. Certified laboratory test data on a switch of the same design and rating shall be provided to confirm the following switching abilities:
 - 1. Overload and endurance per Tables 21.2 and 23.2 of UL-1008 when enclosed according to Paragraph 1.6.
 - 2. Temperature rise tests after the overload and endurance tests to confirm the ability of the transfer switches to carry their rated current within the allowable temperature limits of the insulation in contact with current-carrying parts.

3. Withstand current tests per Paragraph 25 of UL-1008 for 5000 Amperes rms symmetrical, at 480 Volts and X/R ratio of 6.6.
 4. No welding of contacts. Transfer switch must be operable to alternate source after they withstand current tests.
 5. Test all remote monitoring and alarm signals to and from all sources and the pump control panel.
- B. All production units should be subjected to the following factory tests:
1. The complete automatic transfer switch shall be tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency, and time delay settings are in compliance with the specification requirements.
 2. The complete automatic transfer switch shall be subjected to a dielectric strength test per NEMA Standard ICS 1-109.05.
- C. The control panel shall meet or exceed the voltage surge withstand capability in accordance with IEEE Standard 472-1974 (ANSI C37.90a-1974) and the impulse withstand voltage test in accordance with the proposed NEMA Standard ICS 1-109.
- D. A factory-authorized field service representative of the switch manufacturer shall attend startup activities to assist the Contractor with installation, connections, testing, inspection, adjustment of components and certifying the system. Results of the field testing shall be submitted in writing.
- E. Each transfer switch shall be provided with an operator's manual providing installation and operating instructions.
- F. The NETA member firm previously specified in Sections 16395 and 16396 shall provide the following field testing services for the installed ATS, and shall incorporate the results of these tests in the submission of their required test reports:
1. Perform all NETA listed ATS testing procedures from the latest edition of their Acceptance Testing Procedures, and certify compliance.
 2. Measure insulation resistance phase to phase and phase to ground, and include external annunciation and control circuits. Follow manufacturer's procedures and meet specified minimum resistance.
 3. Check for continuity of circuits and for short circuits.
 4. Inspect for physical damage, proper installation and connections, and integrity of barriers, covers and safety features.

5. Verify that manual transfer warnings are properly placed.
6. Perform manual transfer operation.
7. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times, and demonstrate the following:
 - a. Simulate power failures of normal source to ATS and of emergency source with normal source available.
 - b. Simulate loss of phase to ground voltage for each phase of normal source.
 - c. Verify time delay settings.
 - d. Verify pickup and dropout voltages by data readout or inspection of control settings.
 - e. Perform contact resistance test across main contacts and correct values exceeding 500 microhms and value for any one pole deviating from another by more than 50 percent.
8. Remove and replace malfunctioning units or components and retest as specified above.

3.02 CERTIFICATION

- A. The manufacturer shall provide a letter certifying compliance with all requirements of the transfer switch specifications. The certification shall identify equipment by serial number and shall include no exceptions to the specifications, except those stipulated with the approved submittal.

3.03 MANUFACTURER'S WARRANTY

- A. The automatic transfer switch shall be warranted in writing by the manufacturer for defects in materials and workmanship for a period of three (3) years from the date the Contractor achieves Substantial Completion of the project. This date shall be approved by the County and the Contractor shall provide a certificate in the project O&M Manuals documenting the start date and duration of the warranty period. The warranty shall be non-prorated. The warranty shall be comprehensive, and shall include all parts, labor, travel and other miscellaneous expenses.

END OF SECTION

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SECTION 17010

PUMP CONTROL SYSTEM GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. The Contractor shall obtain the services of a subcontractor who shall provide a complete integrated Pump Control System (PCS) including but not limited to variable frequency drives, as shown on the Pump Control System Drawings and as specified in Division 17. This subcontractor will hereafter be referred to as the Pump Control System Supplier. The System Supplier shall have total responsibility for the design, programming, testing, start-up and implementation of the Pump Control System, and all associated control, status and alarm functions for the pumping station.
2. The System Supplier shall retrofit the existing station switchgear to install and fully integrate the new Surge Protective Devices specified in Section 16400.
3. The Pump Control System Supplier shall be located within 150 miles of Towson, MD, and be one of the following pre-approved System Suppliers:

GES Technology, Inc.
1918 Greenwood Street
Harrisburg, PA 17104
(717) 236-8733
Contact: Gary Slatt

Trijay Systems, Inc.
10 Maple Avenue
Line Lexington, PA 18932
(215) 997-5833
Contact: Jim Arevalo

Micro-Tech Designs, Inc.
4312 Black Rock Rd.
Suite 1
Hampstead, MD 21074
(410) 239-2885
Contact: Cameron Farzanfar

1.02 QUALITY ASSURANCE

A. Regulations, Standards and Publications:

UL	Underwriters' Laboratories, Inc.
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
ANSI	American National Standards Institute

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IEEE Institute of Electrical and Electronic Engineers
ISA Instrument Society of America

B. Quality Control:

1. All components of the Pump Control System shall be new and of the most current and proven design. All components shall be suitable for the intended application and shall be installed and wired in strict accordance with the manufacturer's requirements and this specification. The System Supplier shall provide all necessary transformers, power supplies, relays, terminal blocks, fusing, grounding and other components required to meet the manufacturer's requirements and produce a complete and functional system.
2. The complete system must comply with all Federal, State, Municipal, or other authority's laws, rules, or regulations.
3. All control panels, and their components and materials, shall bear the label of the Underwriters' Laboratory. All control panels shall be UL listed as a complete assembly.

C. Equipment Manufacturers:

1. The Pump Control System Supplier shall base his bid on providing the manufacturers specified under Division 17 for all equipment furnished for the System.

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Section 01000.
2. Separate submittals of individual components shall not be accepted.

B. Shop Drawings:

1. Submit required number of detailed shop drawings for all equipment being provided for the Pump Control System. Shop drawings shall be submitted within 90 days of the date of Notice to Proceed, but only after the required pre-submittal workshop has been conducted.
2. Shop drawings shall be submitted in 3-ring loose-leaf binders and shall be complete, neat, orderly, and indexed. The complete shop drawing submittals shall include all of the following:
 - a. Variable Frequency Drives
 - b. Pump Control System Description of Operation Narrative

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- c. A Complete Interconnecting Wiring Diagram
 - d. A Complete List of All Alarms
 - 3. Refer to specification sections for specific shop drawing requirements.
 - 4. The System Supplier shall submit a complete set of engineered drawings for the Variable Frequency Drives. These engineered drawings shall be done by the System Supplier using AUTOCAD. These drawings shall include, but not be limited to, the following:
 - a. Variable Frequency Drive (VFD) elevations and details showing door mounted devices and dimensions. Three line wiring diagrams for each VFD showing power and control wiring, VFD components and devices, terminal numbers, and interconnecting wiring.
 - b. See Section 01000 for additional submittal requirements.
 - 5. In addition to the above requirements, the System Supplier shall submit a narrative of the proposed Description of Operation for review. The narrative shall be based on the requirements of specification Section 17500 – Description of Operation, and on any review comments received during the pre-submittal workshop or submittal progress meetings.
- C. Installation, Operation and Maintenance Manuals: (see also Section 01000)
 - 1. Submit required number of copies of installation, operation and maintenance manuals for all equipment being provided for the Pump Control System.
 - 2. Installation, operation and maintenance manuals shall be submitted in 3-ring loose-leaf binders, and shall be complete, neat, orderly and indexed. Information shall be submitted for each of the following:
 - a. Variable Frequency Drives and Bypass Controllers
 - b. Pump Control System Description of Operation Narrative
 - c. A Complete Interconnecting Wiring Diagram
 - d. A Complete List of All Alarms

PART 2 - PRODUCTS

2.01 SEE SPECIFIC SECTIONS FOR PRODUCTS

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PART 3 - EXECUTION

3.01 COORDINATION

- A. The Pump Control System Supplier shall conduct an initial pre-submittal workshop and coordination meeting with the Engineer, the Contractor and the County to review the scope of the project and the project schedule and discuss the County's preferences for how the system will be designed to operate. The System Supplier shall present his proposed Description of Operation narrative for review and comment.
- B. A submittal progress meeting shall be conducted by the Pump Control System Supplier at the 50 percent complete stage with the Contractor, Engineer and County, to discuss progress of the design and questions that may arise.
- C. Approximately 30 days after the 100 percent complete submittal is made, the Pump Control System Supplier shall conduct a final submittal review meeting with the Contractor, Engineer and County, to discuss final comments prior to system fabrication.
- D. The Pump Control System Supplier shall be responsible for coordinating the compatibility of all components and equipment with the General Contractor, particularly the pump motors and variable frequency drives, and associated components.

3.02 FACTORY ACCEPTANCE TEST

- A. The System Supplier shall conduct a factory acceptance test for the Pump Control System prior to shipment of the equipment. The factory test shall be conducted at the System Supplier's facility and shall demonstrate the control system was designed and performs in accordance with the Specifications and Drawings. All equipment furnished for the Pump Control System shall be assembled and interwired so that it functions as a complete system for the factory acceptance test.
- B. The System Supplier shall provide all necessary equipment and hardware required to conduct the factory test.
- C. The factory acceptance test shall demonstrate the proper operation of all control logic described in the Description of Operation, and all system hardware and software. The factory test shall be witnessed by the Engineer and the County. Coordinate scheduled dates with all required parties.
- D. A detailed step-by-step test procedure for all testing activities is to be delivered to Engineer not less than sixty calendar days prior to the scheduled start date. Engineer reserves the right to reschedule the start of the test if a proper, approved, complete test procedure is not available at least six weeks in advance of the scheduled test date.

- E. Confirm in writing, times and dates two weeks before a test.
- F. Perform a walk-through of all equipment supplied. Utilize checklist provided as part of the test procedure documents to verify presence of all required components. Note all exceptions. Engineer reserves the right to cancel remaining test activities if items are missing.
- G. Inspect each enclosure. Demonstrate quality of workmanship, labeling, dressing of cables, conformance of enclosures with drawings. Record all comments on test procedure documents.
- H. Provide the following documentation:
 - 1. One copy of submittals applicable to the equipment to be tested.
 - 2. One copy of the Drawings and Specifications together with addenda and change orders.
 - 3. One master copy of the test procedure.
 - 4. A complete inventory of the equipment to be tested including make, model and serial number:
- I. Provide use of the following test equipment:
 - 1. Input/Output Test Set. This set shall be wired to representative input and output components to allow complete testing of these components.
 - 2. Off-line diagnostic and test programs.
 - 3. Maintenance and test equipment including, but not limited to: voltmeter, ammeter, ohmmeter, oscilloscope, electrician's tool set, and special test equipment.

3.03 RECORD DRAWINGS

- A. Submit required number of record or as-built drawings for the Pump Control System prior to the delivery of any equipment to the site. Provide an as-built drawing in the control panel.
- B. Following start-up and commissioning of the system, the System Supplier shall make all necessary changes to the as-built drawings and re-submit required number of final as-built drawings. A final as-built drawing shall also be provided in the control panel.

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3.04 SYSTEM INSTALLATION, START-UP AND COMMISSIONING

A. System Installation:

1. The System Supplier shall provide on-site supervision and advice to the installing Electrical Contractor to insure the system is installed in accordance with the specifications and the manufacturer's requirements.
2. All field wiring to the equipment furnished by the System Supplier shall be performed under the Division 16 electrical portion of the Contract by the Electrical Contractor under the supervision of the Pump Control System Supplier.

B. System Start-Up:

1. Submit a detailed testing and start-up plan two weeks prior to start-up for approval, and coordinate scheduled dates with all required parties. Submit open and closed loop signal test sheets listing all possible signals to be tested for review and approval.
2. Conduct open loop point to point wire testing in accordance with the approved signal test sheets in the presence of the Engineer and County. All conduit and wiring work shall be complete in-place prior to testing. No wiring shall be terminated.
3. Conduct closed loop testing from all field devices to PLC in accordance with the approved closed loop test sheets in the presence of the Engineer and County. All wiring shall be complete in-place and terminated prior to testing. The open and closed loop testing shall be on separate days.
4. Start-up the control system by energizing the system equipment and testing the operation of all hardware, software, process control logic, and all customized software programs.
5. All start-up and testing shall be scheduled, performed in an orderly sequence, and conducted in the presence of and to the satisfaction of the Engineer and the County.
6. Include the following information in the submittals for this section.
 - a. Loop checkout schedule.
 - b. Loop checkout procedure including sign-off forms.
 - c. Schedules, procedures and sign-off forms for all other tests specified.

7. Contractor shall supply for use during the field test activities two-way radios and cellular telephones to permit two-way communications by personnel between sites. These phones and radios shall be used by the Engineer, the County and the Contractor as necessary.
8. Perform field testing to verify the operation of the Pump Station controls. Field tests are as follows:
 - a. Loop tests after troubleshooting.
 - b. Function tests.
 - c. Integrated system test.
9. Testing shall begin after installation of the system components at the site. These shall include:
 - a. Communications equipment required for operation of the system.
 - b. Other field instruments, panels, switches, termination cabinets, control devices and related interconnections.
 - c. All conduit and wiring, complete in-place.
10. Begin testing by performing the following step:
 - a. Check equipment against shop drawing list.
 - b. Verify that the equipment has been installed in accordance with Contract Documents and manufacturer's directions.
 - c. Power up the equipment and calibrate power supplies.
 - d. Load applications software.
 - e. Run diagnostics to verify error-free operation.
11. Check each signal wire and all spares from the field element termination point to the PLC I/O terminal block. Verify end to end continuity of each wire, and that no stray voltage exists on any other wires. Verify that voltage drop through the wire from end to end is within acceptable limits, as specified by the Engineer. Note and correct any deficiencies.
12. Verify that each wire label shows proper wire identification, is legible and that the wire designation shown on the loop drawing matches exactly the wire designation shown on the wire label. Wires shall be identified at each

end, including any intermediate junction points. Note and correct all deficiencies.

13. Provide space on the loop drawings and test sheets to hold Engineer, County and Contractor's signatures and dates for this test.
14. Check each loop from the end element to the respective control display. Include instruments, control devices, panels, termination cabinets, input/output cards and other devices in the loop to ensure proper operation and linkage to appropriate HMI displays at station.
15. Whenever possible, motion check the final control element through panels and through operator control stations. When not possible to perform a motion check, simulate the motion check at the final control element location.
16. Document loop checks and submit to the Engineer. Include the following:
 - a. Loop number.
 - b. Loop description.
 - c. Termination information.
 - d. Loop drawing reference.
 - e. Type of test(s) performed.
 - f. Date tested.
 - g. Signature of tester and date.
 - h. Signature of Engineer and date.
 - i. Problem description, if any.
17. Summarize loops found to contain defective or inoperable equipment on separate sheets and submit to the Engineer.
 - a. Correct and recheck work performed under this Contract.
 - b. The Engineer will coordinate correction of defective work by others, (e.g. County, other contractors not involved in this project) and correction of deficiencies discovered in existing wiring or instrumentation. Perform rechecking as a part of this Contract.

18. Test function of the system.
 - a. Include a demonstration of the following maintenance and support functions:
 - (1) System status displays and use.
 - (2) Diagnostics.
 - (3) Power fail/restart.
 - (4) PLC alarming under loss of communications, loss of I/O, etc.
 - b. Operation of PLC on UPS backup power without AC power connected. Verify that battery has sufficient capacity to maintain operation of equipment for minimum period specified.
 - c. Test control functionality, assuring that all control schemes and backup schemes work according to descriptions found elsewhere in Section 17.
19. Document and submit tests to the Engineer. Include the following:
 - a. Description of function.
 - b. Test performed.
 - c. Copies of messages, displays, reports, and trends which verify operation.
 - d. Signature of tester and date.
 - e. Signature of Engineer and date.
 - f. Problem description, if any.
20. Schedule any field testing that may affect the station operation through the Engineer on a daily basis.
21. Perform no testing which may affect Operation without Engineer concurrence.
22. Meet the following conditions prior to the start of any testing:
 - a. Correct deficiencies noted during in-factory testing and inspections following installation.
 - b. Keep on-site documentation pertinent to the equipment being tested.

- c. Keep on-site, labeled, and properly stored, spare parts, expendables and test equipment pertinent to the equipment being tested.
 - d. Keep operational field equipment supplied and pertinent to the equipment being tested.
 - e. Submit Engineer reviewed test schedules and test procedures.
 - f. Re-load all PLC's and all OIT's using images supplied by Contractor or County as appropriate.
 - g. All installation work is complete and approved by the Engineer.
 - h. All drawings and Operation and Maintenance manuals are available for review.
23. Test procedures and test results will reflect information contained within the various operation and maintenance manuals furnished. Perform no test without the appropriate manuals being followed word-for-word unless approved by the Engineer. Lack of acceptable manuals will be cause for declaring the test to have failed regardless of the actual test results.
24. The Engineer shall determine the site sequence in which testing shall be performed.

C. System Commissioning:

- 1. Supervise the factory representatives' calibration for all instrumentation, and place the complete control system into operation. The commissioning of the system shall include the overall calibration of all instruments and equipment, and tuning of all control loops and sequences to provide stable control of the pumps. The validity of all inputs and outputs for the system shall be checked and corrected during the system commissioning.
- 2. The System Supplier shall ensure that any instrument used by him or any of the factory representatives, for purposes of calibration or testing of the installed systems has an accompanying valid and current instrument calibration certificate.
- 3. The System Supplier shall provide someone on-site for the length of time necessary for system installation, start-up and commissioning.

3.05 FINAL ACCEPTANCE TEST

- A. Following the commissioning of the Pump Control System, a final acceptance test shall be conducted for a period of 30 consecutive days. This test shall be scheduled with the County and the Engineer and shall not begin until the System Supplier receives written approval to start. During that time period, the system shall operate

satisfactorily and in compliance with the Specifications. The System Supplier shall promptly correct any problems that occur during the final acceptance test.

3.06 EXPANSION OF SYSTEM I/O

- A. The System Supplier shall include in his cost for this Contract the addition of 20 I/O points to the system as directed by the Engineer. These additional I/O points will originate from the required spare I/O. The Supplier's allowance shall include all costs to add these points to the system including software programming, drawing changes, and field verification.

3.07 ADDITIONAL SOFTWARE CONFIGURATION AND PROGRAMMING

- A. The System Supplier shall include in his cost for this Contract twenty-four (24) additional man-hours of on-site time for software configuration and programming. This time shall be utilized for changes and/or additions that may be required after the commissioning of the system. The Supplier's cost for these additional man-hours shall include software documentation changes.

3.08 DOCUMENTATION OF PARAMETERS, CONFIGURATIONS AND SETPOINTS

- A. The System Supplier shall document the final parameters, configurations and setpoints for all equipment and instrumentation associated with the pump control system. This shall include, but not be limited to, the VFDs, RVSSs, PLCs, OITs and all instruments and recorders. He shall indicate which items remain at the factory default setting and which items have been changed from the factory default. All final parameters, configurations and setpoints shall be recorded prior to turning the pumping station over to the County. All of this record data shall be submitted with the O&M Manuals.

3.09 WARRANTY

- A. Unless otherwise specified, the Contractor shall provide a warranty for a warranty period as set forth in Section 01000 GENERAL REQUIREMENTS for all materials, workmanship and installation. During this period, adjust, repair or replace at no cost to the County any item of material or workmanship found to be defective.
- B. Contractor shall be responsible for and pay for damages caused by or resulting from defects in materials or workmanship.
- C. Warranty period shall commence upon Contractor achieving Substantial Completion of the project, the date of which shall be approved by the County and documented in the project O&M Manuals.

END OF SECTION

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SECTION 17110

VARIABLE FREQUENCY CONTROLLERS AND REDUCED VOLTAGE SOLID-STATE SOFT STARTERS

PART 1 - GENERAL

1.01 REFERENCES

- A. The Variable Frequency Controller (Drive) and Reduced Voltage Solid-State Soft Starter (RVSS) shall be designed to meet the following specifications:
 - 1. NFPA 70 - US National Electrical Code
 - 2. NEMA ICS 7.1 – Safety standards for Construction and Guide for Selection, Installation and Operation of Adjustable Speed Drive Systems
 - 3. NEMA 250 - Enclosures for Electrical Equipment
 - 4. UL 508A - Underwriter's Laboratory
 - 5. CAN/CSA-C22.2, No. 274 - Canadian Standards Association
 - 6. International Electrotechnical Commission – IEC Standards

- B. The Drive and RVSS shall conform to the following regulatory requirements:
 - 1. NFPA 70
 - 2. IEEE 519
 - 3. IEC Standards
 - 4. C-UL marking
 - 5. Listed and classified by Underwriter's Laboratories (UL)

1.02 QUALIFICATIONS

- A. Manufacturer: Only manufacturers with a minimum of 10 years' experience specializing in the design and manufacturing of PWM Drives and RVSS equipment shall be acceptable.

