WC WD
Warren County Water District

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PUBLIC SERVICE COMMISSION

January 22, 2016

LINDA FAULKNER
FILINGS DIVISION DIRECTOR
KY PUBLIC SERVICE COMMISSION
P.O. BOX 615
FRANKFORT, KY 40602

RE: Case No. 2016-00035 – Answer to Filing Deficiencies

Dear Ms. Faulkner:

The Warren County Water District hereby provides answers to the filing deficiencies as follows:

(1) 807 KAR 5:001: Section 14(1) – Full Name, mailing address of applicant and a reference to KRS 278.300.

ANSWER: The applicants name and information was provided in the cover letter. The applicant is Warren County Water District, 523 U.S. 31-W Bypass, P.O. Box 10180, Bowling Green, KY 42101. Reference was made to KRS 278.300 on page 1 of the application.

(2) 807 KAR 5:001: Section 4(3) – Name, address, telephone number, fax number, and e-mail address of submitting party or attorney.

ANSWER: The name, address and phone number of the attorney was provided on page 6 of the application. The attorney's email address is hmoore@coleandmoore.com.

(3) 807 KAR 5:001: Section 15(2)(b) – Copies of franchises or permits, if any, from the proper public authority for the proposed construction or extension, if not previously filed with the Commission.

ANSWER: Please see Tab No. 1 containing the following permits:

1. Army Corps of Engineers NWP No. 12
2. Kentucky Division of Water Stream Construction Permit

(4) 807 KAR 5:001: Section 15(2)(d)(1) – Three (3) copies (one (1) in portable document format on electronic storage medium and two (2) in paper medium) of maps to suitable scale showing the location or route of the proposed construction or extension, as well as the location to scale of like facilities owned by others located anywhere within the map area with adequate identification as to the ownership of other facilities.

Providing high-quality water and wastewater services to families and businesses throughout Warren County.

Delivering Quality and Commitment in Every Drop

ANSWER: Please see Tab No. 2 containing two (2) project map sheets as well as the enclosed two (2) additional project map sets and the CD containing a copy in portable document format (PDF).

(5) **807 KAR 5:001: Section 15(2)(d)(2) – Plans and specifications and drawings of the proposed plant, equipment and facilities.**

ANSWER: Please see the enclosed Specifications and Contract Documents booklet as well as a full size set of the Project Plans. Both documents are signed, sealed, and dated by an engineer registered in Kentucky.

(6) **807 KAR 5:001: Section 18(1)(b) – Description of applicant's property and the field of operation.**

ANSWER: Warren County Water District (WCWD) provides water and sewer services to a portion of the City of Bowling Green, Kentucky and all of Warren County, Kentucky. WCWD serves over 26,000 water customers and over 5,000 sewer customers. WCWD owns and maintains over 1,200 miles of water pipeline, 32 pumping stations, and 28 storage tanks. WCWD owns and maintains over 160 miles of sewer pipeline and over 60 lift stations.

(7) **807 KAR 5:001: Section 18(1)(b) – Statement of original cost of applicant's property and the cost to the applicant, if different.**

ANSWER: Total assets of the Water District are presented in the 2014 Audit as provided in Exhibit J of the application.

(8) **807 KAR 5:001: Section 18(1)(c) - If stock issuance: Whether the debt is to be secured and if so a description of how it is to be secured.**

ANSWER: No stock will be issued. The proposed funding for the project includes a Kentucky Infrastructure Authority Loan as described in the Engineering Report, Exhibit A, of the application. Principal and interest payments are secured through an agreement with Warren County Fiscal Court, Exhibit C, of the application and the proposed tariff, Exhibit F, of the application. The tariff has been filed with the Public Service Commission, Electronic Tariff filing TFS2016-00010.

(9) **807 KAR 5:001: Section 18(2)(c) – If property to be acquired: Detailed estimates by USOA account number.**

ANSWER: Please see Tab No. 3.

(10) **807 KAR 5:071: Section (3)(1)(b) – A copy of a preliminary approval issued by the Division of Water Quality of the Kentucky Department for Natural Resources and Environmental Protection approving the plans and specifications of the proposed construction.**

ANSWER: Please see Tab No. 4.

(11) 807 KAR 5:071: Section 3(3)(a) – Copy of amortization schedules of present and proposed indebtedness.

ANSWER: The amortization schedules for present and proposed indebtedness were provided in the original application, Exhibit K. The new loan is referenced as KIA 2015 C15-003.

(12) KRS 322.340 – Engineering plans, specifications, drawings, plats and reports for the proposed construction or extension prepared by a registered engineer, must be signed, sealed, and dated by an engineer registered in Kentucky.

ANSWER: Please see the enclosed Specifications and Contract Documents booklet as well as a full size set of the Project Plans. The Engineering Report was included in the application as Exhibit A. All documents are signed, sealed, and dated by an engineer registered in Kentucky.

Sincerely,

John M. Dix, P.E.
General Manager

JMD/ska

cc: F. Hampton Moore

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX: (502) 315-6677
http://www.lrl.usace.army.mil/

October 14, 2015

Operations Division
Regulatory Branch (South)
ID No. LRL-2015-535-mck

Mr. Ryan Leisey
Warren County Water District
P.O. Box 10180
Bowling Green, Kentucky 42102-4780

Dear Mr. Leisey:

This is in response to your request on behalf of Warren County Water District for authorization concerning the proposal proposing to bore under Drakes Creek a total distance of approximately 450 linear feet to install an 8-inch SDR 11 HDPE sewer force-main. The proposed bore installation would be located on Drakes Creek near the Scottsville Road bridge, in Alvaton, Warren County, Kentucky (Latitude: 36.895873° N and Longitude: 86.380348° W). The bore pit on the northwest side of the creek would be on Warren County's Phil Moore Park property. The receiving pit on the southeast side of the creek would be on Highway US 231 right-of-way. The information supplied by you was reviewed to determine whether a Department of the Army (DA) permit will be required under the provisions of Section 10 of the Rivers and Harbors of 1899.

The project is authorized under the provisions of Nationwide Permit (NWP) No. 12, Utility Line Activities, as published in the Federal Register February 21, 2012. Under the provisions of this authorization, Warren County Water District must comply with the enclosed Terms and General Conditions for NWP No. 12 and the following Special Condition:

> The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Warren County Water District must also comply with the enclosed Water Quality Certification (WQC) Conditions for NWP No. 12 dated March 19, 2012, issued by the Kentucky Division of Water (KDOW). Once Warren County

Water District obtains their certification, or if no application was required, they may proceed with the project without further contact or verification from us.

This decision is valid until March 18, 2017. The enclosed Compliance Certification should be signed and returned when the project is completed. If this project is not completed by this date or if this project is modified, Warren County Water District must contact us for another permit determination in accordance with the rules and regulations in effect at that time. Please note that we also perform periodic inspections to ensure compliance with our permit conditions and applicable Federal laws. Copies of this letter are being sent to appropriate coordinating agencies (see enclosure for addresses).

If you have any questions, please contact this office by writing to the above address, ATTN: CELRL-OPF-S, or by calling me at 502-315-6709. All correspondence pertaining to this matter should refer to our ID No. LRL-2015-00535-mck.

Sincerely,

Meagan Knuckles
Project Manager
Regulatory Branch

Enclosures

Terms for Nationwide Permit No. 12 – Utility Line Activities

12. Utility Line Activities. Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Utility lines: This NWP authorizes the construction, maintenance, or repair of utility lines, including outfall and intake structures, and the associated excavation, backfill, or bedding for the utility lines, in all waters of the United States, provided there is no change in pre-construction contours. A "utility line" is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and radio and television communication. The term "utility line" does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a power line or utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for overhead utility line towers, poles, and anchors: This NWP authorizes the construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the United States, provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (See 33 CFR Part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP also authorizes temporary structures, fills, and work necessary to conduct the utility line activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if any of the following criteria are met: (1) the activity involves mechanized land clearing in a forested wetland for the utility line right-of-way; (2) a section 10 permit is required; (3) the utility line in waters of the United States, excluding overhead lines, exceeds 500 feet; (4) the utility line is placed within a jurisdictional area (i.e., water of the United States), and it runs parallel to or along a stream bed that is within that jurisdictional area; (5) discharges that result in the loss of greater than 1/10-acre of waters of the United States; (6) permanent access roads are constructed above grade in waters of the United States for a distance of more than 500 feet; or (7) permanent access roads are constructed in waters of the United States with impervious materials. (See general condition 31.) (Sections 10 and 404)

Note 1: Where the proposed utility line is constructed or installed in navigable waters of the United States (i.e., section 10 waters) within the coastal United States, the Great Lakes, and United States territories, copies of the pre-construction notification and NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Note 2: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, in accordance with the requirements for temporary fills.

Note 3: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to Section 9 of the Rivers and Harbors Act of 1899. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

Note 4: For overhead utility lines authorized by this NWP, a copy of the PCN and NWP verification will be provided to the Department of Defense Siting Clearinghouse, which will evaluate potential effects on military activities.

US Army Corps of Engineers.
Louisville District

Nationwide Permit Conditions

The following General Conditions must be followed in order for any authorization by NWP to be valid:

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the US Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the US.

(c) The permittee understands and agrees that, if future operations by the US require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the US. No claim shall be made against the US on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the US that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the US during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, US Forest Service, US Fish and Wildlife Service).

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification (PCN) to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the PCN must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete PCN. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from Corps.

(d) As a result of formal or informal consultation with the USFWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the US to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any "take" permits required under the USFWS's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the USFWS to determine if such "take" permits are required for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA is complete.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the US are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the US to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.

(2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the US, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the US, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the US are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or USEPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the US authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the US for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature: "When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____

(Transferee)

_____

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification (PCN). (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a PCN as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the US expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(4) The PCN must include a delineation of wetlands, other special aquatic sites, and waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the US. The 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of PCN Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP activities that require PCN notification and result in the loss of greater than 1/2-acre of waters of the US, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require PCN notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require PCN notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (USFWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the PCN notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each PCN notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of PCN notifications to expedite agency coordination.

Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project.

STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

General Certification--Nationwide Permit # 12
Utility Line Backfill and Bedding

This General Certification is issued March 19, 2012, in conformity with the requirements of Section 401 of the Clean Water Act of 1977, as amended (33 U.S.C. §1341), as well as Kentucky Statute KRS 224.16-050.

For this and all nationwide permits, the definition of surface water is as per 401 KAR 10:001 Chapter 10, Section 1(80): Surface Waters means those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the commonwealth.

Agricultural operations, as defined by KRS 224.71-100(1) conducting activities pursuant to KRS 224.71-100 (3), (4), (5), (6), or 10 are deemed to have certification if they are implementing an Agriculture Water Quality Plan pursuant to KRS 224.71-145.

For all other operations, the Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 304, 306 and 307 of the CWA, will not be violated for the activity covered under NATIONWIDE PERMIT 12, namely Utility Line Backfill and Bedding, provided that the following conditions are met:

1. The activity will not occur within surface waters of the Commonwealth identified by the Kentucky Division of Water as Outstanding State or National Resource Water, Cold Water Aquatic Habitat, or Exceptional Waters.

2. The activity will not occur within surface waters of the Commonwealth identified as perpetually-protected (e.g. deed restriction, conservation easement) mitigation sites.

3. This general water quality certification is limited to the crossing of surface waters by utility lines. This document does not authorize the installation of utility lines in a linear manner within the stream channel or below the top of the stream bank.

4. For a single crossing, impacts from the construction and maintenance corridor in surface waters shall not exceed 50 feet of bank disturbance.

5. This general certification shall not apply to nationwide permits issued for individual crossings which are part of a larger utility line project where the total cumulative impacts from a single and complete linear project exceed ½ acre of wetlands or 300 linear feet of surface waters. Cumulative impacts include utility line crossings, permanent or temporary access roads, headwalls, associated bank stabilization areas, substations, pole or tower foundations, maintenance corridor, and staging areas.

6. Stream impacts under Conditions 4 and 5 of this certification are defined as the length of bank disturbed. For the utility line crossing and roads, only one bank length is used in calculation of the totals.

7. Stream impacts covered under this General Water Quality Certification and undertaken by those persons defined as an agricultural operation under the Agricultural Water Quality Act must be completed in compliance with the Kentucky Agricultural Water Quality Plan (KWQP).

8. The Kentucky Division of Water may require submission of a formal application for an individual certification for any project if the project has been determined to likely have a significant adverse effect upon water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.

9. Activities that do not meet the conditions of this General Water Quality Certification require an Individual Section 401 Water Quality Certification.

10. Blasting of stream channels, even under dry conditions, is not allowed under this general water quality certification.

11. Utility lines placed parallel to the stream shall be located at least 50 feet from an intermittent or perennial stream, measured from the top of the stream bank. The cabinet may allow construction within the 50 foot buffer if avoidance and minimization efforts are shown and adequate methods are utilized to prevent soil from entering the stream.

