ANNE ARUNDEL COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS

PATUXENT WATER RECLAMATION FACILITY
AIR PIPING AND SUPPORT REPAIRS

Project Number S802300
Contract Number S802380

PROJECT MANUAL

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

Bureau of Engineering
March, 2024

The funding source for this project is:
County Funded

The funding source may include terms and conditions that include requirements related to prevailing wage, overtime, subcontractor participation, and other matters. Those requirements must be met by the Contractor and any subcontractors and reported as required by the funding source.

ANNE ARUNDEL COUNTY

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Project No.: S802300
Contract No.: S802380

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PART I

PART II – SPECIAL PROVISIONS

NOTICE TO CONTRACTORS

Prevailing Wage or Local Hiring Compliant Capital Improvement Contract

Bid No.: S802380
Project No.: S802300

Sealed bids, addressed to Anne Arundel County, Bid No. S802380, for Patuxent Water Reclamation Facility Air Piping and Support Repairs for the Department of Public Works will be received until 1:30 P.M. local time, Tuesday, June 4, 2024, electronically through the County's PORT system, after which they will be opened and publicly read via ZOOM.com. You may join the Zoom meeting for the date and time set on the solicitation. However, the reading of bids will begin approximately 15 minutes after the deadline for submitting them to give staff enough time to assemble the bid responses. Please join the bid opening using the credentials listed below:

Join URL: https://zoom.us/j/172858269

Meeting ID: 172 858 269
Password: 0

Dial by your location
+1 312 626 6799 US
+1 301 715 8592 US
+1 669 219 2599 US
+1 669 900 6833 US
888 475 4499 US Toll-free
877 853 5257 US Toll-free

The Work includes the following major items:

1. Replacement of damaged air piping between oxidation ditches
2. Repair of compromised concrete sections resulting from damage
3. Repair of concrete cracking in oxidation ditch

The Work is subject to the prevailing wage or local hiring laws of Anne Arundel County as more specifically set forth by law and by County policy. The Contractor and any subcontractor must submit the appropriate Wage Requirements Law and Local Hiring forms found at: https://www.google.com/url?q=https://www.aacounty.org/departments/central-services/purchasing/prevailing-wage-law/index.html Failure to submit and complete the required material information on the form(s) may cause the offeror's proposal and bid to be unacceptable under County law, and the bid may be rejected.

On or after April 22, 2024 Plans and Specifications may be downloaded from the Anne Arundel County Purchasing website https://www.aacounty.org/PORT. Plans will only be distributed via the web site.

To all contractors, the Anne Arundel County Purchasing Office now has bid results for Capital Construction Projects on the County's web page. Contractors can access it by entering the following web address: https://www.aacounty.org/departments/central-services/purchasing/bid-

results/index.html

This Contract will be constructed under the provisions of the Anne Arundel County Government January, 2001 "Standard Details and Specifications for Construction" and any subsequent revisions thereto.

The cost range for the Project is: $*500,000 to $1,000,000*

PREVAILING WAGE

The County's prevailing wage and local hiring laws, as found at §8-2-115 and 8-2-116, as amended of the County Code, and the State of Maryland's prevailing wage laws, apply to certain capital improvement contracts and capital projects. See also Anne Arundel County Council Bill 72-21, as amended. To the extent applicable, the County's prevailing wage requirements are enumerated in the "Prevailing Wage Requirements for Capital Improvement Contracts Addendum to the General Conditions of Contract between County and Contractor" and apply to the Work. If applicable to this Contract, the Addendum will be attached to the contract, and will be incorporated herein by reference, and made a part thereof. The Contractor and its subcontractors must comply with all of the auditing, reporting requirements of the law on an ongoing basis or will be subject to penalties, including, but not limited to liquidated damages claims from both improperly paid employees of the Contractor and its subcontractors and the County.

EQUAL OPPORTUNITY

It is the policy of Anne Arundel County, Maryland, to ensure equal employment opportunity for all persons, and to ensure that minority and women-owned business enterprises have the maximum opportunity to participate in the performance of all county contracts for supplies and services.

NON-DISCRIMINATION IN EMPLOYMENT

THE CONTRACTOR OR ANY SUBCONTRACTOR MAY NOT DISCRIMINATE IN ITS EMPLOYMENT PRACTICES AGAINST ANY EMPLOYEE OR APPLICANT FOR EMPLOYMENT BECAUSE OF RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN, ANCESTRY, HANDICAP, AGE OR MARITAL STATUS.

On May 7, 2024 at 11:00A.M. local time, a Pre-Bid conference will be held via Google Meet. Please join the Pre-Bid conference using the credentials below:

Video call link: https://meet.google.com/cmq-jepk-kvp
Or dial (US) ++1 402-789-6247 PIN: 770 911 736#
More phone numbers: https://tel.meet/cmq-jepk-kvp?pin=8662178874285

FOR ADA ACCESSIBILITY ASSISTANCE **ONLY**: Anyone needing special ADA accommodations for the Pre-Bid conference must contact Joelle Ridgeway at 410-222-4383, or by email to agridg24@aacounty.org, at least seven days in advance of the event. TTY users, please call via Maryland Relay 7-1-1. All materials are available in an alternative format upon request.

Questions regarding this Project should be directed to the PROJECT MANAGER, *Kevin Loescher*, at 410-222-7537.

ANNE ARUNDEL COUNTY
Catrice Parsons, Purchasing Agent

ANNE ARUNDEL COUNTY, MARYLAND
PREVAILING WAGE AND/OR LOCAL HIRING
CAPITAL IMPROVEMENT AGREEMENT

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

INFORMATION TO BIDDERS

Sealed bids, addressed to the Purchasing Agent, Anne Arundel County, Maryland, for construction of the Patuxent Water Reclamation Facility Air Piping and Support Repairs as shown on drawings on file in the Office of the Department of Public Works, Heritage Office Complex, 2662 Riva Road, Annapolis, Maryland 21401 will be received electronically through the County's PORT system until Tuesday June 4, 2024 at 1:30 p.m. after which they will be opened and publicly read via ZOOM.com You may join the ZOOM meeting for the date and time set on the solicitation. However, the reading of bids will begin approximately 15 minutes after the deadline for submitting them to give staff sufficient time to assemble the bid responses. Please join the bid opening using the credentials listed below:

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+1 669 900 6833 US
888 475 4499 US Toll-free
877 853 5257 US Toll-free

TTY users, please call via Maryland Relay 7-1-1. All materials are available in an alternative format upon request.

THE RIGHT IS HEREBY RESERVED TO REJECT ANY OR ALL BIDS AND TO WAIVE INFORMALITIES, AS THE INTERESTS OF THE COUNTY MAY REQUIRE.

All work to be performed under this Project shall be done under strict compliance with the Anne Arundel County Government January 2001 "Standard Details and Specifications for Construction" and any subsequent revisions thereto. Copies of Standard Specifications for Construction and Standard Details may be obtained by accessing the Anne Arundel County Department of Public Works website, http://www.aacounty.org/departments/public-works/engineering/design-manual/index.html. The Standard Specifications and Details for Construction will only be available via the web site, and it shall be the duty of the Bidder to be familiar with these documents.

In addition, on May 18, 1990, the Commissioner of Labor and Industry adopted, through incorporation by reference to the Maryland Occupational Safety and Health Standards under COMAR 09.12.31 Maryland Occupational Safety and Health Act, amendments and revisions relating to Excavations as published in 54 Federal Register No. 209 (October 31, 1989) pages 45948-45991 and codified in Sub Part 29 CFR

1926.650-1926.652 and Appendices A-F, together with certain amendments. The amendments are found at Maryland Register, Volume 17, issue 6 (Friday, March 23, 1990), pages 746-748. The Commissioner's action is effective May 28, 1990. All holders of the Anne Arundel County Standard Specification and Details for Construction should familiarize themselves with these regulations and be guided accordingly.

PREVAILING WAGE AND LOCAL HIRING

Under County law, a bid for a contractor to provide certain capital project and capital improvement services may be subject to the Anne Arundel County Code and purchasing regulations regarding compliance with certain wage requirements payable to the Contractor's employees and hiring practices regarding residents of Anne Arundel County. If the awarded contract and/or work to be performed and services to be provided are subject to the prevailing wage law and/or local hiring requirements, the Contractor and all of its subcontractors must comply with the provisions of Anne Arundel County Code §8-2-115 and 8-2-116 and must not retaliate against a covered employee who discloses an illegal or improper action described therein. See Anne Arundel County Bill 72-21, as amended.

An aggrieved covered employee under the prevailing wage and local hiring law is a third-party beneficiary under any applicable capital improvement contract awarded pursuant to this solicitation or that falls under the County's prevailing wage law. An awarded contractor or subcontractor's employee may by civil action recover compensatory damages including interest and reasonable attorney's fees, from the contractor or one of its subcontractors for retaliation if the Contractor or their subcontractor violates the County's prevailing wage laws. The Contractor by submission of their proposal incorporates into any award those required clauses as set forth in the law.

The County will monitor the awarded bidder's compliance with the local hiring and prevailing wage requirements of state and local law. The bidder must submit all documentation necessary to comply with the wage and hiring laws. The awarded bidder will be subject to audits and ongoing reporting requirements, and authorizes the County by submission of their bid to give direction to the contractor to submit required documentation, monitor and inspect the contractor's performance in regards to prevailing wage laws and local hiring requirements to ensure compliance, to receive records upon demand, to prepare required reports and to approve or reject invoices for payment if the awarded bidder does not comply with prevailing wage and local hiring laws, as applicable.

Bids made other than on the attached forms will not be considered. Changes in the phraseology of the bid, additions, or limiting provisions will render the bid irregular and may cause its rejection.

All bids shall include the following forms:

(1) Anti-collusion and non-bribery affidavit

(2) Proposal form

(3) Bid Bond (Bonding Companies must be licensed to do business in the State of Maryland and have complied with the law and the regulations of the U.S. Department of the Treasury and be approved as A Certified Companies or A Certified Reinsurer Companies.)

(4) List of subcontractors and Equipment Suppliers; and

(5) Sales tax affidavit (*To be completed and submitted in duplicate only for water/wastewater treatment facilities.)*

(6) *Prevailing Wage and Local Hiring Affidavit*

Failure to complete and submit these forms shall render the proposal irregular and may be cause for rejection of the bid.

The Proposal form shall include the price, in figures, for each item of the proposed work and must be signed on behalf of the bidder. The bidder must examine the drawings, standard specifications, standard details and contract specifications carefully and should 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 Standard Specifications, Standard Details and Contract Specifications, inquiry should be made of the project engineer of the Department of Public Works before the bid is submitted. Submission of the bid shall indicate that the bidder thoroughly understands the drawings and the terms of the specifications. Bidders are especially directed to fill out the "Total Price" column and total their bids, so that the results of the bidding, barring possible arithmetical errors, will be at once known. Any errors in computation will be corrected by the engineer when the bids are canvassed. The County reserves the right to accept alternatives in any order, to award on any bid item or combination of bid items. And to reject all bids if, in the sole determination of the County, it is advantageous to the County to do so. Any errors in computation or math will not invalidate the bid. In case of any discrepancy between the total figure and the correct total of the line items on the bid, the correct total of all line items shall govern and shall become the bid price.

Each bid must be accompanied by a certified check or bid bond acceptable to the County for five percent (5%) of the amount of the bid, payable to Anne Arundel County, Maryland; and unless so accompanied, the bid will not be considered. The check or bid bond will be forfeited to the County as liquidated damages in case the contract, performance bond, and labor and materials bonds are not executed within ten (10) days after receiving the contract for execution.

The list of subcontractors and equipment suppliers to be submitted with the bid need only show certified small business, minority business and women business enterprises, which the bidder intends to use. In the event that the bidder cannot participate, the bidder shall include with the bid a notarized affidavit showing the evidence of the effort made to achieve this goal. Failure to submit the list of subcontractors and equipment suppliers delineating SBE, MBE, and WBE participation and/or the good faith documentation at the time the bid is submitted shall render the bid irregular and may be cause for rejection of the bid. The complete list of subcontractors and suppliers will be required from the apparent low bidder within (10) days of a request by the County.

The experience and equipment certification is to be submitted to the county by the apparent low bidder within ten (10) calendar days after request from the County.

Each bid must include a signed and notarized affidavit concerning sales and use tax. It is the bidder's responsibility to contact the State of Maryland, Comptroller of the Treasury, Retail Sales Tax Division, to determine if any portion of the project is exempt from sales use tax.

THE APPARENT LOW BIDDER MAY NOT WITHDRAW ITS BID WITHIN NINETY (90) DAYS AFTER BID OPENING.

If the bidder, to whom an award is made, shall fail to execute the contract and bonds, the award may be annulled and the contract awarded to the second lowest responsible bidder, and such bidder shall fulfill every stipulation embraced herein, as if the bidder were the original party to whom the award was made; or the county may reject all of the bids, as its interests may require.

The County will hold the checks and/or bid bonds submitted by all bidders with their bids, until the execution and delivery of the contract and bonds whereupon they shall be returned.

As required by the Maryland Law, all foreign corporations doing business within the State of Maryland are required to be registered with the State Department of Assessments and Taxation as a condition precedent to the award of a contract.

If the contractor is a corporation, the contract shall be accompanied by a copy of the corporate resolution authorizing the officer of said corporation, whose name appears on the contract, to execute the contract. If a person other than an officer is designated, it must be stated under oath that the person is the agent of the corporation and is duly authorized to act on behalf of the corporation.

The Bidder must perform 51 percent (%) of the work with his own forces.

Bidders are further reminded of State Finance and Procurement Article, Section 17-106 Annotated Code of Maryland, which provides:

Before a contractor receives a progress or final payment under a contract covered by payment security, the contractor shall certify, in writing that, in accordance with contractual agreements, suppliers, and subcontractors:

(1) Have been paid from the proceeds of previous progress payments; and

(2) Will be paid in a timely manner from the proceeds of the progress or final payment currently due.

The contractor shall make available, at anytime to the County, the contractor's records for the purpose of auditing and/or verifying the contractor's costs in connection with negotiated contracts, change order, or other amendments to the contract.

Non-Discrimination Clauses:

Contractor shall comply with Executive Order 11246 entitled "Equal Employment Opportunity" as amended by Executive Order 11375, and as supplemented in U.S. Department of Labor Regulations 41 CFR Part 60.

The Contractor agrees not to discriminate in any manner against any employee or applicant for employment because of race, creed, color, or national origin; and, is obligated to include a similar requirement in all subcontracts, except subcontracts for standard commercial supplies or raw materials. In addition, the contractor and all subcontractors shall agree to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of the non-discrimination clause.

Where the Contractor willfully fails to comply with the non-discrimination provisions, the County may, where the Contract is still executory in part, compel continued performance of the Contract, but the County shall be liable only for the reasonable value of services performed and materials supplied from the date that the breach of contract was discovered, and any sums previously paid by the County under the Contract shall be set off against the sums to become due as the Contract is performed.

If any subcontractor willfully fails to comply with the non-discrimination provisions, the Contractor may void the subcontract and shall be liable only for the reasonable value of the services performed and materials supplied to the date of the voiding of the subcontract.

As to all contracts for materials, supplies, maintenance, services or other procurements except building construction services, the vendor agrees not to discriminate in any manner against any employee or

applicant for employment because of race, creed, color, national origin, or sex. Any Contract with the County requiring subcontracts shall include similar requirements in each subcontract. The Contractor further agrees to comply with all applicable federal, state, and local laws and executive orders relating to equal employment opportunity.

Equal Opportunity Clause:

It is the policy of Anne Arundel County, Maryland, to ensure Equal Employment Opportunity for all persons, and to ensure that Minority and Women-Owned Business Enterprises have the maximum opportunity to participate in the performance of all County Contracts for supplies and services.

ANNE ARUNDEL COUNTY, MARYLAND
SOLICITATION CHECKLIST

PROPOSAL NO.: S802300
Project No.: S802380

THIS CHECKLIST IS PROVIDED FOR YOUR CONVENIENCE

_____ Bid Response/Proposal shall be delivered to the County Purchasing Department via PORT no later than the date and time shown in the Solicitation. Did you visit our website at (https://www.aacounty.org/PORT) for any addenda, which may have been posted to our website.

_____ Did an authorized company representative sign the Bid Response Form?

_____ Did an authorized company representative sign and notarize the Affidavit form(s)?

_____ Did you include the required signature authority documents, if required?

_____ If you are an entity (limited liability partnerships, corporations, limited partnerships, limited liability companies, limited liability limited partnerships, business trusts, real estate investment trust and trade name filings), is the legal name of your company listed with the State of Maryland Department of Assessments and Taxation and in good standing? You may check by going to www.dat.maryland.gov.

_____ If this Solicitation requires a Bid/Proposal bond, did you include one?

_____ Did you include Page B7-1 listing the minority subcontractors and equipment suppliers you intend to use, or a notarized affidavit showing the evidence of the effort made to include SBE, MBE and/or WBE participation in your bid?

_____ Did you read the prevailing wage and local hiring laws and County guidelines?

_____ Did an authorized signatory sign and agree to the Prevailing Wage and Local Hiring Affidavit?

MANDATORY REQUIREMENTS

The following item(s) are **MANDATORY** and shall be submitted, in fully executed format, with Bid Response/Proposal in order to be considered for an award. If the following item(s) are not submitted with the Bid Response/Proposal, the Bid/Response/Proposal shall be considered null and void, and therefore, will be rejected.

(A) Bid Bond or Certified Check (5%)

ANNE ARUNDEL COUNTY
PREVAILING WAGE AND LOCAL HIRING

AFFIDAVIT

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

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 Anne Arundel County Code 8-2-115 and 8-2-116 regarding the prevailing wage laws and requirements of the Prevailing Wage guidelines located at (name of County web page citing the guidelines), 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. _____ 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 Anne Arundel 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 prevailaing wages and/or local hiring required by law shall be submitted to Anne Arundel County's Prevailing Wage Director or their 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 8-2-116 of the Anne Arundel County Code, _____ will make best efforts to ensure that residents of Anne Arundel County constitute 51% of the new hires made for the Contract, subject to all exceptions allowable by law and regulation.

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 in accordance with Anne Arundel County Code 8-2-115.

_____
Contractor/Bidder/Offeror

_____
By

_____
Printed Name

_____
Printed Title

_____
Date

_____
Phone

_____
Email

_____
License Number

ANNE ARUNDEL COUNTY

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

AFFIDAVIT

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. Neither _____, nor any of its officers, directors, or
(Contractor)
partners, or any of its employees who are directly involved in obtaining or performing contracts with the State of Maryland, a unit of the State (as defined in '16-101 of the State Finance and Procurement Article), or a local governmental entity in the State, has:

(a) been convicted of bribery, attempted bribery, or conspiracy to bribe, under the laws of any state or of the federal government;

(b) been convicted under a State or federal law or statute of any offense enumerated in §16-203 of the State Finance and Procurement Article; or

(c) been found civilly liable under a State or federal antitrust statute as provided in §16-203 of the State Finance and Procurement Article.

2. _____ shall not knowingly enter into a contract
(Contractor)
with a public body under which a person or business debarred or suspended under Title 16, Subtitle 3 of the State Finance and Procurement Article will provide, directly or indirectly, supplies, services, architectural services, construction related services, leases of real property, or construction.

3. Neither _____, nor any employee or
(Contractor)
representative of _____ :
(Contractor)

(a) agreed, conspired, connived, or colluded to produce a deceptive show of competition in the preparation of the bid or offer being submitted; or

(b) has in any manner, directly or indirectly, entered into any agreement, participated in any collusion to fix the price of the bid or proposal of any bidder or offeror or any competitor, or otherwise taken any action in restraint of free competitive bidding in connection with the contract for which the bid or offer is submitted,

4. The Contractor/Bidder/Offeror:

(a) Is not currently identified on the list created by the Maryland State Board of Public works as a person engaging in investment activities in Iran as described in Section 17-702 of the *Maryland State Finance and Procurement Article*; and

(b) Is not currently engaging in investment activities in Iran as described in Section 17-702 of the *Maryland State Finance and Procurement Article*.

If the person is unable to make the certification, it will provide the County, under penalty of perjury, a detailed description of the Contractor/Bidder/Offeror's investment activities in Iran.

Contractor/Bidder/Offeror: _____

By: _____

Printed Name: _____

Printed Title: _____

Date: _____

Subscribed and sworn to before me, a Notary Public of the State of _____, County or City of_____, this _____ day of _____,_____.

_____

(**Notary Public**)

My Commission expires:_____.

ANNE ARUNDEL COUNTY

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

AFFIDAVIT CONCERNING SALES AND USE TAX

APPLICABLE TO THE CONSTRUCTION OF WATER AND WASTEWATER TREATMENT FACILITIES

I DO SOLEMNLY DECLARE AND AFFIRM, under the penalties of perjury, the following:

1. That I am aware of the following:

a. Water and wastewater treatment facilities consist of both real and tangible personal property.

b. As a general rule, all of the inter-connected machinery and equipment for processing and treating water or wastewater at a treatment facility is considered tangible personal property. This would include, for example, all of the tanks, pumps, pipes, valves, electrical systems, and chemical handling equipment.

c. Buildings and the systems serving the buildings, such as HVAC systems, plumbing and electrical service, as well as roadways, pavements, and fencing at treatment facilities are improvements to the realty. Off-site pipes and pumping equipment which transport water or wastewater to or from a treatment facility are normally real property improvements.

d. However, if significant processing occurs at a wastewater pumping station, the equipment will be considered tangible personal property.

2. That I am further aware of the following:

a. That a contractor who furnishes materials and is responsible for their installation as real property is responsible for paying sales and use tax on the purchase of materials so installed.

b. That a contractor who furnishes and installs any machinery or equipment which remains tangible personal property may buy it tax-free by issuing a resale certificate to the vendor.

c. That the resale of the tangible personal property included in a water or wastewater treatment facility to a local government unit is exempt.

3. That in submitting a bid, the contractor has afforded Anne Arundel County, Maryland the benefit of any exemption.

4. That the contractor will refund to Anne Arundel County, Maryland any refund of sales or use tax received by the contractor as a result of the County's exemption.

_____

Signature

_____

Name and Title of Signer

_____

Company

_____

Date

SUBSCRIBED TO AND SWORN TO BEFORE ME, A Notary Public of the State of _____, County or City of_____ this year and date first above written.

_____

Notary Public

_____

My Commission Expires:

PROPOSAL

TO ANNE ARUNDEL COUNTY, MARYLAND

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

Made this _____ day of _____, _____,

by _____

_____

Business Address:_____

We/I the undersigned Bidder declare that the only person, firm, or corporation, or persons, firms, or corporations, that has or have any interest in this Proposal, or in the Contracts proposed to be taken, is or are the undersigned; that this Proposal is made without any connection or collusion with any other person, firm, or corporation making a Proposal for the same work; the undersigned further certifies that they have received Drawings, Specifications, Addenda (if any), and copy of this Proposal and that they constitute all instruments for bidding this contract, and that the Specifications, form of contract and the Drawings, therein referred to, have been carefully examined and are understood; that as careful an examination has been made of the worksite as is necessary to become informed as to the character and extent of the work required; and that is proposed and agreed, if the Proposal is accepted, to Contract with Anne Arundel County, Maryland, in the form of contract hereto attached, to do the required work in the manner set forth in the Specifications and as shown by the Drawings.

If this Proposal shall be accepted by Anne Arundel County, Maryland and the undersigned shall refuse or neglect, within ten (10) days after receiving the Contract for execution, to execute the same and to give the stipulated Bond, then said County may, at its option, determine that the Bidder has abandoned the Contract, and thereupon the Proposal and the acceptance thereof shall be null and void, and the deposit accompanying the Proposal shall be forfeited and paid as liquidated damages to the County. The base bid, unit prices and alternatives on the attached and signed Proposal Form are to include and cover the furnishing of all necessary machinery, tools, apparatus and means for performing the work, and the doing of all the above mentioned work, in the manner set forth, described and shown in the Specifications and on the Contract Drawings within the prescribed number of consecutive calendar days after service of written notice from the Owner to proceed with the work.

The successful Bidder shall be required to submit a list containing all parties to which he

intends to subcontract any portion of the work. The list shall contain the subcontractor's name, address, work to be sublet and business telephone number.

(NOTE: The Bidder or Bidders must sign here and the address of each must be given. In the case of firms, the firm name must be signed and subscribed to by at least one member. In the case of corporations, the corporate name must be signed by some authorized officer or agent thereof, who shall also subscribe his name and office. The seal of the corporation shall be affixed. Telephone number to be listed).

The names and addresses of all members of a firm or the names, addresses and titles of every officer of a corporation, or duly authorized agent, as the case may be, must be given here by the member of the firm or by the officer or agent of the corporation who signs the Proposal.

_____

_____

_____

_____

_____

We/I will submit within ten (10) days of request by the county, the Experience and Equipment Certification specified and further understand and are/am aware that the work will be awarded to an approved organization which is properly constituted in experience, capital and equipment.

Prior to, or following, the award of this Contract, the Owner or Engineer may request that We/I supply him with whatever information is needed by him in order to become better familiarized with any of the subcontractors and/or equipment suppliers. It is further stipulated that no change in the names of those persons or organizations will be made unless written application is made with justification and prior approval is granted. It is further agreed that the apparent low bidder will submit within 10 days of a request by the county a detailed list of all subcontractors and equipment suppliers including anticipated dollar values.

We/I agree to accept as full compensation the unit prices stipulated for the contingent construction items that are incorporated into the work by direction of the Engineer in the field.

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS
ANNAPOLIS, MARYLAND

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

DATE: _____

This is to certify that _____ has received Addendum No. _____ through _____ and this bid reflects the changes created by these addenda.

THE CONTRACTOR OR ANY SUBCONTRACTOR ON THIS WORK WILL BE REQUESTED TO COMPLY WITH EXECUTIVE ORDER 11246, ENTITLED "EQUAL EMPLOYMENT OPPORTUNITY" AS AMENDED BY EXECUTIVE ORDER 11375, AND AS SUPPLEMENTED IN U.S. DEPT. OF LABOR REGULATIONS (41 CRF PART 60).

Bidder's Names: _____

Bidder's Signature: _____

Bidder's Address: _____

Telephone Number: _____

Bidder's Email Address:_____

Item	Description	Unit Size	Estimated Quantity	Unit Price Dols / Cts	Total Price Dols / Cts
1.0	**Mobilization**: This item is a fixed maximum lump sum item. This line item also includes the cost associated with mobilization for this project. Payment for the work of this Fixed Lump Sum item will be made at the Owner's Fixed Maximum price or the Contractor's bid, whichever is less as stated in the Bid for this item. Work and measurement for payment for this item are as described in County Standard Specification Section 01100.	LS	N/A	$_____	$_____
1.1	**Air Piping and Support Repair and Replacement:** The work included in the lump sum shall incorporate all items not included in other bid items and shown on or specified by the Contract Documents. Measurement for this item is lump sum.	LS	N/A		

CONTINGENCY UNIT PRICES

Item	Description	Unit Size	Estimated Quantity	Unit Price Dols/Cents	Total Price Dol/Cents
2.0	Additional Air Piping Repair and Replacement	LS	N/A	$130,000	
2.1	Concrete Crack Repair	L.F.	200		
2.2	Concrete Surface Repair	Cubic feet	50		
2.3	Concrete Joint Sealant Repair	L.F.	200		

SUBTOTAL ITEMS 1.0 & 1.1: $_____

SUBTOTAL CONTINGENT ITEMS (ITEMS 2.0-2.3): $_____

TOTAL BASE BID: (sum of items 1.0 to 1.1 and Contingent Item 2.0 to 2.3): $_____

In word: _____

_____

BID PRICE MUST BE WRITTEN AND SHOWN IN NUMBERS, IN CASE OF DISCREPANCY THE WRITTEN AMOUNT WILL SUPERSEDE.

Total time for completion, 450 consecutive calendar days.
Liquidated damages shall be, $1,500 dollars per calendar day.

Basis of Award

The award of the Contract shall be in accordance with Section GP 3.0 of the Anne Arundel County Government January 2001 "Standard Details and Specifications for Construction" and any subsequent revisions thereto and based on the sum of Bid Items 1.0-1.1 and 2.0-2.3.

_____
(Bidder)

By: _____
(Title)

In accordance with the County Code, Article 8-2-117(a)7, please list any affiliation with a County employee(s) or official(s) (Write "none" if there are no affiliations.):

_____

_____

_____

CAPITAL IMPROVEMENT CONTRACT

Proposal No.: S802300
Project No.: S802380

THIS CONTRACT, made this _____ day of _____ the year _____, by and between hereinafter called the CONTRACTOR, and ANNE ARUNDEL COUNTY, MARYLAND, a body corporate and politic of the State of Maryland, hereinafter called the COUNTY.

WHEREAS, the Contract for constructing the Patuxent Water Reclamation Facility Air Piping Support Repairs shown on Drawings, marked Proposal S802300 on file in the Office of the Department of Public Works, subject to all the conditions, covenants, stipulations, terms and provisions contained in the Special provisions, attached hereto, and the "Anne Arundel County Standard Specifications for Construction" and "Standard Details" issued January 2001, and any revisions thereto, as adopted by the Department of Public Works, said Standard Specifications and Standard Details being in all respect made a part hereof by reference as full and with the same effect as if the same had been set forth in full herein, has recently been awarded to the Contractor by the County at and for the sum equal to the aggregate cost of the work, labor, materials and supplies done or furnished, at the prices and rates respectively named therefore in the bid attached hereto.

[WHEREAS, the Contract is subject to the prevailing wage and/or local hiring requirements of the Anne Arundel County Code pursuant to County Council Bill 72-21, as amended, and County Code sections 8-2-115 and 8-2-116, and the State of Maryland as applicable.]

AND WHEREAS, it was one of the conditions of said Award that a formal Contract should be executed by and between the contractor and the County evidencing the terms of said Award.

NOW THEREFORE, THIS CONTRACT WITNESSETH, that the Contractor does hereby covenant and agree with the County that he will well and faithfully construct the Patuxent Water Reclamation Facility Air Piping and Support Repairs in accordance with each and every one of the conditions, covenants, stipulations, terms and provisions contained in the above-mentioned Specifications, and as shown on said Drawings, at and for a sum equal to the aggregate cost of the work, labor, materials and supplies done and furnished at the prices and rates respectively named therefore in the Proposal attached hereto, that sum being $_____ (excluding change orders), and will well and faithfully comply with and perform each and every obligation imposed upon him by said Specifications, or the terms of said Award. *(Basis of Award – Total Base Bid (Items _) and Contingent Bid (Items _____).*

The contractor does hereby agree that it will comply with the following:

The Contractor agrees to comply with the requirements of Attachment A hereto entitled "Prevailing Wage and Local Hiring Requirements for Capital Improvement Construction Contracts Addendum to the General Conditions of Contract between County and Contractor". The Contractor agrees to provide a prevailing wage payment bond and to provide all reporting required by either the prevailing wage law or local hiring law as required by statute in such form and substance as may be required therein. The parties agree and understand that in addition to the damages set forth below, the Contractor may be liable for default for failure to abide by the

requirements of the prevailing wage and local hiring laws of the State of Maryland and Anne Arundel County. Remedies for default include, but are not limited to liquidated damages in the amount of three times the wages owed to a specific employee or apprentice, a payment withholding for failure to abide by the County's prevailing wage laws, and/or disqualification from future contracts for a period of time for failure to abide by the County's local hiring laws set forth in County Code 8-2-115 and 8-2-116, as amended and Anne Arundel County Bill 72-21, as amended. They are in addition to, separate from, and not in lieu of any and all other remedies set forth in this Contract for other defaults and breaches including termination in whole or part, or withholding of final payment in the County's discretion. For the purposes of defining the scope of the prevailing wage and local hiring laws of Anne Arundel County, the parties expressly agree that it includes all promulgated rules, regulations and guidelines relating to the prevailing wage program that are published online or that have been provided to the Contractor as of the date of this Contract. The Contractor agrees to provide ongoing wage certifications and reports in the form required by the County's Prevailing Wage program and to permit auditing access. The Contractor further agrees that they have read the prevailing wage and/or local hiring law and the guidance and documentation posted by the County at https://www.aacounty.org/prevailing-wage-law, and agree to comply with all requirements therein.

The Contractor understands and agrees that an aggrieved employee or apprentice as a third party beneficiary, may by a civil action against the Contractor, recover the difference between the prevailing wage for the type of work performed and the amount actually received, with interest and reasonable attorney's fees, as applicable.

The Contractor agrees that for each and every calendar day that the Contractor is in default in completing the work to be done under this Contract, the Contractor shall pay to the County the sum of $1,500.00 which sum is hereby agreed upon as liquidated damages as set forth in the Standard Specifications.

And the County does hereby covenant and agree with the Contractor that it will pay to the Contractor, when due and payable under the terms of said Specifications and of said Award, the above mentioned sum; and it will well and faithfully comply with and perform each and every obligation imposed upon it by said Specifications or the terms of said Award.