- B. Support: Only manufacturers who have maintained factory trained and authorized service facilities within 100 miles of the project and have service and support available 24 hours, 7 days a week shall be acceptable manufacturers. Full-time support personnel shall be employed by the manufacturer.

- C. Certification: Only manufacturers certified to ISO-9001 Series of Quality Standards with drive products manufactured in an ISO certified facility to assure all quality and corrective action procedures have been adhered to shall be acceptable.

- D. Equipment Guarantee Certification Form: In addition to submitting working drawings for the specified equipment, the Contractor shall obtain and submit to the Engineer certification from the equipment manufacturer that the specified equipment meets the requirements of the contract specifications. This certification shall be provided by way of the Equipment Guarantee Certification Form included herewith.

EQUIPMENT GUARANTEE CERTIFICATION FORM

Reference: **Stemmers Run Sewage Pumping Station
Baltimore County Department of Public Works**

THE UNDERSIGNED HEREBY ATTESTS THAT HE/SHE HAS EXAMINED ALL THE PROJECT ELECTRICAL DRAWINGS AND SPECIFICATION SECTION **17110** AND CERTIFIES THAT THE **VARIABLE FREQUENCY CONTROLLERS AND REDUCED VOLTAGE SOLID-STATE SOFT STARTERS** THAT HE/SHE PROPOSES TO FURNISH AND DELIVER MEETS OR EXCEEDS CONTRACT SPECIFICATIONS, IS SUITABLE FOR THE INTENDED PURPOSE STATED IN SPECIFICATIONS SECTION **17110**, IS SUITABLE FOR INSTALLATION AS PRESENTED IN THE ABOVE PROJECT DRAWINGS AND SPECIFICATIONS, AND WILL PROVIDE SATISFACTORY PERFORMANCE AT THE DESIGN CRITERIA SPECIFIED. THIS GUARANTEE OF SUITABILITY FOR INTENDED PURPOSE IS IN ADDITION TO AND SHALL NOT BE IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED.

EQUIPMENT: **VARIABLE FREQUENCY CONTROLLERS AND REDUCED VOLTAGE SOLID-STATE SOFT STARTERS**

MANUFACTURER: _____

Address: _____

By: _____
(Typed Name and Title)

_____/s/_____
(Signature) (Date) (SEAL)

Equipment Guarantee Certification must be signed by a Principal Person (President, Vice-President, etc.) of the equipment manufacturer. In the event the manufacturer is not the Supplier then a Principal Person of the Supplier must also sign this form.

SUPPLIER: _____

Address: _____

By: _____
(Typed Name and Title)

_____/s/_____
(Signature) (Date) (SEAL)

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Variable Frequency Controllers shall be Schneider Electric Square D Altivar Process 630 or 680, or approved equal by Allen-Bradley or Benschaw.
- B. The Drive shall have manual bypass capability using a reduced voltage solid-state soft starter (RVSS). The RVSS shall be Schneider Electric Altistart 48 with door mounted operator module/display, or approved equal by Allen-Bradley or Benschaw.
- C. The Pump Variable Frequency Controllers with RVSS shall be mounted in the MCC or stand-alone/wall mounted as shown on the drawings and shall meet the full load ampere requirements of the pump motors provided.
- D. Where shown as the primary control for the main pumps, provide a RVSS with a full voltage across the line starter for bypass operation of the RVSS. The RVSS shall be Schneider Electric Altistart 48, or approved equal by Allen-Bradley or Benschaw.
- E. Where shown for use with HVAC motors or other miscellaneous loads, and not mounted in the MCC, units shall be complete with enclosure for wall mounting, circuit breaker disconnect, control transformer, HOA switch and associated control components and pilot lights to provide required control.
- F. Equipment shall fit dimensionally in the space shown on the Contract Drawings.

2.02 DESCRIPTION

- A. Only equipment suitable for operating the indicated loads shall constitute an acceptable product offering. Verify full load current of actual equipment to be provided and choose capacity accordingly. The equipment shall fit in the space shown on the drawings.

2.03 GENERAL REQUIREMENTS

- A. The VFDs shall be built to comply with the UL standard and shall be marked in accordance with to UL 508, UL508C or UL 61800-5-1.
- B. Without limiting the generality of other requirements of this Section, all work specified herein shall conform to or exceed the applicable requirements of the following standards; provided, that wherever the provisions of listed publications conflict with the requirements specified herein, the more stringent requirements shall apply:
 - 1. ANSI/NFPA 70: National Electrical Code
 - 2. EN61800-5: Electronic equipment for use in power installation

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3. CSA C22.2 No. 274 – Adjustable Speed Drives
 4. IEC 60068 Part 2-3: Basis Environmental Testing Procedures Part 2: Tests – Test Ca: Damp Heat
 5. IEC 60146-1-1: Semiconductor converters - General requirements and line commutated converters - Part 1-1: Specification of basic requirements
 6. IEC 60664-1: Insulation Coordination for Equipment Within Low-Voltage Systems
 7. IEC 60447: Basic and safety principles for man-machine interface, marking and identification - Actuating principles
 8. IEC 61439-1: Low-Voltage Switchgear and Controlgear Assemblies - Part 1: General Rules
 9. IEC 60364-1: Low-Voltage Electrical Installations - Part 1: Fundamental Principles, Assessment of General Characteristics, Definitions
 10. IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
 11. IEC 106: Guide for Specifying Environmental Conditions for Equipment Performance Rating
 12. IEC 529: Degrees of protection provided by enclosure
 13. IEC 1000: Electromagnetic Compatibility
 14. IEC 1800: Adjustable speed Electrical power drive systems
 15. IEC 60721-3-3: Classification of Environmental Conditions
 16. IEC 60255-8: Overload Relays
 17. IEC 60801-2,-3,-4,-5: Immunity Tests
 18. NEMA ICS Part 4: Overload Relays
 19. NEMA ICS7: Industrial Control and Systems Variable Speed Drives
 20. UL 508C, UL 61800-5-1: UL Standard for Safety Power Conversion Equipment
- C. Variable Frequency Drives (VFDs) shall provide for the starting and speed control of standard NEMA design AC inverter duty asynchronous motors and synchronous motors with permanent magnets by the adjustment of output voltage and frequency. The VFD shall be a digitally controlled drive, using Pulse Width Modulation (PWM).
- D. Unless otherwise specified or shown within the Contract Documents, the Contractor shall be responsible for matching the VFD to the load (variable or constant torque) as well as the speed and current of the actual motor being controlled. This sizing shall match the KVA and inrush characteristics of the motors provided.
- E. The VFD manufacturer shall design the device with more than 70% of recyclability rate. The VFD shall be compliant with the “Green” Premium label (REACH, RoHS-2, EOL, and PEP). The VFD Manufacturer shall design the device according to the IEC 62635 guidelines to reduce the carbon footprint. The materials used in the VFD shall be recyclable, non-toxic and flame retardant. The VFD manufacturer shall provide the carbon foot print of the devices.

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F. Environmental Requirements

1. The VFD shall be rated to withstand the following environmental conditions while able to give a 100% output current continuously. Where derating is necessary to meet on site environmental conditions, the manufacturer shall submit the VFDs derated performance. The derating factor shall be specified so that neither the lifetime of the VFD nor the unit's performance, overload capability included, nor the reliability of the VFD shall suffer.
 - a. Storage Temperature: -40°C to 70°C
 - b. Operating Temperature for UL Type 1 VFDs: -15°C to 50°C without derating, up to 60°C with derating of power stage (UL Type 1)
 - c. Operating Temperature for enclosed VFDs: -10°C to 40°C without derating, down to -10°C with enclosure heater, up to 55°C with derating of power stage
 - d. Relative Humidity: relative humidity without condensation per IEC 60068-2-3
 - e. Operating Altitude: maximum derating up to maximum derating.
 - f. Corrosion Protection Level: Class 3C3 according to IEC 60721-3-3 for cooling air and chemical gases
 - g. Biological Protection Level: Class 3B1 according IEC 60721-3-3
 - h. Dust Protection Level: Class 3S3 according to IEC 60721-3-3
 - i. Vibration and Shock Protection Level: Class 3M3 according to IEC 60721-3-3
2. The VFDs shall have an integral enclosure that shall protect from ingress of dirt and water in accordance with UL Type 1G, or as shown on drawings. The user interface terminal shall be rated UL Type 12, mounted on front face of enclosure, and accessible for programming and controls with the main door closed.
3. VFD enclosures shall be front cabinet accessible and constructed in conformance with IEC 60439-1. Conduit entry shall be bottom entry as standard to allow for top mounted cooling components. The VFD enclosure shall have a forced air and heat sink cooling system that does not require liquid or air condition cooling components for ambient temperatures within the drives stated ambient temperature operating range.

2.04 PERFORMANCE REQUIREMENTS

- A. The VFD shall be rated for the nominal input voltage specified or shown on the drawings. The VFD shall have a three-phase input voltage tolerance within the following range of the corresponding nominal input voltage:
 1. 200V -15% 240V +10%
 2. 380V -15% 480V +10%
 3. 500 to 690V -15% / +10%
- B. The VFD shall meet the following minimum operating requirements:
 1. Rated Frequency: 50 Hz -5% to 60 Hz + 5% (The VFD shall operate from 40 to 72 Hz when powered by standby or emergency generators.)

2. Displacement Power Factor:
 3. Efficiency:
 - a. >98 % at nominal load for VFD (IP 21 / UL Type 1).
 - b. >97.5 % at nominal load for enclosed VFD systems.
 - c. >96 % at nominal load for low harmonic VFD (IP 21 / UL Type 1).
 - d. >95.5 % at nominal load for low harmonic enclosed VFD systems.
 4. Overload Capability: Normal duty at 110% nominal current for 1 min.
 5. Harmonics Mitigation: <48% THDi according to IEC/EN 61000-3-12 at 80-100% load.
 6. Low harmonic distortion drives should only be specified after analysis of the entire distribution system harmonics to determine if they are required.
 7. Surge immunity according to IEC/EN 61000-4-5 Level 3.
- C. The VFD shall provide a speed range in the motor quadrant 1:100 in sensor less vector control and in the generator quadrant 1:50 in sensor less vector control.
- D. The VFD shall provide an over torque capability better than 110% of the rated motor torque for normal duty applications during 60s, every 10 minutes.
- E. The VFD shall provide a speed accuracy $\pm 10\%$ of the nominal slip of the motor in sensor less vector control.
- F. The VFD shall provide a torque control accuracy $\pm 15\%$ in sensor less vector control for AC motors.

2.05 APPLICATION REQUIREMENTS

- A. The VFD shall be able to control motors using the following motor control types in accordance with the applications needs and energy savings: Volts per hertz VC Standard.
- B. The VFD shall provide a Real Time Clock management with battery backup.
- C. The VFD shall be capable of automatic tuning of motor parameters through measurement of the motor without rotation, and without the need to disconnect the load from the motor.
- D. The VFD shall provide functionality adjustable within the drive parameters to reduce voltage surges on motor cables.
- E. The Contractor shall provide AC chokes and filters to fit installation and motor requirements per the following guidelines:
 1. Voltage reflection suppression for motors compliant to IEC60034-25 or NEMA MG1 Part 31.
 - a. Unshielded motor cable length up to 500 feet (150 meters) shall be managed with the VFD functionality.

- b. Unshielded motor cable length up to 1000 feet (300 meters) an AC choke shall be required.
 - c. Unshielded motor cable length up to 1640 feet (500 meters) a dV/dt filter shall be required.
 - d. Unshielded motor cable length up to 3280 feet (1000 meters) a Sinus filter shall be required.
2. Voltage reflection suppression with motors not compliant to IEC60034-25 or NEMA MG1 Part 31.
- a. Unshielded motor cable length up to 50 meters a dV/dt filter shall be required.
 - b. Unshielded motor cable length up to 1000 meters a Sinus filter shall be required.

F. Protection

1. The VFD shall be UL 508 or UL61800-5-1 listed for use on distribution systems.
2. The VFD shall have coordinated short circuit rating designed to UL 508C or UL 61800-5-1 and NEMA ICS 7.1 Short Circuit Rating: 65 kAIC.
3. Micro-short voltage sag immunity per SEMI F47.
4. Upon power-up the VFD shall automatically test for valid operation of memory, option module, loss of analogue reference input, loss of communication, DC to DC power supply, control power and the pre-charge circuit.
5. The VFD shall be protected against short circuits, between output phases and ground and the logic and analogue outputs.
6. The VFD shall have a selectable ride through function that shall allow the logic to maintain control for a minimum of one second without tripping.
7. The deceleration mode of the VFD shall be programmable for normal and trip conditions. The stop modes shall include freewheel stop, fast stop.
8. Upon loss of the analog process follower reference signal, the VFD shall trip and/or operate at a user-defined speed set by a software programmed speed settings or last speed.
9. The VFD shall integrate a protection against IGBT and heat sink over temperature.
10. The VFD shall have solid-state thermal protection that is UL Listed and meets UL 508C as a Class 10 overload protection and meets IEC 60947-2.
11. The VFD shall have a motor thermal memory retention function per UL requirements.
12. The VFD shall be able to protect the motor when temperature probes are connected.
13. The VFD shall be able to limit the motor surge ($I_{dv/dt}$) at twice the DC bus voltage.
14. The VFD shall provide IGBT protection.
 - a. IGBT overcurrent protection
 - b. IGBT checkup sequence
 - c. IGBT checkup sequence before PWM enable sequence
 - d. IGBT over-heat protection

15. The VFD shall provide VFD Current protection.
 - a. Phase short circuit protection
 - b. Ground protection
 - c. Over-current protection
16. The VFD shall provide VFD Voltage error protection.
 - a. Mains over-voltage protection
 - b. Mains under-voltage protection
 - c. DC Bus over-voltage protection
 - d. DC Bus pre-charge protection
17. The VFD shall provide VFD Thermal protection.
 - a. VFD over-temperature protection
 - b. FAN management
 - c. Switching Frequency management
18. The VFD shall provide internal error detection.
19. The VFD shall provide Motor protection functions.
 - a. Motor output phase detection
 - b. Motor surge voltage
 - c. Motor over load detection
 - d. Motor stall protection
20. The VFD shall provide Application protection functions.
 - a. Catch on fly function
 - b. Mains input phase lost protection
 - c. Motor over-speed input protection
 - d. Current limitation
 - e. Power limitation
 - f. Reverse inhibition
 - g. Under-load protection
 - h. Over-load protection
 - i. External error management
 - j. Loss of follower signal
 - k. Thermal Sensor management
 - l. PID Feedback
 - m. Customer defined input

2.06 CONTROL AND INTERFACE REQUIREMENTS

- A. Indicators
 1. The VFD shall display a signal by LED near the connection point of the device when a hazardous voltage is present.
 2. The VFD shall have 3 LEDs for local diagnostics.
 3. The VFD shall have 3 dual color LEDs for embedded communication status.
 4. The VFD shall have 4 dual color LEDs for optional communication status.
- B. User Interface
 1. A detachable UL Type 12/IP65 rated bi-color backlit graphical user interface terminal with keypad and capacitive wheel shall be provided for

monitoring, annunciation, and configuration. The graphical display shall change to a red backlit color when an alarm occurs. The door mounting for the user interface shall be done with a 22 mm hole.

2. A "Simply Start" menu for fast and easy commissioning shall be provided and parameter setting shall be easily accessible and user friendly with plain text messaging and actual setting range.
3. The keypad shall be capable of providing password protection.
4. The user interface shall be capable of saving and downloading configurations of the VFDs, as well as porting them to other VFDs.
5. The user interface shall offer a Mini-USB port for mass storage or PC device connection.
6. The mechanical mounting for the user interface on the cabinet shall be done with a 22 mm hole.
7. The VFD shall have self-diagnostic capabilities to display alarms, errors, and warnings as they occur and be able to store at least 15 last messages into the memory. These shall be accessible by PC maintenance tools or web server with flash record for data logging expertise.
8. The user interface shall be identical throughout the power range to avoid confusion amongst the users and need for training in several different units.
9. The displayed messages shall be in plain text English.

C. Control Interface:

1. VFD shall interface with automation systems to monitor, control, display, and record data for use in processing reports. VFD settings shall be retained within VFD's nonvolatile memory.
2. The speed command and reference may come from different control sources:
 - a. I/O terminals
 - b. Communication network
 - c. Web server
 - d. Remote graphic display terminal
3. A minimum of the following standard inputs / outputs shall be provided to interface with control systems and instrumentation:
 - a. Analog Inputs: 3 programmable 0(4)-20 mA or 0-10 vdc.
 - (1) 2 analog inputs shall also be programmable for temperature sensors (PTC, PT100, PT1000, KTY84).
 - b. Analog Outputs: 2 programmable 0(4)-20 mA or 0-10 vdc.
 - c. Discrete Inputs: 6 programmable isolated logic inputs as either sink or source.
 - (1) 2 discrete inputs shall also be programmable as 0-30 kHz pulse inputs.
 - (2) 2 discrete inputs shall be dedicated Safe Torque Off safety function in accordance with IEC/EN 61508-1 SIL3.
 - d. Discrete Outputs: 3 programmable relay contacts.
 - (1) 1 discrete output shall be dedicated to product watchdog logic.

4. Programmable analog inputs shall be able to be assigned the following parameters:
 - a. Speed reference
 - b. Summing reference
 - c. Subtracting reference
 - d. Multiplying reference
 - e. Torque reference
 - f. Torque limitation
 - g. PID feedback
 - h. Manual PID reference
 - i. PID speed reference
 - j. Forced local reference
5. Programmable analog outputs shall be able to be assigned the following parameters:
 - a. Motor current
 - b. Motor frequency
 - c. Motor torque (signed or unsigned)
 - d. Motor power
 - e. Motor voltage
 - f. Output frequency (signed or unsigned)
6. Programmable discrete inputs shall be able to be assigned the following parameters:
 - a. Run
7. Programmable discrete outputs shall be able to be assigned the following parameters:
 - a. Ready
 - b. Drive running
 - c. Frequency reference attained
 - d. Alarms: load slipping, 4-20mA loss, brake control, external error, PTC, PID error, PID feedback, IGBT temperature, under voltage, torque control, drive temperature, braking resistor, fan counter, fan feedback, customer warning, power threshold, electrical power drift.
8. Safety Inputs
 - a. The VFD shall provide 2 inputs dedicated to Safe Torque Off (STO) safety function, which prohibits unintended equipment operation, in accordance with IEC/EN 61508-1 SIL3.
 - b. The VFD shall be compliant with EN13849 (PL e).
 - c. The VFD shall be compliant with safety of machinery EN 954-1.
 - d. The VFD manufacturer shall provide the certified schematics and the list of devices in order to comply with IEC/EN 60204-1 stopping category 0 and 1.
 - e. The VFD shall integrate the safety contacts in compliance with EN-81 13.2.2.3.

D. Communications

1. The VFD shall provide at a minimum 1 Modbus and 1 Ethernet Modbus TCP communications ports.

2. VFD Ethernet ports shall be IPv6 compliant, allow for web server access and provide network management via SNMP and clock synchronization.
3. The VFD shall provide an embedded web server for enhanced diagnostic, mini usb, parameter access, and energy management. There shall be the capability to create a user-defined custom dashboard for viewing drive and process status through tables, charts, and graphical views. It shall be possible to export data in standard table format using the webserver, for information around energy consumption as well as error and warning history.
4. The VFD shall be compliant with the Cyber Security Management ISA Secure /Achilles.
5. VFD communications modules shall be capable of being remotely powered by a separate external 24 VDC to allow for continued communications when the drive power supply is off.
6. The VFD shall provide integration connectivity via:
 - a. DHCP protocol for Fast Device Replacement
 - b. DTM library in compliance with standard FDT technology

E. Configuration

1. The VFD shall be capable of accepting independent command and speed reference signals from:
 - a. Terminals
 - b. Modbus port
 - c. Ethernet port
 - d. Communication option card
 - e. Keypad display
2. The VFD shall provide a Speed set-point function capable of:
 - a. Maximum output frequency function
 - b. Low and high-speed scaling and limitation function
 - c. Jump frequency
3. The VFD shall provide a Stop function capable of:
 - a. Deceleration ramp on power loss
4. The VFD shall have an acceleration/deceleration, time adjustable ramp function capable of:
 - a. Ramp type: linear ramp, S shape ramp, with U or customized profile
 - b. Ramp Deceleration adaptation
 - c. Ramp switching
5. Application programming dedicated to pumps.
 - a. The VFD shall provide Pump Control & Monitoring Functions.
 - (1) Centrifugal pump characteristics and configurations.
 - (2) Pump monitoring function to define data relevant for pump (acceleration, low speed, high speed, etc.).
 - (3) Application Units function to define units used in applications.
 - (4) Pump Cyclic Start Protection to protect the pump against too many restarts in a dedicated time period.
 - (5) Multi-pump functions.