12. Utility line stream crossings shall be constructed by methods that maintain flow and allow for a dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to re-entering the stream. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the excavation shall not be allowed to enter the flowing portion of the stream.

13. The activities shall not result in any permanent changes in pre-construction elevation contours in surface waters or wetlands or stream dimension, pattern or profile.

14. Utility line activities which impact wetlands shall not result in conversion of the area to non-wetland status. Mechanized land clearing of forested wetlands for the installation or maintenance of utility lines is not authorized under this certification.

15. Activities qualifying for coverage under this General Water Quality Certification are subject to the following conditions:

- Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur.
- Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities.
- Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
- Removal of riparian vegetation shall be limited to that necessary for equipment access.
- To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions.
- Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances in which such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation.

- Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement.

- If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done.
- Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling (800) 928-2380.

Non-compliance with the conditions of this general certification or violation of Kentucky state water quality standards may result in civil penalties.

WATER QUALITY GENERAL CERTIFICATION OF UTILITY LINE ACTIVITIES ALONG STREAMS

IN EFFECT: NOVEMBER 15, 2012

Condition 11 of the March 19, 2012 Section 401 Water Quality Certification (WQC) of the U.S. Army Corps of Engineers' Nationwide Permit (NWP) # 12 Utility Line Backfill and Bedding states:

Utility lines placed parallel to the stream shall be located at least 50 feet from an intermittent or perennial stream, measured from the top of the stream bank. The cabinet may allow for construction within the 50-ft buffer if avoidance and minimization efforts are shown and adequate methods are utilized to prevent soil from entering the stream.

From March 19, 2012 through November 15, 2012, WQC required an individual water quality certification if the utility line was proposed to be placed closer than 50 feet from the top of the stream bank of an intermittent or perennial stream. After November 15, 2012, by order of the Director, we will now issue a general certification if all of the following criteria are met:

1. The project meets all the remaining certification conditions of the 2012 NWP 12;
2. The applicant cannot avoid placing the utility line within 50 feet of the stream bank; and
3. The applicant submits an adequate sediment and erosion control plan (see page 3 for requirements).

If a utility line project qualifies for a general certification of NWP 12 and is within 50 feet of the stream bank, a WQC application and a site-specific sediment and erosion control plan must be submitted for review by WQC before construction and construction-related activities can proceed. This is in addition to the Stormwater Pollution Prevention Plans for construction sites one (1) acre or more in size. Approval of the sediment and erosion control plan by the WQC Section is required before construction activities can begin.

WHY SEDIMENT AND EROSION CONTROL PLANS AND PRACTICES?

Construction activities near streams, rivers, and lakes have the potential to cause water pollution and stream degradation if erosion and sediment controls are not properly installed and maintained. In order to effectively reduce erosion and sedimentation impacts, plans and practices must be designed, located, installed, and maintained in effective operating condition at all times during land disturbing activities to prevent the discharge of sediment and other pollutants into waters of the Commonwealth. Sediment is a major contributor to the pollution of surface waters in Kentucky and construction activities are a major source of sediment and stream siltation. Disturbed soil, if not managed properly, can be washed off-site during storms and can cause major impairment in the receiving waters. Excessive silt causes adverse impacts such as disruption of aquatic organism life cycles, reduced passage, higher drinking water treatment costs for sediment removal, and the alteration of waters' physical/chemical properties, resulting in degradation of its quality. Therefore, erosion prevention and sediment control practices are the key parameter for successful water quality protection.

Applicants should design the site construction and development by selecting erosion prevention and sediment controls and practices to accommodate the unique hydrologic and geologic conditions of the site. Some of the factors to be considered include: local development requirements and/or codes, precipitation patterns for the area when the project will be underway, soil types, slopes, layout of structures for the site, sensitivity of nearby waters and natural areas, and safety concerns. A number of structural practices (e.g., mulching, vegetated buffer strips, grassed swales, retention/detention ponds, silt

fence and haybale barriers, stone check dams, inlet protection, infiltration practices) and non-structural practices (minimizing disturbance, good housekeeping) have shown to be efficient, cost effective, and versatile for construction site developers to implement.

EROSION PREVENTION AND SEDIMENT CONTROL STRATEGIES

Appropriate erosion prevention and sediment control measures and other stormwater management practices must be designed, installed, and maintained. Applicants are encouraged to perform work within surface waters during periods of low-flow or no-flow. To ensure that all sources of soil erosion and sediment on the construction site are adequately controlled, the following strategies should be employed:

- **Sediment and erosion control measures shall not be placed in surface waters.** The design and placement of temporary erosion control measures shall not be conducted in a manner that may result in disruption of flow in wetlands or streams.
- **Maximize the protection of existing vegetation.** Natural vegetation should be retained, protected or supplemented to the maximum extent practical, and vegetation not intended for removal should be adequately marked, fenced, or flagged as necessary.
- **Avoid disturbing critical areas.** Areas such as sinkholes, streams, wetlands, stream buffers, highly erodible soils, and steep slopes should be avoided to the greatest extent feasible. Mark, fence or flag areas in the field that should be protected from construction activities such as clearing, grubbing, grading, mowing, staging activities, material storage and/or other related activities.
- **Minimize size and duration of disturbed soil.** Limit site preparation of activities such as grading and clearing to where they are absolutely necessary and consistent with plan and daily schedules of construction activities.
- **Manage stormwater.** Prevent stormwater from entering areas and leaving areas of disturbed soil by using vegetated strips, diversion dikes and swales, filter berms, sediment traps and basins, check dams, stabilized construction entrances, and silt fences or filter tubes/wattles. Reduce the amount of sediment and water velocity produced from areas of disturbed soils by using vegetation, riprap, sod, seeding and mulching or blankets, as well as the use of structural measures including diversion, check dams, slope drains, and storm drain protection.
- **Stabilize soils.** Stabilize soil with seeding and mulch as soon as possible after disturbance. Soil disturbed by construction activities should be stabilized within 14 days of ceasing construction activities. Erosion prevention measures such as erosion control mats/blankets, mulch, hydro applications, tracking, or soil binders shall be implemented on disturbed areas within 24 hours or as soon as practical after completion of disturbance/grading or following the end of activities. Final stabilization practices shall be initiated on any site where construction activities have been suspended for more than 180 days.
- **Use low-impact/biological/recyclable materials.** To the extent possible, construction managers should utilize natural or recyclable materials as temporary measures than can remain on-site after the completion of construction. One example is using mulch berms as opposed to silt fences, which must be removed and disposed after the completion of construction activities has occurred and vegetation has become well-established. This also reduces waste and removal costs.

SEDIMENT AND EROSION CONTROL PLAN REQUIREMENTS

Erosion prevention and sediment control plans submitted to WQC must contain detailed drawings, a site description and supporting information (narrative), including the following:

1. Narrative discussion of why the utility line must be placed within 50 feet of the top of the stream bank;
2. Construction details with dimensions, cross-sectional views and plan views to scale, showing location of utility lines and all surface waters;
3. Site development plan with the proposed construction area and construction-related activities areas clearly outlined, estimated project start and end dates, project type and description of all construction activities at the site;
4. The location of all surface waters on a 7.5 Minute topographical map, including streams, wetlands, sinkholes, and stormwater discharges from the site;
5. The types, depth, slope, locations and limitations of the soils and geology, natural landscape features, drainage patterns, flooding potential, and other pertinent information that helps identify both beneficial conditions and potential problems of a site;
6. Locations of temporary and permanent erosion, sediment, and stormwater management structures; construction details with dimensions, cross-sectional views and/or plan views with enough information for the reviewer and contractor to understand how to install the practice;
7. Approximate slopes anticipated after major grading activities;
8. Areas of soil disturbance, including an outline of areas which are not to be disturbed;
9. Location and technical specifications of any bank stabilization;
10. Location and boundaries of buffer zones, if any, existing or established to protect waters of the Commonwealth located within the boundaries of the project;
11. Locations of stockpile and/or borrow areas;
12. Separate sheets for staged plans to show detail, including the clearing and grubbing phase, initial grading plan with perimeter control and the final grading plan with final erosion prevention and sediment control plans and stormwater management controls in place.

Approved plans and specifications for projects are incorporated by reference and are enforceable parts of a certification. Any changes to the approved plans or specifications require written approval by WQC. For questions or clarifications, contact the Water Quality Certification Section at (502) 564-3410.

REFERENCES

Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Stormwater Discharge Associated with Construction Activities (KYR10). Locate on line at: http://water.ky.gov/permitting/Pages/WastewaterDischarge.aspx

Best Management Practices (BMPs) for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites. Planning and Technical Specifications Manual for Stormwater Pollution Prevention Plans. Revised October 2009. Technology Transfer Program, Kentucky Transportation Center, University of Kentucky.

General Certification of Nationwide Permit #12, Utility Line Backfill and Bedding, 2012. Locate on line at: http://water.ky.gov/permitting/Pages/CertificationNationwidePermits.aspx

Compliance Certification:

Permit Number: LRL-2015-535-mck

Name of Permittee: Warren County Water District

Date of Issuance: October 14, 2015

Upon completion of the activity authorized by this permit and any mitigation required by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
CELRL-OPF-S
P.O. Box 59
Louisville, Kentucky 40201

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

_____ _____

Signature of Permittee Date

ADDRESSES FOR COORDINATING AGENCIES

Mr. Aaron Keatley
Deputy Commissioner
Kentucky Energy & Environment Cabinet
200 Fair Oaks
Frankfort, KY 40601

Mr. Lee Andrews
U.S. Fish & Wildlife Service
JC Watts Federal Building
330 West Broadway, Room 265
Frankfort, KY 40601

Dr. Jonathan W. Gassett
Commissioner
Dept. of Fish and Wildlife Resources
#1 Game Farm Road
Frankfort, KY 40601

Mr. Lindy Casebier
Acting Executive Director
State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, KY 40601

Commander (oan)
Eighth Coast Guard District
Hale Boggs Federal Building
501 Magazine Street
New Orleans, LA 70130-6298

U.S. Coast Guard
Supervisor, MSD - Cincinnati
3653 River Road
Cincinnati, OH 45264

Ms. Shelley R. Miller
Attorney Advisor
USCG Waterways Management
Eighth Coast Guard District
500 Poydras Street
New Orleans, LA 70130

STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

STREAM CONSTRUCTION PERMIT

For Construction In Or Along A Stream

Issued to: **Warren County Water District**
Address: **PO Box 10180**
Bowling Green, KY 42102-4780

Permit expires on
August 3, 2016

Permit No. **21576**

In accordance with KRS 151.250 and KRS 151.260, the Energy and Environment Cabinet approves the application dated **June 30, 2015** for **installation of a directionally bored 8" sewer force main in the floodplain of Drakes Creek at about stream mile 12.2, with coordinates 36.895873, -86.380348, in Warren County.** AI: 44217

There shall be no deviation from the plans and specifications submitted and hereby approved unless the proposed change shall first have been submitted to and approved in writing by the Cabinet. This approval is subject to the attached limitations. **Please read these limitations carefully!** If you are unable to adhere to these limitations for any reason, please contact this office prior to construction.

This permit is valid from the standpoint of stream obstruction only. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. Specifically if the project involves work in a stream, such as bank stabilization, dredging, relocation, or in designated wetlands, a 401 Water Quality Certification from the Division of Water will be required.

This permit is nontransferable and is not valid unless actual construction of this authorized work is begun prior to the expiration date noted above. Any violation of the Water Resources Act of 1966 as amended is subject to penalties as set forth in KRS 151.990.

If you have any questions regarding this permit, please call Soheyl Bigdeli at (502) 564-3410.

Issued August 3, 2015.