And the Contractor and the County do hereby agree that this Contract constitutes a contract under seal and that they intend the twelve year statute of limitations period to apply, as set forth in Courts & Judicial Proceedings Article, '5-102, Annotated Code of Maryland.

SERVICE OF PROCESS IN THE EVENT OF SUIT

The Contractor does hereby nominate and appoint _____, who actually resides at, _____, who will accept service both before and after completion of the Contract and under no circumstances, is the Contractor to have the right to withdraw or revoke the agency without the prior written permission of the County.

IN WITNESS WHEREOF, Said _____ the Contractor, has hereunto set (his) (its) hand and affixed (his) (its) corporate seal, and the County has caused these presents to be signed and the County has caused its corporate seal to be hereunder affixed, duly attested by the Secretary of the County.

_____(SEAL)
Contractor

_____
Print Name and Title

_____(SEAL)
Contractor

_____
Print Name and Title

ANNE ARUNDEL COUNTY, MARYLAND

_____(SEAL)
Christine M. Anderson,
Chief Administrative Officer - Date

APPROVED FOR FORM AND LEGAL SUFFICIENCY
GREGORY SWAIN, COUNTY ATTORNEY

_____
Assistant County Attorney Date

APPROVED FOR SUFFICIENT FUNDS, AND ENCUMBRANCE OF SAME:

_____
Controller Date

ATTACHMENT A

Prevailing Wage and Local Hiring Requirements for Capital Improvement Construction Contracts Addendum to the General Conditions of Contract between County and Contractor

The Contractor and all Subcontractors must comply with the Prevailing Wage Law and Local Hiring Requirements contained in Chapters 8-2-115 and 8-2-116 of the Anne Arundel County Code. Prevailing wage means the wage rate paid by employers that is determined by a governmental authority, based upon a particular geographic area, for a given class of labor and type of project. This rate means the basic hourly rate and fringe benefit rate established annually by the State of Maryland Commissioner of Labor and Industry for state funded construction contracts in the County and issued with the formal solicitation of the capital improvement contract. 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.

For the purposes of these requirements, employee means an apprentice, laborer or mechanic employed by a contractor on a capital improvement project, including any subcontractors, with a value of over $250,000, or a capital project with a value over $5,000,000. For local hiring requirements set forth in law, they will apply once the threshold of $1,000,000 is met for capital improvement projects.

In the event of a conflict between this addendum, and any other document of the County or understanding between the parties, including but not limited to any capital improvement or capital project contract document and/or solicitation executed or solicited after July 1, 2022, the general conditions or standard specifications of the Department of Public Works including, but not limited to, the design manual and any procurement documents and guidelines relating to capital improvement projects or capital projects, the Purchasing Regulations of the County, and this Addendum-THIS PREVAILING WAGE AND LOCAL HIRING CONTRACT ADDENDUM SHALL CONTROL.

This capital improvement and/or capital project does not include blanket order or open end agreements in which the individual purchase order does not have a value over $250,000, or capital improvement projects subject to a federal or state prevailing wage law, awarded without competition; it is not with another governmental entity; the contractor is not precluded from compliance by the terms of any federal or state law, contract or grant; it is not entered into pursuant to Anne Arundel County Code Section 8-1-107(B); 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 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 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. These rates must be set forth in the Contractor's response to the County's formal solicitation and included as part of the Contract as a condition precedent to any agreement with the County qualifying for the prevailing wage law. Cost estimates may also be required along with reporting requirements for local hiring when applicable. 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. This rate means the basic hourly rate and fringe benefit rate established annually by the State of Maryland Commissioner of Labor and Industry for state funded construction contracts in the County included in the formal solicitation for the capital improvement contract. 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. Wage deductions must be fair and reasonable and may only be made when (1) required by law; (2) authorized in a written agreement between the employee and contractor signed at the beginning of employment that concern food, sleeping quarters, or similar items; and are submitted by the contractor to the Director of the County's Prevailing Wage Program; or are required or allowed by a collective bargaining agreement between a bonafide labor organization and a contractor. Contractors may NOT split or subdivide a capital improvement contract or a subcontract awarded pursuant to the capital improvement contract, pay an employee through a third party, treat the employee as a subcontractor or independent contractor to avoid any requirement of the County's prevailing wage or local hiring laws; or employ an individual classified as a helper or trainee to perform direct and measurable work under a capital improvement contract.

2. Pay employees at a rate equal to or more than the regular prevailing wage rate for overtime for the type of work performed for each hour that the employee performs direct and measurable 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.

3. Classify employees in their proper work classification in conformance with the schedule established by the State of Maryland Commissioner of Labor and Industry;

4. The Contractor may only deduct wages fairly and reasonably when (1) required by law; (2) authorized in a written agreement between the employee and contractor signed at the beginning of employment that concern food, sleeping quarters, or similar items; and are submitted by the contractor to the Director of the County's Prevailing Wage Program; or are required or allowed by a collective bargaining agreement between a bonafide labor organization and a contractor.

5. Electronically submit payroll records through (pending procurement), within 14 days after the end of each payroll period, to verify that Prevailing Wage rates have been paid to employees. A contractor must submit a certified complete copy of its payroll records for a capital improvement contract covered by the County's Prevailing Wage or local hiring laws within 14 days after the end of each payroll period.

6. Contractors must retain records for a period of five years after the work is completed and must permit the Director of the Department that administers the Prevailing Wage program, or their designee, to inspect the payroll records at a reasonable time and as often as necessary.

7. The Contractor's payroll records shall contain a statement signed by the contractor attesting and certifying that the payroll records are complete and correct; the wage rates are not less than required by the County Code and Purchasing Regulations; and the rate of pay and classification for each employee accurately reflects the work the employee(s) performed.

8. All payroll records shall include the name, address, telephone number and email of the contractor; the name and location of the job; and each employee's name, current address unless previously reported; current address unless previously reported; specific work classification; daily basic time and overtime hours; total basis time and overtime hours for the payroll period; rate of pay; fringe benefits by type and amount; and gross wages.

9. The County may in their sole discretion perform random or regular audits and investigate any complaint of a violation of the County's prevailing wage and local hiring laws and requirements If a Contractor or any Subcontractors are late in submitting copies of any payroll records required to be submitted under the Prevailing Wage Law, the County may deem Contractor's invoice(s) submitted to the County for payment unacceptable until the Contractor and Subcontractors provide the required records; and, the County may postpone processing payments otherwise due under the Contract or under an agreement to finance the Contract;

10. A Contractor must make best efforts to fill at least 51% of new jobs required to complete the capital improvement contract or capital project with Anne Arundel County residents. Further, the Contractor will submit quarterly reports relating to local hiring with respect to a capital project or capital improvement project meeting the necessary requirements that lists the number of new hires needed for the contract during the reporting period, the number of County residents hired during the reporting period, the number of all employees hired during the reporting period. The local hiring reporting will include a description of the best efforts made to fill open positions with County residents. New hires reported must list their name, the last four digits of their social security number, the job title, the hire date, the address and the referral source.

11. Any and all disputes will be handled as set forth in the County's prevailing wage and local hiring law. The Contractor agrees to this method of resolving disputes and waives any right of appeal or claims beyond that set forth in the prevailing wage and local hiring law 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 may withhold payment to the Contractor in an amount sufficient to pay each employee of the Contractor or any Subcontractors the full amount of wages due under the Prevailing Wage Law, and an amount sufficient to satisfy a liability of a Contractor or any Subcontractors for liquidated damages as provided under the Prevailing Wage Law, pending a final decision on the violation by the County;. Contractor may appeal a written decision of the Director of Central Services, that the Contractor violated a provision of the Prevailing Wage Law to the Purchasing Agent, within ten (10) days after receiving a copy of the decision. If they do not appeal, the decision of the Director or their designee is final. Within a reasonable time of receipt of a timely appeal, the purchasing agent may investigate, request written testimony, or conduct a hearing as they deem necessary for the review of appeal. The parties agree that the decision of the Purchasing Agent is final and binding and not subject to appeal. The Contractor will cooperate and provide testimony upon request. A Contractor who is found to have violated the provisions of the local hiring law intentionally, may not be awarded a county contract or work on any county contract for a period of one year from the date of the final decision.

13. If a party is found late in submitting copies of payroll records deemed required under the County's prevailing wage and local hiring laws and regulations, the County may deem the invoices deficient until the Contractor provides the required records and may postpone processing payments until the Contractor provides the required records and may postpone processing payments under the contract or agreement with the County.

14. Contractor and all Subcontractors must not discharge, or otherwise retaliate against, an employee for asserting any right under the Prevailing Wage Law or for filing a complaint of a violation.

15. An aggrieved employee is a third-party beneficiary of this Contract and the employee may by civil action recover the difference

between the prevailing wage for the type of work performed and the amount actually received, with interest and a reasonable attorney's fee in the amount of three times the wages owed to a specific employee or apprentice, this right is incorporated into the Contract.

16. Each Contract subject to the Prevailing Wage Law may specify the payment of liquidated damages to the County by the Contractor and any Subcontractors for any noncompliance with the Prevailing Wage Law. Liquidated damages are:

(a) $10 for each calendar day that the payroll records are late; $10 per day for each day that an employee is misclassified; and $10 per violation of the requirement to post the prevailing wage rates at the work site.
(b) Liquidated damages as set forth in Section 15 for the benefit of the third party employee; and
(c) Liquidated damages as set forth for delays in performance or work under the Contract in B1-2 are separate from prevailing wage and/or local hiring.

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.

17. Where the initial Contract Sum is below the monetary threshold, but it is subsequently increased and exceeds the monetary threshold due to an approved Contract Modification, the amount of any such Contract Modification that causes the Contract Sum to exceed the monetary threshold is subject to the Prevailing Wage Law and local hiring requirements.

18. The County also reserves the right to withhold payment pending receipt of payroll records or local hiring reports until such time as they are accurately provided in the County's sole and exclusive discretion.

19. 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.

20. Contractors and all Subcontractors and employees, including apprentices, as defined within the law must provide reporting for local hiring as required by the law on such forms and in such substance as may be required by the County. Failure to provide local hiring reporting may result in a finding of non compliance.

*NOTE: THIS FORM MUST BE ACCOMPANIED BY A VALID POWER OF ATTORNEY

ANNE ARUNDEL COUNTY, MARYLAND

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

CONTRACTOR'S PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____,

as Principal, hereinafter called Principal, and _____, as Surety, hereinafter called Surety, are held and firmly bound unto the Anne Arundel County, Maryland, a body corporate and politic of the State of Maryland, hereinafter called the County, in the amount of _____Dollars ($_____) *(amount to be 100% of Contract Amount),* for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a Written Contract dated _____ with the County for Project No.: S802300 Contract No.: S802380 which contract is by reference made a part hereof and hereinafter referred to as the Contract.

NOW, THEREFORE, the condition of this obligation is such, that if the Principal shall well, truly and properly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said Contract and of all such alterations and modifications thereof as may hereafter be made therein, in the manner and to the extent which said Contract provides for such alterations and modifications, during the original term of said Contract and any extensions thereof which may be granted by the County and agreed upon by the Principal; and if the Principal shall

*NOTE: THIS FORM MUST BE ACCOMPANIED BY A VALID POWER OF ATTORNEY
indemnify and save harmless the County from all loss, cost or damage arising out of a default hereunder or under said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety expressly waives any right to receive NOTICE of extensions of time, or alterations or modifications of the Contract, which are provided for and made pursuant to the terms of, said contract.

PROVIDED, HOWEVER, no right of action shall accrue on this bond to or for the use of any person, firm or corporation whatever other than the County named herein, or its successors in office.

Signed and sealed this _____ day of, _____, _____.

In the Presence of:

_____
(Contractor)

WITNESS:

_____ _____ (SEAL)
Signature of Principal/Corporate Officer

_____ (SEAL)
Title

_____
Surety

***By*: _____ (SEAL)**

_____
Bond No.

NOTE: THIS FORM MUST BE ACCOMPANIED BY A VALID POWER OF ATTORNEY

ANNE ARUNDEL COUNTY, MARYLAND

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

CONTRACTOR'S PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____, as Principal, hereinafter called Principal, and _____, as Surety, hereinafter called Surety, are held and firmly bound unto the Anne Arundel County, Maryland, a body corporate and politic of the State of Maryland, hereinafter called the County, for the use and benefit of Claimant, as herein below defined, in the amount of _____ Dollars ($_____) *(amount of bond to be 50% of Contract Amount)*, for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a Written Contract dated _____with the County for Project No.: S802300 Contract No.: S802380 which contract is by reference made a part hereof and hereinafter referred to as the Contract.

NOW, THEREFORE, the condition of this obligation is such, that if the principal shall promptly make payment to each and every Claimant, as hereinafter, defined, for all labor, materials, supplies and rental of equipment reasonably required and used or consumed in the performance of the Contract and of all such alterations and modifications of said Contract provides for such alterations and modifications, during the original term of said Contract and any extensions thereof which may be granted by the County and agreed upon by the Principal, then this obligation shall be

null and void; otherwise it shall be and remain in full force and effect.

The Surety expressly waives any right to receive notice of extensions of time, or alterations or modifications of the Contract, which are provided for and made pursuant to the terms of, said Contract.

PROVIDED, HOWEVER, anything in said Contract to the contrary notwithstanding, this bond is executed upon and subject to the express conditions and limitations of State Finance and Procurement Article, Section 17-108 and 17-109, Annotated Code of Maryland, as of the date of this contract wherein it is set forth in pertinent part as follows:

Action on security.

(a) *In general.* -- Subject to subsection (b) of this section, a supplier may sue on payment security if the supplier:

(1) Supplied labor or materials in the prosecution of work provided for in a contract subject to this subtitle; and

(2) Has not been paid in full for the labor or materials within 90 days after the day that the person last supplied labor or materials for which the claim is made.

(b) *Payment owed by subcontractor.* –

(1) A supplier who has a direct contractual relationship with a subcontractor or sub-subcontractor of a contractor who has provided payment security but no contractual relationship with the contractor may sue on the security if the supplier gives written notice to the contractor within 90 days after the labor or materials for which the claim is made were last supplied in prosecution of work covered by the security.

(2) A notice under this subsection:

(i) Shall state with substantial accuracy the amount claimed and the person to whom the labor or material was supplied; and

(ii) Shall be sent by certified mail to the contractor at the contractor's residence or a place where the contractor has an office or does business.

Venue; limitations; costs.

*NOTE: THIS FORM MUST BE ACCOMPNIED BY A VALID POWER OF ATTORNEY

(a) *Venue.* -- An action on a payment bond required by this subtitle shall be filed in the appropriate court of the county where:

(1) The contract was executed and performed; or

(2) The contractor has its principal place of business.

(b) *Limitations period.* -- An action on a payment bond required by this subtitle shall be filed within 1 year after the public body finally accepts the work performed under the contract.

Signed and sealed this _____ day of _____,_____.

In the Presence of:

_____
(Contractor)

WITNESS:

_____ _____(SEAL)
Signature of Principal/Corporate Officer

_____(SEAL)
Title

_____
Surety

By: _____

_____
Bond No.

ANNE ARUNDEL COUNTY, MARYLAND

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

CORPORATE RESOLUTION

RESOLVED, that _____ be, and it is hereby authorized to do business and enter into contracts and agreements with Anne Arundel County, Maryland,

RESOLVED, that _____ and _____ who are respectfully the _____ and _____, or its duly authorized agent(s) of the _____are authorized to file and sign contracts on behalf of the said Corporation.

AND IT IS FURTHER RESOLVED, that the authority to said officer(s) or agent(s) conferred by this Resolution shall remain open and good until revoked by a formal action of the Board of Directors of the Corporation and due notice of such revocation delivered to the Anne Arundel County, Maryland in writing under the signature of the Secretary or Assistant Secretary of this Corporation, and this authority shall apply to any present or future incumbent of the aforesaid office.

I HEREBY CERTIFY that the above is a true copy of the Resolution of the Board of Directors of _____, passed at a meeting of said Board duly called and held on the day of _____,_____, at which meeting a quorum of said Board of Directors was present and voted.

_____
Secretary

SEAL

*NOTE: THIS FORM MUST BE ACCOMPANIED BY A VALID POWER OF ATTORNEY.

ANNE ARUNDEL COUNTY, MARYLAND

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

BID BOND

KNOW ALL MEN BY THESE PRESENT, that we

_____ hereinafter called the "Principal" and
Company Name

_____
Surety

as Surety ("Surety"), are held and firmly bound unto Anne Arundel County, Maryland, hereinafter called the "Owner" in the penal sum of _____ Dollars ($_____) lawful money of the United States, for the payment of which sum well and truly make, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying bid dated _____ for the Patuxent Water Reclamation Facility Air Piping and Support Repairs, Anne Arundel County, Maryland.

NOW THEREFORE, if the Principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period is specified, within ninety (90) days after said opening; and within ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the Owner, in accordance with the bid as accepted and give Bond with good and sufficient surety or sureties, as may be required for the faithful performance and proper fulfillment of such contract; or in the event of the withdrawal of said bid within the period specified or the failure to enter into such contract and give such bond within the time specified if the principal shall pay the Owner the difference between the amount specified in said bid and the amount for which the Owner may procure the required work or supplies, or both, if the latter amount be in excess of the former, then the above obligation shall be void, and of no effect, otherwise to remain in full force and effect.

*NOTE: THIS FORM MUST BE ACCOMPANIED BY A VALID POWER OF ATTORNEY.

IN WITNESS WHEREOF, the above bonded parties have executed this instrument under their several seals this _____day of _____,_____, 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 the Presence of:

_____
(Contractor)

WITNESS:

_____ _____**(SEAL)**
Signature of Principal/Corporate Officer

_____**(SEAL)**
Title

_____
Surety

***By:*_____**

_____
Bond No.

NOTE: THIS FORM TO BE SUBMITTED BY APPARENT LOW BIDDER WITHIN TEN DAYS OF REQUEST BY THE COUNTY

ANNE ARUNDEL COUNTY

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

EXPERIENCE AND EQUIPMENT CERTIFICATION

I. General

a. Legal Title, Address and Phone Number of Organization

_____
_____
_____
_____
_____
_____

b. Maryland Representative's Name, Title and Address.

_____
_____
_____
_____
_____
_____

c. (Check one) Corporation _____ Co-Partnership_____ Individual _____

II. Experience

a. Indicate type of contracting undertaken by your organization and years experience.

General _____ Sub _____ Type _____
Years Years Years
Type _____
Years
Type _____
Years

NOTE: THIS FORM TO BE SUBMITTED BY APPARENT LOW BIDDER WITHIN TEN DAYS OF REQUEST BY THE COUNTY

b. State construction experience of principal members of your organization.

Construction Experience

NAME	TITLE (As Pres., Mgr, etc.)	CONSTRUCTION EXPERIENCE YEARS	TYPE OF WORK (Sewer, Hwy, Bridges, Paving, etc.)	IN WHAT CAPACITY (Supt, Foreman)

c. Give any special qualifications of firm members (Registered Engineer, Surveyors, etc.)

_____

_____

_____

d. List Principal projects completed by your organization.

Description	Gen. or Sub (If sub, what type of work)	Your Contract Amount	Year	Reference

e. Have you ever failed to complete any work awarded to you? _____
If so, where and why? _____

_____

_____

_____

NOTE: THIS FORM TO BE SUBMITTED BY APPARENT LOW BIDDER WITHIN TEN DAYS OF REQUEST BY THE COUNTY

f. Has your firm been assessed liquidated damages within the last three years? If so, explain circumstances. (*Attach separate sheet)*

III. Financial Capability

The following financial data shall be provided upon request of the County. If the Bidder is a subsidiary of another firm, then the information requested should be provided for both the Bidder and the parent organization, as it may be applicable to the Bid.

a. The Bidder's most recent Form 10-K, as filed with the U.S. Securities and Exchange Commission ("SEC") and all Form 100's since the last 10-K,

b. All Bidders not filing a Form 10K with the SEC should submit the following information:

1. Federal Tax Returns for the last three (3) years;

2. Audited financial statements for the past three (3) fiscal years to include, at a minimum, income statement, balance sheet, and statement of changes in financial position;

3. Copies of quarterly financial reports since the last audited statement;

4. Any material changes in the mode of conducting business, bankruptcy proceedings, and mergers or acquisitions for the past three years, as well as any disclosure of any potential mergers or acquisitions; and

5. Any and all lawsuits filed against the Bidder since January 1, 1988 and a statement as to the outcome or current status of each such lawsuit.

c. A full and complete description of the legal and financial relationships among all entities which will be bound by the terms and conditions of the Contract including any entities which will guarantee the obligations of, or provide financial support to, any such parties.

IV. Bidder Certification

The above statements are certified to be true and accurate and we have the equipment, labor, supervision and financial capacity to perform this Contract, either with our organization, or with subcontractors.

NOTE: THIS FORM TO BE SUBMITTED BY APPARENT LOW BIDDER WITHIN TEN DAYS OF REQUEST BY THE COUNTY

Dated at _____ this _____ day of _____,_____.

By: _____

_____
(**Title of Person Signing**)

_____
(**Name of Organization**)

State of _____

County of _____

_____ Being duly sworn states that he/she
Name

is _____ of _____
(Office) (Name of Organization)

and that the answers to the foregoing questions and all statements therein contained are true and correct.

Sworn to before me this _____ day of _____,_____.

_____
Notary Public

My Commission Expires

_____

NOTE: THIS FORM IS TO BE SUBMITTED BY THE APPARENT LOW BIDDER WITHIN TEN DAYS OF REQUEST BY THE COUNTY. *(please type or print information clearly)*

ANNE ARUNDEL COUNTY

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

LIST OF SUBCONTRACTORS AND EQUIPMENT SUPPLIERS

NAME OF GENERAL/PRIME CONTRACTOR:_____

Subcontractor's Type of Work or Supplier's Type of Equipment	Name	Address	Percent of Total Contract	Value of Sub-Contract	MBE SBE or WBE

NOTE: THIS FORM IS TO BE SUBMITTED BY THE APPARENT LOW BIDDER WITHIN TEN DAYS OF REQUEST BY THE COUNTY. *(please type or print information clearly)*

Subcontractor's Type of Work or Supplier's Type of Equipment	**Name**	**Address**	**Percent of Total Contract**	**Value of Sub-Contract**	**MBE SBE or WBE**

ANNE ARUNDEL COUNTY

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

APPENDIX "A"

CONTRACTOR CUSTOMER SERVICE PROGRAM

Customer Relations Requirements

All consultants, contractors, subcontractors, suppliers and etc., are required to assume their part in the County's Customer Oriented Programs. A description of the Department's policy and its action items are as follows:

"The Department of Public Works has a customer oriented philosophy that requires all employees, consultants, contractors, etc., to adhere to the five dimensions of quality service."

The Five Dimensions of Quality Service Are:

1. Reliability: Is what was promised provided dependably and accurately?

    a. Scheduling
    b. Proper notification
    c. Traffic control
    d. Sediment control
    e. Quality of work

2. Assurance: Are the employees knowledgeable and courteous, and can they express trust and confidence?

    a. Citizen interaction - knowledgeable
    b. Concerns remedied

3. Empathy: Are caring and individual attention provided?

    a. Citizen interaction - polite, courteous
    b. Callbacks will be treated as part of the construction effort

4. Responsiveness: Is there a willingness to help customers and provide proper service?

a. Response to citizen concern within two days. If required work is anticipated to exceed two days, a schedule must be provided indicating when work will be completed.

b. Additionally, follow-up must be accomplished. Whether the work is complete or not, the follow-up must be done.

5. Tangibles: Are the physical facilities and equipment customer friendly?

a. Traffic control
b. Sediment control
c. Safe driving - includes control of speed of vehicles
d. Sanitary facilities provided for manpower

As a means of ensuring the contractor's participation, each contractor must provide a customer plan and a team composition responsible for adhering to the "Five Dimensions of Customer Service" given previously. Additionally, the plan and the team composition are to be submitted within fourteen (14) calendar days of NTP or concurrent with the contractor's on-site mobilization. The team leader is required to oversee the entire program and be available to assist in resolution of concerns. The other members of the team will provide courteous and prompt assistance to concerns. Any contractor's employee(s) not performing in accordance with the above will be subject to removal from further participation in the project upon written order from the County representative. Failure to participate or respond as required shall be cause for termination of the contract for non-performance.

ANNE ARUNDEL COUNTY

Patuxent Water Reclamation Facility Air Piping and Support Repairs
Proposal No.: S802300
Project No.: S802380

APPENDIX "B"

CONTRACTOR SECURITY PROGRAM

This appendix describes measures to be taken by the contractor to reduce the risk of vulnerability to Anne Arundel County Department of Public Works (DPW) Utility Operations facilities for each of the Homeland Security Threat Advisory Levels. Utility Operations personnel may take measures based on the Department of Public Works Policy and Procedures Manual that will impact the contractor's work. Consultants, contractors, subcontractors, suppliers, etc. are required to perform their part in this program.

The following measures shall be implemented based on the security threat level declared by Utility Operations.

Standard Practice & Measures

1 Carry identification while on Utility Operations property. Minimum identification may consist of a printed or hand written business card or paper bearing the hiring company's name, the individual's name and the signature of the hiring company foreman, supervisor or other representative.

2 Challenge unknown visitors. Request identification and purpose of visit.

3 Review security procedures with personnel.

4 Report suspicious activity (carrying suitcases / containers, photographing, noting or asking questions about operations, pumping or pipeline operations or security measures) to supervision. Supervision determines whether to contact law enforcement and chain of command.

5 Report unidentified vehicles parked or operated in a suspicious manner on or in Utility Operations facilities, equipment or rights-of-way. Notify supervision of infractions. Supervision determines whether to contact law enforcement and chain of command.

Elevated Threat Advisory Level – No Specific Information on Timing or Location

1 Remind personnel to:

a. Carry identification while on Utility Operations property. Minimum identification may consist of a printed or hand written business card or paper bearing the hiring company's name, the individual's name and the signature of the hiring company foreman, supervisor or other representative.

b. Challenge unknown visitors.

c. Request identification and purpose of visit.

2 Cease public tours.

3 If directed by Utility Operations:

a. Remove vehicles and objects (e.g. dumpsters) parked within 25 yards of specified facilities.

b. Park vehicles outside facilities. Implement centralized parking and shuttle service.

c. Report suspicious vehicles or objects to Utility Operations supervision.

d. Verify the identity of individuals entering specified facilities.

e. Facility gates and entrances will be locked, except when passing through. Limit access to essential employees and contractors. Verify the identity of individuals entering facilities. Issue visitor badges to visitors.

f. Inspect buildings, rooms and storage areas not in regular use, daily.

g. Inspect the interior and exterior of buildings for suspicious activities or packages. Check for signs of tampering or indications of unauthorized entry.

4 Utility Operations may:

a. Erect barriers to control the direction of traffic flow and parking.

b. Consult with law enforcement to close public roads and facilities.

Imminent Threat Advisory Level – Threat at Location Impending or Very Soon

1 Remind personnel to:

a. Display identification while on Utility Operations property. Minimum identification may consist of a printed or hand written business card or paper bearing the hiring company's name, the individual's name and the signature of the hiring company foreman, supervisor or other representative.

b. Challenge unknown visitors.

c. Request identification of anyone not displaying it and ask the purpose of his or her visit.

2 Limit access to facilities and activities to personnel with legitimate and verifiable need to enter.

a. Cease Public Tours

3 Buildings, rooms, and storage areas will be locked. Inspect baggage, briefcases, and packages brought to the facility.

4 If directed by Utility Operations:

a. Remove vehicles and objects (e.g. dumpsters) parked within 25 yards of specified facilities. Identify owners of vehicles on Utility Operation property. Have unidentified vehicles inspected by law enforcement personnel and, if appropriate, removed.

b. Park vehicles outside facilities. Implement centralized parking and shuttle service.

c. Inspect delivery vehicles and containers entering the facility. Require advance delivery notification and validate credentials of the driver.

d. Implement daily inspections of specified buildings and grounds.

e. Take steps to control access to specified facilities.

f. Facility gates and entrances will be locked, except when passing through. Limit access to essential employees and contractors. Verify the identity of individuals entering facilities. Issue visitor badges to visitors.

g. Inspect buildings, rooms and storage areas not in regular use daily.

h. Inspect the interior and exterior of buildings for suspicious activities or packages. Check for signs of tampering or indications of unauthorized entry.

i. Implement mailroom procedures. Have mail and packages sent to a central, secure location and inspected before distribution.

5 Utility Operations may:

a. Restrict access to specific facilities.

b. Request closure of public roads and facilities in the vicinity of specified facilities.

c. Stop work in part or in total.

d. Erect barriers to control the direction of traffic flow and parking.

e. Consult with law enforcement to close public roads and facilities.

f. Post guards.

APPENDIX C

PREVAILING WAGE AND LOCAL HIRING

MANDATORY REQUIREMENTS

The Contractor and all Subcontractors must comply with the Prevailing Wage Law and Local Hiring Requirements contained in Chapters 8-2-115 and 8-2-116 of the Anne Arundel County Code and Anne Arundel County Bill 72-21, 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 State of Maryland Commissioner of Labor and Industry rates for state funded construction contracts for Wage Determinations in the County at the time of award of the capital improvement contract, 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 provision:

For the purposes of these requirements, an employee means an apprentice, laborer or mechanic employed by a contractor on a capital improvement project, including any subcontractors, with a value of over $250,000, or a capital project with a value over $5,000,000.

Capital Improvement Project does not include blanket order or open end agreements, or 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 Anne Arundel County Code Section 8-1-107(B); 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 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 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. 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. This rate means the basic hourly rate and fringe benefit rate established annually by the State of Maryland Commissioner of Labor and Industry for state funded construction contracts in the County at the time of award of the capital improvement contract. 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. Wage deductions must be fair and reasonable and may only be made when (1)

required by law; (2) authorized in a written agreement between the employee and contractor signed at the beginning of employment that concern food, sleeping quarters, or similar items; and are submitted by the contractor to the Director of the County's Prevailing Wage Program; or are required or allowed by a collective bargaining agreement between a bonafide labor organization and a contractor. Contractors may NOT split or subdivide a capital improvement contract or a subcontract awarded pursuant to the capital improvement contract, pay an employee through a third party, treat the employee as a subcontractor or independent contractor to avoid any requirement of the County's prevailing wage or local hiring laws; or employ an individual classified as a helper or trainee to perform direct and measurable work under a capital improvement contract.

2. Pay employees at a rate equal to or more than the regular prevailing wage rate for overtime for the type of work performed for each hour that the employee performs direct and measurable 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.;

3. Classify employees in their proper work classification in conformance with the schedule established by the State of Maryland Commissioner of Labor and Industry.

4. The Contractor may only deduct wages fairly and reasonably when (1) required by law; (2) authorized in a written agreement between the employee and contractor signed at the beginning of employment that concern food, sleeping quarters, or similar items; and are submitted by the contractor to the Director of the County's Prevailing Wage Program; or are required or allowed by a collective bargaining agreement between a bonafide labor organization and a contractor.

5. Electronically submit payroll records through (pending procurement), within 14 days after the end of each payroll period, to verify that Prevailing Wage rates have been paid to employees. A contractor must submit a certified complete copy of its payroll records for a capital improvement contract covered by the County's Prevailing Wage or local hiring laws within 14 days after the end of each payroll period.

6. Contractors must retain records for a period of five years after the work is completed and must permit the Director of the Department that administers the Prevailing Wage program, or their designee, to inspect the payroll records at a reasonable time and as often as necessary.

7. The Contractor's payroll records shall contain a statement signed by the contractor attesting and certifying that the payroll records are complete and correct; the wage rates are not less than required by the County Code and Purchasing Regulations; and the rate of pay and classification for each employee accurately reflects the work the employee(s) performed.

8. All payroll records shall include the name, address, telephone number and email of the contractor; the name and location of the job; and each employee's name, current address unless previously reported; current address unless previously reported; specific work classification; daily basic time and overtime hours; total basis time and overtime hours for the payroll period; rate of pay; fringe benefits by type and amount; and gross wages.

9. The County may in their sole discretion perform random or regular audits and investigate any complaint of a violation of the County's prevailing wage and local hiring laws and requirements If a Contractor or any Subcontractors are late in submitting copies of any payroll

records required to be submitted under the Prevailing Wage Law, the County may deem Contractor's invoice(s) submitted to the County for payment unacceptable until the Contractor and Subcontractors provide the required records; and, the County may postpone processing payments otherwise due under the Contract or under an agreement to finance the Contract;

10. A Contractor must make best efforts to fill at least 51% of new jobs required to complete the capital improvement contract or capital project with Anne Arundel County residents. Further, the Contractor will submit quarterly reports relating to local hiring with respect to a capital project or capital improvement project meeting the necessary requirements that lists the number of new hires needed for the contract during the reporting period, the number of County residents hired during the reporting period, the number of all employees hired during the reporting period. The local hiring reporting will include a description of the best efforts made to fill open positions with County residents. New hires reported must list their name, the last four digits of their social security number, the job title, the hire date, the address and the referral source.