- b. The VFD shall provide Pump Protection Functions.
 - (1) Anti-Jam function to remove automatically clogging substances from the pump impellers.
 - (2) Pipe Cleaning function to start pump regularly to avoid sedimentation in pump impeller.
 - (3) Cavitation Pump Protection.
 - (4) Inlet protection to avoid system dry running.
- c. The VFD shall provide Application control functions.
 - (1) Stop and Go function to reduce consumption when VFD is in standby mode.
 - (2) Pulse input in order to connect a flow meter.
 - (3) Process control (PID) function to maintain a process at a given pressure or flow reference.
 - (4) Flow limitation function to allow limiting the consumption of water.
 - (5) Friction loss compensation function to compensate pressure losses in pipes due to friction.
 - (6) Pipe Fill function to manage a smooth control during pipe filling and to lessen the effects of water hammer.
 - (7) Sleep wake-up function to manage periods of the application when process demand is low and when it is not needed.
 - (8) Low demand function to define periods of the application when process demand is low to save energy.
 - (9) Jockey pump control function to start / jockey pump, during sleep period, to maintain emergency service pressure or demand such as low water.
 - (10) Sensor management to define how it will be used to drive inputs to manage pressure sensor or flow sensor.
- d. The VFD shall provide Application protection functions.
 - (1) High flow protection function to detect pipe burst or detect running outside normal working area.
 - (2) Outlet pressure protection function to fix minimum and maximum pressure.
- e. The VFD shall provide Pump curve input to help optimize pump performance.
 - (1) Input and storage of the pump characteristics including 5 points of the pump curve.
 - (2) A best efficiency point (BEP) function to run in optimum conditions and detect deviation from this point.

F. Diagnostics and Configuration

- 1. The VFD Supplier shall have Windows based PC software for configuring and diagnosing the VFD. It shall be possible to set and modify parameters, control the drive, read actual values and make trend analysis using the software. The PC-tools may be connected to the VFD by wired or wireless connection.

2. The VFD shall display all faults in plain text and help screens shall be available to guide the user in the troubleshooting. Codes are not acceptable.
3. The VFD shall provide a Real Time Clock management for time stamping of detected errors.
4. The VFD shall display detected errors with QR codes to guide the user in the troubleshooting.
5. The VFDs must provide LED lights to indicate the status of the VFD.
6. The VFD must have the ability to dynamically display I/O status.

G. Energy Management

1. The VFD shall provide a data logging function to keep files ready for maintenance or user.
2. The VFD shall provide information related to Energy management through different ways such as: web server, keypad, facet for SCADA, communication networks.
3. The user interface shall be able to display a chart relative to energy efficiency and energy management.
 - a. Report in KW
 - b. Display energy history for instant, weekly, monthly, and yearly
 - c. Trend base on variation /time
 - d. Power measurement accuracy shall be less than 5 %
4. The user interface shall be able to display the “efficient” set point for pump based on pump characteristics.
5. The user interface shall be able to display the “efficiency board” including CO2 savings, Savings viewer, and Return of Investment.

2.07 DRIVE SYSTEM OPTIONS

A. Enclosure

1. NEMA 1G with washable metal mesh filters on the outside of the enclosure door and over all other vented openings.
2. Paint: Manufacturer’s standard.
3. Top entry and bottom exit for power cables, unless shown otherwise.
4. Provide a 6.25” x 2” door mounted white lamacoid nameplate with black letters (message to be defined during submittal).
5. UL Label for UL panel recognition.

B. Drive System Input Circuit Breaker

1. Provide a door interlocked motor circuit protector disconnect.
2. Operator Handles:
 - a. Provide flange mounted operator handles for free standing units.
 - b. Provide through the door operating handles for wall mounted units.
 - c. Handles shall be padlockable.

- C. Manual Bypass with Reduced Voltage Solid-State Soft Starters (RVSS)
 - 1. Provide means to manually switch a single motor from drive control to bypass (across the line) operation with soft start.
 - 2. Provide Schneider Electric Altistart 48 RVSS, or equal by Allen-Bradley or Benschaw, to provide soft start and smooth acceleration capability when first switching to bypass operation and smooth deceleration when stopping in bypass.
 - a. Microcomputer shall analyze the motor variables and generate control commands that control the motor to reduce the possibility of surges occurring in the system.
 - b. The starting time shall be adjustable from 2 to 30 seconds.
 - c. The stopping time shall be adjustable from 2 to 120 seconds.
 - 3. Provide separate contactors for drive output and RVSS output.
 - 4. Provide a door-mounted VFD/Bypass selector switch and pilots lights for indication of VFD and Bypass modes of operation.
 - 5. Provide a solid-state electronic adjustable overload relay for motor protection while operating in the RVSS bypass mode.
 - 6. Provide a door mounted HMI for the RVSS. The associated ports for programming and communications shall be available through the front door of the enclosure, and a manual toggle switch shall be provided to switch between the HMI input and the programming port.

- D. Control Power Transformer
 - 1. Provide a control power transformer mounted and wired inside of the drive system enclosure to supply sufficient control power for the VFD, the bypass controller and auxiliary instruments (pressure switches, etc.), as shown on the drawings.
 - 2. The transformer shall be rated for drive, bypass and auxiliary instrument power plus 250VA spare capacity for future customer use.

- E. Auxiliary Relays
 - 1. Provide relays for Drive Fault and Drive Run.
 - 2. Provide (3) additional relays (to include Drive Alarm) to be wired per customer requirements.
 - 3. The relays shall be Schneider Electric RSB2A080BD relays (2 form C contacts, 2N.O. & 2N.C.). The relay contacts shall be rated for 115V AC/30V DC, 5.0 Amp resistive, 5.0 Amp inductive.

- F. Control Interface
 - 1. The control terminals shall be rated for 115V AC.
 - 2. Inputs shall be optically isolated from the drive control logic.
 - 3. The control interface card shall provide input terminals for access to fixed drive functions that include start, stop, external fault, speed, and enable.

- G. Hand-Off-Auto Selector Switch
 - 1. Provide a "Hand/Off/Auto" selector switch for start-stop control.
 - 2. Provide pilot lights for indication of the "Hand" and "Auto" modes.

3. The devices shall be Schneider Electric 9001 pilot devices (30mm, NEMA Type 4/4X/13) mounted on the drive system enclosure door.
- H. Pilot Lights
1. Provide pilot lights, mounted on the enclosure door, for indication of Control Power On, Run, Stop and Drive Fault. Refer to drawings for colors.
 2. The devices shall be Schneider Electric 9001 (30mm, NEMA Type 4/13) LED push to test type with power module type transformer, or equal by Allen-Bradley or ABB, mounted on the drive system enclosure door.
- I. Motor Event (Pump Start) Counter and Elapsed Time Meter
1. Provide a digital, door-mounted Event Counter, electrically interlocked with the Drive Run relay and Bypass contactor (if required), to count the total number of pump start sequences. The Event Counter shall be resettable.
 2. Provide a digital, door-mounted Elapsed Time Meter, electrically interlocked with the Drive Run relay and Bypass contactor (if required), to indicate total actual motor operating hours. The Elapsed Time Meter shall be non-resettable.
- J. Sine Wave Filter
1. Provide an MCC mounted sine wave filter on the output of each pump motor VFD. Sine wave filters shall be the SineWave Guardian, as manufactured by MTE, or equal.
- K. Human Interface Module
1. Provide a door mounted Human Interface Module with integral display, operating keys and programming keys.
 2. The Human Interface shall be full numeric door mounted LCD rated indoor IP66 / UL Type 4X, 12.
 3. The display portion shall have the following features:
 - a. The display shall be a seven (7) line by twenty-one (21) character backlit LCD display with graphics capability.
 - b. The display shall show drive operating conditions, adjustments and fault indications.
 - c. The display shall be configured to display in three distinct sections.
 - (1) The first section shall be a status display for direction, status, fault / alarm conditions and Auto / Manual mode.
 - (2) The second section shall display drive output frequency.
 - (3) The third section shall be configurable as a display for either programming menus / information or as a two-line user display for two additional values utilizing scaled units.
 4. The Human Interface shall provide digital speed control.
 5. The keypad shall include programming keys, drive operating keys (Start, Stop, Direction, Jog and Speed Control), and numeric keys for direct entry.
 6. The HMI shall display detected errors with QR codes to guide the user in troubleshooting.

- L. Pump Controls
 - 1. Implement the pump controls in the VFD as shown on the wiring schematics. Implement the devices provided by the pump manufacturer to monitor and alarm overtemperature, seal failure and vibration. Where shown and/or required, provide a GE Multilin 369 motor protection relay capable of monitoring the pump motor RTD's and outputting the required alarm and shutdown signals. The System Supplier shall coordinate with the pump and VFD suppliers to implement all signals as required.

- M. Software
 - 1. For each project, provide one fully functional licensed copy of the latest version of the configuration and diagnostic software for the VFD's and Bypass Starters. Provide a set of required programming cables. All cable connections shall be brought to the front door of the associated enclosures.

2.08 REDUCED VOLTAGE SOLID-STATE SOFT STARTERS

- A. Reduced Voltage Solid-State Soft Starters (RVSS) with Across the Line Bypass:
 - 1. Where shown as the primary control for the main pumps, provide Schneider Electric Altistart 48 RVSS, or equal by Allen-Bradley or Benschaw, to provide soft start and smooth acceleration capability when in Soft Starter operation and smooth deceleration when stopping with the soft starter. In addition, provide a full voltage across the line starter for Bypass operation of the soft starter.
 - a. Microcomputer shall analyze the motor variables and generate control commands that control the motor to reduce the possibility of surges occurring in the system.
 - b. The starting time shall be adjustable from 2 to 30 seconds.
 - c. The stopping time shall be adjustable from 2 to 120 seconds.
 - 2. Provide means to manually switch a single motor from Soft Starter control to Bypass (across the line) operation (only where primary control is RVSS).
 - 3. Provide separate contactors for soft starter output, across the line bypass output and soft starter bypass. The soft starter bypass contactor shall be utilized to bypass the RVSS once the motor is up to speed and shall be capable of starting and operating the motor if so wired in the field. The contactors shall be electrically interlocked.
 - 4. Provide a door-mounted Soft Starter/Bypass selector switch and pilot lights for indication of Soft Starter and Bypass modes of operation. Provide an HMI for the soft starter. Programming connections shall be made available through the door of the unit so that connections do not require the door to be opened. Provide a door mounted toggle switch to select between input from the HMI, and input from the programming port.
 - 5. Provide a solid-state electronic adjustable overload relay for RVSS protection.
 - 6. Provide a door mounted emergency stop pushbutton with red mushroom head and maintained contacts to deenergize the load in any operating mode.

7. Implement all pump controls according to the schematics shown on the drawings, including incorporation of the necessary devices to monitor pump overtemperature, seal failure and/or RTD's, as required, in coordination with the System Supplier and Pump Manufacturer.

PART 3 - EXECUTION

3.01 QUALITY CONTROL

- A. The vendor's manufacturing facility shall be certified to the ISO-9001 series of standards from the International Standards Organization.
- B. Incoming material shall be inspected and/or tested for conformance to all specifications. The manufacturer shall employ a vendor certification program to assure the quality of incoming materials.
- C. All subassemblies shall be inspected and/or tested for conformance to specifications.
- D. All drives 50HP and above shall be subjected to a 2-hour Run-In Test with a properly sized motor and operated under cycling load conditions on a dynamometer.

3.02 FACTORY TESTING

- A. The following tests shall be carried out in accordance with applicable requirements and/or specifications of Canadian Standards Association (CSA), Underwriters Laboratories (UL), National Electrical Manufacturers Association (NEMA), European Standard (EN), and International Electrotechnical Commission (IEC).
- B. Functional checks shall be performed wherever possible; otherwise, inspection and continuity checks shall be made.
- C. A "HI-POT" dielectric withstand test shall be performed on all buswork and cables from phase-to-phase and phase-to-ground (except solid-state components, low voltage controls and instrument transformers). The voltage level used for this test depends on the product's nominal AC voltage.
- D. Component devices shall be functionally operated in circuits as shown on electrical diagrams or as called for by specific test instructions.
- E. Instruments, meters, protective devices and associated controls shall be functionally tested by applying the specified control signals, current and/or voltages.
- F. All drives shall be Qualification Tested and must meet at least minimum testing for shorted output, capacitive coupling, chattering relay and showering arc.

- G. Drives shall be inspected for the following:
 - 1. Control power failure test
 - 2. Rectifier gating checks
 - 3. Inverter gating checks
 - 4. Line converter tests
 - 5. Machine converter tests
 - 6. Load tests:
 - a. Drives shall be accelerated to the test motor's nominal frequency, under load, decelerated to 10 Hz, then accelerated back to test motor's nominal frequency, with a ramp time of approximately ten seconds. This cycle shall be repeated continuously for up to one hour.
 - b. Drives shall be tested under load at the test motor's nominal frequency.

3.03 WITNESS TESTING

- A. The manufacturer shall make the VFD and/or RVSS available for witness testing by the County's representatives. Witness test shall include a drive system run test that shall consist of operating the variable frequency drive connected to a dynamometer. During the testing of the drive and/or RVSS, a demonstration of the operator interface and functionality will be provided as well as demonstration of the operation of the drive and/or RVSS equipment. The drive will be tested up to rated horsepower at both steady state and varying speeds. VFD supplier shall notify the Engineer (4) weeks in advance of testing date. At the conclusion of testing, the County's representative will convene with the manufacturer's Application Engineer or Project Manager to discuss any concerns or issues that arose during the test. Any modifications or changes requested by the County will be addressed at this meeting.
- B. A review of the electrical and mechanical drawings for the purchased equipment shall be done with the Supplier's Application Engineer or Project Manager prior to commencing the tests. Any questions or clarifications, prior to commencing the test, will be addressed at this time.
- C. A Certified Test Report shall be issued to the Purchaser at the conclusion of the testing.

3.04 PHYSICAL INSPECTION

- A. The product must meet all applicable engineering and workmanship standards and specifications. All components shall be verified against engineering documentation to be present and correctly installed.

- B. Warning plates, isolation barriers, and mechanical interlocks must provide sufficient safety/isolation for personnel and equipment.
 - 1. Warning labels and nameplates must be present and in their specified positions to advise personnel of possible hazards.
 - 2. Isolation barriers must be in place within the cabinet. Such barriers protect personnel from touching live components in an area that otherwise does not have power supplied to it.

3.05 COMMISSIONING

- A. Startup Commissioning Services
 - 1. Startup will be performed at the user's site. The service division of the manufacturer shall perform all startup services. Manufacturer shall provide a minimum of two (2) days of on-site startup service for each VFD and/or RVSS. The use of third-party supplier startup personnel is not acceptable.
 - 2. The installation contractor shall coordinate with the supplier to provide the following:
 - a. A pre-installation meeting with the user to review:
 - (1) Review site ready condition checklist provided by the manufacturer and completed by the installation contractor.
 - (2) The startup plan.
 - (3) The startup schedule.
 - (4) The drive and/or RVSS installation requirements.
 - b. Inspect the equipment's mechanical and electrical devices enclosed.
 - c. Perform a tug test on all internal connections within the equipment and verify wiring.
 - d. Verify critical mechanical connections for proper torque requirements.
 - e. Verify and adjust mechanical interlocks for permanent location.
 - f. Confirm all sectional wiring is connected properly.
 - g. Re-verify control wiring from any external control devices.
 - h. Set up all internal power supplies and thyristor control circuits.
 - i. Verification of proper phasing from isolation transformer to drive.
 - j. Confirm cabling of equipment to motor, isolation transformer and line feed.
 - k. Perform Megger test.
 - l. Apply voltage to the equipment and perform operational checks.
 - m. Bump motor and tune the system attributes. (If the load is unable to handle any movement in the reverse direction, the load should be uncoupled prior to bumping the motor for directional testing.)
 - n. Run the motor system throughout the operational range to verify proper performance.

3.06 WARRANTY

- A. The VFD/RVSS equipment shall be warranted in writing by the manufacturer for defects in materials and workmanship for a period of five (5) years from the date the Contractor achieves Substantial Completion of the project. This date shall be approved by the County and the Contractor shall provide a certificate in the project O&M Manuals documenting the start date and duration of the warranty period. The warranty shall be non-prorated and shall not be subject to any runtime hour limitations. The warranty shall be comprehensive, and shall include all parts, labor, travel and other miscellaneous expenses.
- B. No third-party maintenance is acceptable.

END OF SECTION

SECTION 17500

DESCRIPTION OF OPERATION

A. PUMP CONTROL SYSTEM CONFIGURATION

1. General Description

- a. A pump control system consisting of variable frequency drives shall be provided for the pumping station.

2. Variable Frequency Drives

- a. A variable frequency drive (VFD) with solid state reduced voltage bypass starter shall be provided for each of the pumps.

B. PUMPS

1. General Description

- a. The existing pumps shall remain.
- b. An Ultra Low Harmonic AC variable frequency drive (VFD) shall be provided for each pump to vary the pump discharge rate.

2. Pump Motor Controls

- a. A variable frequency drive with reduced voltage solid state bypass starter shall be provided for each of the pumps.
- b. The Auto position of each pump H/O/A selector switch shall be wired to the drive for selecting automatic speed control.
- c. Each pump H/O/A switch shall have an auxiliary normally open contact that shall close when the switch is placed in the Auto position. This contact shall be wired to the programmable controllers.
- d. Each variable frequency drive and soft-start shall have a run contact that shall close when the drive is energized and outputting a frequency to the pump motor. This contact shall be wired to a run indication light and elapsed time meter on the drive enclosure, and a run relay located inside the enclosure. This contact shall be wired to the programmable controllers.

- e. Each variable frequency drive and soft-start shall have a fault contact that shall be wired to a fault indication light on the drive enclosure and input to the pump control panel.
- f. The run status and fault alarm for each variable frequency drive and soft-start shall be input to the programmable controllers.
- g. Each variable frequency drive shall output a speed signal proportional to the drive speed which shall be wired to the programmable controllers.
- h. Lock-out stop push buttons (maintained type) shall be mounted on the drive enclosure and where shown on the plans. The stop buttons shall be wired in series with the pump VFD control circuit so that when either stop button is pushed in, power to the VFD control circuit shall be disconnected. The stop buttons shall also lock out the solid-state bypass controllers.

3. Description of Operation

- a. The pumps shall be controlled by the individual H/O/A selector switches located on the pump VFDs. The Hand and Off positions of the H/O/A selector switches provide for manual start/stop control of the pumps. When a pump H/O/A switch is placed in the Hand position, the pump start sequence shall begin. When the switch is placed back in the Off position, the pump stop sequence shall begin. While running manually, the pump speed shall be varied by the keypad located on the VFD.
- b. When the pump H/O/A switches are in the Auto position, the pumps shall be automatically controlled by the PLC's in response to the wet well level as follows:
 - (1) Level setpoints shall be programmed in the programmable controllers for the following wet well levels:
 - (a) Wet Well Low Level
 - (b) Lead Pump Stop
 - (c) Lag Pump Stop
 - (d) Lag1 Pump Stop
 - (e) Lag2 Pump Stop
 - (f) Wet Well Level Setpoint

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- (g) Lead Pump Start
 - (h) Lag Pump Start
 - (i) Lag1 Pump Start
 - (j) Lag2 Pump Start
 - (k) Wet Well High Level
- c. The level setpoints shall be adjustable via the operator interfaces located on the control panel.
 - d. The operator interfaces shall be programmed to enable the Operator to select whether the pumps shall be controlled by the level signal from submersible level transducer No. 1 or level transducer No. 2 in either wet well. Selection of the input shall be based on a discrete input from the selector switch on the PCP.
 - e. A PID level controller shall be configured in the programmable controllers to control the level in the wet well. The PLC shall vary the speed of the pumps as required to approximately match the pump discharge flow rate to the pumping station influent flow rate by maintaining a consistent level in the wet well. The desired level to be maintained in the wet well shall be programmed in the PLC's as the level setpoint. The PLC shall compare the actual wet well level measured by the selected wet well level transducer to the setpoint level, and shall output a speed reference signal to the pump VFDs to increase or decrease the speed of the pumps as required to maintain the setpoint level.
 - f. Any pump can be selected as the Lead, Lag, Lag1 or Lag2, in the Lead-Lag sequence.
 - g. Any pump in the Lead-Lag sequence can be taken out of the sequence. This pump becomes a standby pump. One or all pumps can be taken out of the Lead-Lag sequence.
 - h. The pump alternation shall be based upon selection of the Lead, Lag, Lag1 and Lag2 pumps:
 - (1) The Operator shall select the pump order from the operator interface. Any pump shall be able to be assigned to any position in the operational order.