Ron Dutta, P.E., Supervisor
Floodplain Management Section
Surface Water Permit Branch

RD/SB/kec

pc: Bowling Green Regional Office
Josh Moore – Warren County Floodplain Coordinator
Ryan Leisey, PE (by email)
File

Stream Construction Permit
Warren Co Water District
Facility Requirements
Permit Number: 21576
Activity ID No.:APE20150001

STRC0000000002 (Force Main)installation of a directionally bored 8" sewer force main:

Submittal/Action Requirements:

Condition No.	Condition
S-1	Warren County Water District must submit final construction report: Due within 90 days after completion of construction Warren County Water District must notify in writing that the project has been completed in accordance with the approved plans and specifications. A Final Construction Report Form is enclosed. [401 KAR 4:060 Section 6]

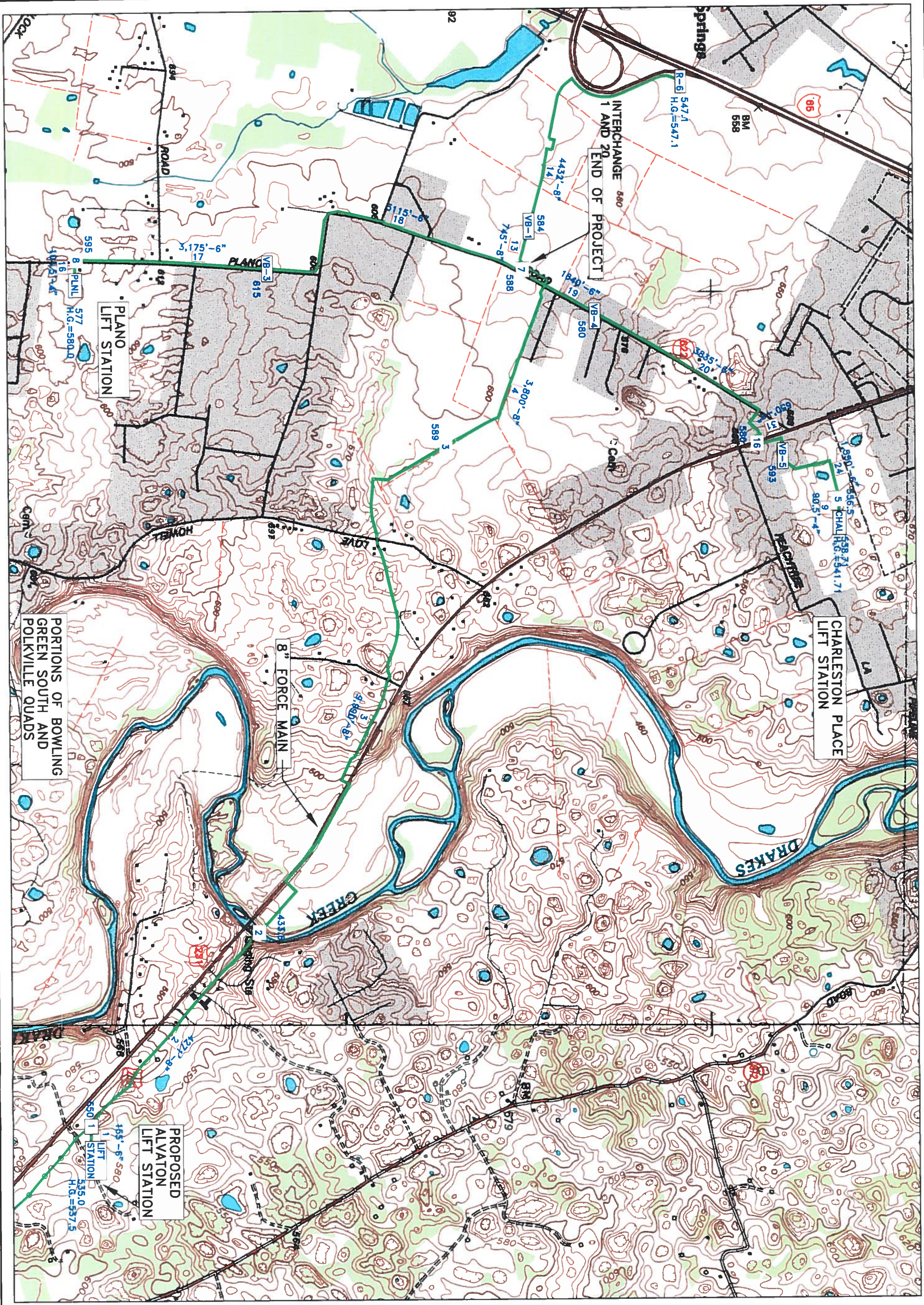
Narrative Requirements:

Condition No.	Condition
T-1	The issuance of this permit by the cabinet does not convey any property rights of any kind or any exclusive privilege. [KRS 151.250 & 401 KAR 4:060]
T-2	This permit is issued from the standpoint of stream obstruction only and does not constitute certification of any other aspect of the proposed construction. The applicant is liable for any damage resulting from the construction, operation, or maintenance of this project. This permit has been issued under the provisions of KRS Chapter 151.250 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. [KRS 151.250]
T-3	A copy of this permit must be available at the construction site. [KRS 151.250]
T-4	Any work performed by or for Warren County Water District that does not fully conform to the submitted application or drawings and the limitations set forth in this permit, is subject to partial or total removal and enforcement actions pursuant to KRS 151.280 as directed by the Kentucky Department for Environmental Protection. [KRS 151.280]
T-5	Any design changes or amendments to the approved plans must be submitted to the Division of Water and approved in writing prior to implementation. [KRS 151.250]
T-6	Since Warren County participates in the National Flood Insurance Program, a local floodplain permit must be obtained prior to beginning of construction. Upon completion of construction Warren County Water District must contact the local permitting agency for final approval of the construction for compliance with the requirements of the local floodplain ordinance. [401 KAR 4:060 Section 9(c)]

STRC0000000002 (Force Main)installation of a directionally bored 8" sewer force main:

Narrative Requirements:

Condition No.	Condition
T-7	At no point below the base flood elevation 478.5 feet MSL shall the use of construction materials or the permanent storage of materials subject to flood damage be allowed. [401 KAR 4:060]
T-8	The permittee must obtain a Water Quality Certification (or a determination that none is required) through the Division of Water, Water Quality Branch before beginning construction. Contact the Water Quality Certification Supervisor at (502) 564-3410. [KRS 224.16-050 & Clean Water Act Section 401]
T-9	Erosion prevention measures, sediment control measures, and other site management practices shall be designed, installed, and maintained in an effective operating condition to prevent migration of sediment off site. [KRS 224.70-110]
T-10	To avoid secondary adverse impacts, all materials used shall be stable and inert, free from pollutants and floatable objects, and shall meet all appropriate engineering standards. (Inert here means materials that are not chemically reactive and that will not rot or decompose, such as soil, rock, broken concrete or similar materials.). [401 KAR 4:060 Section 7]
T-11	All debris and excess material shall be removed for disposal outside of the base floodplain. [401 KAR 4:060]
T-12	The entry of mobile equipment into the stream channel shall be limited as much as reasonably possible to minimize degradation of the waters of the Commonwealth. [401 KAR 4:060]
T-13	Construction other than as authorized by this permit shall require written approval from the Division of Water. [401 KAR 4:060]
T-14	The existing stream flow shall be maintained at all times during construction using standard flow diversion or pump around methods. Cofferdams or other structures placed in the stream shall be removed immediately if adverse flooding conditions result or if a flooding event is imminent. [401 KAR 4:060 Section 4]

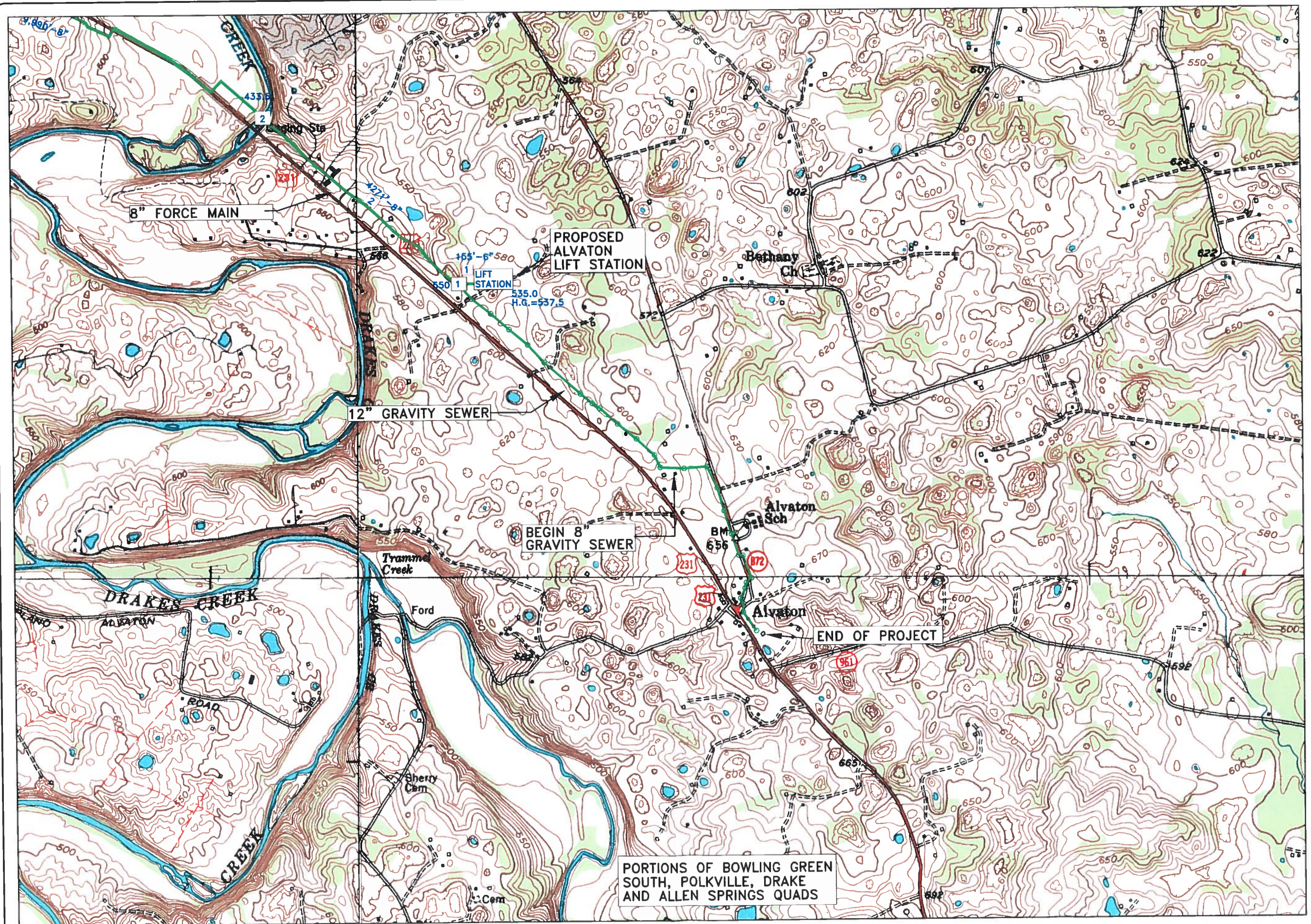


SCALE: 1" = 1500'
DATE: 1/22/16
PROJECT #: 349772
DESIGNED: TS
DRAWN: TS
CHECKED: RJL
REVISIONS:
NO. DATE:

SHEET: 1 OF 2

PROJECT LOCATION MAP
ALVATON SEWER EXTENSION
349772

WC WD Warren County Water District



Warren County Water District

PROJECT LOCATION MAP
ALVATON SEWER EXTENSION
349772

SCALE:	1" = 1500'
DATE:	1/22/16
PROJECT #:	349772
DESIGNED:	TS
DRAWN:	TS
CHECKED:	RJL

REVISIONS:

NO.:	DATE:

SHEET: 2 OF 2

ALVATON AREA SEWER PROJECT
WARREN COUNTY WATER DISTRICT
January 22, 2016

PROJECT PROPERTY AQUISITION ESTIMATE

USOA NO.	DESCRIPTION	QTYS.	UNITS	UNIT PRICE	SUB-TOTAL	TOTAL
101-3032-3	LAND - PUMPING STATIONS	1	EA	$6,500		$6,500
101-3043-3	STRUCTURES\ IMPROVEMENTS - TRANS & DISTR					$552,198
	Lift Station	1	EA	$115,525	$115,525	
	8" Force Main	17,641	LF	$21.52	$379,568	
	Air Release Valve	9	EA	$4,745	$42,705	
	8" Gate Valve	9	EA	$1,600	$14,400	
101-3394-2	FLUSHING STATION	3	EA	$3,900		$11,700
101-3112-3	EQUIPMENT - ELECTRIC PUMPING	2	EA	$12,500		$25,000
101-3314-3	MAINS - SEWER COLLECTION					$859,583
	12" SDR 35 Gravity Sewer	4,622	LF	$80.59	$372,503	
	8" SDR 35 Gravity Sewer	4,236	LF	$92.40	$391,405	
	Manholes	29	EA	$3,299.14	$95,675	
101-3324-3	SCADA	1	EA	$20,000		$20,000
101-3344-3	SEWER TAPS	12	EA	$485		$5,820
	TOTAL					$1,480,801

STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

July 20, 2015

Mr. Ryan Leisey, P.E.
Manager of Engineering and Construction
Warren County Water District
523 US 31 W Bypass
Bowling Green, KY 421024780

Re: Alvaton Area Sewer Expansion
Warren County, Kentucky
Project ID #: 15-0413
Bowling Green WWTP
Activity ID #: 4101, APE20150007
Receiving Treatment Plant KPDES #: KY022403

Dear Mr. Leisey:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of two pumps each at 313 GPM with 117-ft of TDH, approximately 18,100 LF 8-inch and 3,050 LF of 12-inch force-main. Also included is 2,950 LF of 8-inch gravity sewer line. This is to advise that plans and specifications for the above referenced project are APPROVED with respect to sanitary features of design, as of this date with the requirements contained in the attached construction permit.