11. Any and all disputes will be handled as set forth in the County's prevailing wage and local hiring law. The Contractor agrees to this method of resolving disputes and waives any right of appeal or claims beyond that set forth in the prevailing wage and local hiring law 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 may withhold payment to the Contractor in an amount sufficient to pay each employee of the Contractor or any Subcontractors the full amount of wages due under the Prevailing Wage Law, and an amount sufficient to satisfy a liability of a Contractor or any Subcontractors for liquidated damages as provided under the Prevailing Wage Law, pending a final decision on the violation by the County;. Contractor may appeal a written decision of the Director of Central Services, that the Contractor violated a provision of the Prevailing Wage Law to the Purchasing Agent, within ten (10) days after receiving a copy of the decision. If they do not appeal, the decision of the Director or their designee is final. Within a reasonable time of receipt of a timely appeal, the purchasing agent may investigate, request written testimony, or conduct a hearing as they deem necessary for the review of appeal. The parties agree that the decision of the Purchasing Agent is final and binding and not subject to appeal. The Contractor will cooperate and provide testimony upon request. A Contractor who is found to have violated the provisions of the prevailing wage or local hiring law intentionally, may not be awarded a county contract or work on any county contract for a period of one year from the date of the final decision.

13. If a party is found late in submitting copies of payroll records deemed required under the County's prevailing wage and local hiring laws and regulations, the County may deem the invoices deficient until the Contractor provides the required records and may postpone processing payments until the Contractor provides the required records and may postpone processing payments under the contract or agreement with the County.

14. Contractor and all Subcontractors must not discharge, or otherwise retaliate against, an employee for asserting any right under the Prevailing Wage Law or for filing a complaint of a violation;

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

16. Each Contract subject to the Prevailing Wage Law may specify the payment of liquidated damages to the County by the Contractor and any Subcontractors for any noncompliance with the Prevailing Wage Law. Liquidated damages are:

    a. $10 for each calendar day that the payroll records are late; $10 per day for each day that an employee is misclassified; and $10 per violation of the requirement to post the prevailing wage rates at the work site.

    b. Liquidated damages as set forth in Section 15 for the benefit of the third party employee; and

    c. Liquidated damages as set forth for delays in performance or work under the Contract in B1-2 are separate from prevailing wage and/or local hiring.

    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.

17. Where the initial Contract Sum is below the monetary threshold, but it is subsequently increased and exceeds the monetary threshold due to an approved Contract Modification, the amount of any such Contract Modification that causes the Contract Sum to exceed the monetary threshold is subject to the Prevailing Wage Law and local hiring requirements.

18. 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.

19. Local hiring requirements include quarterly reporting to Central Services and/or their designee on the form designated by the Purchasing Agent which contain the following with regards to qualifying capital improvement projects of $1,000,000 or more and capital projects of $5,000,000 of 1)the number of new hires needed for the contract reporting period, 2) the total number of anne arundel county residents during the reporting period, 3) the total number of all employees hired during the contract period, 4) best efforts made to fill the open positions with Anne Arundel County residents; and 5) for a new hire during the reporting period: name, last four digits of the social security number, job title, hire date, address and referral source.

20. If the Purchasing Agent finds that the Contractor violated the local hiring law and it is found that the violation was intentional the Director of Central Services may in their sole discretion find that the contractor, any of its principals, or any firm, corporation or partnership in which the Contractor has an interest, may not be awarded on any County contract for one year from the date of the final decision. If a Contractor is late in submitting local hiring reports required

to be submitted pursuant to the Anne Arundel County Code, the County may postpone processing payments due under the contract until the required reports are submitted.

21. In lieu of hearings, all appeals or determinations will be done through written testimony at the discretion of the Director of Central Services. Reasonable accommodations will be granted upon request. If the Director of Central Services determines that a Contractor has not made best efforts or reported as required for local hiring as required, the Director of Central Services shall issue a written decision detailing the basis for the determination. A Contractor may appeal a written decision of the Director that the Contractor violated a provision of this section to the Purchasing Agent within ten working days after receiving a copy of the decision. If the Contractor does not appeal the Director's decision within ten working days after receipt for either prevailing wage or local hiring, the Purchasing Agent's decision on the appeal is not subject to the appeal. The Purchasing Agent may investigate appeals provided prior to that time, request written testimony which must be provided to continue an appeal, or even conduct a hearing, as the Purchasing Agent deems necessary for the review of the appeal.

INFORMATIONAL WAGE RATES

The wage rates listed below are published by the State of Maryland, Division of Labor and Industry, Prevailing Wage Unit.

The wage rates posted on this site are provided for **informational** purposes ONLY.

The wage and fringe rates may change between the time of issuance of the wage determinations and the award of the public works contract. Therefore, prior to the award of the public works contract, verification must be made with the public body, to insure that the rates contained in this determination are still prevailing.

These **Informational Prevailing Wage Rates** may not be substituted for the requirements of pre-advertisement for bids or onsite job posting for a public work contract that exceeds $250,000 in value and either of the following criteria are met: (1) the contracting body is a unit of State government or an instrumentality of the State and there is any State funding for the project; or (2) the contracting body is a political subdivision, agency, person or entity (such as a county) and the State funds 25% or more of the project.

ANNE ARUNDEL COUNTY **BUILDING CONSTRUCTION** **Print Date Apr 02, 2024**

CLASSIFICATION	MODIFICATION REASON	BASIC HOURLY RATE	BORROWED FROM	FRINGE BENEFIT PAYMENT
BALANCING TECHNICIAN	AD	$45.37		$23.48
BOILERMAKER	AD	$43.37		$25.67
BRICKLAYER	AD	$36.50		$13.77
CARPENTER	AD	$33.21		$14.03
CARPENTER - SHORING SCAFFOLD BUILDER	AD	$33.21		$14.03
CARPET LAYER	AD	$33.34		$14.40
CEMENT MASON	AD	$28.70		$12.55
COMMUNICATION INSTALLER TECHNICIAN	AD	$27.98		$11.30
DRYWALL - SPACKLING, TAPING, & FINISHING	AD	$33.21		$14.03
ELECTRICIAN	AD	$45.06		$19.56
ELEVATOR MECHANIC	AD	$54.02		$44.39
FIRESTOPPER	AD	$29.41		$9.48
INSULATION WORKER	AD	$39.27		$19.42
IRONWORKER - ORNAMENTAL	AD	$34.85		$25.17
IRONWORKER - REINFORCING	AD	$32.46		$22.01
IRONWORKER - STRUCTURAL	AD	$36.10		$25.63
LABORER - AIR TOOL OPERATOR	AD	$25.67		$7.58
LABORER - ASPHALT PAVER	AD	$25.67		$7.58
LABORER - ASPHALT RAKER	AD	$19.73		$6.39
LABORER - BLASTER - DYNAMITE	AD	$25.67		$7.58
LABORER - BURNER	AD	$25.67		$7.58
LABORER - COMMON	AD	$19.73		$6.39
LABORER - CONCRETE PUDDLER	AD	$19.73		$6.39
LABORER - CONCRETE SURFACER	AD	$25.67		$7.58
LABORER - CONCRETE TENDER	AD	$19.73		$6.39
LABORER - CONCRETE VIBRATOR	AD	$19.73		$6.39
LABORER - DENSITY GAUGE	AD	$19.73		$6.39
LABORER - FIREPROOFER - MIXER	AD	$19.73		$6.39
LABORER - FLAGGER	AD	$19.73		$6.39
LABORER - GRADE CHECKER	AD	$19.73		$6.39
LABORER - HAND ROLLER	AD	$19.73		$6.39

LABORER - HAZARDOUS MATERIAL HANDLER	AD	$25.67		$7.58
LABORER - JACKHAMMER	AD	$19.73		$6.39
LABORER - LANDSCAPING	AD	$19.73		$6.39
LABORER - LAYOUT	AD	$19.73		$6.39
LABORER - LUTEMAN	AD	$19.73		$6.39
LABORER - MASON TENDER	AD	$25.67		$7.58
LABORER - MORTAR MIXER	AD	$19.73		$6.39
LABORER - PIPELAYER	AD	$25.67		$7.58
LABORER - PLASTERER - HANDLER	AD	$19.73		$6.39
LABORER - SCAFFOLD BUILDER	AD	$25.67		$7.58
LABORER - TAMPER	AD	$19.73		$6.39
MECHANICAL SYSTEMS SERVICE TECH- HVAC SYSTEMS	AD	$44.66	510	$23.80
MECHANICAL SYSTEMS SERVICE TECH- PLUMBING SYSTEMS	AD	$44.66	510	$23.80
MILLWRIGHT	AD	$37.33	005	$16.60
PAINTER	AD	$27.46		$11.71
PAINTER-INDUSTRIAL	AD	$34.30	510	$14.78
PILEDRIVER	AD	$35.62		$17.01
PLUMBER	AD	$44.66		$23.80
POWER EQUIPMENT OPERATOR - BACKHOE	AD	$33.38		$13.92
POWER EQUIPMENT OPERATOR - BROOM / SWEEPER	AD	$31.43		$13.92
POWER EQUIPMENT OPERATOR - BULLDOZER	AD	$33.38	510	$13.92
POWER EQUIPMENT OPERATOR - CRANE	AD	$40.00		$17.10
POWER EQUIPMENT OPERATOR - CRANE - TOWER	AD	$40.00	510	$17.10
POWER EQUIPMENT OPERATOR - DRILL - RIG	AD	$33.38		$13.92
POWER EQUIPMENT OPERATOR - EXCAVATOR	AD	$33.38		$13.92
POWER EQUIPMENT OPERATOR - FORKLIFT	AD	$33.38		$13.92
POWER EQUIPMENT OPERATOR - GRADALL	AD	$33.70		$12.85
POWER EQUIPMENT OPERATOR - GRADER	AD	$33.38	005	$13.92
POWER EQUIPMENT OPERATOR - GUARD RAIL POST DRIVER	AD	$23.50	005	$5.07
POWER EQUIPMENT OPERATOR - LOADER	AD	$33.38		$13.92
POWER EQUIPMENT OPERATOR - MECHANIC	AD	$35.44		$13.92
POWER EQUIPMENT OPERATOR - PAVER	AD	$31.30		$12.85
POWER EQUIPMENT OPERATOR - ROLLER - ASPHALT	AD	$31.30		$12.85
POWER EQUIPMENT OPERATOR - ROLLER - EARTH	AD	$27.80		$13.92
POWER EQUIPMENT OPERATOR - SCREED	AD	$30.00	005	$11.80
POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)	AD	$31.43		$13.92
POWER EQUIPMENT OPERATOR-VACUUM TRUCK	AD	$36.30		$14.05
RESILIENT FLOOR	AD	$33.34		$14.40
ROOFER/WATERPROOFER	AD	$36.75	510	$14.71
SHEETMETAL WORKER (INCLUDING METAL ROOFING)	AD	$45.37		$23.48
SPRINKLERFITTER	AD	$40.46		$25.47
STEAMFITTER/PIPEFITTER	AD	$44.66		$23.80
STONE MASON	AD	$43.16		$20.48
TILE & TERRAZZO FINISHER	AD	$27.68		$11.83
TILE & TERRAZZO MECHANIC	AD	$33.41		$12.87
TRUCK DRIVER - DUMP	AD	$23.66	510	$11.90
TRUCK DRIVER - DUMP - ARTICULATING	AD	$27.97	005	$0.79
TRUCK DRIVER - FLATBED	AD	$24.99	005	$7.63
TRUCK DRIVER - LOWBOY	AD	$28.98		$9.58
TRUCK DRIVER - TACK/TAR TRUCK	AD	$28.69		$9.58

Incidental Craft Data: Caulker, Man Lift Operator, Rigger, Scaffold Builder, and Welder receive the wage and fringe rates prescribed for the craft performing the operation to which welding, scaffold building, rigging, operating a Man Lift, or caulking is incidental.

These **Informational Prevailing Wage Rates** may not be substituted for the requirements of pre-advertisement for bids or onsite job posting for a public work contract that exceeds $250,000 in value and either of the following criteria are met: (1) the contracting body is a unit of State government or an instrumentality of the State and there is any State funding for the project; or (2) the contracting body is a political subdivision, agency, person or entity (such as a county) and the State funds 25% or more of the project.

Modification Codes:

(AD) 17-209 Annual Determination from Survey Wage Data Received
(CH) 17-211 Commissioners' Hearing
(CR) 17-208 Commissioners' Review
(SR) 17-208 Survey Review by Staff

Each "Borrowed From" county is identified with the FIPS 3-digit county code unique for the specific jurisdiction in Maryland.

For additional information on the FIPS (Federal Information Processing Standard) code, see http://www.census.gov/datamap/fipslist/AllSt.txt

The Prevailing Wage rates appearing on this form were originally derived from Maryland's annual Wage Survey. The Commissioner of Labor & Industry encourages all contractors and interested groups to participate in the voluntary Wage Survey, detailing wage rates paid to workers on various types of construction throughout Maryland.

A mail list of both street and email addresses is maintained by the Prevailing Wage Unit to enable up-to-date prevailing wage information, including Wage Survey notices to be sent to contractors and other interested parties. If you would like to be included in the mailing list, please forward (1) your Name, (2) the name of your company (if applicable), (3) your complete postal mailing address, (4) your email address and (5) your telephone number to PWMAILINGLIST@dllr.state.md.us. Requests for inclusion can also be mailed to: Prevailing Wage, 1100 N. Eutaw Street - Room 607, Baltimore MD 21201-2201.

END OF REPORT

SECTION 01000

GENERAL REQUIREMENTS

PART 1 - GENERAL

These General Requirements of the Special Provisions are hereby made a part of the Contract.

01000.01 GENERAL

A. The plans and specifications are intended to cover a complete project. It should be distinctly understood that failure to mention any work which would normally be required to complete the project shall not relieve the Contractor of his responsibility to perform such work.

B. The Specifications for this project are the Anne Arundel County Government January 2001 "Standard Details and Specifications for Construction" and subsequent addenda thereto, except as modified herein.

C. This Contract will be constructed under provisions of the Anne Arundel County Government January 2001"Standard Details and Specifications for Construction" and subsequent addenda thereto.

D. By submitting a proposal, the bidder verifies that he shall not present claims relating to failure to comply with Section GP-2.04 of the Standard Specifications, Site Investigation.

01000.02 SCOPE OF WORK

A. The Contractor shall provide all labor, materials, equipment and services necessary for and incidental to construction of the proposed Patuxent Water Reclamation Facility Air Piping and Support Repairs complete and in place, including the protection and maintenance of existing structures, facilities and utilities and the restoration of disturbed or damaged property, all as specified herein or shown on the Drawings.

B. The Contractor shall be held solely responsible for all necessary coordination between the various County, State or Federal agencies, utility companies, his sub-contractors, and the Engineer for the duration of this Contract.

C. The work generally includes the repair and replacement of process air piping at the Patuxent Water Reclamation Facility on Professional Boulevard, Crofton, Maryland. The work includes, but is not limited to, constructing new process air piping. Furnish and install all equipment, materials, labor, structures, site work, piping, testing, accessories, appurtenances and all other required work.

01000.03 CONSTRUCTION SCHEDULE

A. The Contractor shall submit to the Engineer for review and acceptance, a construction progress schedule for the complete project in accordance with Section 01310. The progress schedule shall be submitted prior to, or at the pre-construction meeting. No work shall be undertaken on the Contract until the progress schedule has been reviewed and accepted by the Engineer.

B. This schedule shall be the Contractor's working schedule and shall be used to plan, organize and execute the work; record and report the actual performance and progress; and forecast remaining work. The Contractor shall tie the cost loading to the CPM Schedule. The schedule shall comply with Section 01310 and the requirements of Section GP-8.04 in all other aspects and shall clearly depict and describe the sequence of activities planned by the Contractor, their interdependence, and the times estimated to perform each activity.

The schedule shall include a sequence of construction for the upgrades and placing it into service. The schedule shall be submitted showing usage of the entire contract time provided in the contract and shall consist of a detailed breakdown of the tasks for the project.

C. The following construction sequence is provided for the Contractor's information only. The sequence is not intended to be inclusive of all activities required to complete the contract nor shall it be substituted for the Contractor's progress schedule. The Contractor's progress schedule shall show the order and interdependence of these items and associated tasks, and the sequence in which they are to be completed.

General

1. The County shall be responsible for opening/closing of all existing valves associated with the project. The Contractor shall provide a minimum one week notice for operation of existing valves.
2. The County will provide MSDS sheets on all existing chemicals used at the plant.
3. The County will provide information on their lockout/tagout requirements for existing equipment and electrical systems, and will lock out and tag out existing power supplies together with the Contractor.
4. For 480 VAC temporary process equipment installations only, the County will provide locations for temporary power supply circuit breakers at existing Siemens motor control centers. The Contractor shall provide plug-in circuit breaker "buckets" complete with doors and external operating handles, and shall install temporary wiring in conformance with NEC, NFPA, and OSHA requirements.
5. For 120 VAC temporary process equipment installations only, obtain power from the closest 120 VAC panelboard or outlet approved by the County. The Contractor shall provide plug-in circuit breakers where needed in panelboards, and shall install temporary wiring in conformance with NEC, NFPA, and OSHA requirements.

Process Air Piping

1. Coordinate with the County and verify the operability of the salvaged 10-inch butterfly valve (BFV).
2. Remove existing expansion joints and install blind flanges to pressure test existing process air piping to determine, requirement for additional process air piping removal and replacement as shown in Contract Documents. Aluminum frame shall be replaced in either instance of passing or not passing the leakage testing.
3. Install new process air piping, salvaged 10-inch butterfly valve, frames, and supports.
4. Leakage test new process air piping.
5. Install two air piping protection frames at both ends of the existing road between Oxidation Ditches No.1 and No. 2. On both frames hang height guard clearance bars indicating clearance height.
6. Perform concrete surface, crack, and joint repairs.

01000.04 WORK HOURS

A. Work shall be performed according to Section GP-8.05 and completed within the contract time stipulated in the Proposal, including weekends and holidays. The contract time stated herein shall include the time needed by the Contractor for preparation and approval of shop drawings and procurement and assembly of equipment and materials as well as construction work.

Work shall be limited to weekdays (Monday through Friday) and shall commence no earlier than 7:00 A.M. nor proceed later than 3:00 P.M. The Contractor shall obtain written approval at least two (2) full working days in advance from the Owner to conduct work outside of these timeframes.

01000.05 SITE CONDITIONS

A. As the Work progresses, the Contractor shall remove all unused materials, tools, equipment and machinery, waste materials, rubbish, refuse, dust and other debris from the site and see to it that the site is at all times left in a neat and orderly condition. The Contractor shall provide a means for controlling dust at the site and shall keep existing and new equipment clean throughout the duration of the project. The Contractor shall also promptly remove any mud tracked onto adjacent roadways from vehicles leaving or entering the project sites. If the sites are not kept in a neat and orderly condition to the satisfaction of the Engineer, the Engineer will order the Contractor to stop all Work until such order is withdrawn. Issuance of such an order shall not relieve the Contractor from meeting the scheduled completion date of the work as outlined in the project schedule. The Contractor shall be responsible for all costs associated with maintaining the site in a neat and orderly condition.

01000.06 MATERIAL STORAGE

A. The Contractor shall be responsible to provide material storage as required to complete construction. The Contractor may apply for progress payment for materials stored in the off-site location, provided the County inspector is given access to inspect items stored on the site, the materials and equipment are properly stored in accordance with the Manufacturer's recommendations, and evidence of insurance is provided for the said materials and equipment.

01000.07 ENGINEER'S RIGHT TO EXISTING MATERIALS AND EQUIPMENT

A. All existing material and equipment required to be removed, replaced, or demolished shall be disposed of by the Contractor unless noted to be salvaged.

01000.08 OPERATION OF EXISTING VALVES

A. Any existing valves in the facility or piping that will need to be operated during the course of construction shall be operated by Owner personnel only. The Contractor shall notify the Owner a minimum of one week prior to the dates anticipated for operation of the valves.

1000.09 EXISTING SUBSURFACE STRUCTURES

A. General

Certain existing subsurface structures likely to be encountered during the performance of the Work embraced in this Contract or located in close proximity to the Work hereunder as to require special precautions and methods for their protection, such as sewers, drains, water mains, and conduits, together with appurtenances, are shown on the Contract Drawings. The sizes, locations, and depths shown are approximate.

It is the obligation of the Contractor to verify the accuracy and completeness of the information shown, and the Contractor agrees that he shall neither have nor assert against the Owner or Engineer any claim for damages or relief from any obligation of this Contract by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of the Owner or Engineer, except as set forth in subsection (b) and (c) below.

Where any existing subsurface structure such as a sewer, drain, gas pipe, water pipe, conduit, or other structure is found which is not anticipated by the Contract Documents or which is found to be materially different in size, location, or depth from that anticipated by the Contract Documents, the Contractor shall immediately notify the Engineer, and also the superintendent of the utility, before disturbing the structure.

If ordered by the Engineer, such structure shall be uncovered and supported by the Contractor, at his cost and expense, as constituting a part of the Contract, and the Contractor shall not become entitled to claim any damages for or on account of the

presence of such structure or the uncovering and supporting of same.

B. Existing subsurface structures which require changes in the Work of the Contract.

The Engineer will determine whether changes should be made in the Contract Documents for construction of the Work of the Contract to avoid the subsurface structure, whether the Work of the Contract can proceed without changes in the Contract Documents, or whether the structure should be removed, realigned, or changed.

Any increase in cost of the Work resulting from any changes in the Contract Documents necessitated by the unanticipated presence or difference in size, location, or depth of the subsurface structure will be adjusted in the manner provided herein for changes in Contract amount.

C. Existing subsurface structures which require changes in the existing structure.

Where the size, location, or depth of the existing subsurface structure has been anticipated and the Contract Documents require removal, realignment, or change, all Work under this Contract shall be done in accordance with the Contract Documents in mutual cooperation with the utility or other parties concerned.

Where the presence of the subsurface structure or its size, location, or depth is not anticipated by the Contract Documents, any work by the Contractor required to remove, realign, or change the structure shall be done under the provisions for changes in the Work for the removal, realignment, or change and shall be done as mutually agreed by the Contractor, Engineer, and utility or other parties concerned.

D. Interruption of Service

Where it is necessary to interrupt water, gas, or other public utility service to remove, realign, or change a subsurface structure, the Work shall proceed with expedience and shall be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state..

01000.10 LOCK-OUT/TAG-OUT

A. The Contractor shall comply with all applicable Federal, State, and Local regulations regarding lock-out/tag-out requirements when working on electrical and mechanical equipment. The Contractor shall also obtain, understand, and comply with the County requirements and procedures for the lock-out/tag-out of electrical and mechanical equipment.

01000.11 SUB-SURFACE DATA & BORINGS

A. The Drawings show certain information concerning existing above and below ground structures and utilities including pipe, electrical cable, etc., which are existing or are proposed within the limits of the work or in close proximity to the work. The Engineer expressly disclaims any responsibility for the accuracy or completeness of said information, and the Contractor will not be entitled to any extra compensation on account of the inaccuracy or incompleteness of such information, such information being shown only for the convenience of the Contractor.

B. The Contractor is hereby informed that the Public Utilities listed below are known to have installations in the area of this Contract:

1. Baltimore Gas & Electric Company - Gas Division (underground)
2. Baltimore Gas & Electric Company - Electric Division
3. Verizon
4. Comcast
5. Anne Arundel County Department of Public Works

C. If the Contractor, in preparing or submitting his bid relies on sub-surface information shown in the Contract Documents, he does so at his own risk. Before submitting his bid each bidder shall, upon approval of written application, at his own expense, make such additional sub-surface investigations as he may deem necessary to determine his bid price for performance of the work within the terms of the Contract.

D. The Contractor shall perform miscellaneous excavating work as may be necessary or directed. Miscellaneous excavation shall include the digging of test pits to locate underground utilities, etc., or excavation for any special structure, outside the normal structural excavation, that may not be shown on the Drawings or described in the specifications, where such excavation is done at the direction of the Engineer.

1. Test pits shall be dug by the Contractor wherever directed along the line of the proposed work or within the limits of the public right-of-way. Their depth and size shall be such as required by the Engineer.

2. Test pits may be dug by the Contractor, without being directed to do so, along the lines of the proposed work as shown on the Drawings, in advance of the excavation for the purpose of satisfying himself as to the location of underground obstructions or conditions at his own expense.

E. The Contractor shall be fully responsible for determining in the field the exact location of all underground structures and utilities in the vicinity of the work, by means of test pits or other approved methods, and protecting them from damage, whether such structures and utilities are or are not shown on the Drawings.

01000.12 PROTECTION OF PROPERTY, STRUCTURES & UTILITIES

A. The Contractor shall, at his own expense, sustain in their places, and protect from direct or indirect injury all pipes, utilities, walls, buildings, and other structures or property in the vicinity of his work, whether above or below the ground. The Contractor shall take all risks attending the presence of proximity of pipes, poles, walls, buildings, and other structures and property of every kind and description, in the vicinity of his work whether above or below the ground and he shall be responsible for all damage and assume all expense for direct or indirect injury, caused by his work, to any of them or to any person or property by reason of injury to them whether such structures are or are not shown on the Drawings.

The Contractor at his expense shall protect adjacent and other property or premises from damage of any kind during the progress of the Work and shall erect and maintain guards around his Work in such a way as to afford protection to the public. The Contractor shall be held responsible for improper, illegal, or negligent conduct of himself, his subcontractors, employees and agents in and about said Work or in the execution of the Work covered by this Contract.

The Contractor's liability shall also include the damage or injury sustained by any structure whatsoever due to settlement of trenches or excavations or to settlement or lateral movement of the sides of such trenches or excavations, whether such movement occurs during or after excavation or backfilling of such trenches or excavations. His liability to so support and protect all such structures from damage or injury shall continue, without limitation, throughout the Contract period and during the period of guarantee.

The Contractor shall at all times have on the ground suitable and sufficient material and shall use the same as may be necessary or required for sustaining and supporting any and all such structures which are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

In case injury occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, the Contractor shall immediately notify the Engineer, and, at his expense, shall remove such injured Work and shall rebuild the pipeline or structure and shall replace the material surrounding and supporting the same, or shall furnish such material and perform such work of repairs or replacements as the Engineer may order. Any damage whatsoever shall be promptly, completely, and satisfactorily repaired by the Contractor at his expense.

01000.13 RELOCATION AND PROTECTION OF EXISTING UTILITIES

A. The Contractor shall protect and/or support all existing utilities (including electric and telephone poles) within the limit of disturbance that are endangered by his operations and the cost therefore will be taken to be included in the total contract price.

B. The Contractor shall be responsible for making all arrangements for such work, and no extra compensation shall be due the Contractor for making said arrangements.

01000.14 COVERING OF WORK

A. No backfilling or covering of underground Work or covering of Work in structures shall be done without authorization by the Engineer. Any Work covered without such authorization shall be uncovered to such extent as directed or removed and replaced by the Contractor at his expense. If Work is ordered stopped, no more Work shall be done until such order is withdrawn.

01000.15 WATER PRIVILEGES

Where the public water supply is available and under control of the Owner, it will be furnished the Contractor. Such water supply shall be subject at all times to the control and supervision of the superintendent or manager of the water utility, and at a cost determined by the schedule of charges on file at the office of the utility. Prior to making use of any municipal water, permission in writing to use the water for any particular purpose shall be obtained from the superintendent or manager.

01000.16 SEEDING

A. All area disturbed, damaged, or destroyed by the Contractor's operations shall be restored to their original conditions unless other restoration is required by the Plans and/or Specifications. Lawns and improved areas shall be restored as defined in the Contract Documents.

01000.17 EQUIPMENT INSTALLATION

A. All mechanical and electrical equipment shall be checked for correctness of installation by a qualified representative of the manufacturer, and the manufacturer shall certify in writing to the Engineer that the equipment was installed according to his specifications. Where multiple manufacturers have supplied components for a piece of equipment, the manufacturer that assembled the components shall supply the certification. Such manufacturer certifications shall also be included in the final O&M manual.

B. The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the Work.

C. The Contractor shall furnish, install, and protect all necessary concrete pads, which shall include guides, track rails, bearing plates, anchor and attachment bolts, and all other appurtenances needed for the installation of the devices included in the equipment specified. The location, size and templates for the concrete pads shall be furnished by the Contractor supplying the equipment along with all guides, track rails, bearing plates, anchor and attachment bolts and other appurtenances required.

D. Anchor bolts shall be made of ample size and strength for the purpose intended. Unless otherwise specified, anchor bolts in submerged locations shall be bronze or stainless steel; all other anchor bolts shall be cadmium plated. Substantial templates and working drawings for installation shall be furnished.

E. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

F. The Contractor shall furnish all oils and greases for initial operation of each item of equipment and shall furnish the lubricant chart as indicated in the Special Provision entitled "Lubrication Chart and Lubrication". Insofar as possible, all lubricants shall be obtained from one manufacturer approved by the Owner. Each item of equipment shall be tagged to show the date lubricated, the name and type of lubricant used and the recommended frequency of lubrication.

01000.18 SHOP DRAWINGS

A. Shop drawings shall be submitted electronically unless otherwise requested by the Engineer or Owner. Submittal process shall be agreed upon during the preconstruction meeting.

In general, shop drawings submitted by the Contractor will be returned within 21 calendar days of receipt by the Engineer. The Contractor shall account for this review time in his schedule.

The Contractor shall submit shop drawings for the Engineer's review any equipment that is an "Or Equal" substitution to the equipment specified in the Special Provisions within 15 days from the Notice to Proceed.

01000.19 RECORD DRAWINGS

A. During the progress of the work, the Contractor shall keep a careful record of all changes and deviations from the layouts shown on the Contract Drawings. The Contractor shall record such changes and deviations on the prints of the Contract Drawings immediately. The record drawings shall indicate, in addition to any changes or deviations, the actual location referenced from at least two (2) permanently fixed surface structures of all sub-surface utilities of work installed by him. These drawings shall be made available to the Engineer for inspection or checking at any time during the construction period. The Contractor shall turn over to the Engineer one set of clean white prints of the Contract Drawings with all the aforementioned as-built information neatly recorded thereon in red ink, within 30 days of the issuance of the letter of Conditional Acceptance of the work, unless otherwise stipulated.

01000.20 OPERATION AND MAINTENANCE MANUALS

A. The Contractor shall furnish the Operation and Maintenance (O&M) Manual in accordance with Section GP-5.04.08 except as follows:

1. The Contractor shall deliver two hard copies (paper) of the O&M Manual and five compact disk (CD) copies of the O&M Manual in preliminary draft form.

2. The Contractor shall deliver two hard copies (paper) of the O&M Manual and five compact disk (CD) copies of the O&M Manual in final draft form.

3. The Contractor shall deliver two hard copies (paper) of the O&M Manual and five compact disk (CD) copies of the O&M Manual in final form after approval of the final draft.

4. Each hard copy and CD set of the O&M Manual submittal shall include one (1) CD copy of construction progress photos. Image files/folders shall be organized on the CD sequentially by date or other approved means from beginning to end of the project.

5. Anne Arundel County shall approve of each O&M Manual prior to final submission by the Contractor.

B. Electronic O&M Data:

1. Electronic submittals shall contain information described above and shall meet the requirements herein.

2. Electronic equipment manual files shall be submitted in searchable Adobe Acrobat Reader (.PDF) format unless otherwise mutually agreed upon by Contractor and Engineer.

3. Electronic files shall be submitted on one or more compact disks (650 MB CD). Five sets of compact disks shall be provided, four for Owner and one for the Engineer. CDs and covers shall be labeled with the project name, supplier, equipment identification, and specification section. CD's will be separated by volumes. Volumes will be separated by Mechanical, Electrical/ Instrumentation and Generator. Each volume shall result in a single searchable PDF file with the same name as its title of the hard copy binder. The PDF file shall have a table of contents which aligns with the printed table of contents.

4. CD's shall be indexed and tabbed in the same manner as the hard copy versions. Bookmark and thumbnail tabs shall be provided for quick access to the desired volumes and sections.