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- (2) The Operator shall select the mode of alternation from the operator interface. The three alternation modes are Lead Pump Alternation, Time Alternation and Manual Alternation.
 - (3) If Lead Pump Alternation is selected, the pumps shall alternate every time the Lead Pump stops. When the Lead Pump stops, it shall become the Lag2 Pump, and all the other pumps shall move up in the operational order.
 - (4) If Time Pump Alternation is selected, the pumps shall alternate every 24 hours (or other selected time in one hour increments). Under this condition, the Lead Pump shall stop at the 24-hour mark and become the Lag2 Pump. The other pumps shall move up in the operational order.
- i. When the level in the wet well rises to the elevation of the Lead Pump Start level setpoint, the PLC's shall start the Lead Pump. When the Lead Pump is started, it shall run with its speed being varied by the programmable controllers to maintain the setpoint level in the wet well. As long as the influent flow rate into the wet well is sufficient to maintain the level in the wet well above the Lead Pump Stop level, the Lead Pump shall run continuously with its speed varied to match the pump discharge rate to the wet well influent flow rate as the influent flow rate varies from the minimum pumping rate to the maximum capacity of the Lead Pump.
 - j. If the Lead Pump cannot keep up with the influent flow, the level in the wet well shall rise to the Lag Pump Start level setpoint. When this level is reached, a start delay timer in the programmable controllers shall be started. When this timer times out, the PLC's shall start the Lag Pump and shall output equivalent speed reference signals to both the Lead and Lag Pumps so that both pumps match speeds. As long as the level is above the Lag Pump Stop level, both pumps shall run continuously with the speed of the Lead and Lag Pumps being varied by the PLC's as required to match the combined pump discharge rates to the pumping station influent flow rate.
 - k. If the Lead and Lag Pump cannot keep up with the influent flow, the level in the wet well shall rise to the Lag1 Pump Start level setpoint. When this level is reached, a start delay timer in the programmable controllers shall be started. When this timer times out, the PLC's shall start the Lag1 Pump and shall output equivalent speed reference signals to the Lead, Lag and Lag1 Pumps so that all pumps match speeds. As long as the level is above the Lag1 Pump Stop level, all pumps shall run continuously with the speed of all the pumps being varied by the PLC's as required to match the combined pump discharge rates to the pumping station influent flow rate.

- l. If the Lead, Lag, Lag1 Pumps cannot keep up with the influent flow, the level in the wet well shall rise to the Lag2 Pump Start level setpoint. When this level is reached, a start delay timer in the programmable controllers shall be started. When this timer times out, the PLC's shall start the Lag2 Pump and shall output equivalent speed reference signals to all the pumps so that all pumps match speeds. As long as the level is above the Lag2 Pump Stop level, all pumps shall run continuously with the speed of all the pumps being varied by the PLC's as required to match the combined pump discharge rates to the pumping station influent flow rate.
- m. When the level in the wet well is pumped down to the Lag2 Pump Stop level setpoint, the PLC's shall shut down the Lag2 Pump. When the level in the wet well is pumped down to the Lag1 Pump Stop level setpoint, the PLC's shall shut down the Lag1 Pump. When the level in the wet well is pumped down to the Lag Pump Stop level setpoint, the PLC's shall shut down the Lag Pump. When the level in the wet well is pumped down to the Lead Pump Stop level setpoint, the PLC's shall shut down the Lead Pump.
- n. For each pump, the current number of starts and current runtime, hours shall be calculated in the PLC for the current 24 hour period. These values shall roll into yesterday's number of starts and yesterday's runtime hours after the current 24 hour period expires.
- o. When the PLC senses a loss of power from either one or both of the feeders, it will remove the run signal to the pumps after a time delay that is set at the OIT. When the power returns, the pumps will start one at a time. There will be a time delay for each pump start so that all the pumps are staggered on a restart. These delay times shall be set from the OIT.
- p. When the PLC senses a blip in power from the primary feeder or secondary feeder (whichever is supplying the system with power), it will remove the run signal to the pumps. After a time delay that is set at the OIT and the pumps are in the ready state, the pumps will start one at a time. There will be a time delay for each pump start so that all the pumps are staggered on a restart. These delay times shall be set from the OIT.
- q. If the level in the wet well is drawn down to the Wet Well Low Level setpoint, a timer in the programmable controllers shall be started. If this timer times out and the low level condition still exists, the PLC's shall shut down the pumps. When this occurs, a Wet Well Low Level alarm message shall be displayed on the operator interfaces. This condition shall also cause the Secondary PLC to take control of the station as previously described.

- r. If the level in the wet well rises to the elevation of the Wet Well High Level setpoint, a timer in the programmable controllers shall be started. If this timer times out and the high level condition still exists, a Wet Well High Level alarm message shall be displayed on the operator interfaces.
- s. The PLC's shall continuously monitor the analog signal received from each submersible level transducer. The PLC's shall provide failure monitoring for the level transducers.
- t. The PLC's shall provide failure monitoring for each pump as follows:
 - (1) When a pump H/O/A switch is in the Auto position and the pump gets a signal to start, a failure timer in the PLC's shall be started. If this timer times out and the pump VFD is not running, a "Pump Failure" alarm message shall be displayed on the operator interfaces.
- u. The VFD fault status for each drive shall be monitored by the PLC's. If a drive fault occurs, the pump VFD shall shut down. When this occurs, a Pump VFD Fault alarm message shall be displayed on the operator interfaces.
- v. Each pump motor shall be furnished with resistive temperature devices (RTD's) or thermal switches in the motor windings and/or bearings to detect high motor temperatures. These devices shall be wired to the pump VFD and the associated signals shall be input to the PLC's for alarming. Where RTD's are specified, two setpoints shall be established in the VFD for each RTD for high temperature alarm and high temperature shutdown. If the first temperature setpoint is reached, the VFD shall alarm only. If the second setpoint is reached, the VFD shall shut down the pump. Where thermal switches are used, the VFD shall shut down the pump when the switch is actuated. The PLC's shall monitor the status of the high temperature alarms and the high temperature shutdown alarms for each bearing and winding RTD or thermal switch and shall display the alarms on the operator interfaces. Refer to the pump specifications for the types of devices to be provided, and coordinate the signals as required.
- w. A pressure sensor shall be mounted on each pump discharge line. The analog pressure signal shall be input to the PLC's for monitoring. In addition, each sensor shall be actuated on a rise in discharge pressure and connected to a pressure controller which shall close a contact output upon reading a preset (adjustable) pressure. The contacts shall be wired to the VFD's and utilized for failure monitoring as follows:

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- (1) When a pump is started, a failure timer in the VFD's shall be started. If this timer times out and the pressure controller indicates that there is no pressure, the VFD's shall shut down the pump, and a Pump Failure alarm message shall be sent to the PLC's.
 - x. If a pump is taken out of Auto, or experiences a failure, VFD fault or check valve failure alarm, the programmable controllers shall index the lead/lag assignments of the pumps so that this pump is moved to the end of the operational order. The remaining pumps shall move up in the order accordingly. The failed pump shall be locked out of the pump sequence until it is placed back in Auto or its alarm has been cleared.
 - y. This description is written based on a four-pump control system. The operation is similar for systems with more or fewer pumps, and the system shall be programmed based on the actual number of pumps controlled. For the purposes of control, a series set of pumps shall be treated as a single pump.
4. Pump Alarms
- a. The following alarms for each of the pumps shall be displayed on the operator interfaces located on the control panel:
 - (1) Pump Failure
 - (2) Pump VFD Fault
 - (3) Pump Soft-Start Fault
 - (4) Pump Over Temperature
5. Bypass Operation
- a. Operation of the reduced voltage solid state bypass starter shall be identical to that described for the VFD. A two-position selector switch shall be provided on the front of the VFD to select the bypass starter manually. An output from this switch shall be input to the programmable controllers to indicate the bypass starter is in control. All logic, emergency stop pushbuttons and other remote I/O associated with operation of the VFD shall be functional for the bypass starter.

C. VALVE ACTUATORS

1. General Description

- a. Electro-Hydraulic Valve Actuators are provided for the pump cone valves and other valves and gates in the system.

2. Description of Operation

- a. Each valve actuator control panel shall be provided with valve open, valve closed and valve trouble for each valve, and input to the PLC's via the Ethernet network connecting the valve control panels to pump station control panel. Analog valve position of each valve shall also be provided to the PLC's.
- b. Valve trouble signals shall be alarmed through SCADA.
- c. A signal shall be provided from each VFD to the corresponding valve control PLC to disable control of all the corresponding valves associated with that particular pump train whenever the VFD loses control power for any reason.

D. AUTO THROWOVER/AUTO TRANSFER SWITCH (ATS)

1. General Description

- a. The station is provided with a main-tie-main or main-main switchgear system and/or a stand alone or MCC mounted automatic transfer switch (ATS) for redundant power supply.

2. Description of Operation

- a. Open and closed status of all main breakers and tie breakers shall be input to the PLC's.
- b. ATS status shall be input to the PLC's, as well as availability of utility source power.
- c. When the tie breaker closes or the ATS transfers to emergency/secondary power source, the PLC's shall send an alarm via SCADA.
- d. The ATS shall send a time adjustable pre-transfer signal to the PCP to allow for shutdown of the pumps prior to a transfer from generator source to utility source. The pumps shall remain stopped through the transition, and the PCP shall re-initiate the appropriate pump start sequence after a designated time has elapsed post-transfer.

E. POWER MONITORING

1. General Description

- a. Distribution equipment shall be provided to house circuit breakers and motor starters for the pumping station loads.
- b. Digital meters and phase monitors shall be housed in the equipment to monitor the incoming power.
- c. Surge protective devices shall be housed in the equipment to protect the system from transient voltages that may occur due to lightning or surges on the incoming power line.

2. Description of Operation

- a. The digital meters and phase monitors located in the equipment shall continuously monitor the incoming power. A normally closed alarm contact in the meter and/or the phase monitor shall be wired to the PLC's. When normal power is present, this contact shall be open. If a power failure occurs, this contact shall close, and a Power Failure alarm message shall be displayed on the operator interfaces located on the control panel.
- b. Surge protective devices shall be furnished with a normally open alarm contact. This contact shall be wired to the PLCs. If an SPD alarm occurs, this contact shall close, and a SPD Alarm message shall be displayed on the operator interfaces.

END OF SECTION

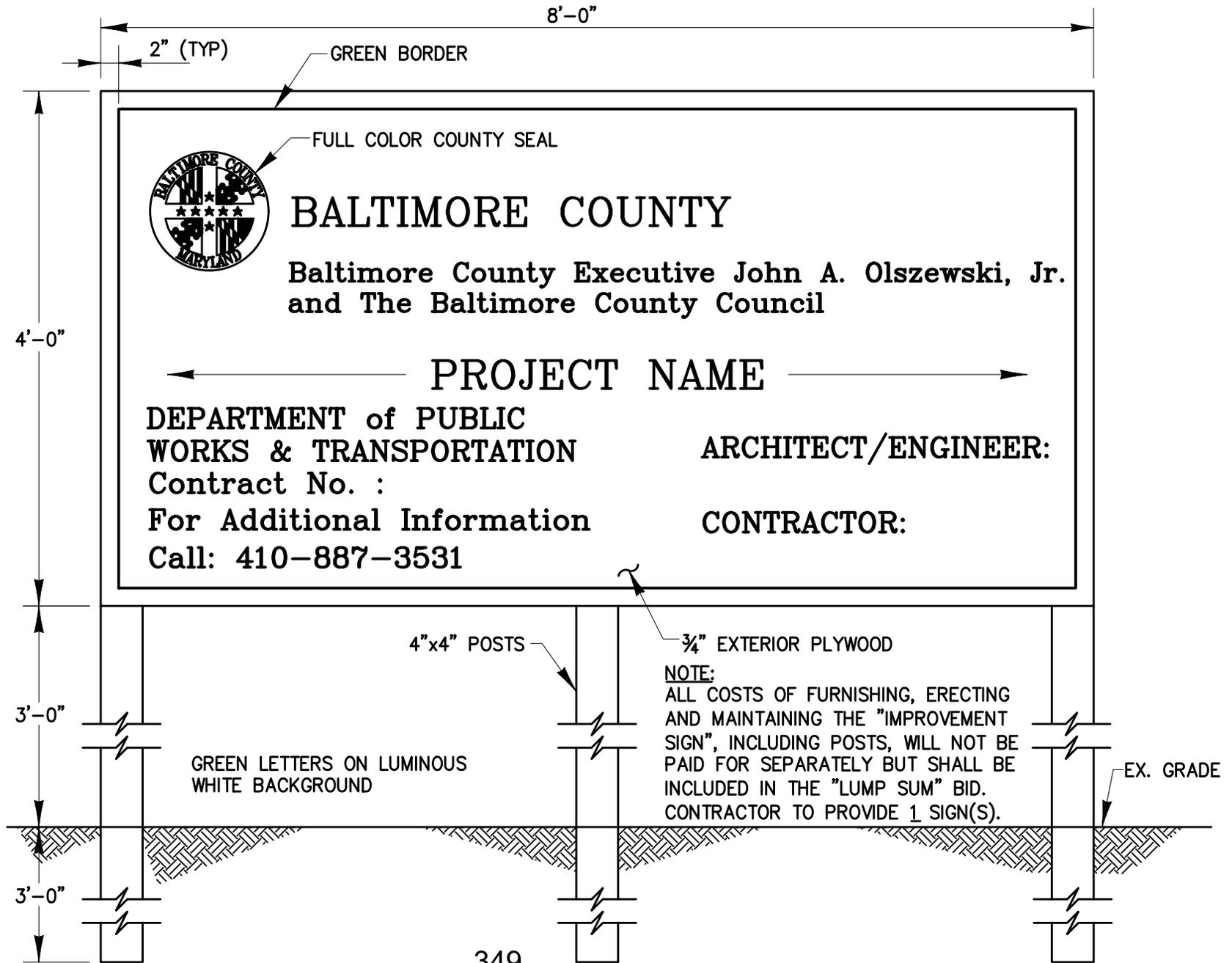
APPENDIX A
CONSTRUCTION SITE SIGN

BALTIMORE, MARYLAND 21202

700 EAST PRATT STREET
SUITE 500



BALTIMORE COUNTY
MAKING IMPROVEMENTS SIGN



SPECIAL PROVISIONS

Builder's Risk Insurance

- A. The Contractor shall, at his/her own cost, insure the work and keep it insured at all times during the period of construction, and until final acceptance of it by the County against loss of damage covered by an "All Risk" Builders Risk type of policy. The amount of insurance shall be the 100% estimated replacement cost of the work.

- B. The policies shall be made payable to the County and the Contractor, as their interest may appear, and the policies shall be left in the possession of the Engineer, prior to the start of construction.

SECTION IV

Permits

SECTION V

Proposal

This Section to be
Completed by Time of Bid

**SECTION-V
PROPOSAL**

DESCRIPTION OF WORK

**Bid Opening via Teleconference WebEx Thursday, October 19, 2023 at 10:30 a.m. EST
WebEx Phone Number 1-415-655-0001 Access Code Number 2314 277 4006.**

Begin Work within Fifteen (15) Days after NOTICE TO PROCEED.

CALENDAR Days for Completion FIVE HUNDRED AND FORTY (540) CALENDAR DAYS

If Contractor fails to complete the Contract within the required “Days for Completion”, the following Liquidated Damages will be paid by the Contractor for each Calendar Day thereafter:

- Day 1 through Day 30 - \$1,500 **per Calendar Day**
- Day 31 through Day 60 - \$2,000 **per Calendar Day**
- Day 61 and there after - \$2,750 **per Calendar Day**

Cost Group “E \$2,500,001 TO \$5,000,000” (Prequalified contractors with a Cost Group restriction must bid within the dollar amount stated on their Certificate of Prequalification).

Work Classification: G-2 with Prequalified G-3 Subcontractors

TO BALTIMORE COUNTY, MARYLAND: To upgrade and renovate the existing station to increase reliability. **Dundalk – District 15c7.**

The following listed Drawing Number(s) are collectively the “Drawings”, and are hereby incorporated in the Contract.

<u>Job Order No.</u>	<u>Drawing Number’s</u>
231-201-0090-9149	2023-0636 through 2023-0643

A pre-bid meeting will be held on Wednesday, September 6, 2023 at 9:00 a.m. EST at the station located at 830 Race Road, Essex, Maryland 21221. A second site visit will be held on Wednesday, September 13, 2023 at 9:00 a.m. EST at the station. Deadline for questions is Friday, September 22, 2023 at 5:00 p.m. EST. A third site visit will be held on Wednesday, October 4, 2023 at 9:00 a.m. EST at the station. This will be the last chance to visit the station. No questions will be answered at this time.

Note: No successful bidder may withdraw their bid within NINETY (90) days after the opening thereof.

The Contractor hereby declares that it has carefully examined the solicitation, plans and specifications, form of contract, Special Provisions and Drawings (collectively the “Contract Documents”). The Contractor also hereby declares that it has carefully examined the February 2000 “Standard Specifications for Construction and Materials” and “Standard Details for Construction,” collectively the “Applicable County Law” and any and all Department of Public Works revisions thereto as of the date of advertisement. The Contract Documents, the Applicable County Law and the Department of Public Works revisions thereto are collectively the “Specifications” and are incorporated herein. Copies of any and all Department of Public Works revisions including but not limited to Addendum No. 3 and General Conditions Building Projects, are on file and available in the Division of Construction Contracts Administration, County Office Building, Towson, Maryland, and can be downloaded and printed from the internet using Acrobat Reader at:

<http://www.baltimorecountymd.gov/Agencies/publicworks/standardsandspecs/specsanddetails.html>

Also, the Contractor has, to its satisfaction, examined the locality of the proposed work and agrees to furnish all labor, tools, materials, machinery, equipment, and other means of construction called for in the manner provided in the Specifications for the prices shown on the next page(s) and as evidenced by Contractor’s signature on the last page thereof.

SCHEDULE OF PRICES

NOTE: The Bidder shall fill out this Proposal, write in the unit prices in clear numerals, and make the extensions.

For complete information concerning these items, see Specifications and contract forms.

C O N T R A C T - P R O P O S A L

CONTRACT NUMBER 23017SX0	JOB ORDER NUMBER 201-0090-9149	ELECTION DISTRICT NUMBER 15C7	ESTIMATE OF CALENDAR DAYS 540
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-----PROJECT DESCRIPTION-----
 STEMMERS RUN SEWAGE PUMPING STATION ELECTRICAL UPGRADES
 830 RACE ROAD, ESSEX, MARYLAND 21221
 DRAWING NUMBERS 2023-0636 THROUGH 2023-0643
 FIVE HUNDRED AND FORTY (540) CALENDAR DAYS

CONTRACTOR NAME - _____	PREQUAL.NO. - _____	VENDOR NO. - _____
ADDRESS - _____	TELE.NO. - _____	

BID/ALT ITEM	----- DESCRIPTION OF ITEM -----	UNIT OF MEASURE	ESTIMATED QUANTITY	----- BID UNIT PRICE	ESTIMATE TOTAL PRICE
1	STEMMERS RUN SEWAGE PUMPING STATION ELECTRICAL UPGRADES	LS	--N/A--	---N/A---	-----*--
2 C	ALLOWANCE FOR FIELD REPROGRAMMING AND PUMP CONTROL PANEL/SYSTEM MODIFICATIONS				
	--- AT --- FIXED --- PRICE --- SHOWN ---	LS		100,000.00	100,000.00
3 C	ALLOWANCE FOR SPARE PARTS				
	--- AT --- FIXED --- PRICE --- SHOWN ---	LS		50,000.00	50,000.00
>>>	TOTAL COST FOR CONTRACT --- 23017SX0			\$	-----*-- <

C - INDICATES CONTINGENT ITEMS 23017SX0 PAGE - 1 * - IF NO CENTS, WRITE NO-CENTS
 * - TWO DIGIT CENTS IN UNIT & TOTAL PRICES ONLY.

PROPOSAL AFFIDAVIT

1. AUTHORIZED REPRESENTATIVE

I HEREBY AFFIRM THAT:

I am the [title] _____ and the duly authorized representative of [business] _____ (the "Business") and that I possess the legal authority to make this Affidavit on behalf of myself and the Business for which I am acting.

2. PROPOSAL CERTIFICATION

THE UNDERSIGNED HEREBY ACKNOWLEDGES receipt of the following Addenda (list by number and date):

_____.

Accompanying this Proposal is a Bid Bond in an amount of 5% of the bid, the exact amount to be determined by the difference between the low bid and the next lowest bid, if two or more bids are received, or 5% of the bid if one bid is received. This guarantees payment to Baltimore County of the amount thus determined as liquidated damages in case of default in any matter specified as required before award or in any matter resulting in failure to execute and deliver an Agreement, together with Payment and Performance Bonds, after award.