If we can be of any further assistance or should you wish to discuss this correspondence, please do not hesitate to contact Mr. Abbas Pourghasemi at 502-564-3410 extension 4833.

Sincerely,

Greg Goode, P.E.
Engineering Section
Water Infrastructure Branch
Division of Water

GG/ AP

Enclosures
c: Warren County Health Department
Division of Plumbing
BGMU

Sewer Line Construction
Bowling Green WWTP
Facility Requirements

Activity ID No.:APE20150007

GACT0000000057 two pumps each 313 GPM with 117-ft of TDH, 18,100 LF 0f 8-inch PVC force-main, 3,050 LF of 12-inch and 2,950 LF of 8-inch PVC SLE:

Submittal/Action Requirements:

Condition No.	Condition
S-1	When this project is completed, the applicant shall: submit written certification: Due 30 calendar days after Completion of Construction to the Division of Water that the facilities have been constructed and tested in accordance with the approved plans and specifications and the approval conditions. Such certification shall be signed by a registered professional engineer. Failure to certify may result in penalty assessment and/or future approvals being withheld. [401 KAR 5:005 Section 24(2)]

Narrative Requirements:

Condition No.	Condition
T-1	All pump stations shall provide a minimum of two (2) hours of detention time, based on the average design flow, above the high level alarm elevation or provide an alternate source of power with wetwell storage providing sufficient time for the alternate power source to be activated. [401 KAR 5:005 Section 8(18)]
T-2	All proposed pump station wetwells shall be sized such that, based on the average flow, the time to fill the wetwell from the pump-off elevation to the pump-on elevation shall not exceed thirty (30) minutes. [401 KAR 5:005 Section 8(16)]
T-3	An audible and visible alarm shall be provided at any proposed wastewater pump station. [Ten States (WW) 46]
T-4	If gravity sewer lines and force mains are to be constructed in fill areas, the fill areas shall be compacted to ninety-five (95) percent density as determined by the Standard Proctor Density test or to a minimum of ninety (90) percent density as determined by the Modified Proctor Density test prior to the installation of the sewer lines. [401 KAR 5:005 Section 8(10)]
T-5	Sewer lines shall be laid at least ten (10) feet horizontally from any existing or proposed water main. The distance shall be measured from edge to edge. [Ten States (WW) 38.31]
T-6	Sewer lines crossing water mains shall be laid to provide a vertical distance of eighteen (18) inches between the outside of the water main and the outside of the sewer line. This shall be the case where the water main is either above or below the sewer line. The crossing shall be arranged so that the sewer line joints are equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer line to prevent damage to the water main. [Ten States (WW) 38.32]

GACT0000000057 two pumps each 313 GPM with 117-ft of TDH, 18,100 LF 0f 8-inch PVC force-main, 3,050 LF of 12-inch and 2,950 LF of 8-inch PVC SLE:

Narrative Requirements:

Condition No.	Condition
T-7	Gravity sewer lines and force mains shall have a minimum of thirty (30) inches of cover or provide comparable protection. [401 KAR 5:005 Section 8(9)]
T-8	Sewer line pipe material, joints, fittings, and installation shall conform to the latest ASTM specifications. [Ten States (WW) 33.7-33.9]
T-9	Gravity sewer lines and force mains shall be designed and constructed to give mean velocities, when flowing full, of not less than two (2) feet per second. Velocity calculations shall incorporate roughness coefficients pursuant to 401 KAR 5:005 Section 8(8). [401 KAR 5:005 Section 8(8)]
T-10	Facilities shall be designed and constructed in accordance with the "Recommended Standards for Wastewater Facilities" of the Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers, commonly referred to as "Ten States' Standards", 2004 edition. [401 KAR 5:005 Section 7(1)(a)]
T-11	If any portion of the sewer project will be constructed in or along a stream or wetland, contact the Water Quality Certification Section, located within the Water Quality Branch, at 502-564-3410, to determine if a 401 certification will be required. [KRS 224.16-050]
T-12	For subfluvial pipe crossings, a floodplain construction permit will not be required pursuant to KRS 151.250, if the following requirements of 401 KAR 4:050 Section 2 are met: 1) During the construction of the crossing, no material may be placed in the stream or in the flood plain of the stream to form construction pads, coffer dams, access roads, etc., unless prior approval has been obtained from the cabinet. 2) The trench shall be backfilled as closely as possible to the original contour. All excess material from construction of the trench shall be disposed of outside of the flood plain, unless the applicant has received prior approval from the cabinet to fill within the flood plain. 3) For subfluvial crossings of erodible channels, there shall be at least thirty (30) inches of clear cover above the top of the pipe or conduit at all points. 4) For subfluvial crossings of nonerodible channels, there shall be at least six (6) inches of clear cover above the top of the pipe or conduit at all points, and the pipe or conduit shall be encased on all sides by at least six (6) inches of concrete. 5) The weight of a pipe and its contents during normal operating conditions at all points must exceed that of an equal volume of water, or the applicant must provide the division with sufficient information to show that the pipe and joints have sufficient strength. Contact the Floodplain Management Section of the Surface Water Permits Branch at (502) 564-3410 with any question on these requirements. [KRS 151.250 & 401 KAR 4:060]
T-13	There shall be no deviations from the plans and specifications submitted with the application or the conditions specified, unless authorized in writing by the cabinet. [401 KAR 5:005 Section 24(3)(b)1]

GACT0000000057 two pumps each 313 GPM with 117-ft of TDH, 18,100 LF 0f 8-inch PVC force-main, 3,050 LF of 12-inch and 2,950 LF of 8-inch PVC SLE:

Narrative Requirements:

Condition No.	Condition
T-14	The issuance of a permit by the cabinet does not convey any property rights of any kind or any exclusive privilege. [401 KAR 5:005 Section 24(5)]
T-15	The permit is issued to the applicant, and the permittee shall remain the responsible party for compliance with all applicable statutes and administrative regulations until a notarized applicable change in ownership certification is submitted and the transfer of ownership is acknowledged by the cabinet. [401 KAR 5:005 Section 28(1)]
T-16	A permit to construct a facility shall be effective and valid for twenty-four (24) months upon issuance unless otherwise conditioned. If construction has not commenced within twenty-four (24) months following a permit's issuance, a new permit shall be obtained before construction may begin. [401 KAR 5:005 Section 24(1)]
T-17	Authority to construct these sewers is hereby granted. This approval is issued under the provisions of KRS Chapter 224.10-100 (19) regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any permits or licenses required by this cabinet and other state, federal, and local agencies. [401 KAR 5:005 Section 24(3)(c)2]
T-18	The plans and specifications submitted for the project are approved by the Department of Environmental Protection as to sanitary features, subject to the requirements contained within the permit. [401 KAR 5:005 Section 24(3)]

PORT0000000159 (Alvaton Area Sewer Extension)5,450 LF of 12-inch and 3,050 LF of 8-inch PVC SLE:

Narrative Requirements:

Condition No.	Condition
T-1	A drop pipe shall be provided where the sewer enters the manhole at two (2) feet or more above the manhole invert. [Ten States (WW) 34.2]
T-2	The entrance of groundwater into or loss of waste from a new gravity sewer line shall be limited to two-hundred (200) gpd per inch of diameter per mile of the gravity sewer line. This limitation includes manholes, gravity sewer lines, and appurtenances. [401 KAR 5:005 Section 8(5)]
T-3	The integrity of a new gravity sewer line shall be verified by either the infiltration-exfiltration or low pressure air testing method, and a deflection test shall be performed, if using flexible pipe. The deflection test shall be performed after the final backfill has been in place for at least thirty (30) days with no pipe exceeding a deflection of five (5) percent. Additionally, each new manhole shall be tested for water tightness. [401 KAR 5:005 Section 8(6)(a)]

PORT0000000160 (Alvaton Area Sewer Extension)two pumps each 313 GPM with 117-ft of TDH and 18,100 LF 0f 8-inch PVC force-main:

Narrative Requirements:

Condition No.	Condition
T-1	Pumps and force mains handling raw wastewater shall be capable of passing spheres of at least three (3) inches in diameter. Pump suction and discharge openings, as well as sewer force main pipe, shall be a minimum of four (4) inches in diameter. The above requirements do not apply to grinder pump stations or force mains directly connected to grinder pump stations. [Ten States (WW) 42.33, 49.1]
T-2	Adequate thrust blocks shall be provided at all significant bends in any proposed sewer force main, in order to prevent movement of the main. [Ten States (WW) 49.4]
T-3	Each high point in the sewer force main shall have an automatic air release valve. [401 KAR 5:005 Section 8(19)]
T-4	The integrity of any proposed force main shall be verified by leakage tests. The specifications shall include testing methods and leakage limits. [401 KAR 5:005 Section 8(6)(b)]

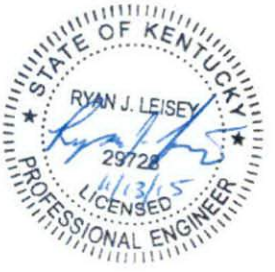
WARREN COUNTY WATER DISTRICT
WARREN COUNTY, KENTUCKY

SPECIFICATIONS AND
CONTRACT DOCUMENTS

ALVATON AREA SEWER PROJECT

Warren County
Water District

November 13, 2015



Prepared by
Engineering Staff
Warren County Water District

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ADVERTISEMENT FOR BIDS

Separate sealed BIDS for the construction of Alvaton Area Sewer Project (construction of approx. 8,000' of gravity sewer, 18,000' of force main, lift station, and appurtenances) will be received by Warren County Water District at the office of the General Manager at 523 U.S. Hwy 31-W Bypass, Bowling Green, Kentucky 42101 until 2:00 PM, Central Standard Time, December 16, 2015, and then at said office publicly opened and read aloud.

The CONTRACT DOCUMENTS may be examined at the office of Warren County Water District, 523 U.S. Hwy 31-W Bypass, Bowling Green, KY and McGraw Hill Construction Dodge at www.construction.com/projectcenter. Copies of the CONTRACT DOCUMENTS may be obtained at the office of the General Manager located at 523 U.S. Hwy 31-W Bypass, Bowling Green, KY 42101, beginning on Tuesday, November 17th upon payment of $100.00 for each set.

November 13, 2015

John M. Dix, General Manager

INFORMATION FOR BIDDERS

General

BIDS will be received by Warren County Water District (hereinafter called the "OWNER") at the Office of the General Manager at 523 US 31W By Pass, Bowling Green, KY 42101 until 2:00 PM, CST, December 16, 2015, and then at said office publicly opened and read aloud.

The ENGINEER is Ryan J. Leisey, P.E. The ENGINEER'S address is Warren County Water District, 523 US 31W Bypass, Bowling Green, KY 42101, Phone 270-842-0052 ext. 512.

Requirements for BID

Each BID must be submitted in a sealed envelope, addressed to John M. Dix, General Manager, Warren County Water District at 523 US 31W By Pass, Bowling Green, KY 42101. Each sealed envelope containing a BID must be plainly marked on the outside as BID for "Alvaton Area Sewer Project " and the envelope should bear on the outside the BIDDER'S name, address, and license number, if applicable, and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at Warren County Water District, PO Box 10180, Bowling Green, KY 42102-4780.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

Each BID must be accompanied by a BID BOND payable to the OWNER for five percent of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible BIDDERS. When the Agreement is executed the BONDS of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the PAYMENT BOND and PERFORMANCE BOND have been executed and approved, after which it will be returned. A certified check may be used in lieu of a BID BOND.

Each BID must be accompanied by the Compliance Statement regarding State and Federal Standards Provisions. The Compliance Statement shall be signed by the BIDDER indicating full compliance with the standard provisions.

Any BIDDER claiming Resident BIDDER status shall submit along with its BID the attached Affidavit for BIDDERS Claiming Resident BIDDER Status. The OWNER reserves the right to request documentation supporting a BIDDER'S claim of Resident BIDDER status. Failure to provide such documentation upon request shall result in disqualification of the BIDDER or Contract termination. A nonresident BIDDER shall submit, along with its BID, its certificate of authority to transact business in the Commonwealth as filed with the Commonwealth of Kentucky, Secretary of State. The location of the principal office

indentified therein shall be deemed the state of residency for that BIDDER. If the BIDDER is not required by law to obtain said certificate, the state of residency for that BIDDER shall be deemed to be that which is identified in its mailing address as provided in its BID.

Stipulations for BID

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the Drawings and Specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to its BID.

The OWNER reserves the right to delete any bid item or in the case of unit price items, the OWNER may delete, reduce or increase the quantities involved. BIDDERS shall be aware of this possibility and shall base their BIDS accordingly.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve the CONTRACTOR from fulfilling any of the conditions of the Contract.

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned and rights of way acquired or to be acquired.

A conditional or qualified BID will not be accepted.