5. In addition to the complete manual submitted in PDF format, the supplier shall furnish electronic files containing the following information in Microsoft Word (.doc), rich text (.rtf), or ASCII text (.txt) format.

   a. Operation Description - Discuss operational procedures for the equipment supplied. Operational procedures shall include "startup procedures," "normal operation," "automated operation," and "shutdown procedures." Where multiple modes of automatic operation exist, describe each mode separately.

b. Controls - Provide a table outlining the controls provided for the unit. Utilize two columns in the table. The left-hand column shall indicate the location of the control (e.g., local to the pump, remote control panel, etc.). In the right-hand column describe the control and its function.

c. Troubleshooting Provide - a troubleshooting table with three columns entitled "Problem," "Possible Causes," and "Corrective Action," Under the "Problem" column, identify possible problems that may occur with the equipment or system including, but not limited to, all malfunctions that can be expected for the equipment and all alarm indications provided by the system. Under the "Possible Causes" column, identify the causes that may be the root of each "Problem." Under the "Corrective Action" column, provide direction to verify and rectify/repair the "Problem.

d. Preventive Maintenance - Provide a preventive maintenance table containing headings for "Daily", "Weekly", "Monthly", and "Annual" (or other period as required) maintenance requirements. Under each heading, indicate visual inspections, procedural inspections, calibration routines, lubrication, and all other manufacturer suggested preventive maintenance procedures required for the equipment or system. List recommended lubricants and any special tools required for the recommended maintenance.

e. Nameplate Data Provide - nameplate data tables consisting of two columns. In the left hand column, indicate the equipment name, equipment designation, manufacturer, model number, serial number, year installed, dimensions, min and max speed, min and max torque, measurement range, accuracy, and all other data that may assist maintenance persons in identifying, replacing, and maintaining the piece of equipment. Provide the appropriate values and designations in the right-hand column. Provide a separate nameplate data table for each major system component, including gear reducers, motors, etc. Motor nameplate data tables shall include as a minimum, manufacturer, model, and serial number.

f. Manufacturer and Sales Representative Information - Indicate the equipment manufacturer name, mailing address, telephone number, fax number, email address, website address, and contact person's name. Provide the same information for the local manufacturer’s representative who supplied the equipment.

01000.21 FIELD QUALITY CONTROL, INSTALLATION, AND INSTRUCTIONAL SERVICES

A. General

1. This article covers on-site services of Supplier's representatives provided by the Contractor during construction, equipment startup, and training of Engineer's personnel for equipment operation, as specifically required in the Specification section for equipment or systems.

2. The Contractor shall include and pay costs for Supplier's services, including, but not limited to, those specified.

B. Installation Services

1. Where installation services are called for in the Specifications, provide competent and experienced technical representatives of manufacturers of equipment and systems to review assembly or installation procedures attributable to, or associated with, equipment furnished.

2. After equipment is installed, representatives shall perform initial equipment and system adjustment and calibration to conform to Specifications and manufacturer's requirements and instructions.

3. Provide Certificate of Installation Services stating proper adjustments have been made to equipment or system and equipment or system is ready for startup and system demonstration. Contractor shall furnish 2 copies of certificate to Engineer.

C. Equipment Testing, Training, and Start-up

1. The Contractor shall assume all costs incurred in the event that the equipment fails to provide satisfactory performance, as determined by the performance tests for equipment furnished under this Contract. These costs include costs for additional infrared analysis, additional utilities, etc., for test reruns when such test reruns were caused by faults properly the responsibility of the Contractor.

2. Electrical acceptance testing shall be performed by an independent testing agency engaged and paid for by the Contractor. The testing agency shall be approved by the Engineer prior to the commencement of work. If the equipment fails the electrical acceptance testing, the Contractor within one week from the initial test date shall perform the required corrective measures to bring the equipment within acceptable testing limits.

3. The Contractor shall furnish personnel to instruct operators in the correct use and lubrication of all electrical and mechanical equipment furnished under this Contract. See individual sections for specific instruction requirements.

4. The Contractor shall furnish personnel and provide coordination support and start-up of all electrical and mechanical equipment furnished and additionally be responsible for coordination support and start-up of the equipment provided by the Engineer under this Contract. See individual sections for specific start-up requirements.

5. Equipment test results shall be included in the final O&M Manuals.

D. Instructional Services

1. Where training is called for in Specifications, provide competent and experienced technical representative of Supplier to provide detailed instructions to Engineer's personnel for operation of equipment. Training services shall include maintenance of instrumentation, maintenance of equipment and operation of instrumentation and equipment in classroom and on-site as stated in Specifications. Training shall include electrical, mechanical, and safety aspects of equipment.

2. Submit documentation identifying name of specific representative, factory authorization, background of named individual(s) to conduct training, training outline, and training schedule. Submit information 30 days before scheduled training period for review and approval by Engineer. Training shall not start until system is on-line and operational, and all final O&M manuals have been approved by the Engineer.

3. Coordinate training periods with Engineer and supplier's representatives.

   a. No training shall be conducted unless instructor has been approved by the Engineer.

   b. Notify the Engineer at least 10 days before training sessions are to begin so Engineer can make arrangements with Engineer's operating personnel.

   c. Failure of supplier's or manufacturer's representative to appear for scheduled training, failure to notify Engineer 24 hours in advance of need to cancel scheduled training or failure to arrive within 30 minutes of start of scheduled training shall result in reimbursement to Engineer for time lost by Engineer's operating personnel in waiting for arrival of manufacturer's representative. Except in the case of failure to arrive on time, reimbursement costs for time lost by Engineer's operating personnel will not exceed 1 hour for each employee scheduled to receive training. Failure to arrive on time will be reimbursed by actual time late up to 1 hour. If the supplier's or manufacturer's representative is later than 1 hour, training will be rescheduled.

4. Similar types of equipment differing in model, size or manufacturer shall require equal service time as stated in specific Specification section.

5. Successful system demonstration specified herein shall be completed before start of Instructional Services.

6. O&M data shall constitute basis of instruction.

a. Review data contents with personnel in full detail to explain aspects of operations and maintenance.

7. Provide Certificates of Instructional Services, cosigned by Engineer and supplier's representative, verifying training accomplished to satisfaction of all parties. Contractor shall furnish 2 copies of certificates to Engineer.

01000.22 SIMULATED SYSTEM AND EQUIPMENT TESTING PLAN

A. The Contractor shall provide all services associated with conducting the detailed testing plan which shall be developed by the Contractor and approved by the Engineer prior to initiation of testing. The testing plan shall include a simulated system and equipment test and an integrated system test. The testing plan shall be approved by the Engineer at least one (1) week prior to the initiation of the testing. Both tests shall be witnessed by representatives of the Owner and Engineer.

B. The Simulated System and Equipment Test portion of the testing plan shall include, but not be limited to, the following:

1. Demonstration of adequate operation of individual pieces of equipment in local manual, or "hand" mode and demonstration of failure or lockout devices that are active in the manual mode, such as "low water level", etc.

2. Demonstration of the use and operation of all local automatic controls and control panels, and the integration of local controls, instrumentation, and equipment under actual operating conditions.

3. Demonstration that each piece of instrumentation is operational, has been calibrated, and is transmitting the correct signals.

4. Demonstration of equipment failures, alarms, sequence failures, and fail-over modes of instrumentation.

5. Provide positive check-out of I/O for each I/O point, both at the I/O rack and at the individual piece of equipment, control panel, motor starter, and alarm panel. I/O points to be interfaced with a PLC where applicable shall be simulated as required to perform the intended operation.

C. The second portion of the plan shall consist of the Integrated System Test. The Contractor shall provide two persons for a period of eight (8) weeks to participate in the test. Each week shall consist of five 8-hour days. The two persons shall each be qualified to test electrical wiring, I/O, instrumentation, and electrical and mechanical equipment. The test will include, but not be limited to, a coordinated startup of the facilities integrated with the process control system. The process control system for the plant will be programmed by others, and the Contractor shall provide equipment and materials during the specified eight (8) week period as required to test the facilities under actual operating conditions with the process control system on-line. The above 8

week testing period does not include the interim testing required to bring on-line systems early in the construction process (e.g. sodium hypochlorite and caustic feed systems). The contractor shall supply sufficient staff during these testing periods to satisfactorily bring the interim systems on-line

01000.23 GUARANTEE

A. In addition to the General Provisions, the Contractor shall guarantee all of the work included in this Contract for a period of one (1) year after the date of completion and acceptance of the facilities by the Engineer as follows:

1. Against all faulty or imperfect materials, and against all imperfect, careless, unskilled workmanship on the part of the Contractor, his sub-contractors, or component manufacturers.

2. The entire facilities and each and every part thereof shall operate with normal care and attention in a satisfactory and efficient manner, and in accordance with the requirements of the Specifications.

3. The Contractor agrees to replace with proper workmanship and materials, and to re-execute, correct, or repair, without cost to the Engineer, work which may be found to be improper or imperfect or which does not operate in a satisfactory manner or fails to perform as specified.

01000.24 BREAKDOWN OF LUMP SUM ITEMS

A. Within 10 days following notice by the Engineer to proceed with this Contract, the Contractor shall present to the Engineer for his review a detailed schedule of values showing the breakdown of all lump sum bid prices in the Contract. Such schedule shall contain the amount estimated for each part of the Work and a quantity survey for each part of the Work. Work to be performed by subcontractors shall be separately identified. Upon request of the Engineer, said schedule shall be apportioned by the Contractor for labor and for materials. If the schedule of values is found to be unsatisfactory by the Engineer, such schedule shall be revised by the Contractor until deemed satisfactory by the Engineer. The schedule of values shall not be changed after the Engineer has approved the same without the express written consent of the Engineer. The approved schedule will be used in the preparation of the progress payment requests. No progress payments shall be paid until the schedule of values is approved.

B. Payment for Payment Item 1.1 Air Piping and Support Repair and Replacement, shall constitute full compensation for furnishing all labor, equipment and materials necessary for the repair and replacement of the process air piping, valves, fittings and supports, leakage testing, and additional demolition, floor and wall finishes, installation of all equipment, site structures, site work, piping, testing, accessories, and appurtenances.

a. This line item does not include the repair and replacement of the existing process air piping to be pressure/leakage tested to determine if additional process piping requires replacement. This covered is under Contingent Item 2.0.

01000.25 NO SEPARATE PAYMENT

A. No separate unit price or lump sum payments will be made for work specified in Divisions 1 through 10 of the County's Standard Specifications except for the following:

1. Section 01100, Mobilization, which is paid under Payment Item 1.0.

All other work in Divisions 1 through 10 of the County's Standard Specifications shall be paid under the Lump Sum Payment Items.

a. Cost for Payment Item 1.0 shall not exceed $50,000.
b. The Owner does not guarantee that the Fixed Maximum Lump Sum price reflects the actual value of the work involved. Such prices merely represent maximum fixed amounts which will be paid to the Contractor for the work performed. If, in the opinion of the Contractor, the Fixed Maximum Lump Sum prices do not reflect the actual value of the work involved, lower prices may be written in the space provided in the bid sheets and the given Fixed Maximum Lump Sum price for that specific item voided.

01000.26 CONTRACTOR CUSTOMER SERVICE PROGRAM

A. The Contractor shall assume their part in the County’s Customer Oriented Programs. The policies of the program are contained in Appendix A “Contractor Customer Service Program” of the front end documents.

01000.27 MANUFACTURERS

A. All equipment shall be furnished by manufacturers who shall have at least three years' experience in the design, production, assembly, and field service of equipment of like type, size, and capacity unless otherwise indicated in the specifications. Where required by the Engineer, the Contractor shall supply a list of at least three (3) successful installations.

01000.28 TOOLS, ACCESSORIES AND SPARE PARTS

A. The Contractor shall, unless otherwise stated, furnish with each type, kind, and size of equipment, one complete set of any special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment.

Each piece of equipment shall be provided with a substantial nameplate, which is securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, and principal rating data.

Where the Specifications require spare parts to be furnished by the Contractor, said spare parts for each item of equipment shall be kept separate and tagged to identify the project, the specific items of equipment to which they belong, part description, part number and manufacturer, and shall be packaged so as to preclude damage from handling and storage, and shall be bagged or packaged together where items are small in dimension.

01000.29 SAFETY PLAN

A. The Contractor shall submit a safety plan, signed by the safety coordinator, for the project that specifically addresses work in confined spaces. The safety coordinator shall be on-site during those times when work is conducted within confined spaces.

01000.30 STORAGE AND MAINTENANCE OF EQUIPMENT

A. Equipment containing moving parts or bearings which is subject to damage by exposure or improper storage shall be protected as set forth herein:

B. The Contractor shall require that the manufacturers of all equipment to be incorporated into the Work of this Contract supply detailed instructions concerning storage and maintenance required to maintain the equipment in good condition until it is placed in operation. These instructions shall be acceptable to the Engineer and shall be strictly enforced. Such acceptance shall not relieve the Contractor of his obligation to properly store and maintain the equipment.

C. Equipment which is intended for outdoor installation may be stored outside subject to and in accordance with the manufacturer's instructions. Equipment intended for indoor installation shall be stored in heated and ventilated warehouses or in heated and ventilated enclosures on the Site of the Work.

D. Equipment which is installed more than seven days prior to being placed in operation shall be protected in strict accordance with the manufacturers' recommendations and in a manner acceptable to the Engineer. Such protection, where dictated, shall consist of complete air-tight encapsulation with desiccants.

E. Equipment improperly stored or improperly protected after installation shall, at the Owner's option, be replaced by the Contractor at no cost to the Owner.

01000.31 CONFINED SPACE REQUIREMENTS

A. The Contractor’s confined space procedures shall be in accordance with the space classifications defined by Anne Arundel County DPW. The Contractor shall follow all confined space procedures in accordance with the Contractor’s confined space program.

The Contractor is responsible for reviewing the County’s space designations in the attached Confined Space procedural Memorandum DPW D-17 as provided in Appendix C of this Project Manual for informational purposes.

A copy of the Contractor's confined space program shall be submitted to the Engineer, for the Engineer's information, in accordance with specified submittal procedures.

The Contractor shall review the County's classification procedure pertaining to excavations greater than four (4) feet in depth and establish whether or not such excavations are to be considered permit-required confined spaces. If any excavations are determined to be permit-required confined spaces, the Contractor shall follow the appropriate confined space procedures.

01000.32 ACCURACY OF DRAWINGS

A. The Contractor shall have sole responsibility for field verifying existing equipment, piping, appurtenances and structures and structural steel locations and dimensions prior to ordering, fabrication and installation of equipment, piping, appurtenances and materials and structural steel, supports and appurtenances. The Contractor shall conform to the Drawings as closely as possible and exercise care to secure approved headroom and space conditions, neat arrangements of equipment, piping, valves, hangers and like items to overcome interferences with the existing conditions.

01000.33 MODEL NUMBERS FOR EQUIPMENT, MATERIALS OR SYSTEMS

A. Where model or series numbers are listed for a particular piece of equipment, material or system, it establishes minimum standards for operation and quality. Additional requirements and standards maybe defined by the Specifications, and furnishing the listed model or series does not relieve the Contractor or Manufacturer from the responsibility of satisfying all requirements and standards set forth in the Specifications. Submittals shall comply with Section GP-5.04.

01000.34 MAINTAINING FLOW OF SEWERS, WATER LINES AND DRAINS

A. The Contractor shall, at his expense, provide for and maintain the flow of all sewers, drains, house inlet connections, and water courses which may be met with during the progress of the Work. He shall not allow the contents of any sewer, drain, or house inlet connection to flow into trenches, sewers, or other structures to be constructed under the Contract, and shall at his expense, immediately remove and cart away from the vicinity of the Work all offensive matter.

The Contractor shall, at his expense, provide for and maintain the flow in all water mains or laterals, which may be met with during the progress of the Work. When water mains or laterals are to be disturbed to the extent that the water will be shut off, the superintendent of the water utility and all parties being served by the lines involved shall be notified 72-hours in advance concerning time and duration of the shut-off period. In cases involving fire hydrants, the fire department shall be so notified.

In the case of an accidental breaking of a water line, the repairs of such break shall have priority over all other operations. The parties whose services are affected by the break

shall be notified at once and assistance given to supply emergency water where necessary by temporary lines, tank truck, or other means. The Contractor shall have the obligation at his expense to assure that all water, gas and sewer connections serving private or public property shall be promptly and correctly restored.

01000.35 LUBRICATION CHART AND LUBRICATION

A. The Contractor shall furnish the Owner a lubrication chart(s) for all equipment furnished or installed by him. The chart(s) shall include the following for each item of equipment:

-name of the item;
-location of the item;
-each point of lubrication on the item;
-for each point of lubrication, the identification of the lubricant recommended and the recommended frequency of lubrication.

B. The information on the chart(s) shall be developed from manufacturers' printed data or from manufacturers' specific recommendations.

C. The identification of the lubricant by manufacturer's name and product identification number (such as Mobil X421) shall be furnished. The name of the proposed manufacturer to be used shall be furnished by the Contractor for approval by the Owner.

D. Following the initial operation of the equipment the Contractor shall relubricate, changing and adding lubricants, at the intervals or frequency as recommended by the manufacturer until acceptance.

01000.36 POWER, FUEL & WATER FOR TESTING

A. The permanent electrical service, or any part thereof, shall not be connected until the tests on wiring and grounding systems have been successfully completed and test data reviewed by the Engineer.

B. Where tests on equipment require electric power for testing, such power shall be supplied through the permanent electrical service and through the permanent electrical distribution and control equipment. All power for testing will be provided by the Owner. The use by the Owner of the permanent electrical service, electrical distribution system, and/or control equipment for the purpose of testing shall not constitute acceptance of the Work.

C. Where tests are specified on fuel-burning equipment, or where tests are specified on other equipment, and require simultaneous operation of the fuel burning equipment, all fuel for such tests will be provided by the Owner.

D. Unless otherwise specified, water of acceptable quality for testing shall be furnished by the Owner. This shall be for one test. Should subsequent tests be required, the Contractor will be charged for water at the current prevailing rate of the Owner

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

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SECTION 01150

PROJECT PHOTOGRAPHS

01150.01 GENERAL

A. Description

1. This Section includes furnishing photographic documentation of the progress of the project.

01150.02 PRODUCTS

A. General

1. Project photographs shall be color images taken with a digital camera.

2. The photographs shall be provided in "JPG" electronic format. Photos shall be furnished the Engineer within two weeks.

   a. All photographs shall be consecutively numbered.

   b. Each print shall be labeled with the photograph number, date taken, project name, location, and photographer's name clearly marked.

01150.03 EXECUTION

A. General

1. A minimum of 6 photographs at the wastewater treatment facility shall be taken each month for the duration of the Contract at the time and locations as directed by the Engineer.

2. A minimum of 12 photographs at the pump station shall be taken of pre-construction and final construction. The final photographs shall be taken from the same locations as the pre-construction photographs.

3. Upon the completion of the project, the Contractor shall submit a complete file of the project photographs archived and organized on Compact Disks (CDs) to the Engineer.

END OF SECTION

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SECTION 01310

CPM CONSTRUCTION SCHEDULE

01310.01 GENERAL

A. Work Included

This section specifies requirements and procedures in preparing and updating construction schedules and reports for planning, coordinating, executing, and monitoring the progress of the work. The construction work shall be scheduled using the Critical Path Method (CPM) of network analysis.

B. Form of Schedules

1. Prepare schedules in the form of critical path method (CPM) as described herein.

    a. Provide separate CPM networks (sub-networks) of activities for each process or facility.

    b. Each sub-network shall be assigned a code and separate activity numbering series.

    c. Interrelationships between sub-networks and any individual activities shall be identified.

C. Scheduling Responsibilities

1. The Critical Path Method type construction schedule shall be used to monitor job progress and as a means to make monthly payments to Contractor. Contractor will be responsible for showing all information concerning the sequencing, logic and durations of all activities as well as providing the initial logic network diagram. Once the schedule is accepted, Contractor will be responsible for providing monthly update information on logic, percent complete, actual start and finish dates and duration changes. Copies of the updated schedule shall be distributed at the progress meetings.

2. It shall at all times remain Contractor's responsibility to schedule and direct his forces in a manner that will allow for the completion of the work within the contractual period.

3. It should be clearly understood that the initial schedule and all update information must be provided by Contractor and that this information is a representation of the best efforts of Contractor and his subcontractors as to how they envision the work to be accomplished. Similarly, all progress information to be provided by and through Contractor must be an accurate representation of his or his subcontractors’ or suppliers’ actual performance. The schedule shall

at all times remain an accurate reflection of Contractor's actual or projected sequencing of work. Once accepted, adherence to the established CPM schedule shall be obligatory upon Contractor and his subcontractors for the work under this Contract. The Engineer may require Contractor to revise the schedule if, in his judgment, the schedule does not accurately reflect the actual execution of the work, or is in violation of any provision of this CPM scheduling specification, and Contractor shall revise the schedule as often as is necessary during the course of performance of the work without additional cost to Owner.

D. Progress of the Work

1. The work shall be started on the date indicated in the Notice to Proceed and shall be executed with such progress as may be required to prevent delay to other Contractors or to the general completion of the project. The work shall be executed at such times and in or on such parts of the project, and with such forces, material and equipment, as to assure completion of the work in the time established by the Contract. Additionally, Contractor shall, at all times, schedule and direct his work so that it provides an orderly progression of the work to completion within the specified Contract Time.

2. Contractor agrees that whenever it becomes apparent from the current monthly CPM Schedule update that delays to the critical path have resulted and these delays are through no fault of Owner or Owner's representatives, and hence, that the Contract completion date will not be met, or when so directed by Owner he will take some or all of the following actions at no additional cost to Owner.

    a. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work that is causing the negative float in the critical path activities.

    b. Increase the number of working hours per shift; shifts per working day, or days per week; the amount of construction equipment; etc., or any combination of the foregoing to substantially eliminate the backlog of work that is causing negative float in the critical path activities. Note that work outside the prescribed hours requires written approval of the Owner.

    c. Schedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.

    d. Contractor shall submit for review a written statement of the steps he intends to take, to remove or arrest the delay to the schedule. If Contractor fails to submit a written statement of the steps he intends to take or fails to take such steps as required by the Contract, Owner may direct the level of effort in manpower (trades), equipment, and work schedule (overtime) to remove or arrest the delay to the critical path in the accepted schedule, and Contractor shall promptly provide such level of effort at no additional cost to Owner. In addition, should schedule

delays persist, Contractor's surety will be asked to attend meetings to update the schedule.

3. Failure of Contractor to comply with the requirements of this provision shall subject him to, at Owner's sole discretion, withholding, in partial or in total, payments otherwise due Contractor for work performed under this Contract. Contractor agrees that any withholding of moneys is not a penalty for noncompliance, but is an assurance for Owner that funds will be available to implement these requirements should Contractor fail to do so, since failure of Contractor to comply with these requirements shall mean that Contractor failed to execute the work with such diligence as to ensure its completion within the time for completion.

01310.02 CPM CONSTRUCTION SCHEDULE

A. Network Requirements

1. The network diagram shall show the order and interdependence of activities and the sequence in which the work is to be accomplished as planned by Contractor. The basic concept of the network analysis diagram is to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of succeeding activities. A time scaled precedence format will be followed. The detailed network diagram will be time scaled showing a continuous flow from left to right.

2. The Schedule Activities shall be developed into three major groups:

   a. Procurement Activities (as applicable)

      (i) Permits
      (ii) Easements
      (iii) Submittal Items
      (iv) Approval of Submittal Items
      (v) Fabrication and Delivery (F&D) of Submittal Items

   b. Each of the following procurement activities should be tied logically to the correct construction activity in the overall CPM construction schedule:

      (i) Permit activities
      (ii) Easement activities
      (iii) F&D activities

   c. Construction Activities: Construction activities will be physical work activities that describe how the job will be constructed.

   d. Testing, Startup, Training and Closeout: CPM activities for this group

shall include all work required to satisfy to appropriate specification sections and meet the requirements of substantial and final completion.

3. Contractor shall break the work into activities durations of one to twenty (1 to 20) working days each, except for non-construction activities (such as procurement of materials and delivery of equipment) and other activities that may require longer durations. To the extent feasible, activities related to a specific physical area of the project should be grouped on the network for ease of understanding and simplification. The selection and number of activities shall be subject to the Engineer's review.

4. Each activity on the network shall have indicated for it the following:

   a. A single duration, no longer than 20 days (i.e., the single best estimate of the expected elapsed time considering the scope of work involved in the activity) expressed in working days. Normal holidays and weather delays shall be included. One critical path shall be shown for the schedule.

   b. An activity identification number will be assigned to each activity. The identification number will be in a format acceptable to the Owner.

   c. A brief description of the activity will be included. If this description is not definitive, a separate listing of each activity and a descriptive narrative may be required.

   d. Each activity shall be cost loaded to indicate the total estimated budget of the activity. No activity budget shall exceed $75,000 except for F&D activities. Material and/or equipment costs to be paid as stored material shall be assigned to F&D activities.

   e. Each activity (except for procurement activities) shall be man-hour loaded with the estimated man-hours to be expended on each activity.

5. The CPM schedule shall include a weather calendar that contains non-working days in addition to weekend and holidays to account for anticipated inclement weather days. The number of anticipated inclement weather days per month shall be equal to those specified in General Provision 8.09.8. The weather calendar shall be applied to all activities, which may be affected by inclement weather.

6. Failure to include in the CPM schedule any element of Work required under the performance of this Contract shall not excuse Contractor from completing all Work required within the applicable completion time, notwithstanding Engineer's network review.

7. A CPM schedule which shows a completion of any portion of the Work prior to the contractual completion date may be accepted but in no event shall be acceptable as a basis for a claim for delay against Owner by Contractor. The period of time between the Contractor's baseline accepted CPM schedule's projected completion dates and the contractual stipulated completion dates, if

any, will be treated as Project Float. The Owner's right to utilize Project Float is as provided in paragraph 01310.04.C.

B. Schedule of Values

1. Each activity on the construction schedule shall be allocated a dollar value in accordance with 01310.02.A.4, above. Each activity's assigned cost shall consist of labor, equipment, and materials costs, and a pro rata contribution of overhead and profit. The sum of activities costs shall be equal to the total Contract Price. In submitting cost data Contractor certifies that the costs are not unbalanced and that the value assigned to each activity represents Contractor's estimate of the actual costs of performing that activity.

2. The accepted schedule of values shall represent a fair, reasonable and equitable dollar cost allocation for each activity on Contractor's construction schedule.

3. If it is determined that the cost data does not meet the requirements for a balanced bid breakdown in the opinion of Engineer, Contractor will present documentation substantiating the cost allocation. Cost allocations shall be considered unbalanced if an activity on the construction schedule has been assigned a disproportionate allocation of direct costs, overhead and profit.

01310.03 SCHEDULE SUBMITTALS

A. CPM Schedule Implementation

1. Within 10 calendar days after the Notice to Proceed, Contractor shall submit pdf copies of his proposed CPM network diagram and tabular reports for the first ninety (90) calendar days of the work. This initial logic diagram shall be drawn as described herein and include both procurement and construction activities. The schedule will be the subject of a schedule review meeting with Contractor, Owner and Owner's representatives within two (2) weeks of its submission. Contractor will revise and resubmit the ninety (90) day schedule until it is acceptable.

2. Within thirty (30) calendar days after Notice to Proceed, Contractor shall submit pdf copies of his proposed CPM network diagram and tabular reports for the entire Contract duration and shall include both procurement and construction activities. These tabular reports shall be sorted by total float and activity number. They shall also contain a predecessor/successor resource loading report, and project calendar. This logic diagram shall be drawn as described herein and will be the subject of a schedule review meeting with Contractor, Owner, and Owner's representatives within two (2) weeks of its submission.

3. If a review of the submitted CPM Schedule indicates a work plan which will not complete the work within the time requirements stated in the Contract, it shall

be the responsibility of Contractor to revise the CPM Schedule as required and resubmit it until it is acceptable. Failure by Contractor to submit an acceptable schedule may, at Owner's sole discretion, justify the withholding of any partial payment(s) otherwise due under the Contract.

4. Acceptance of the schedule shall not constitute a representation by Owner that the work can be completed as shown on the schedule.

B. Submittals

1. In addition to the above scheduling requirements, Contractor will be required to submit a complete and detailed listing of anticipated submittals during the course of the Contract. Contractor will coordinate his submittals with those of his subcontractors and suppliers and will identify each submittal as specified. The anticipated submission due date for each submittal must be indicated along with the date on which its return is anticipated. For planning purposes, shop drawing submittals will usually be returned twenty-one (21) working days after receipt. However, longer durations for review will not be considered a basis for a claim unless the project critical path is delayed thereby. Durations shown for review shall be understood to share available float. Submissions, the review of which is on the critical path, shall be clearly marked in red with the words "Critical Path" by Contractor at the time of submission.

2. The Submittal List shall be submitted within twenty-one (21) working days from the Notice to Proceed. The Submittal Schedule will then be accepted or revised as required and Contractor will incorporate the dates and review durations into his CPM Schedule.

C. Schedule Updates

1. Provide a monthly CPM Schedule update one (1) week prior to the monthly progress meeting. Actual progress of the previous month shall be recorded and scheduling of future work activities shall be indicated. Contractor must provide the following information for each update at a minimum:

   a. Actual start and finish dates for all completed activities.

   b. Actual start dates for all started but incomplete activities and estimated remaining durations.

2. Provide a Monthly Progress Status Report, which provides a narrative explanation of progress identified in the revised construction schedule. The report shall indicate the following items, in addition one copy of the schedule reports listed below:

   a. Summarize revisions made to the Construction Schedule since the previous submittal.

   b. Work completed during the reporting period.

c. Work anticipated to be started during the next period, including those activities already in progress.

d. Problem areas, anticipated delays, and their impact on the schedule.

e. Corrective action recommended, and its effect.

f. The effect of changes on schedules of other prime Contractors, if any.

g. Updated Tabulation of Contract Time.

h. An evaluation of the overall status of the schedule for the job.

i. Schedule reports to be provided with the monthly report include.

(i) Critical Path Report

(ii) Anticipated Work within next month

3. Failure to provide update information listed in 01310.03.C.1 and 2 above, or failure to attend the Monthly Progress Meeting may result in Contractor not receiving progress payments.

01310.04 Contract Completion Time

A. Causes for Extensions of Time

1. The Contract Times will be adjusted only for causes specified in this Contract. In the event Contractor requests an extension of Contract Time, he shall furnish justification and supporting evidence per requests specified elsewhere in these Contract Documents. The Engineer will after receipt of such justification and supporting evidence, make findings of fact and will advise Contractor in writing thereof. If the Owner finds that Contractor is entitled to an extension of Contract Time under the provisions of the Contract, the Owner's determination as to the total number of days extensions shall be based upon the current accepted and updated CPM schedule and on all data relevant to the extension. Such data shall be included in the next monthly updating of the schedule. Contractor acknowledges and agrees that actual delays in activities, which, according to the CPM schedule, do not affect any contract completion date shown by the critical path in the network, do not have any effect on the Contract Time, and therefore will not be the basis for a change in Contract Time.

2. Contract Time extensions for weather delays will be based only on the criteria set forth in General Provision GP 8.09.7. The period of any extension of time shall be only for the portion of the contract actually delayed due to the abnormal weather conditions. Any extension of Contract Time allowed under adverse weather (GP8.09.8) shall be considered non-compensable and have no impact on Contract Price.

B. Adjustment by Owner

1. From time to time it may be necessary for the Contract schedule and/or Contract Times to be adjusted by Owner due to the effects of job conditions, acts or omissions of other Contractors not directly associated with this contract, act of God, technical difficulties, strikes, unavoidable delays on the part of Owner or his representatives, and other unforeseeable conditions which may indicate schedule adjustments and/or an extension of the Contract Time. Under such conditions, Owner shall direct Contractor to reschedule the work to reflect the changed conditions, and Contractor shall revise his schedule accordingly. Schedule extensions affecting the Contract Time shall be granted only by the Owner in writing. No additional compensation shall be made to Contractor for such schedule changes except for unavoidable overall Contract delays, in which case Contractor shall take all possible action to minimize any time extension. Owner, therefore, has the right to accelerate the schedule and Contractor will be compensated for such acceleration as long as such acceleration is not required through fault of Contractor. It is specifically noted that available Project Float in the current updated CPM schedule may be used by the Owner and his representative, as well as by Contractor.

C. Float Time

1. Without obligation to extend the overall completion date or any intermediate completion dates set out in the CPM network, Owner may initiate changes to the Contract work that absorb float time. Owner-initiated changes that affect the critical path on the CPM network shall be the sole grounds for extending (or shortening) said completion dates. Contractor initiated changes that encroach on the float time identified in the CPM network may be accomplished with Owner's concurrence. Such changes, however, shall give way to Owner-initiated changes competing for the same float time.

END OF SECTION

SECTION 01320

CONTINGENT UNIT PRICE ITEMS

01320.01 GENERAL

A. Section Includes

1. Price make-up.

2. Description of contingent unit price items

3. Elements of Bid Item Description page.

4. List of contingent unit price items.

5. Bid Item Descriptions - Attached pages.

B. Price Make-Up

1. Payment for the work of contingent unit price items will be made at the Contractor's bid as stated in the Bid for each item included under this section.

2. No payment will be made under this section for work performed by the Contractor to replace defective work, work which is shown or specified, or which is outside the limits ordered. No payment will be made under this section for work related to the work of this section which is specifically included under other payment item sections.