3. AFFIRMATION REGARDING BRIBERY CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies (as is defined in Section 16-101(f) of the State Finance and Procurement Article of the Annotated Code of Maryland), has been convicted of, or has had probation before judgment imposed pursuant to Section 6-225 of the Criminal Procedure Article of the Annotated Code of Maryland, or has pleaded nolo contendere to a charge of, bribery, attempted bribery, or conspiracy to bribe in violation of Maryland law, or of the law of any other state or federal law, except as follows [indicate the reasons why the affirmation cannot be given and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of person(s) involved, and their current positions and responsibilities with the Business]:

_____.

4. AFFIRMATION REGARDING OTHER CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies, has:

- (1) Been convicted under state or federal statute of a criminal offense incident to obtaining, attempting to obtain, or performing a public or private contract, fraud, embezzlement, theft, forgery, falsification or destruction of records, or receiving stolen property;
- (2) Been convicted of any criminal violation of a state or federal antitrust statute;

(3) Been convicted under the provisions of Title 18 of the United States Code for violation of the Racketeer Influenced and Corrupt Organization Act, 18 U.S.C. §1961, et seq., or the Mail Fraud Act, 18 U.S.C. §1341, et seq., for acts arising out of the submission of bids or proposals for a public or private contract;

(4) Been convicted of a violation of the State Minority Business Enterprise Law, Section 14-308 of the State Finance and Procurement Article of the Annotated Code of Maryland;

(5) Been convicted of conspiracy to commit any act or omission that would constitute grounds for conviction or liability under any law or statute described in subsection (1), (2), (3), or (4) above;

(6) Been found civilly liable under a state or federal antitrust statute for acts or omissions in connection with the submission of bids or proposals for a public or private contract;

(7) Admitted in writing or under oath, during the course of an official investigation or other proceedings, acts or omissions that would constitute grounds for conviction or liability under any law or statute described above, except as follows [indicate reasons why the affirmations cannot be given, and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of the person(s) involved and their current positions and responsibilities with the Business, and the status of any debarment]:

5. AFFIRMATION REGARDING DEBARMENT

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies, has ever been suspended or debarred (including being issued a limited denial of participation) by any public entity, except as follows [list each debarment or suspension providing the dates of the suspension or debarment, the name of the public entity and the status of the proceeding, the name(s) of the person(s) involved and their current positions and responsibilities with the Business, the grounds of the debarment or suspension, and the details of each person's involvement in any activity that formed the grounds of the debarment or suspension]:

6. AFFIRMATION REGARDING DEBARMENT OF RELATED ENTITIES

I FURTHER AFFIRM THAT:

(1) The Business was not established and it does not operate in a manner designed to evade the application of or defeat the purpose of debarment pursuant to Sections 16-101, et seq., of the State Finance and Procurement Article of the Annotated Code of Maryland; and

(2) The Business is not a successor, assignee, subsidiary, or affiliate of a suspended or debarred business, except as follows: [you must indicate the reasons why the affirmations cannot be given without qualification]:

7. SUB-CONTRACT AFFIRMATION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, has knowingly entered into a contract with a public body under which a person debarred or suspended under Title 16 of the State Finance and Procurement Article of the Annotated Code of Maryland will provide, directly or indirectly, supplies, services, architectural services, construction related services, leases of real property, or construction.

8. AFFIRMATION REGARDING COLLUSION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, members or partners, nor any of its employees, have in any way:

(1) Agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the accompanying bid or offer that is being submitted;

(2) In any manner, directly or indirectly, entered into any agreement of any kind to fix the bid price or price proposal of the bidder or offeror or of any competitor, or otherwise take any action in restraint of free competitive bidding in connection with the contract for which the accompanying bid or offer is submitted;

(3) Colluded with anyone to obtain information concerning the bid that would give the Business an unfair advantage over others.

9. POLITICAL CONTRIBUTION DISCLOSURE AFFIRMATION

I FURTHER AFFIRM THAT:

The Business affirms that it is aware of, and will comply with, the provisions of Sections 14-101 through 14-108 of the Election Law Article of the Annotated Code of Maryland, which require that every person who makes, during any 12-month period, one or more contracts, with one or more Maryland governmental entities involving cumulative consideration, or at least \$200,000.00, shall file with the State Board of Elections certain specified information to include disclosure of attributable political contributions in excess of \$500 during defined reporting periods.

10. CERTIFICATION OF CORPORATION REGISTRATION AND TAX PAYMENT

I FURTHER AFFIRM THAT:

(1) The Business is a _____ (State) (Corporation), (LLC), (Partnership), (Sole Proprietor/Individual), (Other: _____), that it **is** registered in accordance with the Corporations and Associations Article of the Annotated Code of Maryland, that it **is** in good standing in the State of Maryland, and that it **has** filed all of its annual reports, together with filing fees, with the Maryland State Department of Assessments and Taxation, and that the name and address of its resident agent filed with the State Department of Assessments and Taxation is:

Name: _____
Address: _____

(If none, so state).

(2) Except as validly contested, the Business has paid, or has arranged for payment of, all taxes due the State of Maryland and Baltimore County, and has filed all required returns and reports with the Comptroller of the Treasury, the State Department of Assessments and Taxation, and the Employment Security Administration, as applicable, and will have paid all withholding taxes due the State of Maryland prior to final settlement.

11. CONTINGENT FEES

I FURTHER AFFIRM THAT:

The Business has not employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Business, to solicit or secure the Contract, and that the Business has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or other consideration contingent on the making of the Contract.

12. NONDISCRIMINATION IN EMPLOYMENT STATEMENT

I FURTHER AFFIRM THAT:

During the performance of any contract awarded of which this affidavit is a part:

(1) The Business will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test. The Business will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test. Such action shall include, but not be limited to the following: employment, promotion, upgrading, demotion or transfer, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Business agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the owner setting forth provisions of this nondiscrimination clause.

(2) The Business will, in all solicitations or advertisements for employees placed by or on behalf of the Business, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test.

(3) The Business shall send to each labor union or representative of workers with which the Business has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the owner, advising the said labor union or workers' representative of these commitments, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Business shall furnish, if requested by the County, a compliance report concerning our employment practices and policies in order for the County to ascertain compliance with the special provisions of this affidavit concerning nondiscrimination in employment.

(5) In the event of the Business's noncompliance with the nondiscrimination clause of this affidavit, the contract may be canceled, terminated, or suspended in whole or in part, and the Business may be declared ineligible for further County work.

(6) The Business shall include the special provisions outlined herein pertaining to nondiscrimination in employment in every subcontract, so that such nondiscrimination in employment provisions shall be binding on each subcontractor or vendor.

13. FOREIGN CONTRACTS

I FURTHER AFFIRM THAT:

The Business affirms that it is aware of, and will comply with, the provisions of Sections 10-2-110 Article 10. Finance, Title 2 – Purchasing, Baltimore County Code 2003, which requires that prior to the award of a contract for services under the provisions of this title, and during the entire term of a contract award, the bidder or vendor shall disclose to the County whether any services covered by the bid or contract, including any subcontracted services, will be performed outside the United States. The disclosure shall be made to the Office of Budget and Finance, Purchasing Bureau.

14. MINORITY BUSINESS ENTERPRISE AND FEMALE CONTRACTORS

THIS BUSINESS INTENDS to affirmatively seek out and consider minority business enterprises to participate in this contract as subcontractors and/or suppliers of materials and services.

THE UNDERSIGNED UNDERSTANDS AND AGREES: that any and all subcontracting of supplies and services in connection with this contract, whether undertaken before or after award of contract, will be in accordance with the Minority Business Enterprise and Female Contractor requirement included in the Bid Proposal package and incorporated herein as if fully set forth; and

THE UNDERSIGNED ALSO UNDERSTANDS AND AGREES that no subcontracting will be approved until Baltimore County has reviewed and approved the affirmative actions taken by this firm.

15. REQUIREMENTS FOR EXECUTING AFFIDAVIT & PROPOSAL

The Affidavit must be signed in ink in order for the bid to be accepted and that the Proposal must be typewritten or filled out in ink.

THE UNDERSIGNED ALSO UNDERSTANDS that:

Proposals submitted by an INDIVIDUAL must be signed by an individual.

Proposals submitted by a PARTNERSHIP must be signed by the partner who is legally authorized authority to bind the partnership. Attach a copy of the Partnership Agreement and a duly certified resolution evidencing the authority of the partner so signing on behalf of the partnership.

Proposals submitted by a CORPORATION must be signed by a legally authorized officer of the corporation and attested to by the Corporate Secretary. Attach a copy of the Articles of Incorporation, By-Laws and a duly certified Board Resolution evidencing the authority of the officer so signing on behalf of the corporation.

Proposals submitted by a LIMITED LIABILITY COMPANY must be signed by a legally authorized member of the company and attested to. Attach a copy of the Operating Agreement, Articles of Organization and a duly certified resolution evidencing the authority of the member so signing on behalf of the limited liability company.

NOTE: The contractor may file with the County a list of the names of those officers, partners or members, as applicable, having legal authority to execute documents on behalf of and legally bind the contractor, duly certified, as applicable and legally required, together with the aforesaid corporate documents, which shall remain in full force and effect until such time as the County Department of Public Works Construction Contract Administration is advised in writing to the contrary.

16. **ACKNOWLEDGMENT**

I ACKNOWLEDGE THAT this Affidavit is to be furnished to the County and may be distributed to units of (1) Baltimore County; (2) the State of Maryland; (3) other counties or political subdivisions of the State of Maryland; (4) other states; and (5) the federal government. I further acknowledge that this Affidavit is subject to applicable laws of the United States and the State of Maryland, both criminal and civil, and that nothing in this Affidavit or any contract resulting from the submission of this bid or proposal shall be construed to supersede, amend, modify or waive, on behalf of Baltimore County, or the State of Maryland or any unit of the State of Maryland having jurisdiction, the exercise of any statutory right or remedy conferred by the Constitution and the laws of Maryland with respect to any misrepresentation made or any violation of the obligations, terms and covenants undertaken by the Business with respect to (a) this Affidavit, (b) the contract, and (3) other Affidavits comprising part of the contract.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

WITNESS/ATTEST:

Date: _____

By: _____
Name:
Title:
(Authorized Representative and Affiant)

BID BOND

Principal _____

Business Address of Principal _____

Surety _____

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

Five Percent of Bid Amount _____ \$ _____ 5% of Bid

Penal Sum of Bond [shall be determined pursuant to latest revised Specification / G.P. 2.07 (2000 Ed.)]

Stemmers Run Sewage Pumping Station Electrical Upgrades
Contract Name

23017 SX0
Contract Number/Proposal Item Number

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal, above named, and Surety, above named, and authorized to do business in the State of Maryland, are held and firmly bound unto the Obligee, above named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the aforesaid Principal is the apparent low bidder and complies with all specified matters required before award or if the aforesaid Principal is awarded the contract, the said Principal will, within the time required, execute and deliver to the Obligee a formal contract and good and sufficient payment and performance bonds in the form provided by the Obligee, then, this obligation to be void; otherwise the Principal and Surety will, upon demand, pay unto the Obligee the entire Penal Sum of this Bid Bond as liquidated damages.

THE SURETY FURTHER GUARANTEES No Proposal will be considered unless accompanied by a guaranty of the amount specified in the Proposal in the form of either a certified check, bank cashier's check or a Bid Bond on the form provided therein or an exact facsimile thereof. The Bid Bond must be executed by a Surety that is, as of the date of the Bid: (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. The Bid Bond must guaranty payment to the County of liquidated damages as follows: (a) if only one Bid is received, the guaranteed payment shall be five (5%) percent of the Bidder's Bid amount, (b) if two or more Bids are received, the guaranteed payment shall be the difference between the Bidder's Bid amount and the next lowest Bid amount, subject to the limitation that the guaranteed payment not be greater than five (5%) percent of the Bidder's Bid amount. This Bid Bond is required in case the successful Bidder, after issuance of notice of Award, fails to comply, timely and completely, with each of the requirements set forth under Section GP-3.04.

Signed and sealed _____
Date

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

In Presence of:

Individual Principal

Witness: _____

as to: _____ (SEAL)

Print Name: _____

Print Name: _____

Corporate Principal

In Presence of:

(Name of Corporation)

Witness: _____

By: _____

Print Name: _____

Print Name: _____ (SEAL)

Title: _____

Surety

(Name of Surety)

Business Address: _____

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

**BALTIMORE COUNTY
PREVAILING WAGE AND LOCAL HIRING**

AFFIDAVIT

(Project Name) _____

Proposal No.: _____

Project No.: _____

On behalf of _____, I do solemnly declare and affirm,
(Contractor)
under penalty of perjury, that to the best of my knowledge, information, and belief:

1. I have submitted all documentation in accordance with Baltimore County Code §-10-2-506 and -§-10-2-507 regarding the prevailing wage and local hiring laws and requirements of the Prevailing Wage guidelines located at ([Prevailing Wage Law](#)), and that I have read and agree to all provisions of said law, as amended, and have a continuing obligation to be compliant with any changes to the law.

2. I shall not knowingly provide any false information relating to payroll documentation and or hiring of local employees for capital improvement contracts that are subject to the prevailing wage and/or local hiring laws of Baltimore County. I further attest and certify that all documentation relating to the same will be accurate and complete and will remain accurate and complete on an ongoing basis, and will reflect the payroll and/or local hiring status of contractors, subcontractors, apprentices, and independent contractors performing work for the Contract (contract number _____). I acknowledge that I have been informed and am aware of the foregoing requirements and that I am authorized to make this certification on behalf of myself and all subcontractors and parties performing work pursuant to this Contract.

3. I certify and attest that I am an officer or agent of the Contractor or subcontractor who supervises the payment of employees. I understand and agree that all documentation related to prevailing wages and/or local hiring required by law shall be submitted to Baltimore County's Prevailing Wage Administrator or designee before any surety is released or final payment due under the terms of the Contract is made.

4. I further certify and attest that I will have personal knowledge of the wages paid to all employees of _____ for work performed on the Contract and of all of the hours worked, and that I am an authorized agent of the Contractor and assume responsibility for my actions.

5. I further certify and attest that _____ will comply with prevailing wage rates set by the State of Maryland as the same apply to the Contract and are a part of the bid documents and Contract, and that _____ will comply with applicable local hiring requirements.

6. I attest and certify that, if the Contract is subject to the local hiring requirement under 10-2-507 of the Baltimore County Code, _____ will make best efforts to ensure that residents of Baltimore County constitute 51% of the new hires made for the Contract, subject to all exceptions allowable by law.

7. I certify and attest that, if the Contract is subject to prevailing wage requirements, no rebates or deductions will be made, directly or indirectly, from any wages paid in connection with the Contract, other than those provided for by law.

8. I certify and attest that, if awarded the Contract and if the Contract is subject to prevailing wage law, I will submit certified payroll to the County through its Prevailing Wage software, PRISM. (<https://baltimorecounty.prismcompliance.com/>)

Contractor/Bidder/Offeror

By

Printed Name

Printed Title

Date

Phone

Email

License Number

BALTIMORE COUNTY, MARYLAND

Prevailing Wage and Local Hiring Contract Requirements and Policies

The Contractor and all Subcontractors must comply with the Prevailing Wage Law and Local Hiring Requirements contained in Baltimore County Code § 10-2-506 and § 10-2-507, respectively, as amended. 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 County will use the prevailing wage established by the State of Maryland Commissioner of Labor and Industry for state funded construction contracts in the county at the time of award. These rates include the basic hourly rate and fringe benefits. Apprentices must be paid at least the rate that the state's apprenticeship and training council sets for an apprentice in the trade involved, based on a percentage of the prevailing wage rate in that trade. Any Contractor that is subject to the prevailing wage or local hiring law will be required to agree to the below provisions:

For the purposes of these requirements, an employee means an apprentice, laborer or mechanic employed by a contractor or subcontractor on a capital improvement project with a value of over \$300,000 and a County-subsidized capital project with a value over \$5,000,000.

Capital Improvement Project does not include blanket order or open end agreements, capital improvement projects subject to a federal or state prevailing wage law, awarded without competition; with another governmental entity; to the extent the contractor is precluded from compliance by the terms of any federal or state law, contract or grant; entered into pursuant to Baltimore County Code § 10-2-310(e); entered into as a joint or cooperative purchase or entered into as an emergency purchase.

The purpose of a prevailing wage is to ensure that contractors institute local hiring practices for Capital Improvement contracts and Capital Projects under certain circumstances as required by law, and that the Contractor's employees who work on capital improvement contracts are paid the going rate for their services. The prevailing wage rates are established by the State of Maryland Department of Labor 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. . Contractor or subcontractor may NOT split or subdivide a capital improvement contract, pay an employee through a third party, treat an employee as a subcontractor or independent contractor to avoid any requirement of the County's prevailing wage law; or employ an individual classified as a helper or trainee to perform direct and measurable work on a capital improvement contract.

2. Pay employees at a rate equal to or more than the prevailing wage rate currently in effect for the type of work performed
3. Pay employees overtime for work (I) more than eight hours in any single calendar day; (II) more than 40 hours in a work week; or (III) on a Sunday or a legal holiday.
4. Classify employees in their proper work classification in conformance with the schedule established by the State of Maryland Commissioner of Labor and Industry.
5. May only make fair and reasonable deductions that are (1) required by law; (2) authorized in a written agreement between an employee and contractor or subcontractor signed at the beginning of employment that concerns food, sleeping quarters, or similar items; and submitted by the contractor or subcontractor to the Director of the County's Prevailing Wage Program; or required or allowed by a collective bargaining agreement between a bona fide labor organization and a contractor or subcontractor.

Electronically submit a certified copy of payroll records through <https://baltimorecounty.prismcompliance.com/> within 14 days after the end of each payroll period, to verify that Prevailing Wage rates have been paid to employees.

6. Retain records for a period of five (5) years after the work is completed and permit the Director of the County Prevailing Wage Program, or his designee, to inspect the payroll records at a reasonable time and as often as necessary.
7. Payroll records shall contain a statement signed by the contractor or subcontractor certifying that the payroll records are complete and correct; the wage rates are not less than required by the Prevailing Wage law; and the rate of pay and classification for each employee accurately reflects the work the employee performed.
8. All payroll records shall include the name, address, telephone number and email address of the contractor or subcontractor; the name and location of the job; and each employee's name, current address, unless previously reported; specific work classification; daily basic time and overtime hours; total basic time and overtime hours for the payroll period; rate of pay; fringe benefits by type and amount; and gross wages. Late submission of copies of any payroll records may be deemed deficient by the County until the required records are provided, and the County may postpone processing payments due under the Contract or under an agreement to finance the Contract.
9. Submit to random or regular audits and investigation of any complaint of a violation of the County's prevailing wage and local hiring laws and requirements.
10. Make best efforts to fill at least 51% of new jobs required to complete the capital improvement contract or capital project with Baltimore County residents.

Submit monthly reports on the form designated by and to the Director of the Department of Economic and Workforce Development relating to local hiring with respect to a capital

improvement contract over \$300,000 and County-subsidized capital project receiving assistance over \$5,000,000 that includes 1) the number of new hires needed for the contract or project, 2) the number of County residents hired during the reporting period, 3) the total number of all employees hired during the contract period, 4) best efforts made to fill open positions with County residents, and 5) for new hires: name, last four (4) digits of the social security number, job title, hire date, address and referral source.

11. Agree that any and all disputes will be handled as set forth in the County's Prevailing Wage and Local Hiring laws. as a condition of award

12. In the event the County determines that a provision of the Prevailing Wage Law has been violated, the County shall issue a written decision, including appropriate sanctions, and may withhold payment due 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 for liquidated damages as provided under the Prevailing Wage Law, pending a final decision on the violation by the County. The Contractor may appeal a written decision of the Director of Economic and Workforce Development to the Office of Administrative Hearings ("OAH"), that the Contractor violated a provision of the Prevailing Wage Law, within ten (10) working days after receiving a copy of the decision. OAH will conduct a hearing upon the receipt of a timely appeal. If no appeal, the decision of the Director of Economic and Workforce Development or his designee becomes final. A Contractor who is found to have violated the provisions of the Prevailing Wage or Local Hiring laws intentionally, may not be awarded a County contract or work on any County project for a period of one year from the date of the OAH determination..

13. May 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;

14. An aggrieved employee is a third-party beneficiary of this Contract and 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.

15. Each Contract subject to the Prevailing Wage Law may specify the payment of liquidated damages to the County by the Contractor for any noncompliance with the Prevailing Wage Law. Liquidated damages are:

- 1) \$10 for each calendar day that the payroll records are late; \$20 for each day that an employee is misclassified and paid less than the prevailing wage rate; and a civil penalty \$50 per violation of the requirement to post the prevailing wage rates at the work site.

These liquidated damages are solely related to prevailing wage and local hiring compliance and do not negate any other remedies available or set forth in the Contract, including delay damages or actual damages. These remedies are separate, in addition to, and not in lieu of any remedies available and set forth in the Contract for other breaches or defaults under the Contract.

16. Where the initial Contract Sum is \$300,000 or below, but it is subsequently increased and exceeds \$300,000 due to an approved Contract Modification, the amount of any such Contract Modification that causes the Contract Sum to exceed \$300,000 is subject to the Prevailing Wage Law and Local Hiring requirements.

17. 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.