Requirements for Award

A PERFORMANCE BOND and a PAYMENT BOND each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER will be required for the faithful performance of the Contract.

Attorneys-in-fact who sign BID BONDS or PAYMENT BONDS and PERFORMANCE BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

The party to whom the CONTRACT is awarded will be required to execute the AGREEMENT and obtain the PERFORMANCE BOND and PAYMENT BOND within ten (10) calendar days from the date when the NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary AGREEMENT and BOND forms. In case of failure of the BIDDER to execute the AGREEMENT, the

OWNER may consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER, within ten (10) days of receipt of acceptable PERFORMANCE BOND, PAYMENT BOND and AGREEMENT signed by the party to whom the AGREEMENT was awarded, shall sign the AGREEMENT and return to such party an executed duplicate of the AGREEMENT. Should the OWNER not execute the AGREEMENT within such period, the BIDDER may, by WRITTEN NOTICE, withdraw the signed AGREEMENT. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued upon execution of the AGREEMENT by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER AND CONTRACTOR. If the NOTICE TO PROCEED is not issued as stated above or within a period mutually agreed upon, the CONTRACTOR may terminate the AGREEMENT without further liability on the part of either party.

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when required to do so by the OWNER. Also see requirements contained in the SUPPLEMENTAL GENERAL CONDITIONS regarding "Subcontractors, Suppliers and Others."

Basis for Award

BIDS that are not arithmetically correct shall be evaluated as follows: Discrepancies in the multiplication of quantities of work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within **75 days** after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the OWNER and the BIDDER.

The OWNER may make such investigations as deemed necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. **Poor performance on any prior Contracts between the BIDDER and OWNER (including work as a Sub-Contractor) shall be considered when determining the ability of the BIDDER to perform the WORK**. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the AGREEMENT and to complete the WORK contemplated therein.

Award will be made in accordance with KRS 45A.494.

Award will be made to the lowest responsible BIDDER. Responsible BIDDERS are companies that have the capabilities in all respects to perform fully the Contract requirements, and the integrity and reliability which will assure good faith performance. For the purpose of this project the OWNER will determine responsibility of bidders based on such investigations as deemed necessary to satisfy the OWNER that the BIDDER is properly qualified. A responsible BIDDER shall be a company that has successfully completed projects comprised mainly of the same or similar type construction in size and scope as the subject project. The BIDDER'S past experience shall include projects with a final Contract amount similar to this project.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the Contract throughout.

The BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the SUPPLEMENTAL GENERAL CONDITIONS.

BID

Proposal of _____ (hereinafter called "BIDDER") organized and existing under the laws of the State of _____ doing business as _____* to Warren County Water District, 523 US 31W By Pass, Bowling Green, Kentucky 42101 (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for Alvaton Area Sewer Project in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to its own organization, that this BID has been arrived at independently, without consultation, communication or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this Contract on or before a date to be specified in the NOTICE TO PROCEED. The BIDDER further agrees fully complete the PROJECT within two hundred seventy (270) consecutive calendar days after the date specified in the NOTICE TO PROCEED. The BIDDER further agrees to pay as liquidated damages, the sum of $400 for each consecutive calendar day thereafter as provided in Section 15 of the General Conditions.

*Insert "a corporation", "a partnership", or "an individual" as applicable.

BIDDER acknowledges receipt of the following ADDENDUM:

_____

_____

_____

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices or lump sum:

NOTE: BIDS shall include sales tax and all other applicable taxes and fees.

BASE BID SCHEDULE

NO.	ITEM	UNIT	UNIT PRICE	AMOUNT	TOTAL PRICE
1	18" Stl. Casing by Bore w/12" SDR 35 Grav. Swr.	LF	_____	122	_____
2	12" Stl. Casing by Bore w/8" SDR 35 Grav. Swr.	LF	_____	395	_____
3	12" Stl. Casing by Bore w/8" SDR 17 HDPE	LF	_____	566	_____
4	12" Stl. Casing by Bore w/8" Class 160 PVC	LF	_____	48	_____
5	8" Class 160 PVC	LF	_____	16,781	_____
6	8" SDR 17 HDPE by Open Cut	LF	_____	154	_____
7	8" Class 160 PVC by Uncased Bore	LF	_____	91	_____
8	12" DIP Gravity Sewer	LF	_____	61	_____
9	12" SDR 35 Gravity Sewer (0-6' Depth)	LF	_____	269	_____
10	12" SDR 35 Gravity Sewer (6-8' Depth)	LF	_____	1,176	_____
11	12" SDR 35 Gravity Sewer (8-10' Depth)	LF	_____	1,381	_____
12	12" SDR 35 Gravity Sewer (10-12' Depth)	LF	_____	523	_____
13	12" SDR 35 Gravity Sewer (12-14' Depth)	LF	_____	402	_____
14	12" SDR 35 Gravity Sewer (14-16' Depth)	LF	_____	304	_____
15	12" SDR 35 Gravity Sewer (16-18' Depth)	LF	_____	384	_____
16	8" SDR 35 Gravity Sewer (0-6' Depth)	LF	_____	695	_____
17	8" SDR 35 Gravity Sewer (6-8' Depth)	LF	_____	336	_____
18	8" SDR 35 Gravity Sewer (8-10' Depth)	LF	_____	273	_____
19	8" SDR 35 Gravity Sewer (10-12' Depth)	LF	_____	510	_____
20	8" SDR 35 Gravity Sewer (12-14' Depth)	LF	_____	884	_____
21	8" SDR 35 Gravity Sewer (14-16' Depth)	LF	_____	388	_____

BASE BID SCHEDULE (CONTINUED)

NO.	ITEM	UNIT	UNIT PRICE	AMOUNT	TOTAL PRICE
22	8" SDR 35 Gravity Sewer (16-18' Depth)	LF	_____	475	_____
23	8" SDR 35 Gravity Sewer (18-20' Depth)	LF	_____	215	_____
24	8" SDR 26 Gravity Sewer (20-22' Depth)	LF	_____	65	_____
25	Air Release Valve Station – Force Main	EA	_____	9	_____
26	Flushing Station – Force Main	EA	_____	3	_____
27	8" Gate Valve – Force Main	EA	_____	9	_____
28	Alvaton Lift Station	LS	_____	1	_____
29	Drakes Creek Directional Bore – 8" SDR 11	LS	_____	1	_____
30	Phil Moore Park Lift Station Upgrade & Yard Piping	LS	_____	1	_____
31	3" Class 160 PVC	LF	_____	1,050	_____
32	3" Gate Valve, 3" Check Valve, Box, Tie-In	LS	_____	1	_____
33	Standard 4' Dia. Manhole	EA	_____	29	_____
34	Manhole Barrel Extension	VF	_____	162	_____
35	Ductile Iron Fittings (Epoxy Coated)	LB	_____	3,700	_____
36	Silt Fence	LF	_____	2,500	_____
37	Asphaltic Concrete Pavement	TN	_____	55	_____
38	Crushed Stone	TN	_____	8000	_____
39	Concrete	CY	_____	30	_____
40	Rip Rap Check Dam	TN	_____	50	_____
41	8"x6" Service Wye & Plug	EA	_____	6	_____
42	12"x6" Service Wye & Plug	EA	_____	6	_____

43	6" Sewer Lateral	LF	_____	150	_____
44	SWPPP Inspection & Reporting	LS	_____	1	_____
45	Final Cleanup	LF	$0.50	25,276	$12,638.00
	TOTAL BASE BID				
A1	Total Additional Cost to Increase Drakes Creek crossing to **10" SDR 11**	LS	_____	1	_____
	TOTAL BASE BID with Alternates				

Respectfully submitted:

_____ Signature	_____ Address
_____ Title	_____ City, State, Zip
_____ Date	_____ Phone Number
_____ License No. (If Applicable)	_____ Facsimile Number

SEAL - (if BID is by a corporation)

ATTEST: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____, as Principal, and _____ as Surety, are hereby held and firmly bound unto Warren County Water District as OWNER in the penal sum of **_____for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 20_____. The Condition of the above obligation is such that whereas the Principal has submitted to Warren County Water District a certain BID, attached hereto and hereby made a part hereof to enter into a Contract in writing, for Alvaton Area Sewer Project.

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a Contract in the Form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said Contract, and for the payment of all persons performing labor furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

** Required Bid Bond is 5 percent of Base Bid amount.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____(L.S.)
Principal

_____
Surety

BY:_____

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

COMPLIANCE STATEMENT REGARDING STATE AND FEDERAL STANDARDS PROVISIONS

1. Equal Employment Opportunity

During the performance of this Contract, the CONTRACTOR agrees as follows:

A. The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, creed, sex, color or national origin. The CONTRACTOR will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, sex, color or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the County setting forth the provisions of this non-discrimination clause.

B. The CONTRACTOR will, in all solicitation or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, or national origin.

C. The CONTRACTOR will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Contract so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to contracts or subcontracts for standard commercial supplies or raw materials.

D. The CONTRACTOR will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.

E. The CONTRACTOR will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the County's Department of Housing and Community Development and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

F. In the event of the CONTRACTOR's noncompliance with the noncompliance clauses of this Agreement or with any of such rules, regulations or orders, this Agreement may be canceled, terminated, or suspended in whole or in

part and the CONTRACTOR may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

G. The CONTRACTOR will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The CONTRACTOR will take such action with respect to any subcontract or purchase order as the County's Department of Housing and Community Development may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that in the event the CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the County's Department of Housing and Community Development, the CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States.

2. <u>"Section 3" Compliance in the Provision of Training, Employment, and Business Opportunities</u>

A. The work to be performed under this Contract is on a project assisted under a program providing direct Federal financial assistance from the Division of Abandoned Mine Lands and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 USC 1701u. Section 3 requires that to the greatest extent feasible opportunities for training and employment be given lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the area of the project.

B. The parties to this Contract will comply with the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary of Housing and Urban Development set forth in 24 CFR Part 135, and all applicable rules and orders of the Department issued thereunder prior to the execution of this Contract. The parties to this Contract certify and agree that they are under no contractual or other disability which would prevent them from complying with these requirements.

C. The CONTRACTOR will send to each labor organization or representative of workers with which she/he has a collective bargaining agreement or other Contract or understanding, if any, a notice advising the said labor organization or workers' representative of his/her commitments under this

Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment or training.

D. The CONTRACTOR will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations issued by the Secretary of Housing and Urban Development, 24 CFR Part 135. The CONTRACTOR will not subcontract with any subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR Part 135 and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.

E. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR Part 135, and all applicable rules and orders of the Department issued hereunder prior to the execution of the Contract, shall be a condition of the Federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successor and assigns to those sanctions specified by the grant or loan agreement or contract through which federal assistance is provided, and to such sanctions as are specified by 24 CFR Part 135.

3. Access to Records

The grantee, the Federal Grantor Agency, the Comptroller General of the United States, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the CONTRACTOR which are directly pertinent to this specific Contract, for the purpose of making audit, examination, excerpts, and transcriptions. The CONTRACTOR shall maintain all required records for three years after the Agency makes final payments and all other pending matters are closed.

4. Civil Rights Act of 1964

Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

5. Section 109 of the Housing and Community Development Act of 1974

No person in the United States shall on the grounds of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to

discrimination under any program or activity funded in whole or in part with funds made available under this title.

6. Interest of Members of a County

No member of the governing body of the County and no other office, employee, or agent of the County who exercises any functions or responsibilities in connection with the planning and carrying out of the program, shall have any personal financial interest, direct or indirect, in this Contract; and the CONTRACTOR shall take appropriate steps to assure compliance.

7. Interest of Other Local Public Officials

No member of the governing body of the locality and no other public official of such locality, who exercises any functions or responsibilities in connection with the planning and carrying out of the program, shall have any personal financial interest, direct or indirect, in this Contract; and the CONTRACTOR shall take appropriate steps to assure compliance.

8. Interest of CONTRACTOR and Employees

The CONTRACTOR covenants that he presently has no interest and shall not acquire interest, direct or indirect, in the study area or any parcels therein or any other interest which would conflict in any manner or degree with the performance of his services hereunder. The CONTRACTOR further covenants that in the performance of this Contract, no person having any such interest shall be employed.

_____

Name and Title of Signer (Print or Type)

_____

Signature Date

AFFIDAVIT FOR BIDDERS CLAIMING RESIDENT BIDDER STATUS

The BIDDER hereby swears and affirms under penalty of perjury that, in accordance with KRS 45A.494(2), the BIDDER is an individual, partnership, association, corporation, or other business entity that, on the date the Contract was first advertised as available for bidding:

1. Is authorized to transact business in the Commonwealth.
2. Has for one year prior to and through the date of Advertisement:
   - 2.1 Filed Kentucky corporate income taxes.
   - 2.2 Made payments to the Kentucky unemployment insurance fund established in KRS 341.49.
   - 2.3 Maintained a Kentucky workers' compensation policy.