C. Description of Contingent Unit Price Items

1. Under this section, the Contractor shall perform the contingent unit price work ordered by the Engineer or Owner. All work under this section shall be done only upon specific direction of the Engineer and shall be only to the lines, grades and limits ordered.

2. The principal items of contingent unit price work scheduled herein are included under this section. The work also includes all accessories, appurtenances or other work required for the completion of contingent unit price items, except those related to the work of these items, but specifically included under other payment item sections of this Contract or other Contracts.

3. Prices for the contingent unit items shall be written by the Contractor in the space provided in the bid sheets, and shall be extended by the given quantities. The contingent unit price items reflect work which is in addition

to the work shown in the Contract Documents and may or may not be ordered by the Owner or Engineer. Should such contingent work be ordered by the Owner or Engineer, the Contractor shall make no claims whatsoever should the actual quantities of such work be different than the estimated quantities given in the bid sheets.

D. Elements of Bid Item Description Page

1. Identification of contingent unit price item, as set forth in the Bid Form.

2. Brief statement of work involved in the item.

3. Listing of components of work which make-up the item including reference to the Section(s) covering each component.

4. Cross-references to associated work not included in the item.

E. List of Contingent Unit Price Items

1.

Contingent Bid Item		Contingent Bid Item Description Number
2.0	Additional Air Piping and Support Repair and Replacement	2.0
2.1	Concrete Crack Repair	2.1
2.2	Concrete Surface Repair	2.2
2.3	Concrete Joint Sealant Repair	2.3

F. Bid Item Descriptions

1. Bid Item Description pages are attached at the end of this Specification section.

01320.02 MATERIALS

Not used.

01320.03 EXECUTION

Not Used.

END OF SECTION

BID ITEM DESCRIPTION 2.0

CONTINGENT UNIT PRICE ITEM BID ITEM 2.0

ADDITIONAL AIR PIPING REPAIR AND REPLACEMENT

A. DESCRIPTION

Under this item, the General Contractor shall furnish all labor, materials, and equipment required to perform the work of additional air piping repair and replacement if found to be required by leakage testing. See sheets M-101 and M-102 for extents of air piping to be tested and replaced if it does not meet leakage testing requirements. Additional air piping will subsequently also require leakage testing.

B. WORK INCLUDED UNDER THIS ITEM

Repair and replacement of additional air piping. Repairs shall be performed as indicated in the Contract Documents.

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

The following items of work closely related to the additional air piping repair and replacement are specifically not included under this Item:

New support frames for air piping covered under other Bid items.

D. METHOD OF PAYMENT

The quantity air piping repair and replacement shall be made in a Lump Sum Price.

No payment will be made under this item for the work of additional air piping repair and replacement which is specified elsewhere.

BID ITEM DESCRIPTION 2.1

CONTINGENT UNIT PRICE ITEM BID ITEM 2.1

CONCRETE CRACK REPAIR

A. DESCRIPTION

Under this item, the General Contractor shall furnish all labor, materials, and equipment required to perform the work of concrete crack repair as ordered by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

Repair of existing concrete cracks greater than 1/16 inch wide but not greater than 1 inch wide. Repairs to include injection of epoxy adhesive. Repairs shall be performed as indicated in the Contract Documents.

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

The following items of work closely related to concrete crack repair are specifically not included under this Item:

Concrete crack repairs for new concrete or existing concrete covered under other Bid items.

D. METHOD OF PAYMENT

The quantity of concrete crack repair for which payment will be made will be the actual number of linear feet of concrete crack repair, based on in-place measurement, as ordered by the Engineer.

No payment will be made under this item for the work of concrete crack repair which is specified elsewhere, herein, or concrete crack repair not ordered by the Engineer.

BID ITEM DESCRIPTION 2.2

CONTINGENT UNIT PRICE ITEM BID ITEM 2.2

CONCRETE SURFACE REPAIR

A. DESCRIPTION

Under this item, the General Contractor shall furnish all labor, materials, and equipment required to perform the work of concrete surface repair as ordered by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

Repair of existing concrete surfaces including, but not limited to, spalling, chipping and delaminating concrete. Repairs shall be performed as indicated in the Contract Documents.

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

The following items of work closely related to concrete surface repair are specifically not included under this Item:

Concrete surface repairs for new concrete or existing concrete covered under other Bid items.

D. METHOD OF PAYMENT

The quantity of concrete surface repair for which payment will be made will be the actual number of cubic feet of concrete crack repair, based on in-place measurement, as ordered by the Engineer.

No payment will be made under this item for the work of concrete surface repair which is specified elsewhere, herein, or concrete surface repair not ordered by the Engineer.

BID ITEM DESCRIPTION 2.3

CONTINGENT UNIT PRICE ITEM BID ITEM 2.3

CONCRETE JOINT SEALANT REPAIR

A. DESCRIPTION

Under this item, the General Contractor shall furnish all labor, materials, and equipment required to perform the work of concrete expansion joint sealant repair as ordered by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

Repair of existing concrete expansion joint sealants. Repairs shall be performed as indicated in the Contract Documents.

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

The following items of work closely related to concrete expansion joint sealant repair are specifically not included under this Item:

Concrete expansion joint sealant repair for existing concrete expansion joint sealant repair covered under other Bid items.

D. METHOD OF PAYMENT

The quantity of concrete expansion joint sealant repair for which payment will be made will be the actual number of linear feet of concrete expansion joint sealant repair, based on in-place measurement, as ordered by the Engineer.

No payment will be made under this item for the work of concrete expansion joint repair which is specified elsewhere, herein, or concrete expansion joint sealant repair not ordered by the Engineer.

SECTION 02050

DEMOLITION

02050.01 GENERAL

A. Description

1. This Section includes requirements for demolition of structures, equipment, piping and related material in areas of construction as specified herein and shown on the Contract Drawings.

2. This Section includes all labor, equipment, and materials necessary for the temporary storage, removal and disposal of all wastes resulting from demolition activities.

3. Demolished material and equipment shall become the property and the responsibility of the Contractor unless otherwise noted in the Contract documents.

4. The Contractor shall include all labor, materials, services, and equipment necessary to complete the demolition activities.

5. The Contractor shall obtain all permits required prior to performing demolition work. Copies of such permits shall be submitted to the Engineer and Owner prior to commencement of Work.

B. Quality Assurance

1. Regulatory Requirements

   a. Provide warning signs, barricades and safety barriers required to protect personnel. Provide fire safety measures at all times in areas where burning torches are being used.

   b. Before demolition begins, disconnect all mechanical and electrical services affected by the work. Interconnecting piping and electrical services that are to remain in service either permanently or temporarily shall be capped, rerouted or reconnected in a manner that will not interfere with the operation of the existing facilities to remain and the demolition work.

2. Welders Qualifications

   a. Welding shall be performed by qualified welders and in accordance with applicable requirements of the AWS “Code for Arc and Gas Welding in Building Construction” and AISC “Minimum

Requirements and Tentative Standard Welded Connections for Building".

4. Work shall in accordance with all applicable codes, standards and specifications including at a minimum:

   a. American Standard Testing and Materials (ASTM).

   b. International Building Code 2018, as applicable.

C. Submittals

1. Submit the following in accordance with Section 01310.

   a. Demolition work schedule and coordination with other work in progress including disconnection schedule of utility services and sequence of operations. Include coordination requirements for shut-down, capping and continuation of utility services (electrical, sanitary sewer lines, potable/non-potable water service, gases, etc.) as required. Also include detailed sequence of selective demolition and removal work to ensure uninterrupted progress of Engineer's on-site operation. Demolition work requiring pumping station shutdowns (complete or partial) shall be coordinated with and approved by the Engineer and Owner as specified in Section 01310.

   b. Method of demolition, removal of waste and removal of items to be salvaged including detailed description of methods and equipment.

2. Submit inspection reports of existing structures, items to be salvaged and equipment that will remain after demolition.

3. Submit copies to the Engineer and Owner of all secured permits required for demolition work.

4. Listing of all equipment which will be removed/ demolished for approval by the Engineer.

5. Provide record updates of Contract Drawings for demolition work, indicating: locations of below ground utility abandonment, relocation, removal, and/or capping; roadway removal; and any other sub-grade structures abandoned in-place.

6. Evidence of welder qualifications.

   a. Field welders shall carry identification cards acceptable to the Engineer, certifying to their fitness for executing work of the character required for the project.

D. Site Conditions

1. Existing Conditions

   a. For demolition work within the limits of an operating facility, coordinate demolition operations to minimize interruption of the facility operations and interference with operating personnel.

   b. Coordinate disconnections and disruptions of utility services with requirements of utility company and the Engineer and Owner.

   c. Coordinate disconnections and disruptions of facility operations with requirements of Owner and the Engineer.

   d. Any existing valves in the facility or piping that will need to be operated during the course of construction shall be operated by Owner personnel only. The Contractor shall notify the Owner a minimum of one week prior to the dates anticipated for operation of the valves.

2. Protection

   a. Provide scaffolding, protective coverings, temporary walks, shoring and bracing during demolition to protect personnel, structures and equipment.

   b. Provide adequate lighting at all times during demolition operations.

   c. Provide and maintain barriers of cloth, plastic or wood to prevent debris and dust associated with the demolition work from leaving the demolition area.

   d. Provide dust and debris covers for mechanical and electrical equipment within the demolition area that will remain in-place or be salvaged.

   e. Provide warning signs as required, for personnel and the public.

E. Demolition Sequence

1. The contractor shall strictly adhere to the construction sequence as submitted by the Contractor and agreed to by the Engineer. See Section Special Provisions section SP-1, for further requirements on construction sequencing. Any discrepancies or difficulties shall be immediately brought to the attention of the Engineer before the execution of the demolition step.

02050.02 MATERIALS

Not used.

02050.03 EXECUTION

A. Demolition General

1. The Contractor shall be responsible for compliance with all Federal, State and Local laws and regulations relative to disposal, and for obtaining all necessary permits and payment of fees for removal and disposal of demolished material.

2. Demolish structures in accordance with accepted industry standard methods. Blasting and explosives will not be acceptable.

3. Execute demolition and dismantling work to ensure safety of persons and adjacent property against damage by settlement, falling debris, or other causes in connection with this work.

4. The Contractor shall be responsible for maintaining the integrity of the pumping station and utilities in the demolition area while the work is proceeding. Any utilities damaged by the Contractor must be repaired by the Contractor at no additional cost to the Contract.

5. The Contractor shall be fully responsible for determining in the field the exact location of all underground structures and utilities in the vicinity of the work, by means of test pits or other approved methods, and protecting them from damage, whether such structures and utilities are or are not shown on the Drawings.

6. The Contractor shall be responsible for the security of the demolition area until work is complete.

7. The Contractor shall provide dust control during all phase of demolition work.

8. Demolition operations shall not damage the structural integrity of members carrying structural loads. Cutting or drilling of structural systems shall be performed under the direction of the Engineer.

9. Conduct selective demolition so that plant operations will not be disrupted. Provide not less than 72 hours' notice to Engineer and Owner of activities that will affect plant's operations.

B. Preparation

1. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

2. Do not close or obstruct streets, walks, or other adjacent occupied or used

facilities without permission from Engineer, Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

3. Erect and maintain dust-proof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

    a. Construct dust-proof partitions approved by the Engineer.

    b. Insulate partition to provide noise protection to occupied areas.

    c. Seal joints and perimeter. Equip partitions with dust-proof doors and security locks.

    d. Protect air-handling equipment.

    e. Weatherstrip openings.

C. Pollution Controls

1. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

    a. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

2. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

D. Selective Demolition

1. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:

    a. Neatly cut openings and holes plumb, square, and true to dimensions required. Cutting, as required, shall be executed to neat and straight lines insofar as possible with chisels, saws, or similar tools where joints will be exposed. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.

b. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

c. Breaking out masonry or concrete with hammers or other tools that leave rough edges will not be permitted where joints are exposed in finish work. Saw cut to a depth so joint will be straight. Cut existing work so that jointing will be as strong as possible with new work and, where exposed to view, as inconspicuous as possible. Cut minimum size openings in existing work to remain for passage of pipes, or conduits.

d. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

e. Maintain adequate ventilation when using cutting torches.

f. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

g. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

h. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

i. Dispose of demolished items and materials promptly. On-site storage of removed items is prohibited.

j. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

2. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.

3. No pipes, conduits, or equipment shall be removed until applicable services have been disconnected.

4. Plug and cap any abandoned underground raceway or conduit to prevent water intrusion.

E. Patching and Repairs

1. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

2. Patching is specified in individual specification sections for the applicable items being demolished and when not specified, use industry standard materials and methods approved by the Engineer.

3. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

    a. Completely fill holes and depressions in existing masonry walls to remain with an approved masonry patching material, applied according to manufacturer's printed recommendations.

4. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

F. Existing Utilities

1. All existing below grade utilities in areas where new structures are to be constructed, as indicated above, shall be removed or relocated in their entirety. Existing below grade utilities outside areas of new structures shall be capped and abandoned in-place as indicated on the Contract Documents unless otherwise noted.

G. Electrical Utilities

1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Engineer and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, when indicated and as acceptable to Engineer and to governing authorities.

    a. Provide not less than 72 hours notice to Engineer and Owner if shutdown of service is required.

2. No electrical enclosures containing live parts shall be left unattended while open.

3. Prior to demolishing electric motors, controls, and other electrical equipment, trace existing wiring to its power source, lock out and tag out the power supply disconnecting means with the Engineer, and disconnect and remove all conduit and wire serving the equipment scheduled for demolition. Cut off concealed conduits a minimum of 1 inch below the surface, and fill and patch the surface to match adjacent surface finishes and materials.

H. Disposal of Demolished Materials

1. General: Demolished material and equipment shall become the property and responsibility of the Contractor with the specific exception of those items scheduled to be salvaged. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

    a. Burning: Do not burn demolished materials.

2. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

I. Restoration Of Surfaces

1. The Contractor shall restore surfaces to the conditions with lines and grades as exists prior to demolition activities or as shown in the Contract Documents.

J. Security

1. The Contractor shall be responsible for the security in and around the area affected by demolition until work is complete, including modifications to the existing chain link fence.

L. Field Quality Control

1. Engineer will visually inspect demolition and adjacent areas for completeness of demolition, damage that may have resulted from the demolition operation and for completeness of clean-up.

2. New construction shall not begin until the inspection by the Engineer is completed and accepted.

END OF SECTION

SECTION 02602

LEAKAGE TESTS

02602.01 GENERAL

A. Description

1. Testing of all pressure and non-pressure piping for leakage as specified.

B. Related Work Included Elsewhere

1. Water Mains
2. Stainless Steel Piping

C. Quality Assurance

1. Applicable Standards

    a. American Water Works Association (AWWA)
    b. American Society for Testing and Materials (ASTM)

2. The Contractor shall furnish all labor, equipment, test connections, vents, water and materials necessary for carrying out the pressure and leakage tests.

3. All testing shall be witnessed by the Engineer.

D. Submittals

1. Report of Test Results.

02602.02 MATERIALS

None Included.

02602.03 EXECUTION

A. Tests on Pressure Piping for Transport of Water or Sewage

1. General

    a. Pipelines designed to transport water or sewage under pressure shall be tested hydrostatically and for leakage prior to being placed in service.

    b. The length of piping and sections included in the tests shall meet the approval of the Engineer.

c. Equipment in or attached to the pipes being tested shall be protected. Any damage to such equipment during the test shall be repaired by the Contractor at his expense.

d. When piping is to be insulated or concealed in a structure, tests shall be made before the pipe is covered.

e. All fittings, hydrants and appurtenances must be properly braced and harnessed before the pressure is applied. Thrust restraining devices which will become a part of the system must also be tested at the test pressure.

f. When testing absorbent pipe materials such as asbestos cement or concrete, the pipeline shall be filled with water at least 24 hours before the test is made.

g. If the line fails the test, the Contractor shall explore for the cause of the excessive leakage and after repairs have been made the line shall be retested. This procedure shall be repeated until the pipe complies.

2. Pressure Test

a. Pressure tests shall conform to AWWA C-600 except as modified herein.

b. Test pressure shall be as scheduled or, where no pressure is scheduled, at 150 psi.

c. Test pressure shall be held on the piping for a period of at least 2 hours, unless a longer period is requested by the Engineer.

3. Leakage Test

a. Leakage tests shall conform to AWWA C-600 except as modified herein.

b. The leakage test shall be conducted concurrently with the pressure test.

c. The rate of leakage shall be determined at 15-minute intervals by means of volumetric measurement of the makeup water added to maintain the test pressure. The test shall proceed until the rate of leakage has stabilized or is decreasing below an allowable value, for three consecutive 15-minute intervals. After this, the test pressure shall be maintained for at least another 15 minutes.

i. At the completion of the test the pressure shall be released at the furthermost point from the point of application.

d. All exposed piping shall be examined during the test and all leaks, defective material or joints shall be repaired or replaced before repeating the tests.

e. The allowable leakage for pressure pipelines shall not exceed the following in gallons per 24 hours per inch of diameter per mile of pipe:

Type of Pipe	Leakage
Ductile iron	10
Polyvinyl chloride, thermal plastic or fiberglass with rubber joints	10
Polyvinyl chloride, thermal plastic or fiberglass with solvent-cemented joints	0
Concrete with steel and rubber joints	10
Steel with welded joints	0
Steel with harnessed joints	10
Wrought steel	0
Copper	0
All piping inside structures	0

f. Regardless of the above allowables, any visible leaks shall be permanently stopped.

g. When testing against closed metal seated valves, an additional leakage per closed valve of 0.0078 gal/h/in. of nominal valve size shall be allowed.

C. Tests for Non-Pressure Pipelines for Transport of Water, Sludge, or Sewage

1. General

a. Pipelines designed to carry water, sludge, or sewage in open channel flow or at minimal pressures shall be tested for leakage prior to being placed in service.

b. The leakage shall be determined by exfiltration, infiltration or low pressure air.

i. The testing method directed by the Engineer shall take into consideration the groundwater elevation of the section of pipe being tested.

ii. The maximum non-pressure pipeline to be tested for leakage shall be the section between manholes or 600 feet as directed by the Engineer.

c. Intermediate leakage tests during construction shall be made at the Contractor's discretion. Upon completion of any pipeline, the entire system including manholes shall be tested for compliance to allowable leakage.

d. When testing absorbent pipe materials such as cement or concrete, the pipeline shall be filled with water at least 24 hours before the test is made.

e. Prior to any testing, groundwater levels shall be determined by the Contractor by installation of piezometers, observation pipes in manholes, or other means approved by the Engineer.

f. If the line fails the test, the Contractor shall explore for the cause of the excessive leakage and after repairs have been made the line shall be retested. This procedure shall be repeated until the pipe complies.

2. Exfiltration Testing

a. Exfiltration tests shall be made by filling a section of pipeline with water and measuring the quantity of leakage.

b. The head of water at the beginning of the test shall be at least two feet above the highest pipe within the section being tested.

i. Should groundwater be present within the section being tested, the head of water for the test shall be two feet above the hydraulic gradient of the groundwater.

ii. Should the requirement of two feet of water above the highest pipe subject any joint at the lower end of the test section to a differential head of greater than 11.5 feet another method of testing shall be employed.

3. Infiltration Testing

a. Infiltration tests will be allowed only when the groundwater level is determined to be two feet or more above the highest pipe of the section being tested.

b. Infiltration test shall be made by measuring the quantity of water leaking into a section of pipeline.

c. Measurement of the infiltration shall be by means of a calibrated weir constructed at the outlet of the section being tested.

4. Allowable Leakage for Non-Pressure Pipelines

The allowable leakage (exfiltration or infiltration) for non- pressure pipelines shall not exceed the following in gallons per 24 hours per inch of diameter per 1000 feet of pipe:

Type of Pipe	Leakage
Ductile iron - mechanical or push-on joints	10
Polyvinyl chloride, thermal plastic or fiberglass with rubber joints	10
Polyvinyl chloride, thermal plastic or fiberglass with solvent-cemented joints	0
Concrete with rubber joints	10
Concrete with steel and rubber joints	10
Corrugated Steel	95
Clay with rubber gasket joints	20
Cast iron soil pipe 1. drains and vents 2. sewer laterals	0
All piping inside structures	0

Regardless of the above allowable leakage any spurting leaks detected shall be permanently stopped.

5. Air Testing

a. For the acceptance of air testing in lieu of hydrostatic testing (exfiltration or infiltration), the Contractor shall perform hydrostatic and air tests on at least three sections of pipeline for each type of pipe being used. The Engineer shall select the sections for the corroborative tests. If these dual tested sections indicate the same results, that is, acceptance under both tests, air testing will be allowed in lieu of hydrostatic testing to meet the project requirements.

b. Air testing for acceptance shall not be performed until the backfilling has been completed.

c. Low pressure air tests shall conform to ASTM C 828 except as specified herein and shall not be limited to type or size of pipe.

d. All sections of pipelines shall be cleaned and flushed prior to testing.

e. The air test shall be based on the average holding pressure of 3 psi gauge, a drop from 3.5 to 2.5 psi, within the period of time allowed for the size of pipe and the length of the test section. The time allowed for the 1 psi drop in pressure, measured in seconds, will be computed by the Engineer and will be based on the limits of ASTM C 828.

i. When groundwater is present the average test pressure of 3 psig shall be above any back pressure due to the groundwater level.

ii. The maximum pressure allowed under any condition in air testing shall be 10 psig. The maximum groundwater level for air testing is 13 feet above the top of the pipe.

f. The equipment required for air testing shall be furnished by the Contractor and shall include the necessary compressor, valves and gauges to allow for the monitoring of the pressure, release of pressure and a separable test gauge.

i. The test gauge shall be sized to allow for the measuring of the one psig loss allowed during the test period and shall be on a separate line to the test section.

D. Manhole Testing

1. General

a. Each manhole shall be tested by either exfiltration or infiltration.

b. A manhole will be acceptable if the leakage does not exceed an allowable of one gallon per vertical foot of depth for 24 hours. Regardless of the allowable leakage any leaks detected shall be permanently stopped.

2. Exfiltration test may be performed prior to or after backfilling. The test shall be made by filling the manhole with water and observing the level for a minimum of eight hours.

3. Infiltration tests shall be performed when the groundwater level is above the joint of the top section of a precast manhole.

E. Oil, and Gas Piping

1. All pipelines for oil and gas shall be cleaned and tested with air at the pressure specified and no leakage will be allowed. After these tests are complete, fuel gas lines shall be flushed out with nitrogen or carbon dioxide before fuel gas is admitted.

E. Process Air Piping

1. All sections of pipelines shall be cleaned and flushed prior to testing.

2. All pipelines shall be tested with air at the specified test pressure. Test pressure shall be held on the piping for a period of at least 2 hours, unless a longer period is requested by the Engineer.

3. No leakage will be allowed during the test.

4. The equipment required for air testing shall be furnished by the Contractor and shall include the necessary compressor, valves and gauges to allow for the monitoring of the pressure, release of pressure and a separable test gauge.

5. The test gauge shall be have a maximum range of 0 to 50 psig and shall be graduated in one-tenth psig increments and shall be on a separate line to the test section

6. Pneumatic Pressure Test

    a. Under no circumstances shall pneumatic testing be performed on non-metallic pipe.
    b. Connect air supply to piping system.
    c. Connect air supply to piping system.
    d. Open inlet valve and allow pressure to increase slowly to 25 psig or 20 percent of scheduled test pressure, whichever is LESS.
    e. Close inlet valve and monitor system pressure for the duration indicated in the test schedule. Checking for any drop in pressure that would indicate leaks.
    f. If leaks are detected, locate leaks and judge the safety of bringing the system to the full test pressure. If judged unsafe, relieve the pressure on the system, repair leaks, and retest system at low pressure before proceeding.
    g. Increase pressure to the specified test pressure. Close inlet valve and monitor system pressure for duration specified in schedule. After the specified duration, check pressure reading on system gauge. No detectable drop in pressure shall have occurred in the system.
    h. If a drop in pressure occurs, Contractor shall check all joints and other possible sources of leaks with soap solution. Once cause is determined release the pressure, repair pipe as necessary, and retest.
    i. Upon compliance with test requirements, vent and allow system to return to atmospheric pressure. Remove items added or replace those removed for testing.

END OF SECTION

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SECTION 03200

CONCRETE REINFORCEMENT

03200.01 GENERAL

A. Description

Concrete reinforcement shall include, but not necessarily be limited to, furnishing and placing various types and/or sizes of steel reinforcing for embedment in Portland cement concrete as specified in the Contract Documents.

B. Related Work Included Elsewhere

Not applicable.

C. Quality Assurance

1. Inspection and Testing

   The Engineer will inspect all materials before and/or after installation to ensure compliance with the Contract Documents. When specific tests of materials are called for in the referenced standards and specifications, the Engineer has the option of requiring that any or all of these tests be performed for materials furnished for a specific project. When testing is required, it will be specified herein or in the "Special Provisions".

2. Tolerances

   Reinforcing bars shall be cut and bent within the following tolerances:

   a. Sheared Length: Plus or minus 1 inch for #3 to #11 bars inclusive and 2 inches + for #14 and #18 bars.

   b. Depth of Truss Bars: Plus 0, minus 1/2 inch.

   c. Stirrups, Ties, and Spirals: Plus or minus 1/2 inch.

   d. All Other Bends: Plus or minus 1 inch.

   e. Tolerances in placement shall conform to Paragraph 7, Section 7 of the Manual of Standard Practice of the Concrete Reinforcing Steel Institute.

D. Submittals

1. Shop Drawings

   Shop drawings shall be submitted as specified in the "General Provisions" for all reinforcing bars and shall contain the following data, lists, and information; bar lists, placement plans, and bending diagrams: description, details, dimensions, and locations of each item; details in accordance with requirements of ACI318.

2. Certificates of Compliance

   Certificates of compliance shall be submitted in accordance with the "General Provisions" for all concrete reinforcement stating that the material furnished meets the requirements specified in Section 03200.02.

3. Certified Test Results

   a. Certified test results shall be submitted for all epoxy coatings for deformed steel reinforcing bars showing that they meet the requirements specified in Section 03200.02.

   b. A certified copy of mill tests shall be submitted on each heat of reinforcing steel delivered, showing physical and chemical analysis.

03200.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for concrete reinforcement.

B. Contractor's Options

Substitution of smaller size bars will be permitted only upon specific authorization by the Engineer. Substituted bars shall provide a steel area equal to or larger than that called for by the design provided the spacing is not reduced to a point where the clear distance between the bars is less than one and one-half times the nominal diameter of the bars, nor one and one-half times the maximum size of the course aggregate, nor 1 1/2 inches, and further provided that the planned cover is maintained. No additional compensation will be allowed because of the substitution of larger areas of steel.

C. Detailed Material Requirements

1. General

   Reinforcing steel shall conform to the requirements of ACI 318.

2. Bar Reinforcement

Bar reinforcement shall consist of deformed bars meeting the requirements of AASHTO M 31, Grade 60. Grade 40 may be used for #5 and smaller bars where indicated on the Plans.

3. Tie or Dowel Bars

Tie or dowel bars shall be round steel bars meeting the requirements of AASHTO M 31, Grade 40 or ASTM A 36.

Sleeve for dowel bars shall be of sheet metal capable of sliding over 2 ± 1/4 inch of the dowel and shall have a closed end with a stop to hold the end of the sleeve at a minimum distance of 1 inch from the end of the dowel bar.

4. Welded Steel Wire Fabric

Welded steel wire fabric shall meet the requirements of AASHTO M 55. Fabric used in pavement construction shall be furnished in flat sheets. When galvanizing is specified, the fabric shall be galvanized after fabrication.

5. Welded Deformed Steel Wire Fabric

Welded deformed steel wire fabric shall meet the requirements of AASHTO M 221.

6. Fabricated Steel Bar Mats

Fabricated steel bar mats shall consist of steel meeting the requirements of AASHTO M 31 fabricated to meet the requirements of AASHTO M 54.

7. Wire Fabric for Pneumatically Applied Mortar

Wire fabric for pneumatically applied mortar and concrete encasement shall meet the requirements of AASHTO M 55. It shall be fabricated from size W1.4 wire on 3 inch centers in each direction. It shall have a minimum galvanized coating of 0.8 ounces per square foot when tested in accordance with AASHTO T 65.

8. Cold Drawn Steel Wire

Cold drawn steel wire for concrete reinforcement shall meet the requirements of AASHTO M 32.

9. Tie Devices

Tie devices for use in securing contiguous traffic lanes of Portland cement concrete pavement or a traffic lane and concrete curb or combination curb and

gutter shall be of malleable iron or steel. The tie devices shall meet the dimensions specified and produce a frictional force of at least 160 pounds per foot of spacing when tested in accordance with MSMT 512.

10. Galvanizing

Galvanizing for deformed steel bars shall be in accordance with ASTM A 153.

11. Epoxy Coatings for Deformed Steel Reinforcing Bars

Epoxy coatings for deformed steel reinforcing bars shall be epoxy powders which are electrostatically spray applied to sandblasted near white steel (fusion bonded epoxy resin). Ties, supports, and inserts used in conjunction with epoxy coated steel reinforcing bars shall be similarly coated.

a. Prequalification

Prequalification of epoxy coating will be based on MSMT 613 with the following limits:

Property	Requirement
Thickness, mils	5 to 11 after curing
Holidays/foot	2 max.
Bend Test	No cracks in coating
Hardness, KHN	16 min.
Pullout Strength Ratio Coated/Uncoated	0.80 min.
Impact Resistance, Area of Damage Square Inches	0.15 max.
Abrasion Resistance, mg loss	100 mg/1000 cycles max.
Chemical Resistance	The coating shall not blister, soften, disbond or develop holidays.
Chloride Penetration	1×10^{-4} Molar max.
Resistance to Applied Voltage	No evolution of hydrogen gas at the cathode or rusting at the anode within one hour. No holidays developed at the end off 30 days of testing.

b. Control and Acceptance

Control and acceptance of epoxy coating will be based on MSMT 613 with the following limits:

Property	Specification
Thickness, mils	5 to 11 after
curing Holidays/foot	2 max.
Bend Test (No. 5 Deformed Steel Reinforcing Bars)	No cracks in coating
Hardness, KHN	16 min.

NOTE: Condition of cure shall be checked by the applicator's method deemed most effective to determine that the coating is fully cured.

c. Patching Materials

Patching or repair material shall be available through the epoxy powder manufacturer. The material shall be compatible with epoxy coating and inert in concrete. The material shall be capable of allowing concrete to be placed within 1 hour after application at an ambient temperature of 35°F.

03200.03 EXECUTION

A. Fabrication

1. General

After bar lists and bending diagrams have been approved, fabricate each unit of reinforcement to the type, shape, size, grade, and dimensions shown on the approved shop drawings.

2. Cutting and Bending

Perform cutting and bending of reinforcing bars before shipment to the site. Bend all bars cold in a manner that will not injure the material and in accordance with the Manual of Standard Practice of the Concrete Reinforcing Steel Institute.

B. Shipping, Handling, and Protection of Material

Reinforcing steel bars shall be shipped in standard bundles and tagged and marked in accordance with the provisions of the Code of Standard Practice of the Concrete Reinforcing Steel Institute. Bundles shall be kept intact and material undamaged and properly identified until ready for use.

Reinforcing steel bars shall be stored on blocking, racks, or platforms so as not to be in contact with the ground.

Bars shall be kept free from dirt, paint, oil, grease, loose or thick rust, detrimental mill scale, or other foreign substances. However, when steel has on its surface detrimental rust, mill scale, dust, or dirt, it shall be cleaned by a method approved by the Engineer.

C. Placing and Fastening

The placing of bars shall conform to the recommended practices in "Placing Reinforcing Bars" as published by the Concrete Reinforcing Steel Institute.

Reinforcing steel shall be accurately placed in the position shown on the plans and firmly held during the depositing and setting of the concrete. Cover, or the distance between the external face of the bar and the face of the finished concrete, shall be as indicated on the Plans. Reinforcing steel bars embedded in concrete shall not be bent after they are in place. Bars shall be tied at all intersections with 16 1/2 gage black annealed wire except that where spacing is less than 1 foot each direction alternate intersections need not be tied. All intersections shall be tied in the top mat of reinforcement placed on the top slabs of box culverts. Abrupt bends shall be avoided except where one steel bar is bent around the other. Stirrups and ties shall always pass around the outside of main bars and be securely attached thereto. All reinforcing steel shall be securely held at the proper distance from the forms by means of plastic coated steel chairs. Blocks for holding reinforcement away from contact with earth shall be precast concrete blocks of approved shape, mix, and dimensions and shall have tie wires embedded in them. Layers of bars shall be separated by approved plastic coated metal chairs or bolsters.