Classification	Modification Reason	Basic Hourly Rate	Borrowed From	Fringe Benefit Payment
CARPENTER	AD	\$31.40		\$14.02
CARPENTER - SHORING SCAFFOLD BUILDER	AD	\$31.40		\$14.02
CEMENT MASON	AD	\$20.00	025	\$4.53
ELECTRICIAN	AD	\$42.80	510	\$18.18
IRONWORKER - FENCE ERECTOR	AD	\$28.23	025	\$19.64
IRONWORKER - REINFORCING	AD	\$29.67		\$22.74
IRONWORKER - STRUCTURAL	AD	\$34.85	027	\$25.17
LABORER - AIR TOOL OPERATOR	AD	\$23.16		\$6.64
LABORER - ASPHALT PAVER	AD	\$23.16		\$6.64
LABORER - ASPHALT RAKER	AD	\$23.16		\$6.64
LABORER - BLASTER - DYNAMITE	AD	\$23.16		\$6.64
LABORER - BURNER	AD	\$23.16		\$6.64
LABORER - COMMON	AD	\$23.16		\$6.64
LABORER - CONCRETE PUDDLER	AD	\$23.16		\$6.64
LABORER - CONCRETE SURFACER	AD	\$23.16		\$6.64
LABORER - CONCRETE TENDER	AD	\$23.16		\$6.64
LABORER - CONCRETE VIBRATOR	AD	\$23.16		\$6.64
LABORER - DENSITY GAUGE	AD	\$23.16		\$6.64
LABORER - FIREPROOFER - MIXER	AD	\$23.16		\$6.64
LABORER - FLAGGER	AD	\$23.16		\$6.64
LABORER - GRADE CHECKER	AD	\$23.16		\$6.64
LABORER - HAND ROLLER	AD	\$23.16		\$6.64
LABORER - HAZARDOUS MATERIAL HANDLER	AD	\$23.16		\$6.64
LABORER - JACKHAMMER	AD	\$23.16		\$6.64
LABORER - LANDSCAPING	AD	\$23.16		\$6.64
LABORER - LAYOUT	AD	\$23.16		\$6.64
LABORER - LUTEMAN	AD	\$23.16		\$6.64
LABORER - MASON TENDER	AD	\$23.16		\$6.64
LABORER - MORTAR MIXER	AD	\$23.16		\$6.64
LABORER - PIPELAYER	AD	\$23.16		\$6.64
LABORER - PLASTERER - HANDLER	AD	\$23.16		\$6.64
LABORER - SCAFFOLD BUILDER	AD	\$23.16		\$6.64
LABORER - TAMPER	AD	\$23.16		\$6.64
MARINE - DIVER	AD	\$41.54		\$16.51
MARINE - DIVER TENDER	AD	\$34.62		\$16.51
MARINE - WELDER	AD	\$27.44	510	\$1.39
MILLWRIGHT	AD	\$34.90		\$17.16
PAINTER - BRIDGE	AD	\$41.68		\$15.08
PILEDRIVER	AD	\$34.62		\$16.51
POWER EQUIPMENT OPERATOR - ASPHALT DISTRIBUTOR	AD	\$30.05	510	\$12.60
POWER EQUIPMENT OPERATOR - BACKHOE	AD	\$30.95		\$12.60
POWER EQUIPMENT OPERATOR - BOOM TRUCK	AD	\$30.50	027	\$9.65
POWER EQUIPMENT OPERATOR - BROOM / SWEEPER	AD	\$27.99		\$12.60
POWER EQUIPMENT OPERATOR - BULLDOZER	AD	\$30.95		\$12.60

POWER EQUIPMENT OPERATOR - CONCRETE PUMP	AD	\$31.50		\$9.65
POWER EQUIPMENT OPERATOR - CRANE	AD	\$38.70		\$16.40
POWER EQUIPMENT OPERATOR - DRILL - RIG	AD	\$30.95		\$12.60
POWER EQUIPMENT OPERATOR - EXCAVATOR	AD	\$30.95		\$12.60
POWER EQUIPMENT OPERATOR - FORKLIFT	AD	\$27.99		\$12.60
POWER EQUIPMENT OPERATOR - GRADALL	AD	\$31.95		\$12.60
POWER EQUIPMENT OPERATOR - GRADER	AD	\$31.95		\$12.60
POWER EQUIPMENT OPERATOR - GUARD RAIL POST DRIVER	AD	\$24.85	027	\$11.55
POWER EQUIPMENT OPERATOR - LOADER	AD	\$30.95		\$12.60
POWER EQUIPMENT OPERATOR - MECHANIC	AD	\$30.95		\$12.60
POWER EQUIPMENT OPERATOR - MILLING MACHINE	AD	\$30.95		\$12.60
POWER EQUIPMENT OPERATOR - OILER	AD	\$30.89		\$0.00
POWER EQUIPMENT OPERATOR - PAVER	AD	\$30.05		\$12.60
POWER EQUIPMENT OPERATOR - ROLLER - ASPHALT	AD	\$30.05		\$12.60
POWER EQUIPMENT OPERATOR - ROLLER - EARTH	AD	\$27.99		\$12.60
POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)	AD	\$27.99		\$12.60
POWER EQUIPMENT OPERATOR - SKIDDER	AD	\$26.89	025	\$12.10
POWER EQUIPMENT OPERATOR - TRENCHER	AD	\$33.89	025	\$22.91
POWER EQUIPMENT OPERATOR-VACUUM TRUCK	AD	\$35.00		\$13.35
TRUCK DRIVER - DUMP	AD	\$22.00	003	\$11.21
TRUCK DRIVER - DUMP - ARTICULATING	AD	\$22.00		\$5.10
TRUCK DRIVER - FLATBED	AD	\$22.50	003	\$6.50
TRUCK DRIVER - LOWBOY	AD	\$32.50	027	\$0.00
TRUCK DRIVER - TACK/TAR TRUCK	AD	\$24.94		\$7.58
TRUCK DRIVER - TANDEM AD	AD	\$30.68	025	\$21.12
TRUCK DRIVER - TRACTOR TRAILER	AD	\$26.95	510	\$11.15
TRUCK DRIVER - WATER	AD	\$24.94		\$9.22

BALTIMORE COUNTY, MARYLAND
USE OF MINORITY BUSINESS ENTERPRISES AND WOMEN'S BUSINESS ENTERPRISES
IN
COUNTY CONTRACTS
MBE/WBE Plan Package



Office of Budget and Finance
Historic Courthouse
400 Washington Ave
Towson, Maryland 21244
410-887-3407

www.baltimorecountymd.gov/go/mwbe
@BaCoBiz4All



PROSPECTIVE BIDDERS/OFFERORS

Baltimore County Executive Order 2017-003 Use of Minority Business Enterprises and Women's Business Enterprises states:

SECTION 6. BID REQUIREMENTS.

(A)(1) All bidders shall submit a list of all subcontractors contacted in preparation of their bid package or proposal.

(2) The list shall include the service to be performed, bid amount, and the race/ethnicity/gender of the business owner(s).

(B)(1) All bidders shall submit a list of all subcontractors to be used on a county contract in the bid package.

(2) This list shall include all subcontractors (both MBE/WBE and non MBE/WBE) used, the service to be performed, the total amount to be paid, and the race/ethnicity/gender of the owner.

If the solicitation includes a MBE/WBE **subcontracting** goal, you **MUST** demonstrate “**Good Faith**” effort either by:

1. Complete and sign FORM A, FORM B (to include FORM B-Prime if MBE/WBE Prime wishes to count towards the goal) and FORM C **listing all subcontractors** with the initial bid submission.
 - a. *All Forms must be completed and signed. However, FORM C **MUST** be completed and signed by both the prime and the MBE/WBE subcontractor.*
- OR**
2. If you are unable to meet any portion of the goal, you **MUST** do one of the following:
 - a. If you are requesting a **partial waiver**, complete and sign FORM A with initial bid submission. FORM B (to include FORM B-Prime if MBE/WBE Prime wishes to count towards the goal) and FORM C (**listing all subcontractors**). In addition, complete, sign and submit FORM D and FORM E **accompanied with all supporting documentation** for the portion of the goal that will not be achieved as specified on FORM A.
 - b. If you are requesting a **full waiver**, complete and sign FORM A indicating your intent to request a full waiver **accompanied with a completed and signed FORM C listing all subcontractors**, FORM D and FORM E **accompanied with all supporting documentation. This MUST be submitted with the initial bid as specified on FORM A.**
 - c. *All Forms must be completed and signed. FORM C and FORM D **MUST** be completed and properly signed by both the Prime AND the MBE/WBE subcontractor(s).*

NOTE: The MBE/WBE **subcontracting** goal applies to ALL prime/general contractors including certified and non-certified minority and women owned firms. **However, a Minority-owned or a Women-owned prime may self-perform up to 50% of MBE/WBE subcontracting goal set in the solicitation. The MBE/WBE primes that wish to count towards the goal must list themselves on all appropriate forms.**

MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE REQUIREMENTS (MBE/WBE): The resulting minority and women business participation requirement for this contract is 23%.

_.1 Each Prime Contractor must comply with all Minority Business Enterprise and Women Business Enterprises (MBE/WBE) participation requirements. Included with this solicitation package are copies of the County's MBE/WBE policy and provisions and MBE/WBE participation schedule forms. All MBE/WBE participation forms must be completed, executed, and **returned with the bid, proposal or qualifications** if a goal has been assigned. MBE/WBE participation forms are available online at www.baltimorecountymd.gov/go/mwbe or you may contact the buyer on the solicitation.

_.2 The Prime Contractor shall comply with the required participation levels on a cumulative basis for the full term of the contract. The Prime Contractor shall estimate the participation level (for the full term of the contract) for each subcontractor and/or supplier listed on the participation schedule.

_.3 If no minimum participation level has been assigned, the Prime Contractor shall nevertheless make a genuine good faith effort to comply with the County's MBE/WBE minimum participation goal even if the Prime Contractor has the capability to complete the work with its own workforce. The Prime Contractor shall make a good faith effort to obtain MBE/WBE subcontractor participation. The selected MBE/WBE subcontractor(s) must perform a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved.

Certified Minority-owned or Certified Women-owned Prime Contractors may count their participation for up to 50% of the solicitation goal. Certified firms must make a good faith effort to obtain MBE/WBE subcontractor participation for the remaining portion of the goal. Example: 20% MBE/WBE participation goal. Certified Minority-owned or Certified Women-owned firm bidding as the prime may count for 10% of the goal provided they are self-performing the work. The remaining 10% must be subcontracted to an MDOT and/or City of Baltimore certified firm.

If the materials or supplies are purchased from an MBE/WBE supplier, 60% of the cost of the materials or supplies from the certified MBE/WBE supplier will be counted toward the MBE/WBE goal.

The failure of a Bidder/Offeror to properly complete and submit the appropriate MBE/WBE plan forms and, if applicable, required Good Faith Effort (GFE) documentation shall result in the bid/proposal being deemed as nonresponsive and not susceptible of being selected for award.

x.x Within 10 working days of receiving notification that the Bidder/Offeror is the apparent awardee, the Bidder/Offeror shall provide the following documentation to the Buyer:

a. BCG FORM C-Subcontractor MBE-WBE SUBCONTRACTOR PARTICIPATION NOTICE OF INTENT TO AWARD accompanied by a fully executed copy of the subcontract for each subcontractor.

b. Any other documentation required by the Buyer to ascertain Bidder's/Offeror's susceptibility of being selected for award in connection with the certified MBE/WBE participation goal.

NOTE: If the apparent awardee fails to return each completed document within the required time, THE PROCUREMENT OFFICER MAY DETERMINE THAT THE APPARENT AWARDEE IS NOT RESPONSIBLE AND THEREFORE NOT SUSCEPTIBLE FOR CONTRACT AWARD.

x.x Prospective Bidders/Offerors are advised to carefully review the Minority and Disadvantage Business Enterprise Package regarding MBE/WBE or DBE participation.

x.x All MBE/WBE subcontractors must be MDOT or Baltimore City certified at the time of bid/proposals submission to count towards the MBE/WBE solicitation subcontract goal.

x.x If the Bidder/Offeror is a certified Minority or Women Business Enterprise, it should be so indicated with the certification number in the Bid or Technical Proposal.

4. Under circumstances where mobilization payments are issued to the Prime Contractor, the subcontractor shall be paid an amount equal to their participation percentage no later than five (5) business days before they are required to mobilize to perform the contracted work.

The Prime Contractor shall submit proof of mobilization payment to subcontractors when the subcontractor performs their initial item of work in the MBE/WBE Compliance portal.

5. **Prompt Payment**

The Prime Contractor agrees to pay each subcontractor under this contract for satisfactory performance of its responsibilities under the applicable subcontract within 30 days of the subcontractor's satisfactory completion of the work as accepted by Baltimore County, Maryland. The Prime Contractor agrees further to return retainage payments to each subcontractor within 30 days after the subcontractor's satisfactory completion of work. Any delay or postponement of payment from the above referenced time frame may occur only for good cause

following written approval of Baltimore County, Maryland. This clause applies to both MBE/WBE and non-MBE/WBE subcontracts.

- The Prime Contractor shall report the subcontractor's mobilization cost as the initial payment in the PRiSM Compliance Portal found under Compliance Reporting for Prime and Sub-Contractors at www.baltimorecountymd.gov/go/MBE/WBE.
- The Prime Contractor must include in its subcontracts language providing that the Prime Contractor and the subcontractors will use appropriate alternative dispute resolution mechanisms to resolve payment disputes.
- The Prime Contractor will not be reimbursed for work performed by subcontractors unless and until the Prime Contractor ensures that the subcontractors are promptly paid for the work they have performed.
- Prime Contractors may be subject to liquidated damages pursuant to Maryland and/or Baltimore County law, to ensure that MBE/WBEs and other contractors are fully and promptly paid.

_.6 All Prime Contractors and MBE/WBE and/or DBE subcontractors are required to report monthly to the County through the online Compliance Portal (PRISM). The portal can be found under *Compliance Reporting for Prime and Sub-Contractors* at www.baltimorecountymd.gov/go/MBE/WBE. Prime Contractors must provide a contact person and contact information for the MBE/WBE compliance reporting. If the Prime Contractor cannot submit its report on time, it must notify the County MBE/WBE Office and request additional time to submit the report. Failure to report in a timely manner may result in a finding of noncompliance, and may result in a finding of default under the terms of the contract. The County, in its sole discretion, may require additional reports regarding MBE/WBE. Questions regarding the use of this system can be directed to the MBE/WBE Office at mwbe@baltimorecountymd.gov or call 410-887-3407.

Revised 4/5/2023

BALTIMORE COUNTY, MARYLAND **MBE/WBE PARTICIPATION SUMMARY**

Executive Order: Minority business enterprises and women business enterprises (MBE/WBE) shall have the maximum opportunity to participate in the performance of contracts financed in whole, or in certain circumstances, in part with County funds. Accordingly, on December 6, 2022, the County Executive adopted the EXECUTIVE ORDER No. 2022-005 addressing MBE/WBE participation in County contracts. The Executive Order may be found on the Baltimore County website at www.baltimorecountymd.gov/go/mwbe.

Each Contract: The County shall establish a minimum MBE/WBE participation amount for each contract, as applicable.

Bidder/Offeror Responsibility: The bidder/offeror shall ensure that MBE/WBE participation occurs in accordance with the contract requirements and the County Executive's Executive Order. All bidder/offerors shall ensure that MBE/WBE have the maximum opportunity to compete for and perform County contracts, as applicable. Baltimore County, Maryland, and/or its bidders/offerors and contractors shall not discriminate on the basis of race, color, national origin, disability or sex in the award and performance of any County contract.

APPROVED MBE/WBE LISTINGS

Published compilations of approved and certified MBE/WBE, contractors, subcontractors, material suppliers, etc. include:

1. DIRECTORY OF MINORITY BUSINESS ENTERPRISE (MDOT):
<https://marylandmdbe.mdbecert.com/>
2. MINORITY BUSINESS DIRECTORY OF THE CITY OF BALTIMORE:
<http://cityservices.baltimorecity.gov/mwboo/>

BIDDER/OFFEROR'S ACTIONS

Seeking Firms: The bidder/offeror will seek commitments by subcontract or otherwise from MBE/WBE firms for supplies and/or services, any combined value of which equals or exceeds the required percentage of MBE/WBE participation goal for the County contract. However a MBE/WBE Prime that affirms its MBE/WBE status on the Minority and/or Women Prime Participation Affidavit may count up to 50% of the goal.

1. Expenditures for Materials and Supplies: **REGULAR DEALER**: A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. To be a regular dealer, the firm must engage in as its principal business and in its own name, the purchase and sale of the products in question. A regular dealer in such bulk items as cement, gravel, stone and petroleum need not keep such products in stock, if it owns or operates distribution equipment. Brokers and Packagers shall not be regarded as manufacturers or regular dealers within the meaning of this section.

A **Regular Dealer** must be engaged in selling the product in question to the public. This is important in distinguishing a **Regular Dealer**, which has a regular trade with a variety of customers, from a firm which performs supply-like functions on an ad hoc basis or for any one or two contractors with whom it has a special relationship.

A business that simply transfers title of a product from manufacturer to ultimate purchaser (e.g. broker or sales representative who re-invoices a product from the producing company to the

BALTIMORE COUNTY, MARYLAND
MBE/WBE PARTICIPATION SUMMARY

recipient or contractor) or a firm that puts a product in a container for delivery **would not** be considered a **Regular Dealer**.

A supplier of bulk goods may qualify as a **Regular Dealer** if it either maintains an inventory or owns or operates distribution equipment. With respect to the distribution equipment (e.g., a fleet of trucks), the term "operates" is intended to cover a situation in which the supplier leases the equipment on a regular basis for its entire business. It is not intended to cover a situation in which the firm simply provides drivers for trucks owned or leased by another party, (e.g., a prime contractor) or leases such a party's trucks on an ad hoc basis for a specific job.

Any participating DBE/MBE must serve a commercially useful function on a contract and not function as a broker, unless certified as a broker (insurance, real estate, etc). A firm is considered to perform a commercially useful function when it executes a distinct element of work by actually performing, managing and supervising the work involved and/or negotiating the cost of, arranging and accepting delivery of, and paying for the materials or supplies required for the work of its contract. **A contractor may count toward its DBE/MBE goal 60 percent of its expenditures for materials and supplies required under the contract and obtained from a DBE/MBE, regular dealer and 100 percent of such expenditures to a DBE/MBE manufacturer.**¹

2. Customary Fees: Fees may be counted by a contractor towards its DBE/MBE goals for the following expenditures to DBE/MBE firms that are not manufacturers or regular dealers:
 - a. The fees or commissions charged for providing a bona fide service, such as professional, technical, consultant or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials or supplies required for performance of the contract, provided that the fee or commission is determined by the County to be reasonable and not excessive as compared with fees customarily allowed for similar services.
 - b. The fees charged for delivery of materials and supplies required on a job site (but not the cost of the materials and supplies themselves) when the hauler, trucker, or delivery service is not also the manufacturer of or a regular dealer in the materials and supplies, provided that the fee is determined by the County to be reasonable and not excessive as compared with fees customarily allowed for similar services.
 - c. The fees or commissions charged for providing any bonds or insurance specifically required for the performance of the contract, provided that the fee or commission is determined by the County to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Information to be supplied: All bidders/offerors shall submit the following information to the County at the time of bid submission:

1. The name of an employee designated as the bidder/offeror's liaison to the County's Minority Business Enterprise Unit.

BALTIMORE COUNTY, MARYLAND
MBE/WBE PARTICIPATION SUMMARY

2. The following forms shall be completed and submitted
 - Certified MBE/WBE Utilization and Fair Solicitation Affidavit (**Form A**); from among those names appearing in the Approved MBE/WBE Listings (excepting Federal Highway Administration projects, which exclusively require DBE approved and certified by the Maryland Department of Transportation Certification Committee);
 - A MBE/WBE Participation (**Form B**) completed and signed by the prime contractor and MBE/WBE for each MBE/WBE listed on the Form.
 - A MBE/WBE Disclosure and Participation Statement (**Form C**) completed and signed by the prime contractor and MBE/WBE firms for each MBE/WBE listed on the Form. Form C must match what is stated on Form B.
 - If applicable, MBE/WBE Subcontractor Unavailable Certificate (**Form D**) completed and signed by the prime contractor and MBE/WBE for each MBE/WBE listed on the Form.
3. If applicable, MBE/WBE Outreach Efforts - Compliance Statement (**Form E**) completed and signed by the Bidder/Offeror. The prime shall submit a list of all subcontractors.
4. If the bidder/offeror intends to fulfill the MBE/WBE requirements by use of a joint venture, he/she must submit a Joint Venture Disclosure Affidavit (**Form D-EEO-006-A and B**) showing the extent of MBE/WBE participation. If a bidder/offeror intends to use an MBE/WBE joint venture as a subcontractor to meet its MBE/WBE requirements, the affidavit must be submitted through the bidder/offeror by the proposed subcontractors and signed by all parties.
5. If the bidder/offeror's proposed MBE/WBE participation does not meet the MBE/WBE contract requirements, information sufficient to demonstrate that the bidder/offeror has made every effort to meet the requirements must be submitted. (See DETERMINATION OF BID RESPONSIVENESS hereafter)

RECORDS AND REPORTS

Returning Records: The bidder/offeror must keep such records as are necessary to determine compliance with its MBE/WBE utilization requirements:

1. The MBE/WBE and non-minority contractors, type of work being performed, actual values of work and services.
2. Documentation of all correspondence, contacts, telephone calls, etc., to obtain MBE/WBE services for the contract.
3. All prime contractors and MBE/WBE sub-contractors are required to report monthly to the County through an online system called PRISM. If the contractor cannot submit his/her report on time, he/she will notify the County MBE/WBE office and request additional time to submit the report. Failure of the contractor to report in a timely manner may result in a finding of noncompliance.
4. The County in its sole discretion and/or upon written request may require additional reports regarding MBE/WBE.