The OWNER reserves the right to request documentation supporting a BIDDER'S claim of Resident BIDDER status. Failure to provide such documentation upon request shall result in disqualification of the BIDDER or Contract termination.

_____ _____
Signature Printed Name

_____ _____
Title Date

Company Name _____

Address _____

_____

_____

Subscribed and sworn to before me by _____ _____
(Affiant) (Title)

of _____ this _____day of _____, 20___.
(Company Name)

_____
Notary Public

My commission expires: _____

GENERAL CONDITIONS

1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 ADDENDA—Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications or corrections.

1.3 BID—The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 BIDDER—Any person, firm or corporation submitting a BID for the WORK.

1.5 BONDS—Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.

1.6 CHANGE ORDER—A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.7 CONTRACT DOCUMENTS—The contract, including Advertisement For Bids. Information For Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

1.8 CONTRACT PRICE—The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.9 CONTRACT TIME—The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.10 CONTRACTOR—The person, firm or corporation with whom the OWNER has executed the Agreement.

1.11 DRAWINGS—The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.12 ENGINEER—The person, firm or corporation named as such in the CONTRACT DOCUMENTS.

1.13 FIELD ORDER—A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.14 NOTICE OF AWARD—The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.15 NOTICE TO PROCEED—Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.

1.16 OWNER—A public or quasi-public body or authority, corporation, association, partnership. or individual for whom the WORK is to be performed.

1.17 PROJECT—The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.18 RESIDENT PROJECT REPRESENTATIVE—The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.19 SHOP DRAWINGS—All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.20 SPECIFICATIONS—A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.21 SUBCONTRACTOR—An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.22 SUBSTANTIAL COMPLETION—That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS — Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.

1.24 SUPPLIER—Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.25 WORK—All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.26 WRITTEN NOTICE—Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to the first partial payment estimate, the CONTRACTOR shall submit construction progress schedules showing the order in which he proposes to carry on the WORK, including dates at which he will start the various parts of the WORK, estimated date of completion of each part, and as applicable:

3.2.1. The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR's risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of

any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

7.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Inspections, tests or approvals by the engineer or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data

and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

7.7 If any WORK is covered contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection, and testing; and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS

Whenever a material, article or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. PATENTS

The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or permanent changes in

existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13. CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY AND PERSONS

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when protection of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER. shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR's representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30)

days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

(a) Unit prices previously approved.

(b) An agreed lump sum.

(c) The actual cost for labor, direct overhead, materials, supplies, equipment and other services necessary to complete the work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To any preference, priority or allocation order duly issued by the OWNER.

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather, and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR's expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered arid generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the Contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK. CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within thirty (30) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS.

19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTORS unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may he specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

21. INSURANCE

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person us a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than $500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than $500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $200,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.4 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the work is performed. Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any work is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees, unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

21.5 The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the

CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal BONDS. CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorneys fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be

given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefore as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.

26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(S), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

26.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

26.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER's representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects, The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

30. ARBITRATION

30.1 All claims, disputes and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

30.2 Notice of the demand for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and with the American Arbitration Association, and a copy shall be filed with the ENGINEER. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

The CONTRACTOR will pay all sales, consumer, use and other similar taxes required by the law of the place where the WORK is performed.

SUPPLEMENTAL GENERAL CONDITIONS

The provisions of the Supplemental General Conditions as described herein change, amend, or supplement the General Conditions. Provisions of the General Conditions which are not changed, amended, or supplemented, remain in full force.

1. Contract Approval

Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

2. Contract Change Orders

2.1 All changes affecting the project's construction cost or modifications of the terms or conditions of the contract must be authorized by means of a written Contract change order which is mutually agreed to by the OWNER and the CONTRACTOR. The Contract change order will include extra work, work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units which are different than those shown in the bidding schedule because of final measurements. All changes must be recorded on a Contract change order before they can be included in a partial payment estimate.

2.2 When the CONTRACT sum is, in whole or in part, based on unit prices, the OWNER reserves the right to increase or decrease a unit price quantity as may be deemed reasonable or necessary in order to complete the work contemplated by this CONTRACT.

3. Partial Payment Estimates

3.1 Forms supplied by the ENGINEER shall be used when estimating periodic payments due the CONTRACTOR.

3.2 The OWNER may, after consultation with the ARCHITECT/ENGINEER, withhold or on account of subsequently discovered evidence, nullify the whole or part of any approved partial payment estimate to such extent as may be necessary to protect the OWNER from loss on account of:

3.2.1. Defective work not remedied.

3.2.2. Claims failed.

3.2.3. Failure of CONTRACTOR to make payments properly to subcontractors or suppliers.

3.2.4. A reasonable doubt that the WORK can be completed for the balance then unpaid.

3.2.5. Damage to another CONTRACTOR.

3.2.6. Performance of WORK in violation of the terms of the CONTRACT DOCUMENTS.

3.3 Where WORK on unit price items is substantially complete but lacks testing clean-up and/or corrections, amounts shall be deducted from unit prices in partial payment estimates to amply cover such testing, clean-up and/or corrections.

3.4 When the items in 3.2 and 3.3 are cured, payment shall be made for amounts withheld because of them.

3.5 Payments will not be made that would deplete the retainage nor replace in escrow any funds that are required for retainage nor invest the retainage for the benefit of the CONTRACTOR.

4. Conflict of Interest

4.1 Unacceptable bids. An ENGINEER or ARCHITECT (individual or firm including persons they employ) who has prepared plans and specifications will not be considered an acceptable bidder. Any firm or corporation in which such ENGINEER or ARCHITECT (including persons they employ) who has prepared plans and specifications will not be considered an acceptable bidder. An firm or corporation in which such an officer, employee, or holds or controls a substantial interest will not be considered an acceptable bidder. Contracts or purchases by the CONTRACTOR shall not be awarded or made to a supplier or manufacturer if the ENGINEER or ARCHITECT (firm or individual) who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer. Bids will not be awarded to firms or corporations which are owned or controlled wholly or in part by a member of the governing body of the OWNER or to an individual who is such a member.

4.2 The OWNER's officers, employees, or agents shall not engage in the award of administration of this CONTRACT if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (a) the employee, officer or agent; (b) any member of their immediate family; (c) their partner or (d) an organization which employs, or is about to employ, any of the above has financial or interest in the CONTRACTOR. The OWNER's officers, employees or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from the CONTRACTOR. The OWNER's officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from the CONTRACTOR or subcontractor.

5. Protection of Lives and Property

5.1 In order to protect the lives and health of its employees under the CONTRACT, the CONTRACTOR shall comply with all pertinent provisions of the Occupational Safety and Health Administration (OSHA) and any State Safety and Health agency requirement.

5.2 The CONTRACTOR alone shall be responsible for the safety, efficiency, and adequacy of its plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

6. Remedies

6.1 Unless otherwise provided in this CONTRACT, all claims, counterclaims, disputes, and other matters in question between the OWNER and the CONTRACTOR arising out of or relating to this CONTRACT or the breach thereof will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the OWNER is located.

6.2 The arbitration provisions of this section may be initiated by either party to this CONTRACT by filing with the other party and the ENGINEER/ARCHITECT a WRITTEN REQUEST for arbitration.

6.3 Each party to this CONTRACT will appoint one arbitrator; the two arbitrators will select a third arbitrator.

6.4 The arbitrators will select a hearing location as close to the OWNER's locale as possible.

6.5 The procedure for conducting the hearings will follow the Construction Industry Arbitration Rules of the American Arbitration Association.

7. Gratuities

7.1 If the OWNER finds after a notice and hearing that the CONTRACTOR, or any of the CONTRACTOR's agents or representatives, offered or give gratuities (in the form of entertainment, gifts, or otherwise), to any official, employee, or agent of the OWNER or State officials in attempt to secure this CONTRACT or favorable treatment in awarding, or making any determinations related to the performance of this CONTRACT, the OWNER may, by written notice to the CONTRACTOR, terminate this CONTRACT. The OWNER may also pursue other rights and remedies that the law or this CONTRACT provides. However, the existence of the facts on which the OWNER bases such findings shall be an issue and may be reviewed in proceeding sunder the Remedies clause of this CONTRACT.

7.2 In the event this CONTRACT is terminated as provided in paragraph 7.1 the OWNER may pursue the same remedies against the CONTRACTOR as it could pursue in the event of a breach of the CONTRACT by the CONTRACTOR. As a

penalty, in addition to any other damages to which it may be entitles by law, the OWNER may pursue exemplary damages in an amount (as determined by the OWNER) which shall be not less than three nor more than ten times the costs the CONTRACTOR incurs in providing any such gratuities to any such officer or employee.

8. Audit and Access to Records

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

9. Small, Minority and Women Businesses

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

10. Anti-kickback

The CONTRACTOR shall comply with the Copeland Anti-Kickback Act (18 USC 874) as supplemented in Department of Labor regulations (29 CFR, Part 3). This act provides that each CONTRACTOR shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which whey are otherwise entitled. The OWNER shall report all suspected or reported violations.

11. Violating Facilities

Where this CONTRACT exceeds $100,000 the CONTRACTOR shall comply with all applicable standards, orders, or requirements issued under section 306 of the

Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations 40 CFR Part 15 which prohibits the awarding of non-exempt federal contracts, grants, or loans to facilities included on EPA's list of violating facilities. The CONTRACTOR will report violations to the OWNER.

12. State Energy Policy

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

13. Equal Opportunity Requirements

13.1 For all Contracts in excess of $10,000 the CONTRACTOR shall comply with Executive Order 11246, entitled "Equal Employment Opportunity," as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60).

13.2 The CONTRACTOR will execute the "Compliance Statement Regarding State and Federal Standards Provisions."

13.3 The CONTRACTOR's compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmation action obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical are where the CONTRACT is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the CONTRACT, and in each trade, and the CONTRACTOR shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the CONTRACTOR's goals shall be a violation of the CONTRACT, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

13.4 The CONTRACTOR shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the CONTRACT resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the CONTRACT is to be performed.

14. Substitutions

14.1 Requirements regarding "Substitutions" as described in paragraph 8 of the General Conditions shall be modified by adding the following:

14.2 Information on any requests for substitutions shall be submitted to the ENGINEER and must be approved in writing by the ENGINEER prior to the bid date. Substitutions not so approved will not be allowed.

15. Deductions from Estimates

With reference to Paragraph 3 of these Supplemental General Conditions, when computing the total estimate to date, 20 percent shall be deducted from unit prices on pipe when pressure testing, bacteriological testing, and rough cleanup work is not completed and 10 percent shall be deducted when only rough cleanup work is lacking. The ENGINEER may not require these deductions if the work is progressing in an organized, systematic, and expeditious manner.

16. Additional Insurance Requirements and Summary

16.1 In addition to the coverages listed in Paragraph 21 "Insurance," the CONTRACTOR shall also secure Explosion, Collapse, and Underground (XCU) coverage in the amounts listed herein for other liability coverages. The CONTRACTOR shall also obtain Products and Completed Operations Insurance for the term of the contract and warranty periods. CONTRACTOR=s vehicle coverage in the amount specified herein for other liability coverages shall include "any auto" used on the project.

16.2 The CONTRACTOR=s liability insurance shall be a total coverage in an amount such that the sum of the underlying coverage and the umbrella coverage shall total $2,000,000 each occurrence and $2,000,000 aggregate. A summary of insurance coverages and minimum amounts required is presented below (also see General Conditions, Paragraph 21 for further details of coverage requirements):

General public liability:	
Bodily injury	$500,000
Property Damage	$200,000
Personal Injury	$500,000
Vehicle, "Any Auto"	$500,000 / $200,000
Explosion, Collapse & Underground	$500,000 / $200,000
Products and Completed Operations	Total Contract Amt.
"All Risks" Builders' Risk Insurance	Total Contract Amt.
Excess Liability Umbrella Coverage	Amt required for sum of general liability and umbrella to equal minimum of $2,000,000
Workmen's Compensation	As req'd by Kentucky statutes

16.3 The CONTRACTOR=s Certificate of Insurance acceptable to the OWNER shall be delivered to the OWNER with the executed Agreement, Performance Bond and Payment Bond according to the timetable described on Page 2 of the Information for Bidders. The OWNER shall not be required to execute the Contract and proceed with the project until an acceptable insurance certificate is delivered to the OWNER. If the Certificate of Insurance as specified is not delivered to the OWNER within 10 calendar days from the date when the Notice of Award if delivered to the Bidder, the OWNER may consider the Bidder in default, in which case the Bid Bond shall become the property of the OWNER.

16.4 The Certificate of Insurance shall include positive statements regarding Explosion, Collapse, and Underground Coverage and Products and Completed Operations coverage as specified above and all other coverages required in the General Conditions and Supplemental General Conditions. If any insurance coverage expires during the term of the Contract or warranty period the CONTRACTOR shall deliver to the OWNER a new Certificate of Insurance as specified prior to the expiration date of the former policy. The cancellation clause on the Certificate of Insurance shall be worded as shown on the sample certificate on the next page and the OWNER shall be listed as an "Additional Named Insured."