Any broken or damaged concrete spacer blocks shall be removed before concrete is placed. The use of pebbles, pieces of broken stone or brick, metal pipe, or wooden blocks as spacers will not be permitted. Reinforcing steel when placed in the work shall be free from flake rust, dirt, and foreign material before any concrete is placed. Any mortar which may be adhering to the reinforcing steel shall be removed. No concrete shall be deposited until the Engineer has inspected the placing of the reinforcing steel and given permission to place the concrete. The Contractor shall allow the Engineer 4 hours of normal working time after the reinforcement and forms are in place to conduct the inspection. Any bars of incorrect size, length, or shape shall be removed and replaced with correct bars. Any bars located or spaced incorrectly shall be relocated or spaced correctly before permission is given to place concrete, and such replacements and corrections shall be at the Contractor's expense. All concrete placed in violation of these provisions shall be rejected and removed.

When the ambient air temperature is below 40°F, the temperature of the air in contact with the reinforcement shall be raised to 40°F prior to placing concrete. When the ambient air temperature is above 70°F and the reinforcement is exposed to the direct rays of the sun, the reinforcement shall be cooled by means of a water spray or by shading prior to placing concrete.

D. Splicing

Reinforcement shall be furnished in full lengths as indicated on the Plans. Splicing, except where shown on the Plans, will not be permitted without written approval from the Engineer; and if additional splices are used, the additional weight occasioned by such splices shall be at the Contractor's expense.

All splices shall conform to Class "C" in ACI 318 or as shown on the Plans. Splices shall be well distributed where conditions permit. Except where otherwise shown on the Plans, lap splices shall be made with the bars placed in contact and wired together. Lapped splices for reinforcement shall not be used for bar sizes larger than No. 11.

No welding of reinforcing steel or attachments thereto will be permitted without written authorization by the Engineer, unless so indicated on the Plans. Welding, if permitted, shall be in accordance with AWS D1.4.

03200.04 METHOD OF MEASUREMENT

Measurement for concrete reinforcement consisting of plain round bars, deformed bars, or wire mesh will not be made, but shall be included in the unit or lump sum price bid for other items unless the Proposal indicates that measurement by one of the following methods is applicable.

A. Unit Price

1. Reinforcing Bars

Measurement for reinforcing bars will be made based on the total weight of all reinforcement accepted and installed according to the Contract Documents.

For plain or Deformed Bars, computed theoretical weights will be used with no allowances for over or underruns unless actual certified shipping weights are available, in which case these weights will be used as the basis of measurement; and allowances may be made for overruns not in excess of 3.5% on any one shipment. Under no circumstances will any allowances for overruns be made unless actual certified shipping weights indicate that such overruns actually existed. No allowances will be made for extra weight resulting from the use of substituted items or from the inclusion of extra laps and splices, even though approval has been granted for the use of substituted items or materials or lengths and sizes other than those originally required. Measurement of this item will not include the weight of any clips, chairs, spacers, tie wires, welds, or other accessory devices used in placing and securing the reinforcement.

The theoretical computed weights for Plain and Deformed Bars will be based upon the original approved and accepted overall lengths of bars computed on the basis of the following unit weights per linear foot.

Bar Number	Weight Pounds Per Linear Foot
3	0.376
4	0.668
5	1.043
6	1.502
7	2.044
8	2.670
9	3.400
10	4.303
11	5.313
14S	7.650
18S	13.600

2. Welded Steel Wire Fabric

Measurement for welded steel wire fabric will be made based on the area of the fabric as installed complete in place. No allowances will be made for overlap.

B. Lump Sum

Measurement for concrete reinforcement will be made on the basis of a lump sum for all reinforcement in the Project or a lump sum for all reinforcement in each structure or structural unit.

03200.05 BASIS OF PAYMENT

A. General

1. Payment for concrete reinforcement consisting of plain round bars, deformed bars, or wire mesh will not be made as such, but the cost thereof shall be included in the unit or lump sum price bid for other items unless the Proposal indicates that payment is applicable.

2. When applicable, payments will be made at the unit or lump sum prices bid. These prices shall include furnishing all labor, tools, equipment, and materials necessary to satisfactorily complete the work as shown and specified in strict accordance with the Contract Documents, and accepted by the Engineer.

B. Unit Price

1. General

No payment will be made for the following:

a. Clips, ties, bar supports, spacers, chairs, or other devices for holding reinforced steel in place.

b. Additional reinforcing steel for splices permitted by the Engineer for Contractor's convenience.

c. Overrun of scale weights of reinforcing steel.

d. Reinforcing steel and accessories required for lump sum items.

2. Reinforcing Bars

Payment for reinforcing bars will be made at the price bid per pound.

3. Welded Steel Wire Fabric

Payment for welded steel wire fabric will be made at the price bid per square foot.

C. Lump Sum

1. Payment for concrete reinforcement will be made at the lump sum price bid for all reinforcement and appurtenances in the Project, or for all reinforcement and appurtenances in each structure or structural unit.

2. To provide for unforeseen changes in planned dimensions affecting reinforcing steel bid on a lump sum basis, the Proposal will include an item for contingent reinforcing steel. This item shall be used only upon written direction of the Engineer. If necessary changes in planned dimensions result in an increase in the quantity, then the pertinent lump sum price shall be increased by an amount obtained from the product of the additional poundage times the unit price bid per pound for contingent reinforcing steel. Should, however, the necessary changes in planned dimensions result in a smaller quantity than planned, then the pertinent lump sum price shall be reduced by an amount obtained from the product of the decrease in poundage times the unit price bid per pound for contingent reinforcing steel. The item shall include cost of furnishing, coating, fabricating, placing, and tying of the reinforcing steel and work required to complete the revisions to the reinforcing steel.

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SECTION 03600

NON-SHRINK GROUTS AND MORTARS

03600.01 GENERAL

A. Description

Non-shrink grouts and mortars shall include, but not necessarily be limited to, prepackaged, non-shrink, cement-based grouts and mortars requiring only the addition of water. The grouts and mortars shall be specifically formulated for use as a sealant around wall penetrations, for use under machine or column bases, for bolt anchorages, and similiar applications where drying shrinkage would be detrimental. Non-shrink grouts and mortars shall be furnished and placed in accordance with the Contract Documents, where indicated on the Plans, or as directed by the Engineer.

B. Related Work Included Elsewhere

Not applicable.

C. Quality Assurance

1. Inspection

   The Engineer will inspect all materials before and/or after installation to ensure compliance with the Contract Documents.

2. Containers

   All non-shrink grouts and mortars shall be furnished and stored in the manufacturer's original containers.

D. Submittals

1. Shop Drawings

   Shop drawings shall be submitted as specified in the "General Provisions" for all non-shrink grouts and mortars furnished. The shop drawings shall include product description and storage, handling, mixing, and placing instructions or recommendations.

2. Certificates of Compliance

   Certificates of compliance shall be submitted in accordance with the "General Provisions" for all non-shrink grouts and mortars stating that the material furnished meets the requirements specified in Section 03600.02.

03600.02 MATERIALS

A. Materials Furnished by the County

1. The County will not furnish any materials for non-shrink grouts and mortars.

2. The Contractor may obtain potable water from the County's potable water system for mixing with the dry material. The Contractor shall contact the Bureau of Utilities, Meter Section, for requirements.

B. Contractor's Options

Non-shrink grouts and mortars may be either metallic or non-metallic as specified in Article C.

C. Detailed Material Requirements

1. Water from Other Than Potable Sources

   Water shall meet the pH requirements of AASHTO T 26, Method B. Water shall not smell or be discolored. Water suspected of questionable quality shall meet limits of the comparison tests with distilled water in accordance with AASHTO T 26. The chloride concentration of water used in mixing and curing of non-shrink grouts and mortars will be determined in accordance with ASTM D 512 and shall not have a chloride concentration exceeding 1000 ppm.

2. Non-Shrink Grouts and Mortars

   Non-shrink grouts and mortars shall conform to the requirements of the Corps of Engineers specification CRD-C 588, Type 3.1, b or d. The grout or mortar shall have a minimum compressive strength of 5000 psi in 7 days when tested in accordance with AASHTO T 106 except that the cube molds shall remain intact with the top firmly attached throughout the curing period. The non-shrink grout or mortar shall have a minimum expansion of 0.0% after 7 days when tested in accordance with AASHTO T 160.

03600.03 EXECUTION

A. Preparation

1. All surfaces to receive non-shrink grout and mortar shall be cleaned of all oil, grease, dirt, and laitance down to sound concrete. Rust shall be removed from the underside of all plates and from all bolts or other embedment items by sanding or power brushing.

2. Where the concrete surface to receive the non-shrink grout or mortar is smooth, the surface shall be roughened with a small chipping hammer and then saturated with water prior to placing the grout or mortar.

B. Forms

When required, forms shall be furnished and placed to confine the non-shrink grout. The forms shall be strong enough to resist buckling and tight enough to prevent leakage.

C. Mixing

1. Mixing water shall be proportioned in accordance with the manufacturer's recommendations for the intended application. Use the stiffest mix possible consistent with placement methods.

2. Mixing shall be accomplished in water-tight containers following the manufacturer's recommendations.

D. Pouring or Pumping Grout

Grout shall be poured or pumped into position in such a manner as to avoid air pockets and to fill the entire void. When necessary, use rods or other tools to compact the grout and remove all voids.

E. Placing Mortar

Carefully place the mortar in such a manner to avoid air pockets and assure that the material is in complete contact with all surfaces. Unless otherwise specified, the finished surface shall be tooled smooth to match the adjacent area.

F. Curing

The non-shrink grout or mortar shall be cured for the time and in the manner recommended by the manufacturer.

03600.04 METHOD OF MEASUREMENT

Non-shrink grouts and mortars will not be measured.

03600.05 BASIS OF PAYMENT

Non-shrink grouts and mortars will not be paid for as a separate item but is considered incidental to other items of work. Payment will be included in other related items of work and will constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the required work.

END OF SECTION

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SECTION 03930

CONCRETE REHABILITATION

PART 1 GENERAL

1.01. SUMMARY

A. This section includes the following:

1. Removal of deteriorated concrete and subsequent patching and rebuilding.

2. Epoxy crack injection.

3. Corrosion-inhibiting treatments.

1.02. SUBMITTALS

A. Product Data - Include material descriptions, chemical composition, physical properties, test data, and mixing and application instructions.

1. Include Material Safety Data Sheets, if applicable.

B. Product Certificates - Signed by manufacturers certifying that products furnished comply with requirements and are recommended by manufacturer for uses indicated.

C. For products required to be installed by workers approved by product manufacturers, include letters of acceptance by product manufacturers certifying that installers are approved to apply their products.

D. Rehabilitation program for each phase of the rehabilitation process, including protection of surrounding materials and project site during operations. Describe in detail the materials, methods, equipment, and sequence of operations to be used for each phase of the Work.

1. If alternative materials and methods to those indicated are proposed for any phase of rehabilitation work, submit substitution request and provide a written description of proposed materials and methods, including evidence of successful use on other comparable projects, and a testing program to demonstrate their effectiveness for this project.

1.03. QUALITY ASSURANCE

A. Installer Qualifications - An experienced installer who retains installers that employ workers trained and approved by manufacturer to apply corrosion-inhibiting treatments, concrete patching and rebuilding materials, and epoxy crack injection materials.

B. Manufacturer Qualifications - Manufacturers shall have factory-trained representatives who are available for consultation and project site inspection at no additional cost.

C. Source Limitations - Obtain each of the following through one source from a single manufacturer:

1. Concrete patching and rebuilding materials.

2. Epoxy crack injection materials.

1.04. DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in manufacturer's original and unopened containers, labeled with type and name of products and manufacturers.

B. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.

C. Store cementitious materials off the ground, under cover, and in a dry location.

D. Store aggregates, covered and in a dry location, where grading and other required characteristics can be maintained and contamination avoided.

1.05. PROJECT CONDITIONS

A. Environmental Limitations for Epoxies - Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.

1. Use only Class A epoxies when substrate temperatures are below or are expected to go below 40 degrees F within 8 hours.

2. Use only Class A or B epoxies when substrate temperatures are below or are expected to go below 60 degrees F within 8 hours.

3. Use only Class C epoxies when substrate temperatures are above 60 degrees F.

B. Cold Weather Requirements for Cementitious Materials - Do not apply unless air temperature is between 40 and 90 degrees F and will remain so for at least 48 hours after completion of work.

C. Cold Weather Requirements for Cementitious Materials - Comply with the following procedures:

1. When air temperature is below 40 degrees F, heat patching material ingredients and existing concrete to produce temperatures between 40 and 90 degrees F.

2. When mean daily air temperature is between 25 and 40 degrees F, cover completed Work with weather-resistant insulating blankets for 48 hours after repair.

3. When mean daily air temperature is below 25 degrees F, provide enclosure and heat to maintain temperatures above 32 degrees F within the enclosure for 48 hours after repair.

D. Hot Weather Requirements for Cementitious Materials - Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 degrees F and above.

PART 2 PRODUCTS

2.01. MANUFACTURERS

A. Products - Subject to compliance with requirements, provide one of the following:

1. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent

a. Euclid Chemical Company; CORR-BOND.

b. Sika Corporation; Armatec 110 EpoCem.

c. Sonneborn, Div. of ChemRex, Inc.; Sonoprep.

2. Repair Mortar (1 Part Microsilica Modified)

a. Tnemec Series 217 MortarCrete.

b. Euclid Chemical Company; EUCOCRETE.

c. Sika Corporation; Sika MonoTop 611.

3. Epoxy Crack Injection Adhesive

a. Sika Corporation; Sikadur Injection Gel.

2.02. BONDING AGENTS

A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent - Product that consists of water-insensitive epoxy adhesive, Portland cement, and water-based

solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.

B. Mortar Scrub-Coat - 1 part Portland cement complying with ASTM C 150, Type I, II, or III and 1 part fine aggregate complying with ASTM C 144, except 100 percent passing a No. 16 sieve.

2.03. REPAIR MORTAR

A. Repair Mortar - Unless otherwise indicated, use the following:

1. Cementitious Patching Mortar - Packaged, dry mix complying with ASTM C928.

B. Overhead Patching Mortar - For overhead repairs, use patching mortar recommended by manufacturer for overhead use and as specified above.

C. Coarse Aggregate for Adding to Repair Mortar - Washed aggregate complying with ASTM C33, Size No. 8. Add only as permitted by repair mortar manufacturer.

2.04. CONCRETE

A. Steel Reinforcement and Reinforcement Accessories - Comply with Section 03200, Concrete Reinforcement.

2.05. CRACK INJECTION MATERIALS

A. Epoxy Crack Injection Adhesive - ASTM C881.

B. Epoxy Capping Adhesive - Product manufactured for use with crack injection adhesive by same manufacturer.

2.06. MIXES

A. Mix products in clean containers according to manufacturer's written instructions.

1. Add clean silica sand and coarse aggregates to products only as recommended by manufacturer.

2. Do not add water, thinners, or additives unless recommended by manufacturer.

3. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.

4. Do not mix more materials than can be used within recommended open time. Discard materials that have begun to set.

B. Mortar Scrub-Coat - Mix with enough water to provide a consistency of thick cream.

C. Dry-Pack Mortar - Mix with just enough liquid to form a damp cohesive mixture that can be squeezed by hand into a ball but is not plastic.

PART 3 EXECUTION

3.01. PREPARATION

A. Protect people, motor vehicles, equipment, surrounding construction, project site, plants, and surrounding buildings from injury resulting from concrete rehabilitation work.

1. Erect temporary protective covers over pedestrian walkways and at points of entrance and exit for people and vehicles that must remain in operation during course of concrete rehabilitation work. Construct covers of tightly fitted, 3/4-inch exterior-grade plywood supported at 16 inches o.c. and covered with asphalt roll roofing.

2. Protect adjacent equipment and surfaces by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent. If practical, remove items, store, and reinstall after potentially damaging operations are complete.

3. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.

4. Dispose of runoff from wet operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

B. Shoring - Install temporary supports before beginning concrete removal. Design and maintenance of shoring shall be the sole responsibility of the contractor.

C. Concrete Removal - Saw-cut perimeter of areas indicated for removal to a depth of at least 1 inch. Make cuts at a slight bevel. Remove loose and deteriorated concrete by breaking up and dislodging from reinforcing.

1. Remove concrete between cuts to a depth of at least 1 inch.

2. Where reinforcing bar is exposed, bond between reinforcing bar and surrounding concrete is broken, or reinforcing bar is corroded, remove

concrete from entire perimeter of bar to provide at least a 3/4-inch clearance.

3. Test areas where concrete has been removed by tapping with hammer, and remove additional concrete until unsound concrete is completely removed.

4. Provide fractured aggregate surfaces with a profile of at least 1/8 inch that are approximately perpendicular or parallel to original concrete surfaces. At columns and walls, make top and bottom surfaces level.

5. Thoroughly clean removal areas of loose concrete, dust, and debris.

D. Reinforcing Bar Preparation - Remove loose and flaking rust from reinforcing bars by sand blasting to comply with SSPC SP-6.

1. Where section loss of reinforcing bar is more than 25 percent, cut bars and remove and replace as indicated in the drawings. Remove additional concrete as necessary to provide at least a 3/4-inch clearance at existing and replacement bars. Splice replacement bars to existing bars according to ACI 318, by using mechanical couplings.

E. Concrete Surface Preparation - Clean concrete by sand blasting to remove dirt, oils, films, and other materials detrimental to treatment application. Allow surface to dry before applying corrosion-inhibiting treatment.

3.02. APPLICATION

A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent - Apply to reinforcing bars and concrete by stiff brush or hopper spray according to manufacturer's written instructions. Apply to reinforcing bars in two coats, allowing first coat to dry two to three hours before applying second coat. Allow to dry before placing patching mortar or concrete.

B. Mortar Scrub-Coat - Dampen repair area and surrounding concrete 6 inches beyond repair area. Remove standing water and apply scrub-coat with a brush, scrubbing it into surface and thoroughly coating repair area. If scrub-coat dries, recoat before applying patching mortar or concrete.

C. Repair Mortar - Unless otherwise recommended by manufacturer, apply as follows:

1. Wet substrate thoroughly for a minimum of 24 hours and then remove standing water. Scrub a slurry of neat patching mortar mixed with latex bonding agent into substrate, filling pores and voids.

2. Place patching mortar by troweling toward edges of patch to force intimate contact with edge surfaces. For large patches, fill edges first and then work toward center, always troweling toward edges of patch. At fully

exposed reinforcing bars, force patching mortar to fill space behind bars by compacting with trowel from sides of bars.

3. For vertical patching, place material in lifts of not more than 2 inches nor less than 1/4 inch. Do not feather edge.

4. For overhead patching, place material in lifts of not more than 2 inches nor less than 1/4 inch. Do not feather edge.

5. After each lift is placed, consolidate material and screed surface.

6. Where multiple lifts are used, score surface of lifts to provide a rough surface for application of subsequent lifts. Allow each lift to reach final set before placing subsequent lifts.

7. Allow surfaces of lifts that are to remain exposed to become firm and then finish to a smooth surface with a wood or sponge float.

8. Wet-cure cementitious patching materials for not less than seven days by water-fog spray or water-saturated absorptive cover. Alternately, apply minimum of two coats of membrane forming curing compound.

D. Dry-Pack Mortar - Use for deep cavities. Place according to manufacturer's written instructions and as follows:

1. Provide forms where necessary to confine patch to required shape.

2. Wet substrate and forms thoroughly and then remove standing water.

3. Place dry-pack mortar into cavity by hand, and compact into place with a hardwood drive stick and mallet or hammer. Do not place more material at a time than can be properly compacted. Continue placing and compacting until patch is approximately level with surrounding surface.

4. After cavity is filled and patch is compacted, trowel surface to match profile and finish of surrounding concrete. A thin coat of patching mortar may be troweled into the surface of patch to help obtain required finish.

5. Wet-cure patch for not less than seven days by water-fog spray or water-saturated absorptive cover.

E. Concrete - Comply with manufacturer's written instructions and the following:

1. Apply epoxy-modified, cementitious bonding and anticorrosion agent to reinforcing.

2. At unformed surfaces, screed concrete to produce a surface that when finished with patching mortar will match required profile and surrounding concrete.

3. Wet-cure concrete for not less than seven days by leaving forms in place or keeping surfaces continuously wet by water-fog spray or water-saturated absorptive cover.

4. Fill placement cavities with dry-pack mortar and repair voids with patching mortar. Finish to match surrounding concrete.

F. Epoxy Crack Injection - Comply with manufacturer's written instructions and the following:

1. Clean areas to receive capping adhesive of oil, dirt, and other substances that would interfere with bond, and clean cracks with oil-free compressed air or low-pressure water to remove loose particles.

2. Place injection ports as recommended by epoxy manufacturer, spacing no farther apart than thickness of member being injected. Seal injection ports in place with capping adhesive.

3. Seal cracks at exposed surfaces with a ribbon of capping adhesive at least 1/4 inch thick by 1 inch wider than crack.

4. Inject cracks wider than 0.003 inch to a depth of 8 inches or to a depth at which crack width is less than 0.003 inch, whichever is less.

5. Inject epoxy adhesive, beginning at widest part of crack and working toward narrower parts. Inject adhesive into ports to refusal, capping adjacent ports when they extrude epoxy. Cap injected ports and inject through adjacent ports until crack is filled.

6. After epoxy adhesive has set, remove injection ports and grind surfaces smooth.

END OF SECTION

SECTION 05140

STRUCTURAL ALUMINUM FRAMING

05140.01 GENERAL

A. Summary

1. Related Documents:
   a. Drawings and the General Requirements of the Subcontract apply to this Section.
   b. Review these documents for coordination with additional requirements and information that apply to work under this Section.

2. Section Includes:
   a. Aluminum framing members, support members, bracing members and connections.
   b. Base plates, leveling plates, leveling nuts and bolts.
   c. Grouting under base plates.

3. Related Sections:
   a. Division 01 Section "General Requirements."
   b. Division 03 Section “Nonshrink Grouts and Mortars”

B. References

1. General

   a. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
   b. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
   c. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

2. Federal Specifications:

   a. TT-P-645 – Paint, Aluminum, Heat Resisting

3. Aluminum Association:

   a. Aluminum Design Manual

4. ASTM International:

   a. ASTM B308/B308M Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles
   b. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
   c. ASTM B429 Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube

5. American Welding Society:

   a. AWS D1.2 - Structural Welding Code, Aluminum.

C. Submittals

1. Submit under provisions of Division 01 Section "General Requirements."

2. Shop Drawings: For aluminum fabrications as follows:

   a. Complete fabrication and erection plans and procedures giving full information on all aspects of the erection that will affect alignment, plumb and dimensional accuracy of the structure
   b. Connections, including size and spacing of bolts and welds.
   c. Indicate profiles, sizes, spacing, and locations of structural members, openings, camber and attachments.
   d. Indicate welded connections with AWS welding symbols. Indicate net weld lengths. Include details of welding materials, equipment, sequence and technique to be used.

3. Manufacturer's Certificate: Submit certification that manufactured products (including bolts, nuts and washers) meet or exceed specified requirements.

   a. Deliver manufactured products to the site in unopened containers. Certification numbers must appear on product containers for bolts, nuts and washers and the numbers shall correspond to the identification numbers on the Manufacturer's Certificate. The Manufacturer's symbol and grade markings must appear on bolts, nuts and washers.

4. Mill Test Reports: Submit mill test reports indicating structural strength, destructive and nondestructive test analysis and chemical analyses from the aluminum used in the Work.

5. Welders' Certificates: Documentation certifying welders employed by the Subcontractor meet AWS qualifications.

6. Submit the following as specified elsewhere in this Section:

   a. Written welding procedures in accordance with AWS D1.2 for each proposed joint.

b. Procedure qualification records in accordance with AWS D.1.2 for procedures qualified by testing.
c. Inspection reports of the Subcontractor's independent testing laboratory.

D. Quality Assurance

1. Fabricate aluminum members in accordance with CBC and Aluminum Design Manual “Specification for Aluminum Structures - Building Load and Resistance Factor Design”.

2. Welders shall be qualified in accordance with AWS D1.2 for each process, position and joint configuration.

3. Maintain one copy of each referenced document on site.

4. Delegated Design Responsibilities: Design connections not detailed on the Drawings under the direct supervision of a Structural Engineer experienced in design of aluminum and licensed in the State of Maryland.

E. Project Conditions

1. Verify dimensions on Shop Drawings in the field.

05140.02 PRODUCTS

A. MATERIALS

1. Rolled and Extruded Members: Alloy and temper 6016-T6 unless otherwise indicated on the Drawings.

   a. Rolled or Extruded Structural Shapes: ASTM B 308.

2. Aluminum Tubing: Alloy and temper 6016-T6.

3. Bolts, Nuts, and Washers:

   a. Bolts and Nuts in Structural Connections: alloy 6061-T6 unless otherwise indicated on the Drawings.
   b. Flat Washers: Alclad 2024-T4.
   c. Spring Washers: alloy 7075-T6AISI 316 stainless steel.

4. Welding Materials:

   a. Filler Metals: AWS D1.2.
   b. Electrodes and Equipment Settings: As recommended by the filler metal manufacturer for the position, thickness and conditions of use.

6. Furnish written verification to the EOR that filler metal is appropriate to the materials and welding process.

B. CONNECTIONS

1. Unless otherwise indicated on the Drawings, weld shop and field connections, except moment connections that shall be bolted. Weld in accordance with approved welding procedures.

2. The Subcontractor is responsible for the design of the connections not detailed on the Drawings.

3. Design connection components to resist the loads and moments indicated on the Drawings; if the reaction or load is not indicated on the Drawings, design connections as follows:

    a. The minimum design load shall be 5 kips.
    b. All bolted connections shall have a minimum of two bolts.

4. Connect gusset plates connecting horizontal and vertical bracing to beams and/or columns to both adjacent members; where this is not practical, make provisions for the moment induced by the eccentricity of the load to the work point of the connection.

    a. Locate gusset plates for horizontal bracing within the top two rows of bolts of beam connection angles, unless otherwise indicated on the Drawings.
    b. The minimum thickness of gusset plates in single shear shall be 5/16-inch for bolts in single shear and 3/8-inch for bolts in double shear.

C. Fabrication

1. Fabricate aluminum members in accordance with the approved Shop Drawings. Where practical, fabricate and assemble in the shop.

2. Obtain field measurements necessary for fabrication.

3. Dimensional Tolerances:

    a. Overall length of members with both ends milled shall vary by not more than 1/32-inch.
    b. Overall length of members without milled ends shall vary by not more than 1/16-inch for lengths less than 30 feet and not more than 1/8-inch for lengths 30 feet and over.

4. Where structural joints are welded, the detail of the joints, welding technique, weld quality and appearance, and methods for correcting defective welds shall conform to the AWS D1.2.

a. Welding Process: Inert shielded gas or resistance welding process.

5. Where milling is indicated on the Drawings, machine the contact surfaces true to obtain full and complete contact.

6. Structural members are selected from generally available rolled sections; however, if the specified sections are not available, provide sections with equivalent physical properties at no additional cost after approval by the EOR.

D. Finishes

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces as follows:

a. Where aluminum members are in contact with steel, prime both aluminum and steel members with one coat of paint meeting Federal Specification TT-P-645. Paint t aluminum with an additional coat of varnish containing 2 pounds of aluminum pigment per gallon.
b. Where aluminum members are in contact with porous materials, masonry or concrete, apply to the contact surfaces of the aluminum members a heavy coat of alkali resistant bituminous paint.
c. Where aluminum members are embedded in concrete containing admixtures which are corrosive to aluminum, or in concrete subjected to highly corrosive environments, prime the aluminum with one coat of paint meeting Federal Specification TT-P-645. Otherwise, aluminum members embedded in concrete need not be painted.

05140.03 EXECUTION

A. Preparation

1. Provide temporary supports and internal braces necessary to support structure during erection. Temporary supports and braces shall be adequate for anticipated wind, seismic, equipment and erection loads. Remove temporary shoring after the erection is complete.

2. Before erection, paint contact surfaces between dissimilar materials.

B. Examination

1. Verify that field conditions are acceptable and are ready for erection.

2. Beginning of installation means Subcontractor accepts that existing conditions meet the requirements for installation.

C. Erection

1. Where members can not be properly assembled due to mis-fabrication or deformation due to handling or transportation, report the condition to the EOR with a proposed method of correction for approval. Erect structure to the lines and grades indicated on the Drawings and in accordance with the Shop Drawings.

2. Do not field cut or alter structural members without approval of the University.

3. Grout base plates with non-shrink grout. Clean concrete bearing surfaces from bond-reducing materials and roughen if necessary to improve bond to surfaces. Grout base plates in accordance with Division 03 Section " Cast-in-Place Concrete ". Paint the bottom surface of base plate. Set base plate on wedges or other adjustable devices. After the base plate has been positioned and plumbed, tighten the anchor bolts. Grout solidly between the bearing surfaces to ensure that no voids remain.

4. Where field welding to existing structural members is required, confirm the weldability of the existing aluminum by cutting or drilling samples and having them tested by the contractor's Independent Testing Laboratory. The testing laboratory shall recommend the location for taking samples, provide a report on weldability, recommend the type of electrode, and weld and inspect the final welds.

    a. The contractor shall be responsible for preparing the existing structure for welding and touch-up of the surfaces.

D. Inspection and Testing

1. Inspection and testing will be performed under provisions of Division 01 Section "Special Procedures". The Subcontractor shall be responsible for in-house visual inspection and implementing a quality control program.

2. Notify the owner of the fabrication and erection schedules and permit the owner's representative to observe shop assembly, make visual inspections, nondestructive tests of welds, observe erection and perform field testing. Correct defective work, rejected by the owner’s representative at no additional cost to the Owner.

3. A certified welding inspector employed by the Owner's Independent Testing Laboratory will verify that welds are made in accordance with approved welding procedures and visually inspect shop and field welding operations as directed by the Owner.

4. Nondestructive testing of welding to the criteria in AWS chapter 5 by the Owner’s Independent Testing Agency

    a. Perform visual testing of welds in the fabricator's shop.
    b. Column flanges in moment frames are to be inspected 6 inches above and below the point where girder flanges and continuity plates are attached. Any recordable discontinuity causing complete loss of back reflection and which can not be encompassed within the larger of a 3 inch diameter circle or one half the plate thickness will be cause for rejection.

5. Full penetration groove welds shall be ultrasonic tested by a qualified technician who will operate the equipment, record any defects found and their disposition. The technician will be under the supervision of a Level II or III ASNT technician. Repair and re-test defective welds at no additional cost to the Owner.

6. Initially, 100 percent of the welds which require ultrasonic testing shall be tested to establish the qualifications of each individual welder. If the reject rate of a welder's work is demonstrated to be less than 5 percent of the tested welds, then the frequency of testing may be reduced to 25 percent. If the reject rate of a welder's work increases to 5 percent or more, 100 percent shall be re-established until the rate is reduced to less than 5 percent. The percentage of rejection shall be calculated and recorded for each welder. The body of data used to calculate the reject rate shall contain at least 40 tests. The reject rate is defined as the number of rejected welds divided by the number of welds completed multiplied by 100. For evaluating the reject rate of continuous welds over 3 feet long, each 12 inch increment one inch or less thick, shall be considered one weld and each 6 inch increment over one inch thick, shall be considered one weld.

END OF SECTION

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SECTION 05500

MISCELLANEOUS METALS

05500.01 GENERAL

A. Description

Miscellaneous metals shall include, but not necessarily be limited to, furnishing and installing anchors, fasteners, hardware, railings, and other miscellaneous metal items in accordance with the Contract Documents or as directed by the Engineer.

B. Related Work Included Elsewhere

Painting; Section 09900.

C. Quality Assurance

The Engineer will inspect all materials and work to ensure compliance with the Contract Documents. All miscellaneous metal items and fabrications shall be anchored firm and tight, in true alignment with neat fits, and without distortions, unsightly fastenings, raw edges, or protrusions.

D. Submittals

1. Shop Drawings

   Shop drawings shall be submitted as specified in the "General Provisions" for all miscellaneous metal items. The shop drawings shall include the following information:

   a. Sizes; finishes; all materials, locations, attached hardware, and fittings; and detail for all items including fabricated metal work, threaded fasteners, and welds. Indicate all welds, both shop and field, by AWS standards symbols.

   b. Furnish setting diagrams, erection plans, templates, and directions for the installation of backing plates, anchors, and other items.

   c. Submit catalogue descriptions of manufacturers' standard items.

05500.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any miscellaneous metals.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Whenever practicable, items shall be standard products, meeting the requirements specified herein, of a manufacturer regularly engaged in production of such items.

2. All fasteners, hangers, or other miscellaneous connections or accessories shall be of the same material or compatible with the item being fastened or hung.

3. Shapes and Bars

   a. Mild steel shall conform to requirements of ASTM A 36.

   b. Stainless steel shall conform to requirements of ASTM A 276, Type 316.

   c. Aluminum shall conform to requirements of ASTM B 221, Alloy 6061-T6.