BALTIMORE COUNTY, MARYLAND
MBE/WBE PARTICIPATION SUMMARY

- a. **Prompt Payment of Subcontractors:** It is the policy of the Baltimore County Government MWBE Office that a contractor shall promptly pay a subcontractor any undisputed amount to which a subcontractor is entitled under a procurement contract.

The Prime Contractor agrees to pay each subcontractor under this contract for satisfactory performance of its responsibilities under the applicable subcontract within 30 days of the subcontractor's satisfactory completion of the work as accepted by Baltimore County, Maryland. The Prime Contractor agrees further to return retainage payments to each subcontractor within 30 days after the subcontractor's satisfactory completion of work. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of Baltimore County, Maryland. This clause applies to both MBE/WBE and non-MBE/WBE subcontracts.

1. The Prime Contractor must include in its subcontracts language providing that the Prime Contractor and the subcontractors will use appropriate alternative dispute resolution mechanisms to resolve payment disputes.
2. The Prime Contractor will not be reimbursed for work performed by subcontractors unless and until the Prime Contractor ensures that the subcontractors are promptly paid for the work they have performed.
3. Prime Contractors may be subject to liquidated damages pursuant to Maryland and/or Baltimore County law, to ensure that DBEs and other contractors are fully and promptly paid.

Retaining Records: All MBE/WBE records must be retained for 3 years following the expiration or any earlier termination of the contract and shall be available for inspection and photocopying by the County.

Investigation and Notification: Whenever the County believes the bidder/offeror, contractor, or any subcontractor may not be operating in compliance with the MBE/WBE requirements, the County may, in its sole discretion, conduct an investigation. If the County finds the bidder/offeror, contractor, or any subcontractor is not in compliance with the MBE/WBE requirements, the County may exercise any and all rights and remedies available to the County, under the contract, at law or equity, as deemed applicable and appropriate by the County in its sole discretion.

DETERMINATION OF BID RESPONSIVENESS

Request for Deviation: If the bidder/offeror is unable to procure from MBE/WBE firms (by subcontract or otherwise), supplies and services, any combined value of which equals the required percentage of the total value of the contract, the bidder/offeror may request, in writing, a deviation or waiver of the contract requirements. To obtain such a waiver, the bidder/offeror must submit the following information at the time bids are due:

The request for waiver request shall include (1) a signed unavailability statement (Form D) executed by all MBEs and WBEs that the bidder/offeror solicited for participation and (2) Outreach Efforts/Compliance Statement (Form E) that demonstrates the bidder/offeror's good faith efforts to comply with the contract requirements, including copies of solicitation documentation to all potential subcontractors:

BALTIMORE COUNTY, MARYLAND
MBE/WBE PARTICIPATION SUMMARY

Emails, letters, facsimile transmittals and confirmations containing plans, specifications, and anticipated time schedule for portions of the work to be performed and meeting notes and agendas clearly identifying the certified MBE or WBE classification and dates that the bidder/offeror contacted each MBE/WBE; and

Telephone logs containing names, addresses, dates, telephone numbers, work to be performed, anticipated time schedule and classification of certified MBEs and WBEs contacted.

Bid Rejection: The failure of any bidder/offeror (including the apparent low bidder/offeror) to provide a responsive MBE/WBE Plan as required by the solicitation may result in the bidder/offeror being deemed non-responsive and the County's rejection of the bid.

Liquidated Damages If the County issues a notice of intent to award contract to the apparent low bidder/offeror who provided a responsive MBE/WBE Plan, but, if after said notice and before execution of Contract Documents, it is determined by the County that the apparent low bidder/offeror has failed to comply with the MBE/WBE Plan, such failure may result in the recommendation by the appropriate Procurement Official to annul the award and forfeit the bidder/offeror's Proposal Guaranty to the County, not as a penalty, but as liquidated damages, it being acknowledged that actual damages will be difficult if not impossible to accurately measure. In addition, the County may proceed as it determines to be in its best interest, including but not limited to, the Notice of Award may be made to the next lowest responsive and responsible bidder/offeror or the work may be re-advertised.

Penalties: Baltimore County, Maryland (the "County") requires all Prime Contractors and all Subcontractors to submit monthly reports through an online MBE/WBE Compliance Portal (PRISM). The Portal can be found under Compliance Reporting for Primes and Subcontractors at <https://baltimorecounty.prismcompliance.com/>

To ensure that reports are filed in a timely manner, and that MBE/WBE requirements are met, the County will assess penalties for non-compliance, as follows:

- (a) For failure to file timely monthly reports:
 - a. Assessment of a late fee of \$10 per day per task, up to a maximum of \$1,500 per task and/or
 - b. For multiple violations, termination of the contract for convenience or for default, with the contractor suspended from participating in County contracts for five (5) years.
- (b) For failure to meet MBE/WBE requirements:
 - a. Assessment of a liquidated damages of up to 10% of the contract value; and/or
 - b. Termination of the contract for convenience, with the contractor suspended from participating in County contracts for five (5) years together with assessment of a liquidated damages of up to 10% of the contract value; and/or
 - c. Termination of the contract for default together with assessment of a liquidated damages of 10% of the contract value.

Contract Breach: If, after execution of a County contract, the contractor becomes aware it may or will fail to fulfill the applicable MBE/WBE requirements and/or may or will deviate from the contractor's bid response/contract terms, the contractor shall promptly advise the County of this in writing. Thereafter, the County will determine what action or remedy is appropriate on a case-by-case basis, in the County's sole discretion.

BALTIMORE COUNTY, MARYLAND
MBE/WBE PARTICIPATION SUMMARY

Approval Required for Changes: Any and all changes to the MBE/WBE subcontractors or the type or amount of work to be performed by such subcontractors during the contract term must be mutually agreeable to the County and the contractor and shall be documented via a contract amendment, executed by legally authorized representatives of the County and the contractor.

Cooperation in Reviews: The bidder/offeror will cooperate with the County in any reviews of the contractor's procedures and practices with respect to MBE or WBE firms, which the County may from time to time conduct in its sole discretion.

Other: If the documents used to determine the contractor's efforts, achievement of, and/or the status of an MBE/WBE requirement or fulfillment thereof contain false, misleading or misrepresented information, the contractor may be declared in breach of the contract and the County may take any and all actions and/or seek remedies available to the County under the contract, at law, or in equity. If an MBE/WBE is disqualified by any public entity, including but not limited to, Baltimore City, the State or MDOT, at any time after award or during the term of the contract, the County may, in its sole discretion, require the prime contractor to promptly submit for County approval, the contractor's plans for fulfilling the required MBE/WBE participation under the contract, and/or request such detail and additional information as the County, in its discretion deems appropriate.



PRIME CONTRACTOR MINORITY AND WOMEN PARTICIPATION AFFIDAVIT

A. AUTHORIZED REPRESENTATIVE

I HEREBY AFFIRM THAT:

I am the [title] _____ and the duly authorized representative of [business] _____ (the "Business") and that I possess the legal authority to make this Affidavit on behalf of myself and the Business for which I am acting.

B. AFFIRMATION REGARDING MINORITY AND WOMEN PARTICIPATION

I FURTHER AFFIRM THAT:

I am aware that, pursuant to the July 27, 2017 Executive Order of Baltimore County, Maryland, the following words have the meanings indicated.

(A) "Minority Business Enterprise" or "MBE" means a business enterprise that is owned, operated and controlled by one or more minority group members (African American, Hispanic American, Asian American, or Native American) who have at least 51% ownership and in which the minority group members have operational and managerial control, interest in capital and earnings commensurate with their percentage of ownership.

(B) "Women's Business Enterprise" or "WBE" means a business enterprise that is owned, operated and controlled by one or more women who have at least 51% ownership and in which the women have operational and managerial control, interest in capital and earnings commensurate with their percentage of ownership.

_____ The Prime is a MBE or WBE

Maryland State Department of Transportation (MDOT) # _____

City of Baltimore # _____

Name Other Jurisdiction: _____ # _____

The ownership of the Noncertified MBE/WBE business consists of _____% minorities and _____% women (for a total of _____%), each of which has operational and managerial control, interest in capital and earnings commensurate with their percent ownership.

_____ % African American _____ % Hispanic American _____ % Women
_____ % Asian American _____ % Native American _____ % Disadvantaged (DBE)

_____ The MBE/WBE prime anticipates meeting up to 50% of the stated participation goal with its own workforce. **MBE/WBE primes percentage must be stated on the MBE/WBE PRIME PARTICIPATION SCHEDULE (FORM B) to count towards the goal.**

_____ The prime anticipates does not anticipate utilizing subcontractors for _____% of the work of the contract requirements, of which it anticipates _____% will be MBEs and _____% will be WBEs.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

Date: _____

By: _____
(Authorized Representative and Affiant's Name and Title)

BALTIMORE COUNTY, MARYLAND
Certified MBE/WBE Utilization and Fair Solicitation Affidavit
(FORM A)

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

* * * * *

I acknowledge the goal for solicitation #23017SX0 is a minimum of 23%. This goal must be met by any combination of the MBE/WBE subcontractors. However, for instances where the Prime is counting up to 50% of the goal, the remaining goal balance must be met by any combination of the MBE/WBE subcontractors.

- The goal breakdown is as follow::
 - _____% Minority/Women Prime
 - _____% for certified MBE-owned businesses and/or
 - _____% for certified WBE-owned businesses.

I have made a good-faith effort to achieve this MBE/WBE solicitation requirement. If awarded the contract, I will comply with this MBE/WBE contract requirement and will continue to use my best efforts to increase MBE/WBE participation during the contract term.

PLEASE CHECK ONE BOX (EITHER 1, 2, OR 3)

- 1 Prime has met the MBE/WBE contract requirements for this solicitation and contract. I submit the MBE/WBE Participation Form B and Form C, along with this Affidavit, which details how the Prime will achieve the contract requirements. Submit a complete list of all additional subcontractors
- Or**
- 2 After having made a good-faith effort to achieve the MBE/WBE requirements, the Prime can only achieve partial success. I submit the MBE/WBE Participation Form B, Form C, Form D and Form E along with this Affidavit, which details how the Prime will partially achieve the contract requirements. Submit a complete list of all additional subcontractors

I request a partial waiver and will meet the following MBE/WBE participation goals:

- Partial waiver of MBE/WBE subcontract participation::
 - _____% Minority/Women Prime
 - _____% for certified MBE-owned businesses and/or
 - _____% for certified WBE-owned businesses.

Or

- 3 After having made a good faith effort to achieve the MBE/WBE requirements for this contract, the Prime is unable to achieve the requirements and/or sub requirements for this contract. I submit the MBE/WBE Participation Form D and Form E, along with this Affidavit, which details the steps the Prime has taken in an attempt to achieve the contract requirements. Therefore, I request a full waiver.

IF YOU HAVE CHECKED BOX 2 OR 3, THE FOLLOWING IS APPLICABLE:

- 1) If a bidder is unable to comply with the goals established in a bid for a project, the bidder may submit a request for a waiver at the time of bid submission. However, occasions for granting waivers will be limited.

BALTIMORE COUNTY, MARYLAND
Certified MBE/WBE Utilization and Fair Solicitation Affidavit
(FORM A)

- 2) The request for waiver shall include documentation that demonstrates the bidder's good faith efforts to comply with the goals, including:
- (I) Signed unavailability statements from all MBEs and WBEs that the bidder solicited for participation; and
 - (II) Copies of solicitation documentation to include the scope of services to be performed by the subcontractors accompanied with the following:
 - (a) Emails, letters, facsimile transmittals and confirmations containing plans, specifications, and anticipated time schedule for portions of the work to be performed and meeting notes and agendas clearly identifying the certified MBE or WBE classification and dates that the bidder contacted each; and
 - (b) Telephone logs containing names, addresses, dates, telephone numbers, work to be performed, anticipated time schedule and classification of certified MBEs and WBEs contacted.
 - (c) Responses from MBE/WBE firms contacted to fulfill the goal.

As I have checked Box 2 or 3 of this Affidavit, I understand I must submit the following supporting documentation with the bid:

- *MBE/WBE Participation Schedule* (Form B)
- *MBE/WBE Disclosure and Participation Statement* (Form C)
- *MBE/WBE Subcontractors Unavailable Certificate* (Form D) (if applicable)
- *MBE/WBE Outreach Efforts – Compliance Statement* (Form E) (if applicable)

I acknowledge that the MBE/WBE subcontractors/suppliers listed on the *MBE/WBE Participation Schedule* (Form B) will be used to accomplish the percentage of MBE/WBE participation that the Prime shall achieve. A fully executed Form C must match Form B.

In the solicitation of subcontract quotations or offers, MBE/WBE subcontractors were provided the same information and amount of time to respond, as were non-MBE/WBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MBE/WBE subcontractors at a competitive disadvantage to non-MBE/WBE subcontractors.

I solemnly affirm under the penalties of perjury that this Affidavit is true to the best of my knowledge, information, and belief.

Bidder/Offeror Name	Phone Number
Address	Affiant Signature
Address (continued)	Printed Name & Title
E-mail address	Date

**BALTIMORE COUNTY, MARYLAND
SUBCONTRACTOR PARTICIPATION SCHEDULE
(FORM B)**

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD

Prime Name	Prime Address, Telephone Number and Email
Bid/Proposal Name and Number	Project Location
	Base Bid \$ _____
1. Subcontractor Name and Tax ID	Subcontractor Address
Telephone Number _____ Fax Number _____ Select One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SBE <input type="checkbox"/> N/A Provide if Applicable: <input type="checkbox"/> MDOT <input type="checkbox"/> Baltimore City # _____	Minority Status (if applicable): <input type="checkbox"/> African American <input type="checkbox"/> Disabled <input type="checkbox"/> Alaska Native <input type="checkbox"/> Disadvantaged Corporation <input type="checkbox"/> Female <input type="checkbox"/> Asian American Pacific <input type="checkbox"/> American Indian <input type="checkbox"/> Asian American Sub-continent <input type="checkbox"/> Hispanic American <input type="checkbox"/> <input type="checkbox"/> Native American <input type="checkbox"/> Small Business <input type="checkbox"/> Other
NAICS Code(s), Work to be Performed and Dollar Amount	Percent of Total Contract
2. Subcontractor Name and Tax ID	Subcontractor Address
Telephone Number _____ Fax Number _____ Select Once: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SBE <input type="checkbox"/> N/A Provide if Applicable; <input type="checkbox"/> MDOT <input type="checkbox"/> Baltimore City # _____	Minority Status <input type="checkbox"/> African American <input type="checkbox"/> Disabled <input type="checkbox"/> Alaska Native <input type="checkbox"/> Disadvantaged Corporation <input type="checkbox"/> Female American Indian <input type="checkbox"/> Asian American Pacific <input type="checkbox"/> Hispanic American <input type="checkbox"/> Asian American Sub-continent <input type="checkbox"/> Native American <input type="checkbox"/> Small Business <input type="checkbox"/> Other
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
3. Subcontractor Name and Tax ID	Subcontractor Address
Telephone Number _____ Fax Number _____ Select Once: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SBE <input type="checkbox"/> N/A Provide if Applicable: <input type="checkbox"/> MDOT <input type="checkbox"/> Baltimore City # _____	Minority Status <input type="checkbox"/> African American <input type="checkbox"/> Disabled <input type="checkbox"/> Alaska Native <input type="checkbox"/> Disadvantaged Corporation <input type="checkbox"/> Female <input type="checkbox"/> Asian American Pacific <input type="checkbox"/> American Indian <input type="checkbox"/> Asian American Sub-continent <input type="checkbox"/> Hispanic American <input type="checkbox"/> Native American <input type="checkbox"/> Small Business <input type="checkbox"/> Other
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
Subcontractor Total Dollar Amount	Total Subcontractor Percent of Entire Contract
Form Prepared by: Name/Date: _____ Title: _____ Email: _____	Reviewed and Accepted by Baltimore County Minority Business Enterprise Office Name _____ Title _____ Date _____

<input type="checkbox"/> MBE or <input type="checkbox"/> WBE Prime Participation	_____ %	\$ _____
Total MBE Subcontracting Participation	_____ %	\$ _____
Total WBE Subcontracting Participation	_____ %	\$ _____
Total MBE/WBE Participation	_____ %	\$ _____
Total SB/SBE Participation	_____ %	\$ _____

BALTIMORE COUNTY, MARYLAND
MBE/WBE PRIME PARTICIPATION SCHEDULE
(Form B-Prime)

PLEASE COMPLETE AND SUBMIT THIS FORM TO ATTEST EACH SPECIFIC ITEM OF WORK THAT YOUR MBE/WBE PRIME FIRM WILL PERFORM USING ITS OWN WORKFORCE PERTAINING TO THE PERCENTAGE STATED MBE/WBE PARTICIPATION SCHEDULE (FORM B) FOR PURPOSES OF MEETING THE MBE/WBE PARTICIPATION GOALS.

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Provided that _____ (Prime Contractor's Name) with Certification Number _____ is awarded the County contract in conjunction with Solicitation No. _____, such MBE Prime Contractor intends to perform with its own forces at least \$ _____ which equals to ___% of the Total Contract Amount for performing the following products/services for the Contract:

NAICS CODE	WORK ITEM, SPECIFICATION NUMBER, LINE ITEMS OR WORK CATEGORIES (IF APPLICABLE). FOR CONSTRUCTION PROJECTS, GENERAL CONDITIONS MUST BE LISTED SEPARATELY.	DESCRIPTION OF SPECIFIC PRODUCTS AND/OR SERVICES	VALUE OF THE WORK

<p>MBE PRIME CONTRACTOR</p> <p>Signature of Representative: _____</p> <p>Printed Name and Title: _____</p> <p>Firm's Name: _____</p> <p>Federal Identification Number: _____</p> <p>Address: _____</p> <p>Telephone: _____</p> <p>Date: _____</p> <p>Certified <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Certifying Jurisdiction _____</p>	<p>MBE PRIME CONTRACTOR</p> <p>Minority Status:</p> <p><input type="checkbox"/> African American</p> <p><input type="checkbox"/> Hispanic American</p> <p><input type="checkbox"/> Women</p> <p><input type="checkbox"/> Asian American</p> <p><input type="checkbox"/> Native American</p> <p><input type="checkbox"/> Disadvantaged</p>
---	--

**BALTIMORE COUNTY, MARYLAND
SUBCONTRACTOR DISCLOSURE AND PARTICIPATION STATEMENT
(FORM C)**

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

NOTE: ANY INCONSISTENCY BETWEEN THIS FORM AND FORM B MBE/WBE PARTICIPATION MAY RENDER A BID/PROPOSAL NON-RESPONSIVE AND THE COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Contract Name, Bid/Proposal Number: _____

Name of Prime: _____

Name of MBE/WBE Subcontractor: _____

Print Representative Name, Title

Best Contact Information

MDOT Baltimore City _____
Certification Number

MBE WBE SBE N/A

1. NAICS Code(s), Work/Services to be performed by MBE/WBE Subcontractor: _____

2. Subcontract Amount: \$ _____ or _____ % of the County contract cost.

3. Bonds - Amount and type required of Subcontractor if any: _____

4. MBE/WBE Anticipated Commencement Date: _____ Completion Date: _____

5. This is a MBE-Owned Business Firm: Yes _____ No _____

6. This is a WBE-Owned Business Firm: Yes _____ No _____

NOTE: If the Prime is notified that it will be awarded the above referenced contract, the undersigned MBE/WBE subcontractor and Prime must enter into a subcontract for the work/service indicated above upon the Prime's execution of a contract for the above referenced project with the Baltimore County, and provide a copy of the fully executed MBE/WBE SUBCONTRACTOR PARTICIPATION NOTICE OF INTENT TO AWARD (FORM C-Subcontractor) accompanied with the anticipated Work Breakdown Schedule (providing the subcontractor's mobilization timeframe) to mwbe@baltimorecountymd.gov within 10 calendar days of receipt by the Prime of FORM C-Subcontractor from the County. The undersigned subcontractor is a MDOT or Baltimore City certified MBE/WBE firm. The terms and conditions stated above are consistent with our agreements.