16.5 The insurance shall cover all OWNER-furnished materials and equipment stored at the Site or at another location prior to being incorporated in the Work and accepted by OWNER.

17. Bid Bonds

17.1 A certified check or cash in the amount of 5 percent of the total bid may be used in lieu of a bond from a surety company; however, an "Official" check is not an acceptable substitute. Throughout these Contract Documents, the term BID BOND shall be defined so as to include the certified check or cash, where such security is used in lieu of a bond from a surety company.

17.2 If the BIDDER fails to execute and deliver the Agreement, Performance Bond, Payment Bond, and Certificate of Insurance acceptable to the OWNER within 10 days from the date when the NOTICE OF AWARD is delivered to the BIDDER, the OWNER may consider the BIDDER in default. In this case the BID BOND accompanying the proposal shall become the property of the OWNER.

18. Execution of Performance and Payment Bonds

The Attorney-in-Fact that executes Performance and Payment Bonds for the Surety must be a resident of the Commonwealth of Kentucky. Otherwise, the bonds must be co-signed by an agent with residence in Kentucky who has Power of Attorney from the Surety.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): MM/DD/20YY

PRODUCER

Insurance Agent/Broker Name
Insurance Agent/Broker Street Address or P.O. Box
Insurance Agent/Broker City, State & Zip Code
Contact & Phone Number

INSURED

Contractor Name
Contractor Street Address or P.O. Box
Contractor City, State & Zip Code

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE		NAIC #
INSURER A:	Name of Insurance Company	NAIC#
INSURER B:	Name of Insurance Company (if applicable)	NAIC#
INSURER C:	Name of Insurance Company (if applicable)	NAIC#
INSURER D:	Name of Insurance Company (if applicable)	NAIC#
INSURER E:	Name of Insurance Company (if applicable)	NAIC#

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	☒	GENERAL LIABILITY ☒ COMMERICAL GENERAL LIABILITY ☐ CLAIMS MADE ☒ OCCUR ☒ INCLUDES XCU COVERAGE ☐ ____ GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PROJECT ☐ LOC	Policy #	Effective Date	Expiration Date	EACH OCCURENCE	$1,000,000
						DAMAGE TO RENTED PREMISES (Ea occurrence)	$100,000
						MED EXP (Any one person)	$5,000
						PERSONAL & ADV INJURY	$500,000
						GENERAL AGGREGATE	$2,000,000
						PRODUCTS - COMP/OP AGG	$1,000,000
							$
A	☒	AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ☐ NON-OWNED AUTOS ☐ ____ ☐ ____	Policy #	Effective Date	Expiration Date	COMBINED SINGLE LIMIT (Each Occurrence)	$500,000
						BODILY INJURY (Per person)	$
						BODILY INJURY (Per accident)	$
						PROPERTY DAMAGE (Per accident)	$
A	☐	GARAGE LIABILITY ☐ ANY AUTO ☐ ____				AUTO ONLY - EA ACCIDENT	$
						OTHER THAN AUTO ONLY: EA ACC	$
						AGG	$
A	☒	EXCESS/UMBRELLA LIABILITY ☒ OCCUR ☐ CLAIMS MADE ☐ DEDUCTIBLE ☐ RETENTION $____	Policy #	Effective Date	Expiration Date	EACH OCCURRENCE	$1,000,000
						AGGREGATE	$1,000,000
							$
							$
							$
A	☒	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below	Policy #	Effective Date	Expiration Date	☒ WC STATUTORY LIMITS ☐ OTHER	
						E.L. EACH ACCIDENT	$500,000
						E.L. DISEASE - EA EMPLOYEE	$500,000
						E.L. DISEASE - POLICY LIMIT	$500,000
	☒	OTHER "ALL RISKS" BUILDER RISK OR INSTALLATION FLOATER, AS APPLICABLE	Policy #	Effective Date	Expiration Date		MINIMUM OF CONTRACT AMOUNT

"EXAMPLE"

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

"PROJECT NAME"

Certificate holder is also additional insured.

CERTIFICATE HOLDER

Owners Name
P. O. Box 10180
Bowling Green, KY 42102

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE INSURER AFFORDING COVERAGE WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

ACORD 25 (2001/08)

19. Guarantee

19.1 The following shall be added to Paragraph 29 of the General Conditions, "Guarantee":

19.2 When a failure of the CONTRACTOR=s work creates an emergency which threatens service to the OWNER=s customers and, in the opinion of the OWNER, the CONTRACTOR=s forces cannot be mobilized in a timely fashion, the OWNER may perform Warranty work. Work may also be performed by the OWNER under the above conditions prior to commencement of the warranty period. The CONTRACTOR shall pay the OWNER for the actual cost of all such work.

20. Subcontractors, Suppliers and Others

The CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those who are to furnish the principal items of materials and/or equipment) against whom the OWNER or ENGINEER may have reasonable objection. The CONTRACTOR shall deliver a list of all such Subcontractors, Suppliers, or other persons or organizations for acceptance by the OWNER and ENGINEER at least twenty (20) days prior to their being employed on the Project. Said list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each name listed. The CONTRACTOR shall supply any additional information regarding those named on said list that may be requested by the OWNER or ENGINEER. Acceptance of or objection to any Subcontractor, Supplier, or other person or organization shall be forwarded to the CONTRACTOR in writing within 10 days of receipt of said list by the OWNER or ENGINEER. If there are written objections, the CONTRACTOR shall then submit substitute names for acceptance. No acceptance by the OWNER or ENGINEER of any Subcontractor, Supplier, or other person or organization shall constitute a waiver of any right of the OWNER or ENGINEER to reject defective work or to object to such party after further investigation or unacceptable performance.

21. Progress Payment Subcontractors and Suppliers Release of Liens

21.1 With each partial payment estimate the CONTRACTOR shall submit to the ENGINEER a "Progress Payment Subcontractors and Suppliers Release of Lien" on the forms provided by the ENGINEER. The purpose of the releases of lien is to indicate to the OWNER that the CONTRACTOR has paid for all subcontracted work, equipment rental, supplies and/or materials (either stored or installed) that were included on the previous partial payment estimate. A separate release form shall be executed by an authorized representative of each subcontractor or supplier that had items included for payment on the previous estimate.

21.2 If the CONTRACTOR fails to provide clear release(s) of lien, the OWNER may proceed with either of the alternatives set forth in the General Conditions, Section 19.6.

22. Termination of Contractor's Services

In regards to Paragraph 18.2 of the General Conditions, the OWNER may terminate the services of the CONTRACTOR, take possession of the project, and finish the work by whatever method the OWNER may deem expedient. The reasons for such action by the OWNER are listed in the first sentence of said Paragraph 18.2 and each reason separated by the conjunction "or" shall be considered independent of the others, therefore it is not necessary for one of the reasons listed to occur in combination with any other reason listed for the OWNER to rightfully take such action.

23. Independent Contractor

Throughout the term of the contract and the specified warranty period the CONTRACTOR is and shall be considered an independent contractor and as such, is not an agent of the OWNER.

24. Required Documents for Processing Final Payment and Disbursement of Payment

When the project is completed the CONTRACTOR shall execute the following documents:

24.1 Final Estimate shall be prepared and submitted in accordance with the General Conditions, Section 19 and Supplemental General Conditions Section 3.

24.2 Prior to Disbursement of Final Payment the CONTRACTOR shall provide a "Certification of Release of Contractors Liens" as set forth on page SGC-12 of the Supplemental General Conditions and as called for in the General Conditions, Section 19.6 Payment to Contractor.

24.3 "Warranty Agreement" as set forth on Page SGC-13 of the Supplemental General Conditions and as called for in the General Conditions, Section 29 Guaranty.

24.4 "Certification of Receipt of Final Payment" as set forth on page SGC-14 of the Supplemental General Conditions shall be executed by the CONTRACTOR upon receipt of payment.

24.5 In addition to the above the CONTRACTOR shall provide for contract closeout purposes all other information, documentation, and/or certifications as may be required by any agency involved with the project including the OWNER. It shall be the CONTRACTOR's responsibility to determine from the OWNER and execute any and all such documents that may be required prior to submitting Final Estimate.

25. Wage Rates

Prevailing wage rates as issued by the Kentucky Department of Labor **are required** on this Contract.

KENTUCKY LABOR CABINET
PREVAILING WAGE DETERMINATION
CURRENT REVISION
LOCALITY NO. 032

WARREN COUNTY

Determination No. CR 2-032

Date of Determination: October 13, 2015

Project number: 114-H-00523-14-1

Type: _____ Bldg ___X____ HH

This schedule of the prevailing rate of wages for Locality No. 032, which includes Warren County, has been determined in accordance with the provisions of KRS 337.505 to 337.550. This determination shall be referred to as Prevailing Wage Determination No. CR 2-032.

Apprentices shall be permitted to work as such subject to Administrative Regulations. Copies of these regulations will be furnished upon request to any interested person.

Overtime is to be computed at not less than one and one-half (1 1/2) times the indicated BASE RATE for all hours worked in excess of eight (8) per day, or in excess of forty (40) per week. However, KRS 337.540 permits an employee and employer to agree, in writing, that the employee will be compensated at a straight time base rate for hours worked in excess of eight (8) hours in any one workday, but not more than ten (10) hours worked in any one workday, if such written agreement is prior to the over eight (8) hours in a workday actually being worked, or where provided for in a collective bargaining agreement. The fringe benefit rate is to be paid for each hour worked at a straight time rate for all hours worked. Fringe benefit amounts are applicable for all hours worked except when otherwise noted. Welders will receive rate for craft in which welding is incidental.

No laborer, workman or mechanic shall be paid at a rate less than that of the General Laborer except those classified as bona fide apprentices registered with the Kentucky State Apprenticeship Supervisor unless otherwise specified in this schedule of wage rates.

NOTE: The type of construction shall be determined by applying the following definitions.

BUILDING CONSTRUCTION
Building construction is the construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment, or supplies. It includes all construction of such structures, the installation of utilities and the installation of equipment, both above and below grade level, as well as incidental grading, utilities and paving.

HIGHWAY CONSTRUCTION
Highway construction includes the construction, alteration or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction. It includes all incidental construction in conjunction with the highway construction project.

HEAVY CONSTRUCTION
Heavy projects are those projects that are not properly classified as either "building" or "highway". For example, dredging projects, water and sewer line projects, dams, flood control projects, sewage treatment plants and facilities, and water treatment plants and facilities are considered heavy.

ANTHONY RUSSELL, COMMISSIONER
KENTUCKY LABOR CABINET

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
ASBESTOS/INSULATION WORKERS:		BASE RATE FRINGE BENEFITS	$23.55 8.66
ASBESTOS & LEAD ABATEMENT WORKERS:		BASE RATE FRINGE BENEFITS	$15.55 4.55
BOILERMAKERS:		BASE RATE FRINGE BENEFITS	$23.95 12.04
BRICKLAYERS:		BASE RATE FRINGE BENEFITS	$25.96 11.10
REFRACTORY/ACID BRICKLAYERS		BASE RATE FRINGE BENEFITS	$26.65 11.10
CARPENTERS/BUILDING:			
Carpenters:	BUILDING	BASE RATE FRINGE BENEFITS	$23.55 16.64
Piledriver	BUILDING	BASE RATE FRINGE BENEFITS	$23.80 16.64
CARPENTERS/HEAVY HIGHWAY:			
Carpenters:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$26.40 13.95
Piledrivermen:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$26.65 13.95
Divers:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$39.98 13.95
CEMENT MASONS:		BASE RATE FRINGE BENEFITS	$ 20.40 8.25
ELECTRICIANS:			
Electricians:		*BASE RATE FRINGE BENEFITS	$30.01 15.65

*When workmen are required to work from bosun chairs, trusses, stacks, tanks, scaffolds, catwalks, radio and TV towers, structural steel and bridges or similar hazardous locations where workmen are subject to a direct fall, add 25% above workman's hourly rate for work that is 50' to 75' above the surface and add 50% above workman's hourly rate for work that is over 75' above the surface. No premium shall be paid on work performed using JLGs, bucket trucks, or other similar elevated mechanized work platforms up to 75' above the surface upon which the platform sits. Structural steel is defined as open, unprotected, unfloored raw steel.