4. Plate, Sheet, Strip

   a. Mild steel shall conform to requirements of ASTM A 36, or A 283, Grade C.

   b. High strength steel shall conform to requirements of ASTM A 242.

   c. Corrosion resistant steel shall conform to requirements of ASTM A 242; 0.25 to 0.75 percent copper.

   d. Stainless steel shall conform to requirements of ASTM A 240, Type 316.

   e. Aluminum shall conform to requirements of ASTM B 209, Alloy 6061-T6.

5. Pipe and Tube

   a. Mild Steel

      1) For welding, shall conform to requirements of ASTM A 53, Type S, Grade B, Schedule 40, black. Provide Schedule 80 for handrail posts.

      2) For screwed connections, shall conform to requirements of ASTM A 120 or ASTM A 53, Type E or S, Grade B, Schedule 40. Provide Schedule 80 for handrail posts.

   b. Stainless

      1) For welding, shall conform to requirements of ASTM A 312, Grade TP 316 L, Schedule 10 S minimum.

      2) For screwed connections, shall conform to requirements of ASTM A

312, Grade TP 316, Schedule 40S.

3) For press fits, shall conform to requirements of ASTM A 312, Grade TP 316, Schedule 5S minimum.

c. Aluminum shall conform to requirements of ASTM B 221, Alloy 6061, T6.

6. Bolts, nuts, washers

a. General

1) Provide galvanized for use with galvanized material.

2) Provide stainless for use with corrosion resistant metals and stainless material.

b. Stainless

1) Bolts shall conform to requirements of ASTM A 320, Type 316.

2) Nuts shall conform to requirements of ASTM A 194, Grade 8.

3) Washers shall be Type 316.

c. Expansion bolts shall be the metal shield type.

05500.03 EXECUTION

A. Fabrication

1. General

a. Fabricate all work true to shape, size and tolerances as indicated in the Contract Documents and on approved Shop Drawings; with straight lines, square corners, or smooth bends; free from twists, kinks, warps, dents, and other imperfections. Straighten work bent by shearing or punching.

b. Thickness of the metal and details of assembly and support shall provide sufficient strength and stiffness to resist distortion during shipment, handling, installation, and under severe service conditions. Dress exposed edges and ends of metal smooth, with no sharp edges and with corners slightly rounded. Construct connections and joints exposed to weather to exclude water.

c. Provide sufficient quantity and size of anchors for the proper fastening of the work.

2. Fabricated Products

a. Railings

1) Fabricate railings and handrails as indicated to conform to OSHA regulations from aluminum alloy, steel-hot dip galvanized after fabrication, or stainless steel.

2) Fabricated pipe handrail with all intersections and joints neatly fitted, fully welded, and ground smooth and flush. Aluminum members shall be shop welded only in accordance with AWS D1.2. Field welding of Aluminum will not be permitted. Heat and bend smoothly, without distortion. Fabricate posts and stand-offs for pipe railing of the same material as the railing, evenly spaced as shown, with anchor flanges. Handrails along walls shall return to the wall at ends with quarter round bends and welded flanges.

3) Fabricate flanges for posts from aluminum 3/8 inch thick plate, and for stand-offs from not less than 3/16 inch thick plate.

4) For fastening aluminum pipe railing and handrails, use stainless steel bolts with heavy aluminum washers and nuts. For fastening steel pipe railing and handrail, use galvanized bolts, nuts, and washers.

b. Connections

1) Shop connections in weldable materials, not designed for service removal, shall be welded. All welding shall conform to AWS D1.1 requirements. Grind all exposed welds smooth. Remove weld, brazing, and solder spater, flux, slag, and oxides from finished surfaces. Use sheet metal lock seams only when indicated on the Plans or approved shop and working drawings.

2) Complete all provisions for bolted field connections in the shop unless otherwise indicated.

3) Match exposed work to produce continuity of line and design. Fabricate and fasten metal work so that the work will not be distorted, the finish impaired, nor the fasteners overstressed from the expansion and contraction of the metal.

4) Conceal fastenings whenever practicable. Use fastenings exposed to public view of the same color and appearance as the surrounding metal.

c. Miscellaneous anchors, strap anchors, clip angles, and plates, hangers, etc., and other items, together with all miscellaneous structural shapes required for construction of the work shown on the Plans, shall be furnished in accordance with the requirements of the Plans.

B. Painting and Coatings

1. Where indicated, shop and/or field paint miscellaneous metal items according to one of the paint systems specified in Section 09900.

2. Metal coatings

   a. Galvanized sheet shall conform to requirements of ASTM A 446. All other galvanizing shall conform to requirements of ASTM A 123 or ASTM A 153 or both ASTM A 385 and ASTM A 386, as applicable.

      Items to be shop painted which are fabricated without welding entirely from galvanized shapes, hardware, and sheet shall not be galvanized after fabrication. All other fabrications to be galvanized shall be hot-dipped after fabrication.

3. Galvanized touch up shall be zinc dust coating conforming to requirements of Military Specification P-26915.

4. Bituminous corrosion protection shall conform to requirements of Military Specification C-18480.

5. Coat aluminum accessories and items embedded in concrete with an inert compound capable of effecting isolation of the deleterious effect of the aluminum on the concrete.

C. Delivery, Handling, and Storage

1. Identify, and match mark if applicable, all materials, items, and fabrications, for installation and field assembly.

2. Wherever practicable, deliver items to job site as complete units, ready for installation or erection, with all anchors, hangers, fasteners, and miscellaneous metal items required for installation.

3. Provide adequate storage facilities at the job site for the protection and storage of all delivered materials. Handle and store in such a manner as to not damage factory finishes. The Contractor shall repair damaged finishes at no cost to the County.

D. Erection and Installation

1. Erection and installation of miscellaneous metal items shall be in accordance with requirements specified elsewhere in the Contract Documents.

2. Miscellaneous metal items and fabrication shall be installed in their proper locations as shown or directed and shall be anchored, rigid and secure, plumb and level unless

otherwise shown, and in true alignment with related and adjoining work.

3. The Contractor shall provide shims, washers, anchors, and such additional work as necessary to achieve a satisfactory installation.

05500.04 METHOD OF MEASUREMENT

Miscellaneous metals will not be measured.

05500.05 BASIS OF PAYMENT

Miscellaneous metals will not be paid for as separate items but the materials and their installation are considered incidental to the work required in the construction of specific structures that will be paid or under various items indicated in the Proposal. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to Complete the required work.

END OF SECTION

SECTION 09900

PAINTING

Delete Specification Section 09900 - PAINTING from the Anne Arundel County Standard Specifications and replace with the following:

09900.01 GENERAL

A. Description of Work

1. The Contractor shall furnish all material, labor, equipment and services necessary for and incidental to the finishing and application complete of all field painting.

2. The Contractor shall, under this section, paint to completion all items and surfaces left unfinished by the requirements of other sections and normally requiring painting for either protection, identification and/or decoration. The sole determination to be by the Engineer.

3. The Contractor shall examine the Contract Drawings and Specifications and thoroughly familiarize himself with all provisions regarding required painting of work done under other sections.

4. All designated surfaces shall be painted and finished as part of this section. This includes, but is not limited to, wastewater storage tanks, equipment, fans, ducts, etc.

5. The specialty items which are delivered with a prime coat shall be finished as part of this section.

6. The painting of all exposed uncovered pipe, non-corrosive pipe hangers, convertors, grills and other mechanical work, requiring paint shall be included in this section.

7. The submission of a Proposal by the Contractor confirms an understanding of all conditions pertaining to this work and proper application ofmaterials specified.

8. NOTE: Painting of exterior concrete walls and surfaces is not permitted except as called out on the Contract Drawings. If a special situation exists which require painting of exterior concrete prior approval must be obtained from Engineering and also the Chief of the Bureau of Operations.

B. Related Work Specified Elsewhere

1. In addition to the work specified in this section, requirements for painting and other coatings are included in the following section:

2. Mechanical General Requirements, Section 15100

C. Quality Assurance

1. Include on label of containers: manufacturer's name, type of paint, manufacturer's stock number, color number and instructions for reducing where applicable.

2. Samples of materials, when requested by the Engineer, are to be obtained from material stored at project site or source of supply.

3. Field Quality Control: Request review of first finished room, space and workmanship. This room to be held as a standard of performance and quality. For spray application, paint surface not smaller than 100 square feet as project standard.

D. Submittals

1. Furnish manufacturer's label or other printed product literature for each material to be used on the project for acceptance by the Engineer.

2. The manufacturer's representative shall certify that the paint systems to be used are proper for the type of exposure and service and that all coats in each system are compatible with each other.

3. Furnish sample of all opaque finishes on primed cardboard and stained wood samples on type and quality of wood specified for use on project. Make all samples in triplicate not less than 20 square inches each.

4. Contactor shall submit a complete schedule of paint systems and surface preparations proposed as follows:

    a. List all interior and exterior surfaces and major equipment to be painted.

    b. Schedule shall reflect approved paint manufacturer's recommendations for their systems.

    c. Schedule shall itemize each painted item or surface and contain the following information in tabular format:

        i. Type of surface preparation

        ii. Paint system

        iii. Prime coat (product, number of coats, dry mil thickness per coat, average square feet coverage per gallon).

        iv. Intermediate coat, if required (same info as above).

        v. Finish coat (same info as above).

        vi. Color

E. Products Delivery, Storage and Handling

1. Deliver in original sealed containers with seals unbroken and labels intact.

2. Deliver to project site or segregate at source of supply in advance of need so as to allow four (4) working days fortesting.

3. Store only acceptable project material on project site.

4. Store in suitable location, restricting storage to paint materials and related equipment.

5. Comply with all applicable health and fire regulations.

F. Job Conditions

1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating system can be applied. Unless otherwise recommended by the manufacturer, finishes and coatings shall not be applied when surface temperatures are above 85 degreesF.

2. Do not apply finishes in areas where dust is being generated. All materials shall be applied free of runs, sags, wrinkles, streaks, skinners and brush marks.

3. Cover or otherwise protect finishes of other trades and surfaces not being painted concurrently or not to be painted. All materials shall be applied uniformly. If any reduction of the coating viscosity is necessary it shall be done in accordance with manufacturer's label directions.

4. The subcontractor shall be held responsible for the finished appearance and satisfactory completion of his work and, therefore, he shall not commence any painting until surfaces to be finished are in proper condition in every respect. New masonry surfaces shall not be primed until it has been determined that the substrates have dried sufficiently to safely accept paint material. A moisture meter shall be used to make this determination. Report to Engineer any area that does not meet therequirements.

5. A minimum interior temperature of 65 degrees F. shall be maintained during the actual application and drying of the paint, and until occupancy of the structure occurs. Adequate ventilation shall be maintained at all times to control excessive humidity which will adversely affect the curing and coatings. The Contractor is solely responsible for maintaining suitable temperatures and ventilation.

6. Before painting begins, all other crafts shall have completed their work, and shall have removed all dirt and debris resulting therefrom. The rooms or areas are to be left in broom clean condition.

7. Enamel undercoats are to be sanded smooth prior to recoating. Top and bottoms of doors are to be finished in the same manner as door facing, after the carpenters completethe fitting of them.

8. No exterior painting shall be undertaken if air or surface temperature is below 50 degrees F. nor immediately following rain or until frost, dew or condensation has evaporated. Surfaces shall always be tested with a moisture meter before proceeding.

09900.02 09900.02 MATERIALS

A. Acceptable Manufacturers

1. Except as otherwise specified, materials shall be the products of the following manufacturers:

   a. Carboline

   b. PPG Coatings

   c. Tnemec Company, Inc.

   d. Or Equal approved by County

2. Materials selected for a coating system for each type of surface shall be the products of a single manufacturer, except where required by the Contract Documents.
3. Submission of materials other than basis of design must be accompanied with performance criteria from ASTM tests that demonstrate equal or greater performance on tests that coorelate with the intended service.

B. Materials

1. Products specified are as manufactured by Tnemec Company, Inc. 410-608-2900, (designated Tn.), unless otherwise indicated; equivalent or superior products of acceptable manufacturers listed in this Specification may be used in lieu of those listed.

2. All paints must meet current ecological standards and lead hazard regulations

   a. All paints must conform to COMAR 26.11.39 including the VOC content limits under 26.11.39.05. Under this standard industrial maintenance coating volatile organic compounds are limited to 250 grams per liter.
   b. No paints will be permitted on the job site with lead contents in excess of 0.06% by weight. If the Contractor applies any paints or coatings with lead content in excess of 0.06% by weight, then he shall be responsible for the proper removal and recoating, at no cost to the County, of the affected surface(s) to conform with this specification

C. Colors

1. Colors of paints shall match control samples. All colors not designated on the Drawings or in the Specifications will be selected by the Owner. All primers and undercoats are to be tinted to the approximate shade, but not the same, as the

selected finish color.

2. Check finish schedules for areas to be treated with accent colors (deep colors), or special materials. Where deep tones are used it is the responsibility of the Contractor to utilize the appropriate deep base primer as recommended by the paint manufacturer for use on the surface for which they are intended.

D. Mixing and Tinting

1. Deliver paint and enamels ready mixed to job site, in manufacturer's original labeled containers.

2. Accomplish job mixing and job tinting only when acceptable to the Engineer. These should be limited to primers, sealers and undercoats.

3. Use tinting colors recommended by manufacturer for the specific type of finish.

09900.03 EXECUTION

A. Inspection

1. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into acceptable condition through preparatory work as included in this Specification.

2. Do not proceed with surface preparation of coating application until conditions are suitable.

3. All unfinished surfaces and material except those excluded by the Contract Documents shall be painted. See painting schedule herein for types and locations of the various surface requiring painting or finishing and the number of coats. An additional coat will be required on any surface when, in the sole judgment of the Engineer, the finish surface is not satisfactory; this will be done at no increase in Contact price.

B. Preparation of Surface

1. Ferrous Metal Surfaces (except stainless steel): SSPC-SP6 Commercial Blast Cleaned Steel or SP11 Power Tool Cleaning to Bare Metal with a (1) mil profile. Remove all rust, paint and mill scale. Prime immediately with Tnemec Series 394 Perime-Prime applied at 2.5 to 3.5 mils DFT. Feather edges of damaged shop coat to achieve smooth finish.

2. Concrete – Immersion & Non-Immersion & Severe Exposure Services: See specification 09980.

3. Ductile Or Cast Iron

   a. Prepare ductile or cast iron surfaces in accordance with NAPF 500-03-04

Abrasive Blast Cleaning with the exception that ALL rust and mold coating be removed. Only tightly adherent annealing oxide may remain.

b. Bituminous coated pipe shall NOT be allowed if field painting is required.

c. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

C. Application

1. Do not apply coating until moisture content of surface is within limitations recommended by the paint manufacturer's test with moisture meter.

2. Apply paint coatings with suitable brushes, rollers or spray equipment which has been kept clean, free from contamination and suitable for finish required.

3. Rate of application of coating shall be as recommended by the paint manufacturer for the purpose and surface involved.

4. Comply with required drying time between coats as directed by manufacturer.

5. Sand and remove dust between each coat to remove defects visible from 5 feet. Finish coats shall be smooth, free from brush marks, streaks, laps, sags, skips, holidays, etc.

6. Do not apply additional coats until completed coat has been inspected and accepted by the Engineer. Only inspected coats of paint will be considered in determining number of coats applied.

D. Cleaning

1. Touch up and restore where finish is damaged.

2. Remove spilled, splashed or spattered paint from all surfaces.

3. Do not mar surface finish of item being cleaned.

4. Leave storage space clean and in condition required for equivalent spaces in project.

E. Exterior Painting Schedule

1. Steel-Structural, Pipes and Equipment

a. Exterior, Non-Immersion

Tnemec	D.F.T. (3)
Surface Preparation: SSPC-SP6/NACE No.3 Commercial Blast Cleaning	
1st Coat: V69-1211 HiBuild Epoxoline II	3.0 - 5.0
2nd Coat: V69-color HiBuild Epoxoline II	3.0 - 5.0
3rd Coat: 1095-color Endura-Shield II	2.0 - 3.0
	8.0 -13.0

b. Interior, Non-Immersion

Tnemec	D.F.T. (3)
Surface Preparation: SSPC-SP6/NACE No.3 Commercial Blast Cleaning	
1st Coat: V69-1211 Hi-Build Epoxoline II	3.0 - 5.0
2nd Coat: V69-Color Hi-Build Epoxoline II	3.0 - 5.0
3rd Coat: V69-Color Hi-Build Epoxoline II	3.0 - 5.0
	9.0 - 15.0

c. Immersion, Wastewater

Tnemec	D.F.T. (3)
Surface Preparation: SSPC-SP10/NACE No. 2 Roughen the surface before topcoating if the 104-1211 has been exposed exterior for 14 days or longer.	
1st Coat: 104-1211 H.S. Epoxy	8.0 – 10.0
2nd Coat: 104-color H.S. Epoxy	8.0 – 10.0
	16.0 - 20.0

d. Below Grade

Tnemec	D.F.T. (3)
Surface Preparation: SSPC-SP6/NACE No.3 Commercial Blast Cleaning	
1st Coat: 46H-413 Hi-Build Tneme-Tar	16.0 – 20.0
	16.0 - 20.0

2. Galvanized Steel, Non-Ferrous Metal, Pipe, and Miscellaneous Fabrications

a. Exterior, Non-Immersion

Tnemec	D.F.T. (3)
Surface Preparation: SSPC-SP16	
1st Coat: V69-color Hi-Build Epoxoline II	3.0 - 5.0
2nd Coat: Series 1095-Color Endura-Shield II	2.0 - 3.0
	5.0 - 8.0

b. Interior, Non-Immersion

Tnemec	D.F.T. (3)
Surface Preparation: SSPC-SP1 Solvent Cleaning	
1st Coat: V69-Color Hi-Build Epoxoline II	3.0 - 5.0
2nd Coat: V69-Color Hi-Build Epoxoline II	3.0 - 5.0
	6.0 -10.0

c. Aluminum Surfaces in Contact with Concrete

Tnemec	D.F.T. (3)
Surface Preparation: SSPC-SP16 "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-ferrous Metals"	
1st Coat: V-69-Color Hi-Build Epoxoline II	3.0 - 5.0
2nd Coat: V-69-Color Hi-Build Epoxoline II	3.0 - 5.0
	6.0 -10.0

3. Concrete: Painting of exterior concrete walls and surfaces is not permitted except as outlined in spec 09980.

F. Mechanical Work

1. Factory finish coats are specified elsewhere for certain items of mechanical equipment. Field painting will not be required for such items which have factory finish, except where finish is damaged by handling, weather or other reasons. Damaged portions shall be field primed and finished with sufficient finish coats to give a smooth, unmarred finish, with primer and finish being of the same type and color paint as originally used in the factory applications. Damaged portions shall either be field refinished or replaced, subject to the approval of the Engineer.

Finish coat shall be uniform for factory painted equipment.

2. Prime coat paint used on mechanical equipment shall be compatible, so as not to be lifted by subsequent coats or cause other undesirable effects, with the field finish coats hereinafter specified. The equipment manufacturer's standard shop prime coat may be used only if compatibility is proven to the Engineer's satisfaction. For any equipment delivered to the site with a shop prime coat not compatible with the finish coats, the Contractor may be ordered to sandblast or otherwise restore the equipment to the bare metal condition. A field prime coat, conforming to these specifications, shall then be applied to the equipment.

3. Color and marking of various exposed piping systems shall be as specified hereinafter or as subsequently furnished to the Contractor prior to the beginning of work. Valves, fittings, and accessories located in a particular pipeline shall be painted the same coloras the line piping, unless otherwise specified.

4. Galvanized pipe and equipment, excluding hot-dipped galvanized metal) shall be pre-treated with Kopper No. 888 cleaner and 1 coat Kopper No. 40 passivator or equal and prime coated with one coat Kopper No. 654 primer or equal and finished with 2 coats Koppers No. 200 Epoxy or equal.

G. Exposed Piping/Concrete Color and Marking Schedule

LOCATION/PROCESS	COLOR	MARKING
Sewage lines	Pale mint green	Sewage
Sewage pumps	Dark green	N/A
Scum lines	Beige	Scum
Valve handles and lid	Safety Yellow	N/A
Air lines	Aqua green	Air
Vent Pipes	Brown	N/A
Non-potable Water	Purple	N/A

Exposed pipe/Concrete installed under this contract shall be finished painted and marked in accordance with the above color and marking schedule.

H. Electrical Work

1. Major items of electrical equipment shall be furnished with factory finish. Field painting will not be required for such items except when finish is damaged. Damaged portions shall be field primed and finished with one finish coat, with

primed and finish being of the same type and color paint as originally used in the factory application. Repainting shall be performed using the same methods as used by the manufacturers of the equipment. Damaged portions shall be refinished to give uniform color and texture. Finish coat shall be uniform for factory painted equipment.

2. Exposed electrical items of work which do not have a factory painted finish such as pull boxes, junction boxes, terminal boxes, conduits, racks, supports and ferrous accessories, shall be painted in an identical manner to that specified for mechanical work items.

3. Bright metal parts such as stainless steel or chrome plate device plates, knobs and items provided with a plastic base or painted finish and trim shall not be painted. PVC-coated conduit systems shall not be painted.

END OF SECTION

SECTION 15000

BASIC MECHANICAL MATERIALS AND METHODS

15000.01 GENERAL

A. Description

1. 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 other requirements are specified. Mechanical systems shall be complete including all miscellaneous materials, and ready for operation as indicated in accordance with the Contract Documents.

B. Quality Assurance

1. Unless otherwise indicated, materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment shall be provided. The manufacturer's latest standard design that conforms to these Specifications shall be provided. When two or more units of the same class of equipment are required, these units shall be the products of the same manufacturer.

2. Each major component of equipment shall have the manufacturer's name, address and model number on a name- plate attached to the item of equipment.

3. Welding shall be performed by certified welders in accordance with the requirements of AWS D1.1 for the types of welding required on the Work.

4. Except where otherwise specified, structural and miscellaneous fabricated steel used in equipment shall conform to AISC standards. Structural members shall be designed for appropriate shock and vibratory loads.

5. Materials and workmanship shall conform to the requirements of the latest editions of the following codes, regulations and specifications:

NFPA	AGA	AFBMA
UL	ARI	
ASME	ANSI	
AGMA	AWS	
AMCA	AISC	

In addition, materials and workmanship shall conform to applicable local codes, regulations and ordinances. Adherence to the referenced codes and regulations shall constitute minimum requirements for the mechanical work. If a conflict arises between the codes and the Contract Documents, the more stringent

requirements shall apply unless otherwise approved by the Engineer.

C. Submittals

1. Submit Contractor's Drawings in accordance with the General and Special Provisions for the following:

   a. Shop drawings for equipment and materials which shall include descriptive and published details concerning performance and capacity ratings for each piece of equipment. For electrical motor driven equipment, schematic drawings showing coordination with electrical system shall be included. Rated horsepower, rated current and electrical service requirements shall be provided.

   b. Catalog data for materials.

   c. Scaled mechanical layout working drawings showing dimensioned plan views and elevations of mechanical equipment; equipment mounting and foundations; and components including space conditions, 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 placing in service.

2. Submit operation and maintenance manuals for each mechanical system and piece of equipment in accordance with the General and Special Provisions. Specific pieces of equipment for which operation and maintenance manuals are required are listed in the respective specification sections.

3. Submit certificates of compliance for pipes, fittings and eight inch and smaller diameter valves.

4. Submit manufacturer's certificates for material and equipment as specified.

D. Delivery, Storage and Handling

1. 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.

2. Materials and equipment shall be protected from exposure to the elements and shall be kept dry at all times. Items shall be handled and stored to prevent damage and in accordance with manufacturer's recommendation.

3. Material and equipment damaged by handling and storage shall be repaired or replaced by the Contractor as directed by the Engineer, at no expense to the

County.

E. Job Conditions

1. The Drawings indicate the extent and general arrangement of equipment, piping and ductwork. Equipment shall fit in the space allotted and allow adequate clearance for entry, installation, replacement, servicing and maintenance. Actual and final arrangement, location, grades and elevations of equipment, appurtenances, piping and ducts shall be verified by the Contractor before ordering material and equipment. If departures are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted to the Engineer for approval as soon as practicable but not later than submittal of scaled mechanical shop drawings. No departure shall be made without the Engineer's written approval.

2. The Work shall be coordinated 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.

F. Safety Requirements

1. Belts, pulleys, chains, gears and other rotating parts shall be enclosed or properly guarded so personnel may safely be in close proximity thereto.

2. Items such as catwalks, ladders and guardrails shall be provided where required for safe operation and maintenance of equipment.

3. Provide safe working space around equipment.

G. Sequencing and Scheduling

1. Sequencing and scheduling of mechanical work shall be coordinated with the building construction, the Special Provision entitled “Construction Sequence”, and other related parts of the Work including verification that all structures, piping, wiring, conduits and equipment components are compatible.

H. Maintenance Materials

1. Maintenance materials in the form of spare parts and extra material, if required, are specified in the specific Specification Section for equipment or materials.

2. 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.

3. Extra material shall be packed in strong cartons, labeled with manufacturer's

name, material name, type, color and location material was installed.

4. Maintenance material shall be stored in a location directed by the Engineer.

I. Manufacturer's Services

1. Manufacturers of furnished equipment shall provide qualified field representatives to provide manufacturer's services as required during installation, start-up, inspections/tests and to instruct the 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:

   a. 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 startup.

   b. 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.

   c. When required in the specification sections for the equipment, factory-trained service and operating personnel shall be provided to instruct the County personnel in the operation and maintenance of the equipment. Instruction sessions shall be conducted at times and locations as approved by the Engineer.

15000.02 MATERIAL

A. Materials Furnished by the County

The County will not furnish any items specified herein.

B. Contractor's Options

1. In the design and supply of equipment, interchangeability of parts and items for equipment, piping, ductwork, motors and other appurtenances shall be provided.

C. Detailed Material Requirements

1. Equipment Bases

   a. Unless otherwise indicated, equipment shall be provided with concrete bases a minimum of three to five and one-half inches high.

   b. The edges of all concrete bases shall have a 3/4-inch chamfer.

c. Cast iron or welded steel baseplates shall be provided. Each unit and its drive assembly shall be supported on a single baseplate.

2. Anchor Bolts

a. Anchor bolts shall be Type 316 Stainless Steel, unless otherwise noted.
b. Where cast-in-place anchor bolts are required, the Contractor shall provide anchor bolts together with template or setting drawing sufficiently in advance to permit anchor bolts to be set when structural concrete is being placed.

3. Safety Guards

a. Belt and chain drives, fan blades, couplings 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 1/2 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 stainless steel. Safety guards in outdoor locations shall be designed to prevent entrance of rain and dripping water.

4. 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 openings shall be accessible from normal operating area or platform. Drain ports shall allow for collection of waste oil in containers from operating are or platform without removing the unit from its installed position.

5. Shop Painting

a. Equipment, supports, piping, ductwork and appurtenances shall be surface prepared and shop coated as specified in Section 09900 and as shown on the Drawings except at connecting ends and where it hinders installation. These points shall be primed and field painted after installation. Shop primer shall be compatible with required field coat.

6. Special Tools and Accessories

a. Provide special tools, instruments and accessories when required to adjust, maintain or repair equipment. Equipment requiring special devices for lifting and handling shall be furnished complete with these devices.

15000.03 EXECUTION

A. Preparation

1. Locations, areas and surfaces to receive mechanical equipment, piping, duct work and appurtenances shall be inspected to verify that areas are ready for installation. Before installation, defects and damaged areas shall be repaired, and surfaces and areas shall be adjusted so they are ready for proper installation.

2. Areas to be occupied by mechanical equipment and appurtenances shall be measured to verify that space is adequate and in accordance with approved Contractor's Drawings. If adjustment is required, approval from the Engineer shall be obtained to adjust any locations and equipment as approved.

B. Installation

1. Equipment and appurtenances shall be installed in accordance with manufacturer's instructions. The contractor shall provide complete final connections to equipment, including pipe, duct, electric and controls.

2. 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. Installation of mechanical systems, components and materials shall be coordinated with other portions of the work, including electrical wiring and conduit systems, structural supports and concrete work, and architectural work.
4. Piping/flange alignments at pump casing connections shall meet the following standards in order to minimize piping/casing strain:

    a. Mating flanges shall be concentric to within 1/8-inch tolerance unbolted.

    b. Mating flange faces shall be parallel to within a tolerance of no greater than ½ the gasket thickness unbolted.

    c. Flange face separation shall be no more than 1/16-inch beyond the normal gasket thickness unbolted.

C. Foundations, Bases and Supports

1. Equipment, ductwork, electrical conduits and piping shall be supported by providing compatible frames, braces, hangers and anchors.

2. Unless otherwise shown on the Drawings, floor mounted equipment shall be set

on reinforced concrete pads a minimum of three and one-half to five and one-half inches high, doweled to the floor. Equipment pads and anchors shall be placed and set simultaneous with the floor, unless shown otherwise on the Drawings. The edges of all concrete bases shall have a 3/4-inch chamfer. Baseplate, anchor bolts and vibratory absorption pad construction shall be provided 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 nor less than 1/2 inch above top of nut. Leveling nuts under equipment bases shall not be used.

3. Equipment suspended inside buildings shall be braced and supported to provide a rigid installation. Supports and hangers shall be attached to bearing walls, roof and floor supports, or framing members. Cross bracing shall be provided, as required, to develop a rigid installation.

D. Access Panels

1. The Contractor shall provide access panels and openings where it will be necessary for maintenance and servicing of concealed equipment, piping and ductwork.

E. Lubrication

1. Equipment shall be lubricated in accordance with manufacturer's instructions after installation and prior to initial operation. Following testing and prior to final acceptance, the Contractor shall lubricate the equipment again, if directed.

F. Adjustment and Initial Operation of Equipment

1. Before systems and equipment are initially started, piping, ductwork and equipment shall be cleaned. Moving parts shall be checked for freedom of movement, alignment and adjustment.

2. The Contractor shall provide manufacturer's services as required herein before equipment is energized and operated. Adjustments shall be made as required and recommended by the manufacturer's representative.

G. Surface Touch-up/Field Painting

1. The Contractor shall touch-up surfaces where shop coats have been damaged using paint, coatings and film thickness identical to original shop coats.

2. The Contractor shall clean field installed bolts, nuts, washers and support systems. Items shall be painted or coated identical to original shop coat and/or surrounding area.

3. Field painting shall be performed as specified in Section 09900 and as shown on Drawings.

H. Protect and Clean

1. Equipment shall be protected during and after installation from construction dust and debris. Temporary protection shall be provided as required until equipment is in operation or receipt of Certificate of Substantial Completion.

2. The Contractor shall clean equipment, surrounding area and ductwork inside and out.

I. Field Quality Control

The Contractor shall demonstrate and test the operation of the various systems and equipment in the presence of the Engineer in accordance with the individual sections for the equipment.

J. Operation Instructions

After the various systems have passed the field quality control requirements and prior to Certificate of Substantial completion, the Contractor shall provide manufacturer's services for operation and maintenance as specified in the individual sections for the equipment.

END OF SECTION

SECTION 15064

STAINLESS STEEL PIPING AND FITTINGS

15064.01 GENERAL

A. Work Included

1. This section includes requirements for providing, complete, stainless steel plant piping and fittings as indicated in the Contract Documents.

B. Quality Assurance

1. Standards

   a. American National Standards Institute (ANSI)

   b. American Welding Society (AWS)

   c. American Society for Testing and Materials (ASTM)

   d. American Society of Mechanical Engineers (ASME)

   e. Manufacturer's Standardization Society of the Valve and Fitting Industry, Inc. (MSS)

   f. American Water Works Association (AWWA)

2. Shop Testing shall include the following:

   a. Chemical and physical properties

   b. Hydrostatic test of all components, spool pieces, etc to 12 psig

3. Welding Procedure Qualification

   a. Furnish to Engineer for prior review, procedure, specifications and qualification records of welding procedures for all pipe welding to be performed under this section, in accordance with AWS Standards.

C. Submittals

1. Copies of affidavit from manufacturer that all materials furnished have been tested and comply with all applicable provisions of the Standards listed and this specification.

2. Detail drawings of each size of pipe and fitting including joint type, diameters, pipe wall thicknesses, and dimensions.

3. Layout drawings for pipe installation including location of joints, supports, anchors, and fittings.

4. Copies of each of the following shop test results shall be submitted:

   a. Chemical and physical properties

   b. Hydrostatic tests

5. Prior to the start of the work, Contractor shall submit a list of proposed welders and the type of welding for which each has been qualified.

15064.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any stainless steel pipe or fittings.

B. Contractor's Options

None.

C. Detailed Material Requirements

1. Stainless steel pipe, pickled and passivated, shall be provided as follows:

4-Inch and less	ASTM A312, TP304, Schedule 5S, seamless.
6-Inch Through 8-Inch	ASTM A778, TP304L, Schedule 5S.
10-Inch Through 12-Inch	ASTM A778, TP304L, 12 Gauge.
14-Inch Through 18-Inch	ASTM A778, TP304L, 11 Gauge.