Signature of MBE/WBE Subcontractor: _____ Date: _____

MBE/WBE Subcontractor's Printed Name and Title: _____

The terms and conditions stated above are consistent with our agreements.

Signature of Prime: _____ Date: _____

Prime's Printed Name and Title: _____

**BALTIMORE COUNTY, MARYLAND
MBE/WBE –UNAVAILABILITY CERTIFICATE
(FORM D)**

**If applicable, this document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

1. It is hereby certified that the firm of _____
(Name of Minority firm)

located at _____
(Number) (Street)

(City) (State) (Zip)

was offered an opportunity to bid on the _____ contract.

2. The _____ (MBE/WBE Firm), is either unavailable for the work/service or unable to prepare a bid for this project for the following reason(s):

Signature of Minority Firms MBE/WBE

Representative Title

Date

MDOT/Baltimore City Certification #

Telephone #

3. PRIME'S SIGNATURE AND CERTIFICATION

I certify under oath that I contacted the Certified MBE/WBE and they advised me that they are unavailable, unable to perform the work/services for the above-contract or failed to respond to repeated requests for a price proposal for the above-contract.

Signature of Prime

Title

Date

BALTIMORE COUNTY, MARYLAND
MBE/WBE - OUTREACH EFFORTS - COMPLIANCE STATEMENT
(FORM E)

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

In conjunction with the bid or offer submitted in response to Solicitation Number _____, I state the following:

1. Bidder/Offeror identified opportunities to subcontract in these specific work categories:

2. Attached to this form are copies of the solicitation documentation in accordance with Section 6 (E) Bid Requirements of the Executive Order, used to solicit certified MBE/WBEs for the subcontract opportunities accompanied with the signed MBE/WBE Subcontractor Unavailability Certificate (Form D).

3. Bidder/Offeror made the following attempts to solicit MBE/WBEs:

Signature – Bidder Offeror

Print or Type Name of Firm

Street Address

City State Zip Code

Date



DONALD I. MOHLER III
County Executive

KEITH DORSEY, Director
Office of Budget and Finance

To: Contractors/Consultants
From: Minority and Women Business Enterprise Office
Date: July 19, 2018

Subject: Compliance Reporting - Penalties

Baltimore County, Maryland (the "County") requires all Prime Contractors and all Subcontractors to submit monthly reports through an online MBE/WBE Compliance Portal (PRISM). The Portal can be found under Compliance Reporting for Primes and Subcontractors at www.baltimorecountymd.gov/go/mwbe.

The County has found that a number of companies are failing to file reports in a timely manner, which makes it difficult for the County to verify compliance. As a result, the County has determined to assess penalties for non-compliance, effective September 1, 2018, as follows:

- (a) For failure to file timely monthly reports:
 - (i) Assessment of a late fee of \$10 per day per task, up to a maximum of \$1,500 per task; and/or
 - (ii) For multiple violations, termination of the contract for convenience or for default, with the contractor suspended from participating in County contracts for five (5) years.
- (b) For failure to meet MBE/WBE requirements:
 - (i) Assessment of a penalty of up to 10% of the contract value; and/or
 - (ii) Termination of the contract for convenience, with the contractor suspended from participating in County contracts for five (5) years together with assessment of a penalty of up to 10% of the contract value; and/or
 - (iii) Termination of the contract for default together with assessment of a penalty of 10% of the contract value.

Each action and/or remedy described above is at the sole discretion of the County, and is in addition to any damages which the County may be entitled to under the contract.

This short video can be used as guidance on submitting the Prime to Subcontractor Payment Reporting:

http://stage.prismcompliance.com/etc/movies/vendor_contractpayment_tutorial.htm

If after contract expiration it has been determined the MBE/WBE firms named were not used, or were under used, by the contractor and supporting documentation was not provided and approved by the County, the contractor may be assessed a penalty of up to 10% of the contract value and/or suspended from participating in County contracts for 5 years.

Questions regarding this correspondence and/or the use of this system can be directed to the MBE Office at mwbe@baltimorecountymd.gov or call (410) 887-3407.

Cc: File

SECTION VI

POST AWARD DOCUMENTS

**This Section to be Completed
by Successful Bidder after Award**

CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (“Contract”), IS MADE THIS _____ day of _____ 20___, by and between Baltimore County, Maryland, a body corporate and politic (“County”), and _____, (“Contractor”).

WITNESSETH, that the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the County, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work, services, and labor in fulfillment of the requirements of Contract No. 23017 SX0 (the “Project”) in strict conformity with the solicitation, plans, specifications, special provisions, any and all addenda, and the proposal, at the prices named therein, and all of which are collectively the Proposal, and said Proposal is attached hereto and made a part thereof.

The Project shall be done in strict compliance with (i) the Proposal, (ii) the Baltimore County Department of Public Works February 2000 “Standard Specifications for Construction and Materials” and “Standard Details for Construction” (iii) and any and all revisions thereto as of the date of advertisement, including but not limited to the supplemental specification known as Addendum 3 and General Conditions Building Projects, as applicable, and all of which (i-iii) are made a part hereof and incorporated herein (collectively, the “Specifications”). Contractor understands and agrees it is Contractor’s responsibility and obligation to obtain a copy of the “Specifications” and agrees the Specifications are incorporated herein. Copies of the revisions are on file and available at the Division of Construction Contracts Administration, County Office Building, Towson, Maryland, and are on the County’s website at <http://www.baltimorecountymd.gov/Agencies/publicworks/standardsandspecs/specsanddetails.html>. In the event of a conflict between (a) the February 2000 “Standard Specifications for Construction and Materials” and “Standard Details for Construction” and (b) the supplemental specification known as Addendum 3 and General Conditions Building Projects, as applicable, then (b) the supplemental specification shall control.

The Project shall be subject to the inspection and approval of the Director of Public Works and Transportation for Baltimore County, or his authorized representative, and in the event any portion thereof shall be rejected by said Director or his representative as defective or unsuitable, then the said portion shall be removed and replaced and be performed anew to the satisfaction and approval of the said Director or his representative at the cost and expense of the Contractor.

THE CONTRACTOR AFFIRMS that it is aware of, and will comply with, the provisions of Sections 14-101 through 14-108 of the Election Law Article of the Annotated Code of Maryland, as the same may be amended from time to time, which require that every person who makes, during any 12-month period, one or more contracts, with one or more Maryland governmental entities involving cumulative consideration, of at least \$200,000.00, to file with the State Board of Elections certain specified information to include disclosure of attributable political contributions in excess of \$500 during defined reporting periods.

THE CONTRACTOR FURTHER COVENANTS AND AGREES that all the Project shall be furnished, performed and delivered, in every respect, to the satisfaction and approval of the Director of Public Works and Transportation, aforesaid, on or before the expiration of **FIVE HUNDRED AND FORTY (540) CALENDAR DAYS** plus any extensions thereto agreed to in writing by a legally authorized representative of the County pursuant to the terms of this Contract (the “Contract Period”) after written notice has been given by the Director or his authorized representative to begin the work. IT IS AGREED THAT TIME IS OF THE ESSENCE. In the event the Contractor fails to achieve Final Completion and Final Acceptance (as defined in the Specifications) of the Contract work within the Contract Period specified herein, then the Contractor shall pay the County the sum of **ONE THOUSAND FIVE HUNDRED DOLLARS (\$1,500.00) FOR EACH CALENDAR DAY (DAY 1 THROUGH 30) AFTER THE EXPIRATION OF THE CONTRACT PERIOD AND TWO THOUSAND DOLLARS (\$2,000.00) FOR EACH CALENDAR DAY (DAY 31 THROUGH 60) AFTER THE EXPIRATION OF THE CONTRACT PERIOD AND TWO THOUSAND SEVEN HUNDRED FIFTY DOLLARS (\$2,750.00) FOR EACH CALENDAR DAY (DAY 61 AND THEREAFTER)**, until the contractor achieves Final Completion and Final Acceptance of the Project

Contractor’s Initials

Date

IT IS FURTHER AGREED that:

- (a) These Liquidated Damages are a reasonable estimate of the County's damages solely due to the public's loss of use of the Project during the delay period and is not a penalty.
- (b) It is very difficult, if not impossible, to accurately measure the damages to the County due to the public's loss of use of the Project during the delay period.
- (c) Notwithstanding GP 8.09 of the Baltimore County Standard Specification for Construction, in addition to the damages due to the public's loss of use of the Project during the delay period, the County is likely to incur additional direct costs during the delay period, including but not limited to, costs for construction management, consultants, architectural services, office trailer and supplies, utilities, County employees' time, County vehicles, and such other costs that the County will incur to continue administration of the construction and the Contract during the delay period, all of which will be monitored by the County, and if so required by the County, the Contractor shall pay such actual damages incurred during the delay period. THE PARTIES HERETO UNDERSTAND AND AGREE THAT CONTRACTOR'S OBLIGATION TO PAY THE COUNTY FOR ACTUAL DAMAGES DURING THE DELAY PERIOD SHALL BE IN ADDITION TO THE CONTRACTOR'S OBLIGATION TO PAY THE LIQUIDATED DAMAGES DUE TO THE PUBLIC'S LOSS OF USE OF THE PROJECT.
- (d) The County shall have the right, but not the obligation, to deduct the Liquidated Damages due to the public's loss of use of the Project, and the County's actual costs and costs to continue administration of the construction and the Contract, from any monies due or any monies that may become due to the Contractor.

IT IS DISTINCTLY UNDERSTOOD AND AGREED that no claim for extra work, material or overhead not specifically provided for in the Contract will be allowed by the County, nor shall the Contractor do any work or furnish any materials not covered by this Contract and the Specifications, unless the same is ordered in writing by a legally authorized representative of the Department of Public Works and Transportation in accordance with the terms of the Contract. Any such work or materials which may be done or furnished by the Contractor without any such written order first being given shall be at said Contractor's sole risk, cost and expense and Contractor hereby covenants and agrees that without such written order, Contractor shall make no claim for compensation for work, materials, or overhead so done or furnished.

NOTWITHSTANDING GP 4.06 OF THE BALTIMORE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION, IT IS SPECIFICALLY AGREED that the Contractor shall have no entitlement to damages arising out of delay, disruption, interference or hindrance from any cause whatsoever. However, this provision shall not preclude recovery or damages by the Contractor for hindrances or delays due solely to fraud or gross negligence on the part of the County or its agents.

IT IS FURTHER DISTINCTLY AGREED that the said Contractor shall not assign this Contract, nor any part thereof, nor any right to any of the monies to be paid hereunder, nor shall any part of the work to be done or material furnished under said Contract be sublet without the prior written consent of a legally authorized representative of the Department of Public Works and Transportation in accordance with the terms of this Contract. Further, the acceptance of the final payment by the Contractor shall effectuate a release in full of all claims against County and its officials, employees, representatives, and agents arising out of, or by reason of the Project and this Contract.

The Contractor shall review government issued identification and badge all employees of the Contractor and its subcontractors. The Contractor shall also review all federal forms, including but not limited to I-9's, for compliance as well as copies of all employment eligibility and identity documentation maintained to the extent required by law.

The Bonds, given by the Contractor in a sum equal to the total contract price of the Project in compliance with the terms and provisions of this Contract, are hereby attached and incorporated herein.

IT IS AGREED that in the event that the County is delayed or prevented from timely execution of this Contract, the Contractor releases County and agrees Contractor shall have no action, claim or demand against County therefore.

Contractor's Initials

Date

THE CONTRACTOR HEREBY FURTHER AGREES to receive the prices set forth in the Proposal incorporated herein as full compensation for the completion of the Project and, in all respects, to complete said Contract to the satisfaction of the County.

THE CONTRACTOR REPRESENTS AND WARRANTS:

- (i) it is duly formed and validly existing under the laws of the State of _____;
- (ii) it is in good standing in the State of Maryland;
- (iii) it has the power and authority to consummate the obligations and responsibilities contemplated hereby, and has taken all necessary action to authorize the execution, delivery and performance required under this Contract;
- (iv) the Contractor and the person executing this Contract for the Contractor each warrant that he/she is duly authorized by the Contractor to execute and seal this Contract on the Contractor's behalf;
- (v) the warranties of merchantability and fitness for a particular purpose and use and warranties of title and against infringement, and all express warranties contained in this Contract, including but not limited to the Proposal (and any sample or model presented by Contractor and expressly accepted by the County) shall apply to the portion of this Contract pertaining to or for goods;
- (vi) all representations and warranties made in the Proposal and herein remain true and correct in all respects when made, as of the date of this Contract, and throughout the term of this Contract; and
- (vii) there exists no actual or potential conflict of interest between its performance under this Contract and its engagement or involvement in any other personal or professional activities and in the event such conflict or potential conflict arises during the term of this Contract, the Contractor shall immediately advise the County in writing thereof.

THE CONTRACTOR shall not disclose any documentation and information of any kind or nature disclosed to the Contractor in the course of its performance of duties hereunder without the express prior written consent of the County.

Those sections in this Contract which by their nature are intended to survive, including but not limited to, Contractor's representations and warranties, confidential information, and indemnification shall survive the termination of this Contract.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand and seal the day and year first above written.

CONTRACTOR NAME: _____

WITNESS FEDERAL TAX ID or SS #: _____

_____ By: _____ (Seal)

_____ Name: _____
Type (Print) Name

Title: _____ Date: _____

WITNESS: **BALTIMORE COUNTY, MARYLAND**

_____ By: _____ Date: _____
Executive Secretary Stacy L. Rodgers, County Administrative Officer

_____ Type (Print) Name

APPROVED FOR FORM AND LEGAL AND SUFFICIENCY* (Subject to execution by the duly authorized Administrative official and Chairperson of the County Council, as indicated).

APPROVED: _____ Date: _____
D'Andrea I. Walker, Director,
Department of Public Works and Transportation

Office of the County Attorney
*Approval of Form and Legal Sufficiency does not convey approval or disapproval of the substantive nature of this transaction. Approval is based upon typeset documents. All modifications require re-approval.

PERFORMANCE BOND

Bond No. _____

Principal _____

Business Address of Principal _____

Surety _____

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

Penal Sum of Bond (express in words and figures)
Stemmers Run Sewage Pumping Station Electrical Upgrades
Contract Name
23017 SX0
Contract Number

DOLLARS \$ _____
_____ 20 _____
Date of Contract
_____ 20 _____
Date Bond Executed

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL, above-named, and SURETY, above-named, and authorized to do business in the State of Maryland, are held and firmly bound unto the OBLIGEE, above-named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, THE PRINCIPAL entered into a certain contract with the OBLIGEE described and dated as shown above and is required to provide this bond pursuant to Maryland State law and/or County law and the contract.

NOW, THEREFORE, if the aforesaid PRINCIPAL shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the OBLIGEE with or without notice to the SURETY, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the SURETY being hereby waived, then, this obligation to be void; otherwise to remain in full force and effect.

THE SURETY FURTHER GUARANTEES That it is (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. A Performance Bond is required for each and every Contract in excess of twenty-five thousand (\$25,000). A Performance Bond shall be in the amount equal to at least one hundred (100%) percent of the Contract price. The fully executed Performance Bond shall be delivered by the Bidder to the Department's Division of Construction Contracts Administration no later than the time the Contract is to be executed by the Contractor.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals on the date indicated above, the name and seal of each party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

In Presence of: _____ **Individual Principal**

Witness: _____ as to: _____ (SEAL)

Print Name: _____ Print Name: _____

Attest: _____ **Corporate Principal**

(Name of Corporation)

Witness: _____ By: _____ Affix

Print Name: _____ Print Name: _____ Corporate

Title: _____ Seal

Attest: _____ **Surety**

(Name of Surety)

Business Address: _____

Witness: _____ By: _____ Affix

Print Name: _____ Print Name: _____ Corporate

Title: _____ Seal

Reviewed for Baltimore County Requirements

Office of the County Attorney

PAYMENT BOND

Bond Number _____

Principal

Business Address of Principal

Surety

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

DOLLARS \$ _____

Penal Sum of Bond (express in words and figures)

Stemmers Run Sewage Pumping Station Electrical Upgrades
Contract Name

_____ 20 _____
Date of Contract

23017 SX0
Contract Number

_____ 20 _____
Date Bond Executed

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL, above-named, and SURETY, above-named, and authorized to do business in the State of Maryland, are held and firmly bound unto the OBLIGEE, above-named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, THE PRINCIPAL entered into a certain contract with the OBLIGEE described and dated as shown above and is required to provide this bond pursuant to Maryland State law and/or County Law and the contract.

NOW, THEREFORE, the condition of this obligation is such that if the aforesaid PRINCIPAL shall promptly make payments to all persons supplying labor and/or material to the PRINCIPAL and to any subcontractor of the PRINCIPAL in the prosecution of the work provided for in said contract and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the SURETY being hereby waived, then, this obligation to be void; otherwise to remain in full force and effect.

THE SURETY FURTHER GUARANTEES That it is (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. A Payment Bond is required for each and every Contract in excess of twenty-five thousand (\$25,000). A Payment Bond shall be in the amount equal to at least one hundred (100%) percent of the Contract price. The fully executed Payment Bond shall be delivered by the Bidder to the Department's Division of Construction Contracts Administration no later than the time the Contract is to be executed by the Contractor.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals on the date indicated above, the name and seal of each party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

In Presence of:

Individual Principal

Witness: _____

as to: _____ (SEAL)

Print Name: _____

Print Name: _____

Attest:

Corporate Principal

(Name of Corporation)

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

Attest:

Surety

(Name of Surety)

Business Address: _____

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

Reviewed for Baltimore County Requirements

Office of the County Attorney



INSURANCE PROVISIONS

1. GENERAL REQUIREMENTS

- 1.1 Coverages Required:
Unless otherwise required by the specifications or the contract, the Contractor/Vendor shall purchase and maintain the insurance coverage's listed herein.
- 1.2 Certificate of Insurance:
Before starting work on the contract, or prior to the execution of the Contract on those bid, the Contractor/Vendor shall provide Baltimore County, Maryland with a Certificate of Insurance provided by the County, or an exact replica thereof, evidencing the required coverages.
- 1.3 Baltimore County as Insured:
The coverage required, excluding Workers' Compensation and Employers' Liability and Medical Malpractice Liability/Professional Liability/Errors and Omissions Liability, must include Baltimore County, Maryland and its agents, employees, officers, directors, and appointed and elected officials as an additional insured.
- 1.4 Contractor's/Vendor's Responsibility:
The providing of any insurance herein does not relieve the Contractor/Vendor of any of the responsibilities or obligations the Contractor/Vendor has assumed in the contract or for which the Contractor/Vendor may be liable by law or otherwise.
- 1.5 Failure to Provide Insurance:
Failure to provide and continue in force the required insurance shall be deemed a material breach of the contract.

2. INSURANCE COVERAGES

- 2.1 General Liability Insurance
 - 2.1.1 Minimum Limits of Coverage:
Personal Injury Liability and Property Damage Liability Combined Single Limit - \$500,000 each occurrence.
 - 2.1.2 Such insurance shall protect the Contractor/Vendor from claims which may arise out of, or result from, the Contractor's/Vendor's operations under the contract, whether such operations be by the Contractor/Vendor, any subcontractor, anyone directly or indirectly employed by the Contractor/Vendor or Subcontractor, or anyone for whose acts any of the above may be liable.
 - 2.1.3 Minimum Coverages to be Included:
(a) Independent Contractor's coverage;
(b) Completed Operations and Products Liability coverage; (c) Contractual Liability coverage.
 - 2.1.4 Damages not to be Excluded:
Such insurance shall contain no exclusions applying to operations by the Contractor/Vendor or any Subcontractor in the performance of the Contract including but not limited to: (a) Collapse of, or structural injury to, any building or structure; (b) Damage to underground property; or

(c) Damage arising out of blasting or explosion.

2.2 Automobile Liability Insurance

- 2.2.1 Minimum Limits of Coverage:
Bodily Injury Liability and Property Damage Liability
Combined Single Limit - \$500,000 any one accident.
- 2.2.2 Minimum Coverages to be Included:
Such insurance shall provide coverage for all owned, non-owned and hired automobiles.

2.3 Workers' Compensation and Employers' Liability Insurance

Such insurance must contain statutory coverage, including Employers' Liability insurance with limits of at least:
Bodily Injury by Accident - \$250,000 each accident
Bodily Injury by Disease - \$500,000 policy limit
Bodily Injury by Disease - \$250,000 each employee

2.4 Valuable Papers and Records Coverage and Electronic Data Processing (Data and Media) Coverage

Minimum Limits of Coverage:
\$100,000 Per Claim and Each Occurrence
\$100,000 in the Aggregate

2.5 Other

Such other insurance in form and amount as may be customary for the type of business being under taken by the Contractor/Vendor.

2.6 Builder's Risk-See Special Provisions, Page 350.