2. Joints for stainless steel piping system shall be as specified herein. Where the type of joint is not scheduled or shown, the joints shall be as required to conform to the type of pipe joints at the point of installation.

4-Inch and less	Butt welded or flanged
6-Inch and Larger	Butt welded or flanged

3. Fittings shall conform to the following:

4-Inch and less	Butt weld type, stainless steel, schedule to match piping, ASTM A403, Type 304, WP Class

6-Inch and Larger	Butt weld type, stainless steel, pickled and passivated, schedule to match piping, ASTM A774, Type 304L, conforming to MSS SP-43; all ells LR, unless otherwise designated.

4. Stub ends shall be stainless steel, ASTM A240, Type 304L, conforming to MSS-SP43, or flared nipples, schedule to match pipe. Flanged pipe ends shall be made up of type 304L stainless steel slip-on type rolled angle face rings and primed ductile iron backup flanges drilled to ANSI 16.1 Class 125 standard. The angle face ring thickness shall be equal to or greater than the wall of the pipe or fitting to which it is welded and it shall be continuously welded on both sides to the pipe or fitting. The angle leg shall not interfere with the flange bolt holes. The back-up flanges shall be supplied with the following nominal thickness:

Nominal Pipe Size	Flange Thickness
less than 3-inches	1/2 inch
4 inches	9/16 inch
6 - 10 inches	5/8 inch
12 - 16 inches	3/4 inch

5. Flanges shall be provided as a minimum at all flanged equipment items. Joints for shipping, handling, and installation shall be flanged or arched band couplings.

6. Arched band type couplings shall be stainless steel of equal or superior alloy and wall thickness as the pipe and shall be Victaulic Depend-O-Lok type or equal. Couplings will be Fixed - FxF. The pipe shall be plain end with external weld beads ground smooth with stainless steel restraining rings shop welded to the piping for fixed couplings.

7. Unless otherwise specified, bolting shall be carbon steel, ASTM A307, Grade A hex head bolts and ASTM A563, Grade A hex head nuts, except submerged (below the overflow level of hydraulic structures) bolts, which shall be Type 316 stainless, ASTM A193, Grade B8M hex head bolts and ASTM A194, Grade 8M hex head nuts.

   a. When mating flange on valves or equipment is cast iron, use ASTM A307, Grade B, square head bolts and ASTM A563, Grade A heavy hex head nuts.

8. Gaskets shall be 1/8-inch thick neoprene rubber, durometer hardness of No. 80, 1500 psi minimum tensile strength, 125 percent minimum elongation, flat ring type with RF flanges and full face type with FF flanges, Garlock Style 7797, or equal.

9. Thread lubricant shall be Teflon tape.

10. Covered welding electrodes for shielded metal arc process for Type 304L pipe shall be in accordance with AWS 5.4, E 308L.

11. Welding rod and bare electrodes for gas tungsten arc or gas metal arc processes for Type 304 pipe and Type 304L pipe shall be in accordance with AWS 5.9, ER 308 and AWS5.9, ER 308L, respectively.

12. Suitable dielectric insulation shall be provided to isolate dissimilar metals when applicable.

13. A stainless steel waterstop shall be welded to all pipe sections passing through walls as shown on the Contract Drawings.

15064.03 EXECUTION

A. Fabrication and Installation

1. All fabrication and welding shall be performed in the shop by certified welders to ASME approved procedure and AWS Standards. Field welding shall not be permitted. All welding shall be by the shielded arc, inert gas, MIG or TIG method. Filler wire shall be added to all welds to provide a cross section of weld metal equal to, or greater than, the parent metal. Inert gas shielding shall be provided to the interior and exterior of the joint. Interior weld beads shall be smooth, even, and not have an interior projection more than 1/16 inch beyond the I.D. of the pipe or fitting.

2. Spools shall be fabricated to the "Pipe Fabrication Institute" fabricating tolerances ES-3 (1981).

3. After manufacture, all pipe, fittings, supports, specials, etc. shall be passivated by immersion in an air agitated pickling tank containing a 25% solution of nitric and hydrofluoric acids for 40 to 50 minutes. The acid shall be neutralized by immersion in a rinse tank containing clean water and tri-sodium phosphate.

4. After welding, all welded joints shall be cleaned with an industry standard cleaning solution, brushed with stainless wire brushes, and rinsed clean.

5. All fabricated piping shall have openings plugged and flanges secured for storage and/or transport after fabrication. All fabricated piping shall be piece marked with identifying numbers or codes which correspond to the contractors layout and installation drawings. The marks shall be located on the spools at opposite ends and 180 degrees apart.

6. The piping supplier during manufacturing, fabrication, and handling stages,

and the contractor during handling and installation stages, shall use extreme care to avoid the contact of any ferrous materials with the stainless steel piping. All saws, drills, files, wire brushes, etc., shall be used for stainless steel piping only. Pipe storage and fabrication racks shall be non-ferrous or stainless steel or rubber lined. Nylon slings or straps shall be used for handling stainless steel piping. Contact with ferrous items may cause rusting of iron particles embedded in the piping walls. After installation, the contractor shall wash and rinse all foreign matter from the piping surface. If rusting of embedded iron occurs, the contractor shall pickle the affected surface with Oakite Deoxidizer SS or equal, scrub with stainless steel brushes, and rinse clean.

7. After installation, the contractor shall paint all steel or iron flanges, couplings, and appurtenances in accordance with Section 9900, "Field Painting." Painting of the stainless steel pipe is not required. However, the contractor shall be responsible for supplying and installing the stainless steel piping with a consistently clean surface. Identifying spool piece marks shall be removed with paint thinner or solvents and the entire stainless steel surface shall be washed with detergent and hot water and rinsed clean.

B. Supports and Hangers

1. All hanger-pipe contact surfaces shall have a dielectric barrier consisting of neoprene rubber wrapping or plastic coated hangers. Hangers and supports shall be as specified in Section 15140, "Pipe Hangers and Supports." Unsupported spans shall not be more than 10 feet.

2. The load rating of universal concrete inserts shall not be less than that of the hanger rods they support.

C. Field Quality Control

1. All lines shall be tested and inspected at a test pressure of 12 psi and by the procedures specified in Section 02602. Test procedures shall be as specified in Section 02602, "Leakage Tests."

END OF SECTION

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SECTION 15100

MECHANICAL GENERAL REQUIREMENTS

15100. 01 GENERAL

A. Description:

1. Under this Section, the Contractor shall furnish all labor, materials and equipment for Mechanical General Requirements, as shown on the Plans, as specified and/or directed.

B. References:

The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1. Code of Federal Regulations (CFR) Publications:

29-1910-SUBPART O	Machinery and Machine Guarding
29-1910.219	Mechanical Power-Transmission Apparatus

C. Related Requirements:

This Section applies to certain sections of Division 1, "General Requirements", Division 2, "Site Work", and all sections of Division 15, "Mechanical" of this Project Specification, unless specified otherwise in the individual section.

D. Submittals:

Submit shop drawings, manufacturer's data, publication compliance, certified test reports, and manufacturer's certificates of compliance for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and have them approved before procurement, fabrication or delivery of the items to the job site. Shop drawings shall be accompanied by a letter of transmittal in duplicate, and all shop drawings shall be suitably identified with the name of the project, contract number, Contractor's name, date and initials indicating approval of such submittal by the Contractor under the applicable specification. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and the specific technical paragraph reference which specifies each item, applicable industry and technical society publication references, and other information necessary to establish contract compliance of each item to be furnished.

1. Manufacturer's Data: Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

2. Shop Drawings: Drawings shall be a minimum of 8.5 inches by 11 inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment. Drawings shall also include equipment spaces identifying and indicating proposed location, layout and arrangement of equipment, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.

3. Manufacturer's Certificates of Compliance: Submit certification from manufacturer attesting that materials and equipment to be furnished for this project comply with the requirements of this Specification and of the reference publications. Pre-printed certifications will not be acceptable; certifications shall be the manufacturer's original; certifications shall be not more than one year old. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; "equal or exceed the service and performance of the specified material". The certification shall simply state that the product conforms to the requirements specified. Certificates shall be signed by the manufacturer's official authorized to sign certificates of compliance.

4. Reference Standards Compliance: Where equipment or materials are specified to conform to industry and technical society reference standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters' Laboratories (UL), proof of such conformance shall be submitted. If an organization uses a label or listing to indicate compliance with a particular reference standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections.

    a. Independent Testing Organization Certificate: In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing and approved by the Engineer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

E. Operation And Maintenance Manual:

Furnish an operation and maintenance manual for each item of equipment. Furnish three copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual to the Owner's Representative for review and approval not more than 90 calendar days after an item is approved, but at least 60 calendar days prior to field acceptance testing of the item. Furnish the remaining manuals at least 60 days prior to contract completion. Inscribe the following identification on the cover: the words "OPERATION AND MAINTENANCE MANUAL", the name and location of the equipment or the building, the name of the Contractor, and the contract number. The manual shall include the names, addresses, and telephone numbers of each subcontractor installing equipment, and of the local representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: wiring and control diagrams with data to explain detailed operation and control of each item of equipment; a control sequence describing start-up, operation and shut-down; description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shut-down instructions; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the project site. The manual shall be complete in all respects for equipment, controls, accessories, and associated appurtenances provided.

F. Posted Operating Instructions:

Provide for each system and principal item of equipment as specified in the technical sections for the use of the operation and maintenance personnel. The operating instructions shall include the following:

1. System Descriptive Information: Wiring diagrams, control diagrams, piping diagrams, control sequence and operating points for each principal system and item of equipment. Post instructions where directed.

2. Equipment Instructions: Attach to or post adjacent to each principal item of equipment and include directions.
   a. Start up, proper adjustment, operating, lubrication, and shutdown procedures.
   b. Safety precautions, procedure in the event of equipment failure.
   c. Other areas as recommended by the manufacturer of each system or item of equipment.

Print or engrave and frame under glass or in approved laminated plastic. Operating

instructions exposed to the weather shall be made of weatherproof materials or enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

G. Cataloged Products:

Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that complies with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

H. Layout of the Work:

Coordinate the proper relation of the work to the building structure, utilities and to the work of all trades. Visit the premises and become familiar with the dimensions in the field and advise the Owner's Representative of any discrepancy before performing any work.

1. Contract Drawings: The Contract Drawings represent the general intent as to piping and equipment arrangements. All locations and dimensions shown shall be field verified and minor alterations made if so required. Where dimensions are not given for the location and arrangement of mechanical systems, locations may be assumed to be approximate, and may be altered if required. Major modifications to the indicated arrangements shall be approved by the Owner's Representative prior to the installation of mechanical systems. Schematic diagrams represent the overall system requirements and do not necessarily indicate the physical orientation, location or dimensions of that system.

2. Coordination Drawings: Each Contractor and/or his Subcontractor shall submit drawings showing the coordination of work between work of their respective trade and with the work of the other trades and structural and architectural elements of the work. Items to be shown on the drawings shall include, but are not limited to, ductwork systems, control dampers, HVAC piping, plumbing piping, plumbing fixtures, fire protection piping, sprinkler head layout, smoke detectors, heat detectors, light fixtures, electrical equipment, pull boxes, and conduit runs that utilize a 1-inch diameter or larger conduit. Drawings shall have sufficient detail to show overall dimensions of related items, clearances and relative location of work in the allotted spaces. Drawings shall indicate any routing changes that are required to be made to resolve clearance problems between the elements of various trades.

    a. Each Contractor and/or his Subcontractor shall be solely responsible for

the generation of the coordination drawings including distribution to, and collection of related information from each Contractor or Subcontractor. Drawings shall be produced in AutoCAD format and submitted on sheets no larger than 24 x 36-inches. Upon written request, background drawings will be provided to the Contractor for the purpose of coordination drawing development. The Owner or Engineer does not warranty the accuracy of any background drawings provided and the Contractor shall be responsible to field verify all background drawings. Submit complete drawings to Engineer a minimum of one week prior to the intended start of the related construction.

3. Record Drawings: The Contractor shall maintain a record of the progress of the work and shall submit three (3) sets of As-Built Drawings upon completion of the project. Drawings shall be produced in AutoCAD format and submitted on CD with the Operations and Maintenance manuals.

I. Manufacturer's Recommendations:

Unless otherwise stated in the Contract Specifications, all new equipment items, and specialties shall be installed in strict accordance with the recommendations of the manufacturer of the items being installed. Prior to the installation of new items, the Contractor shall submit to the Owner's representative printed copies of the manufacturer's installation recommendations. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material. Failure to install items in accordance with manufacturer's recommendations can be cause for rejection of the work items installed.

J. Delivery, Storage, and Handling:

Properly store, adequately protect, and carefully handle equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Engineer. Replace damaged or defective items.

K. Safety Requirements:

1. Equipment Safety: Fully enclose or properly guard in accordance with 29 CFR 1910.219 belts, pulleys, chains, gears, couplings, projecting setscrews, keys, rotating parts, and other power transmission apparatus, located where persons can come in close proximity thereto. Points of operation, ingoing nip points, and machinery producing flying chips and sparks shall be guarded in accordance with the applicable portions of 29 CFR 1910-SUBPART O. Provide positive means of locking out equipment so that equipment cannot be accidentally started during maintenance procedures. High-temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of the type specified. Provide catwalks, maintenance platforms,

and guardrails where required for safe operation and maintenance of equipment. Provide ladders or stairways to reach catwalks and maintenance platforms. Ensure that access openings leading to equipment are large enough to carry through routine maintenance items such as filters and tools.

2. Warning Sign: Provide a permanent placard or sign at the entrance to confined spaces contained in or associated with the equipment supplied as a part of the Contract work.

L. Electrical Requirements:

Furnish motors, controllers, disconnects and contactors with their respective pieces of equipment. Motors, controllers, disconnects and contactors shall conform to and have electrical connections provided under Electrical Contract Sections, "Interior Wiring Systems". Furnish internal wiring for components of packaged equipment as an integral part of the equipment. Extended voltage range motors will not be permitted. Controllers and contactors shall have a maximum of 120 volt control circuits, and shall have auxiliary contacts for use with the controls furnished. When motors and equipment furnished are larger than sizes indicated, the cost of additional electrical service and related work shall be included under this Section. Power wiring and conduit for field installed equipment shall be provided under and conform to the requirements of Electrical Specification Section, "Interior Wiring Systems".

M. Special Conditions:

When performing work within areas of active use, the Contractor shall be responsible to coordinate with the Owner regarding planned interruptions to mechanical and electrical services. The Contractor shall minimize disruption of existing non-contract work areas as much as possible.

1. Upon damage to equipment, buildings and/or structures, the Contractor shall immediately notify the Owner. All damages shall be repaired by the Contractor or shall be replaced if beyond repair to match the Owner's satisfaction.

2. Protection of Buildings from the Weather: The interior of the buildings and all materials and equipment shall be protected from the weather at all times.

3. Protection of Personnel: Where the safety of non-contractor personnel is endangered in the area of the work, barricades shall be used. Additional protection shall be provided, if required, to preserve the safety of non-contractor personnel in the immediate area of the work.

N. Instruction to Owner's Personnel:

When specified in other sections, furnish the services of competent instructors to give full instruction to the designated Owner's personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the specified equipment or

system. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of days (8 hours per day) of instruction furnished shall be as specified in the individual section. When more than 4 days of instruction are specified, use approximately half of the time for classroom instruction. Use other time for instruction with the equipment or system. When significant changes or modifications in the equipment or system are made under the terms of the Contract, provide additional instruction to acquaint the operating personnel with the changes or modifications.

15100. 02 PRODUCTS

Not Used.

15100. 03 EXECUTION

A. Final Test:

1. The Contractor is responsible to startup, adjust and test all installed equipment and systems, in accordance with manufacturer's instructions, the Contract documents and generally accepted industry practices. The final result must be a complete operable test system.

END OF SECTION

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SECTION 15121

FLEXIBLE PIPE COUPLINGS

15121.01 GENERAL

A. Description

1. Sleeve type couplings, split sleeve type couplings and flexible metal hose couplings as specified or shown on the Contract Drawings.

B. Quality Assurance

1. Acceptable Manufacturers

    a. Split Sleeve Type Couplings

        1. Couplings

            a) Steel pipe couplings shall be Victaulic Depend-O-Lok® FxE or ExE.
            b) Cast or ductile iron pipe couplings shall be Victaulic Depend-O-Lok® FxE or ExE.

        2. O-rings / Gaskets

            a) O-ring gaskets for split sleeve couplings shall be Victaulic Depend-O-Lok®, elastomer of a grade suitable for the intended service.

    b. Sleeve Type Couplings

        1. Couplings

            a) Steel pipe couplings shall be Dresser Style 38, Smith Blair Model 411, or equal.

            b) Cast or ductile iron pipe couplings shall be Dresser style 38, Smith Blair Model 411, or equal.

        2. Gaskets

            a) Gaskets for Dresser Couplings shall be Plain Grade 27 or equal.

b) Gaskets for Smith Blair adaptors shall be 100% natural or synthetic rubber with no reclaimed materials as manufactured by Smith Blair, Inc. or equal.

c. Transition Type Sleeve Couplings

1. Where specified or required, approved transition type couplings manufactured by Victaulic Depend-O-Lok®, Dresser Industries, Inc., Smith Blair, Inc., or equal shall be used.

c. Rubber Expansion Couplings

Rubber expansion couplings shall be standard or tapered spool type and shall be as manufactured by Mercer Rubber Company, Proco Products or Equal.

2. Parts Interchangeability

To the extent possible, all couplings of like size and type shall be manufactured by a single manufacturer.

3. Experience

All equipment furnished under this section shall be furnished by manufacturers who shall have at least three years' experience in the design, production, assembly, and field service of equipment of like type, size, and capacity.

C. Submittals

1. Prior to obtaining any equipment in connection with this section, the Contractor shall submit detailed drawings and descriptions of all couplings.

2. Submit a material of construction list and complete parts list.

3. The submittal shall include complete information relating to the storage, handling, installation, and inspection of the couplings.

4. Victaulic Depend-O-Lok® couplings shall be shown on drawings and product submittals and shall be specifically identified with the required end (restrained or expansion) shown.

15121.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any flexible pipe couplings or appurtenances.

B. Contractor's Options

None.

C. Detailed Material Requirements

1. Split Sleeve Type Couplings

    a. Split-sleeve type couplings shall be designed to fit the outside diameter of the pipes they connect.

    b. In ground couplings shall be epoxy coated steel.

    c. Exposed coupling housings shall be steel conforming to ASTM A36 and be primed for field painting.

    d. The ends of pipe and fittings which are to be joined by split sleeve type couplings shall be furnished plain and shall be cleaned and prepared in accordance with the directions of the coupling manufacturer.

    e. If restraint rings are required for fixed connections, rings shall be of the same material as the coupling housing and shall be welded in accordance with the manufacturer’s recommendations.

2. Sleeve Type Couplings

    a. Sleeve type couplings shall be designed to fit the outside diameter of the pipes they connect.

    b. In ground couplings shall be cast construction or epoxy coated steel.

    c. Exposed couplings shall be same material as metal pipe they connect and be primed for field painting.

    d. The ends of pipe and fittings which are to be joined by sleeve type couplings shall be furnished plain and shall be cleaned and prepared in accordance with the directions of the coupling manufacturer.

    f. Middle ring shall be furnished without a pipe stop unless otherwise specified, and shall have the following minimum dimensions:

Pipe Diameter	Thickness	Length
Steel Pipe		
Less than 6 inch	3/16 inch	5 inches
6 inch	1/4 inch	5 inches
8 inch - 14 inch	5/16 inch	7 inches
16 inch - 30 inch	3/8 inch	7 inches
36 inch and larger	1/2 inch	10 inches
Ductile Iron Pipe		
Less than 6 inch	1/4 inch	5 inches
6 inch - 8 inch	5/16 inch	5 inches
10 inch - 24 inch	3/8 inch	7 inches
30 inch and larger	1/2 inch	10 inches

g. Bolts and nuts shall be galvanized or Zinc plated for exposed or non-submerged service and shall be stainless steel for buried service.

h. All flanges, bolts, nuts and washers used shall be isolated from dissimilar metals by using dielectric insulating sleeves and washers.

3. Rubber Expansion Couplings

a. Rubber expansion couplings shall be standard spool type.

b. The tube shall be of single piece construction and extend to the outside edges of the flanges.

c. The exterior surface shall be oil resistant.

d. The split retainer ring shall be galvanized steel.

4. Flexible Metal Hose Couplings

a. General

Flexible metal hose couplings shall be provided in the piping connections to compressors, engines, and in similar applications where elimination of the transmission of vibrations through piping is required.

b. Pressure Applications

Flexible metal hose couplings in pressure piping shall be of seamless corrugated metal tubing, covered with bronze wired braid, and shall be equipped with pressure-tight connectors of a type suitable for the pipelines

in which they are to be used. Unless otherwise shown, flexible seamless metal hose shall be of bronze.

c. Non-Pressure Applications

Shall be strip wound galvanized steel, unless otherwise scheduled or shown.

5. Expansion Couplings

a. All expansion couplings shall be of the split-sleeve type or internally guided sleeve-type and shall be packed with materials which are suitable for the intended service.

b. Expansion couplings 2-1/2 inches and smaller shall be all bronze with screwed ends unless specified or shown otherwise.

c. Expansion couplings three inches and larger shall have an iron body with flanged ends or steel body Victaulic Depend-O-Lok® couplings with expansion ends.

e. Expansion joints in the stainless steel air header piping shall be flanged, double arch, reinforced rubber spool type.

d. Flexible pipe coupling in the air header piping shall be designed for a minimum operating temperature of 300 ^{o}F for a minimum operating pressure of 25 psi.

6. Solid Sleeves

a. Solid Sleeves shall conform to AWWA C110, short pattern, unless otherwise specified.

b. Joints for solid sleeves shall not be hot-poured.

7. Pressure Rating

Flexible pipe couplings shall be designed to a minimum of the test pressure for the pipeline in which they are to be installed.

8. Harnessing

a. Flexible pipe couplings shall be harnessed where shown and as specified on the Contract Drawings.

b. Materials

1. Harness rods and nuts shall be of heat treated steel.

2. Minimum yield strength, 70,000 psi.

3. Minimum ultimate strength, 110,000 psi.

4. American Standard Course Threads.

5. Galvanized or cadmium plated, unless otherwise scheduled or shown.

6. Steel lugs or ears shall be as shown on the Contract Drawings.

9. Joints

Where the type of joint is not scheduled or shown, the joints shall be as required to conform to the type of pipe joints at the point of installation.

15121.03 EXECUTION

A. General

1. Flexible pipe couplings shall be installed in accordance with the manufacturer's recommendations.

2. Couplings shall not be used to support the weight of adjoining pipe or fittings.

3. Split-Sleeve Couplings Joints – The contractor shall inspect each coupling to insure that there are no damaged portions of the coupling. Particular attention should be paid to the sealing pad / sealing plate area. Before installation, each coupling shall be thoroughly cleaned of any foreign substance which may have collected thereon and shall be kept clean at all time thereafter. Wrenches used shall be of a size and type recommended by the manufacturer. Bolts and studs shall be tightened so as to secure a uniform gasket compression between the coupling and the body of the pipe with all bolts or studs tightened approximately the same amount. Final tightening shall be done by hand (no air impact wrenches) and is complete when the coupling is in uniform contact around the circumference of the pipe.

    a. In no case shall the deflection in the joint between the pipe ends exceed the maximum deflection recommended by the manufacturer. No joint shall be misfit any amount that would be detrimental to the strength and water tightness of the finished joint.

4. Harness rods shall be installed on flexible pipe couplings where scheduled or shown on Contract Drawings.

a. Steel lugs shall be of the type shown on the Contract Drawings.

b. Lugs and welds shall be designed and installed to develop the full strength of the harness rods.

c. Socket clamps shall be used with harness rods on ductile iron push-on jointed pipe.

5. When installed for underground or submerged service the coupling and harness rods shall be painted, after being installed, with two coats of tar pitch preservative coating, unless otherwise shown or scheduled.

END OF SECTION

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SECTION 15140

PIPE HANGERS AND SUPPORTS

15140.01 GENERAL

A. Description

1. General

   a. Pipe hangers and supports include all metallic hanging and supporting devices and all concrete piers for above-ground or interior pipeline conduits and fittings, except electrical conduits. Hangers and supports for electrical work are specified in the Section entitled "Conduits".
   b. Contractor shall be responsible for the structural design of all pipe hangars and supports specified in this Section and shown on the Contract Drawings.

B. Quality Assurance

1. Qualifications of Manufacturer

   a. All equipment furnished under this Section shall be furnished by manufacturers who meet the quality, workmanship, and experience requirements as specified in the General Provisions section of this contract.

2. Acceptable Manufacturers

   a. Anvil International, Inc (Formerly Grinnell)
   b. Eaton (formerly B-line)
   c. Equal

3. Unless stated otherwise, the catalog figure numbers in this Section refer to products of the Anvil International, Inc (Formerly Grinnel). Equivalent products by other acceptable manufacturers will be reviewed by the Engineer.

4. Applicable Codes

   a. American Society of Mechanical Engineers (ASME)
   b. American National Standards Institute (ANSI)
   c. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS)

5. Standard Design

a. Hangers and supports shall conform to the latest requirements of the ASME Code for Pressure Piping B31.1.0, and the MSS Standard Practice SP-58, SP-69, and SP-90 except as supplemented or modified by the requirements of this specification. Hangers and supports shall be adequate to maintain the supported load in proper position under all operating conditions. Supports and anchors shall be adequate to support the pipe filled with water with a minimum safety factor of 5 and for the test pressure specified.

C. Submittals

1. Shop Drawings/Manufacturer's Data

a. Shop drawings and/or manufacturer's data demonstrating detailed compliance with the provisions of this Section shall be submitted to the Engineer in accordance with the General Provisions.

b. The manufacturer shall provide (for informational purposes only) to the Engineer and Contractor, at least 90 days prior to the scheduled arrival date of the initial equipment, complete instructions for unloading, handling, protection and storage of the equipment.

c. Pipe support calculations shall be provided by the Contractor for all pipe hangars, supports, struts, and associated anchorage for both seismic and non-seismic systems. Calculations shall be performed by a Maryland professional engineer.

D. Delivery, Storage and Handling

1. Generally, unpainted machined parts shall be protected from damage by the elements with the application of a strippable protective coating.

2. Unloading of the equipment shall be performed by the Contractor. Unload, handle, protect, and store the equipment in accordance with the manufacturer's instructions.

3. Material and equipment damaged by handling or storage shall be repaired or replaced, at no extra cost to the Owner, by the Contractor as directed by the Engineer.

15140.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any pipe hangers or supports.

B. Contractor's Options

None.

C. Detailed Material Requirements

1. Pipe

   a. Pipe for supports shall be in accordance with the following standards:

      Wrought Steel Pipe - ASTM A53 Schedule 40
      Cast Iron Pipe - ASA Des: 21.6 and 21.8, Thickness Class 22

2. Plate and Castings

   a. Structural steel, wrought metals and metal castings used for hangers and supports shall meet the requirements of the applicable Sections of the Contract Documents.

3. Construction

   a. Hangers

      1) Overhead hangers for pipes eight inches in diameter and smaller shall be supported by threaded rods and shall be equal to Figure 108, Split Ring Type.

      2) Overhead hangers for pipes 10 inches in diameter and larger, and for smaller pipes where shown or specified, shall be single rolls and sockets equal to Figure 171.

      3) Ceiling flanges shall be utilized for pipes 8 inches or less and shall be equal to Figure 153. Concrete rod attachment plates shall be utilized for pipes larger than 8 inches and shall be equal to Figure 52.

      4) Natural Gas Piping:
         a) 3/4 inch to 2 inch – adjustable ring, wrought carbon steel, black.
         b) 2-1/2 inch to 6 inch – adjustable clevis, wrought carbon steel, black. Where installed on pipe rack, roller support.

   b. Supports

      1) Brackets for supporting piping from walls or columns shall be furnished with back plates where required to prevent the safe bearing capacity of the wall from being exceeded and shall be equal to Figures 194, 195 and 199.

2) Saddle stands shall be of the adjustable type equal to Figure 264, with floor flanges for bolting to floors or foundations. Stanchions shall be equal to Figure 259.

3) Where piping is installed on structural steel supports, blocking or pipe rolls shall be provided to prevent lateral pipe movement. For piping up to 24", pipe rolls for welded brackets shall be equal to Figure 175. Where required or specified pipe rolls shall be equal to Figure 271.

4) Insulated pipes 2-1/2 inches in diameter and larger shall be provided with protection saddles, Figures 160 thru 165, 165A, and 166A as required or specified.

5) Beam and channel clamps shall be of malleable iron and shall be equal to Figure 133. Side I-beam clamps shall be equal to Figure 225 and side channel clamps shall be equal to Figure 226.

6) Channel sections shall be complete with clamping nuts and fittings. Channel sections systems for piping supports systems shall be Series PS-200 Power Strut or equal. Finish for channel sections and fittings shall be hot dipped galvanized conforming to ASTM A153. All exposed channel ends shall be provided with end caps.

7) Concrete pier supports shall be of Class "B" concrete. 60 durometer rubber shall be placed between concrete and pipe.

8) Pipe sections continuously supported by channel iron shall be as follows:

For PVC Pipe

Pipe Size (inches)	Maximum Hanger Spacing (feet)	Size of Channel Iron (inches)
2"	10	2
3"	10	3
4"	10	4

9) Clamps for supporting piping (3/8" to 4") from walls shall be malleable iron and shall be equal to Figure 126.

10) U-straps shall be carbon steel and shall be equal to Figure 262.

11) Riser or offset pipe clamps shall be provided for small diameter piping 4" and smaller for horizontal or vertical runs along walls, beams, or columns and shall be galvanized steel equal to Figure 103 or 261. When supporting PVC pipe, neoprene rubber 1/8" thick shall be inserted between pipe and clamp.

c. Inserts

1) Inserts for concrete shall be hot dipped galvanized and shall be installed in concrete structures where required and where shown on Contract Drawings.

2) Continuous inserts shall be PS-349 by Power Strut or equal.

3) Spot inserts shall be Power Strut G-152 or equal.

4) All concrete inserts shall have plastic coated filler to prevent concrete seepage.

d. Hanger Rods

1) The minimum acceptable size hanger rod for each installation shall be determined from the following table:

Size of Pipe-Inches	Diameter of Rod-Inches
Up to 2	3/8
2-1/2 to 3-1/2	1/2
4 and 5	5/8
6 and 8	3/4
10 and 12	7/8
14 and 16	1
18 to 30	1-1/4
36 to 42	1-1/2
42 to 48	1-3/4

e. Shop Painting

1) Hangers and supports shall be painted in accordance with Section 9900, "Field Painting."

15140.03 EXECUTION

A. Installation

1. Installation shall be performed as recommended by the manufacturer and shall be such that the centerline elevations of supported piping are maintained in an

orderly manner.

2. Unless otherwise indicated, hangers and supports for all pipe other than PVC shall be spaced not more than 10 feet apart and at or near changes in direction of pipelines.

3. PVC pipe supports shall be in accordance with the following and at or near changes in direction of pipelines.

Non-continuously Supported Pipe

Pipe Size* (Inches)	Maximum Hanger or Clamp Spacing (feet)
½" PVC	4.25
1" PVC	5.0
2" PVC	6.5
3" PVC	7.75
4" PVC	8.5
6" PVC	10.25
8" PVC	11.25

* Fractional piping diameters shall conform to the next smallest support spacing.

4. For copper pipe and copper tubing carrying liquid with specific gravity of 1.0 or less:

Pipe Size	Spacing
1/2 inch	5 feet
3/4 inch	5 feet
1 inch	6 feet
1-1/2 inch	8 feet
2 inch	8 feet
2-1/2 inch	9 feet
3 inch	10 feet

5. For steel pipe carrying water or liquid with specific gravity less than or equal to 1.0, at pressures from 0 to 125 psig and temperatures from 0 to 250 deg F:

Pipe Size	Spacing
1/2 inch	7 feet
3/4 inch	7 feet
1 inch	7 feet
1-1/2 inch	9 feet
2 inch	10 feet
2-1/2 inch	11 feet
3 inch	12 feet
4 inch	14 feet
6 inch	17 feet

8 inch	19 feet
10 inch	20 feet
12 inch	23 feet
16 inch	27 feet
20 inch	30 feet

6. For steel pipe carrying natural gas:

Pipe Size	Spacing
1/2 inch	6 feet
3/4 or 1 inch	8 feet
1 ¼ or larger (horizontal)	10 feet
1 ¼ or larger (vertical)	Every floor level

7. Unless otherwise shown, specified or directed, no piping shall be supported from other piping or from metal stairs, ladders or walkways.

B. Field Painting

1. Field painting shall be performed in accordance with Section 09900, "Field Painting".

END OF SECTION

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