CR 2-032
October 13, 2015

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
ELECTRICIANS: HEAVY/HIGHWAY			
LINEMAN:	HEAVY HIGHWAY	BASE RATE	$30.78
		FRINGE BENEFITS	11.08
EQUIPMENT OPERATOR:	HEAVY HIGHWAY	BASE RATE	$27.52
		FRINGE BENEFITS	10.44
GROUNDSMEN:	HEAVY HIGHWAY	BASE RATE	$18.23
		FRINGE BENEFITS	8.61
ELEVATOR CONSTRUCTORS:		BASE RATE	$28.62
		FRINGE BENEFITS	7.47
FIREPROOFING:	BUILDING	BASE RATE	$19.25
		FRINGE BENEFITS	4.28
GLAZIERS:		BASE RATE	$8.50
		FRINGE BENEFITS	0.00
IRONWORKERS: (Including reinforcing and structural)		BASE RATE	$27.56
		FRINGE BENEFITS	20.57

LABORERS/BUILDING:

GROUP 1
General laborers, watchman, water boy, wrecking labor on building and structures, clearing right-of-way and building site, carpenter tender, deck hand, flagging traffic, truck spotters and dumper, axe and cross cut saw filer, concrete puddlers and form strippers, asbestos abatement laborers, toxic waste removal laborer, lead abatement laborers, and industrial deep cleaning:

BUILDING	BASE RATE	$21.30
	FRINGE BENEFITS	11.93

GROUP 2
All power driven tools, hod carriers, mason tenders, finishing tenders, mortar mixers, jack hammer, vibrators, soil compactors, wagon drill, core drill, test drill, well drill, concrete pump machine, tunnel boring machine, men in tunnel and crib ditch work, signal man, riprap rock setters and handlers, asphalt rakers, tampers and smoothers, pipe layers, grout pump man, chain saw, pipe clearing, doping and wrapping, swampers and straight cable hooking, cement guns, grade checkers machine excavating, tool room checkers, batch plant scale man, sand hog free air, sand hog compressed air, cutting torch man on salvage work, road form setters,

CLASSIFICATIONS RATE AND FRINGE BENEFITS

LABORERS/BUILDING (CONTINUED):

GROUP 2 CONTINUED:
brick slingers, hand spikers, power buggy, handling of creosote material, sandblasters, curing of concrete and apply hardner, air and gas tampers, concrete saw, power post hole diggers and green cut men on concrete work, request that two men be used on pavement breakers, multi-craft tender:

	BUILDING	BASE RATE	$21.50
		FRINGE BENEFITS	11.93
Group 3			
Powderman or Blasters:	BUILDING	BASE RATE	$22.80
		FRINGE BENEFITS	11.93

LABORERS/HEAVY HIGHWAY:

HEAVY HIGHWAY GROUP 1:
Aging and curing of concrete (any mode or method), asbestos abatement worker, asphalt plant laborers, asphalt laborers, batch truck dumpers, carpenter tenders, cement mason tenders, cleaning of machines, concrete laborers, demolition laborers, dredging laborers, drill helper, environmental laborer - nuclear, radiation, toxic and hazardous waste - Level D, flagmen, grade checkers, all hand digging and hand back filling, highway marker placers, landscaping laborers, mesh handlers and placers, puddler, railroad laborers, rip-rap and grouters, right of way laborers, sign, guard rail and fence installers (all types), signal men, sound barrier installer, storm and sanitary sewer laborers, swampers, truck spotters and dumpers, and wrecking of concrete forms:

	HEAVY & HIGHWAY	BASE RATE	$23.31
		FRINGE BENEFITS	11.85

HEAVY HIGHWAY GROUP 2:
Batter board men (sanitary and storm sewer), brickmason tenders, mortar mixer operator, scaffold builders, burner and welder, bushhammers, chain saw operator, concrete saw operators, deckhand scow man, dry cement handlers, environmental laborers - nuclear, radiation, toxic and hazardous waste - Level C, forklift operators for masonry, form setters, green concrete cutting, hand operated grouter and grinder machine operator, jack hammers, lead paint abatement, pavement breakers, paving joint machine, pipe layers-laser operators (non-metallic), plastic pipe fusion, power driven Georgia buggy or wheelbarrow, power post hole diggers, precast manhole setters, walk-behind tampers, walk-behind trenchers, sand blasters, concrete chippers, surface grinders, vibrator operators, wagon drillers:

	HEAVY & HIGHWAY	BASE RATE	$23.56
		FRINGE BENEFITS	11.85

HEAVY HIGHWAY GROUP 3:
Asphalt luteman and rakers, gunnite nozzleman, gunnite operators and mixers, grout pump operator, side rail setters, rail paved ditches, screw operators, tunnel laborers (free air), and water blasters:

	HEAVY & HIGHWAY	BASE RATE	$23.61
		FRINGE BENEFITS	11.85

HEAVY HIGHWAY GROUP 4:
Caisson workers (free air), cement finishers, environmental laborer - nuclear, radiation, toxic and hazardous waste - Levels A and B, miners and drillers (free air), tunnel blasters, tunnel muckers (free air), directional & horizontal boring, air track driller (all types), and powderman and blaster:

	HEAVY & HIGHWAY	BASE RATE	$24.21
		FRINGE BENEFITS	11.85

CLASSIFICATIONS	RATE AND FRINGE BENEFITS	
MARBLE, TILE & TERRAZZO SETTERS:	BASE RATE	$23.32
	FRINGE BENEFITS	6.23
MARBLE, TILE & TERRAZZO FINISHERS:	BASE RATE	$15.88
	FRINGE BENEFITS	5.47
MILLWRIGHTS:	BASE RATE	$25.90
	FRINGE BENEFITS	20.87

OPERATING ENGINEERS/BUILDING:

CLASS A-1:
Operating Engineers possessing 3rd party certification NCCCO (National Commission for the Certification of Crane Operators) (or Operating Engineers Certification Program) shall be paid the minimum rate per hour on the following equipment: Crane, dragline, hoist (1 drum when used for stack or chimney construction or repair), hoisting engineer (2 or more drums) orangepeel bucket, overhead crane, piledriver, truck crane, tower crane, hydraulic crane.:

BUILDING	BASE RATE	$29.94
	FRINGE BENEFITS	14.40

CLASS A:
Articulating Dump, Auto Patrol, Batcher Plant, Bituminous Paver, Cableway, Central Compressor Plant, Clamshell, Concrete Mixer (21 cu. ft. or over), Concrete Pump, Crane, Crusher Plant, Derrick, Derrick Boat, directional boring machine, Ditching and Trenching Machine, Dragline, Dredge Operator, Dredge Engineer, Elevating Grader and all types of Loaders, Forklift (regardless of lift height), GPS systems (on equipment within the classification), Hoe-Type Machine, Hoist (1 drum when used for stack or chimney construction or repair), Hoisting Engineer (2 or more drums), laser or remote controlled equipment (within the classification), Locomotive, Motor Scraper, Carry-all Scoop, Bulldozer, Heavy Duty Welder, Mechanic, Orangepeel Bucket, Piledriver, Power Blade, Motor Grader, Roller (bituminous), Scarifier, Shovel, Tractor Shovel, Truck Crane, Winch Truck, Push Dozer, Highlift, All types of Boom Cats, Core Drill, Hopto, Tow or Push Boat, A-Frame Winch Truck, Concrete Paver, Gradeall, Hoist, Hyster, Pumpcrete, Ross Carrier, Boom, Tail Boom, Rotary Drill, Hydro Hammer, Mucking Machine, Rock Spreader attached to equipment, Scoopmobile, KeCal Loader, Tower Cranes (French, German and other types), Hydrocrane, Backfiller, Gurries, sub-Grader, Tunnel Mining Machines including Moles, Shields, or similar types of Tunnel Mining Equipment:

BUILDING	BASE RATE	$28.85
	FRINGE BENEFITS	14.40

***Operators on cranes with boom one-hundred fifty feet (150') and over including jib, shall receive seventy-five cents ($.75) above base rate. All cranes with piling leads will receive $.50 above base rate regardless of boom length**

BUILDING CLASS B:
All Air Compressors (over 900 cfm), Bituminous Mixer, Joint Sealing Machine, Concrete Mixer (under 21 cu. ft), Form Grader, Roller (rock), tractor (50 HP and over), Bull Float, Finish Machine, Outboard Motor Boat, Flexplane, Fireman, Boom Type Tamping Machine, Greaser on Grease Facilities servicing Heavy Equipment, Switchman or brakeman, Mechanic Helper, Whirley Oiler, Self-Propelled Compactor, Tractair and Road Widening Trencher and Farm Tractor with Attachments (except backhoe, highlift and endloader),

CLASSIFICATIONS RATE AND FRINGE BENEFITS

OPERATING ENGINEERS/BUILDING (CONTINUED):

BUILDING CLASS B: (CONTINUED):
Elevator (regardless of ownership when used for hoisting any building materials), Hoisting Engineer (1 drum or buck hoist), Firebrick (Masonry Excluded), Well Points, Grout Pump, Throttle-Valve Man, Tugger, Electric Vibrator Compactor and Caisson Drill Helper:

BUILDING	BASE RATE	$25.07
	FRINGE BENEFITS	14.40

BUILDING CLASS C:
Bituminous Distributor, Cement Gun, Conveyor, Mud Jack, Paving Joint Machine, Roller (earth), Tamping Machine, Tractors (under 50 HP), Vibrator, Oiler, Concrete Saw, Burlap and Curing Machine, Truck Crane Oiler, Hydro-Seeder, Power Form handling Equipment, Deckhand Steersman, Hydraulic Post Driver and Drill Helper:

BUILDING	BASE RATE	$23.43
	FRINGE BENEFITS	14.40

OPERATING ENGINEERS/HEAVY HIGHWAY:

HEAVY HIGHWAY CLASS A-1:
Operating Engineers possessing 3rd party certification NCCCO (National Commission for the Certification of Crane Operators) (or Operating Engineers Certification Program) shall be paid the minimum rate per hour on the following equipment: Cableway, carry deck crane, cherry picker, clamshell, derrick, derrick boat, dragline, hoist engine (2 or more drums) hydraulic boom truck, hydrocrane, orangepeel bucket, overhead crane, piledriver, rough terrain crane, tower cranes (French, German and other types) truck crane:

HEAVY HIGHWAY	BASE RATE	$31.08
	FRINGE BENEFIT	14.40

HEAVY HIGHWAY CLASS A:
A-Frame Winch Truck, Auto Patrol, Backfiller, Batcher Plant, Bituminous Paver, Bituminous Transfer Machine, All types of Boom Cats, Bulldozer, Cableway, Carry-All Scoop, Carry Deck Crane, Central Compressor Plant Operator, Clamshell, Concrete Mixer (21 cu. ft. or over),
Concrete Paver, Truck-Mounted Concrete Pump, Core Drills, Crane, Crusher Plant, Derrick, Derrick Boat, Ditching and Trenching Machine, Dragline, Dredge Operator, Dredge Engineer, Earth Movers, Elevating Grader and all types of Loaders, Grade-All, Gurries, Heavy Equipment Robotics Operator/Mechanic, Highlift, Hoe-Type Machine, Hoist (two or more drums), Hoisting Engine (two or more drums), Horizontal Directional Drill Operator, Hydraulic Boom Truck, Hydrocrane, Hyster, KeCal Loader, Letourneau, Locomotive, Mechanic, Mechanically Operated Laser Screed, Mechanic Welder, Mucking Machine, Motor Scraper, Orangepeel Bucket, Piledriver, Power Blade, Pumpcrete, Push Dozer, Rock Spreader attached to Equipment, All Rotary Drills, Roller (bituminous), Scarifier, Scoopmobile, Shovel, Side Boom, Subgrader, Tailboom, Telescoping Type Forklift, Tow or Push Boat, Tower Cranes (French, German and
other types), Tractor Shovel, Truck Crane, Tunnel Mining Machines including Moles, Shields, or Similar types of Tunnel Mining Equipment:

HEAVY & HIGHWAY	**BASE RATE	$29.95
	FRINGE BENEFITS	14.40

****Operators on cranes with booms one hundred fifty feet (150') and over including jib shall receive $1.00 above base rate.**

CLASSIFICATIONS — RATE AND FRINGE BENEFITS

OPERATING ENGINEERS/HEAVY HIGHWAY (CONTINUED):

HEAVY HIGHWAY CLASS B:
All Air Compressors (over 900 cu. ft. per min.), Bituminous Mixer, Boom Type Tamping Machine, Bull Float, Concrete Mixer (under 21 cu. ft.), Electric Vibrator Compactor/Self-Propelled Compactor, Elevator (one drum or buck hoist), Elevator (regardless of ownership when used to hoist building material), Finish Machine, Firemen, Flex-Plane, Forklift (regardless of lift height), Form Grader, Hoist (one drum), Joint Sealing Machine, Mechanic Helper, Outboard Motor Boat, Power Sweeper (riding type), Roller (rock), Ross Carrier, Skid Mounted or Trailer Mounted Concrete Pumps, Skid Steer Machine with all Attachments, Switchman or Brakeman, Throttle Valve Man, Tractair and Road Widening Trencher, Tractor (50 HP and over), Truck Crane Oiler, Tugger, Welding Machine, Well Points, and Whirley Oiler:

HEAVY & HIGHWAY	BASE RATE	$27.26
	FRINGE BENEFITS	14.40

HEAVY HIGHWAY CLASS B2:
Greaser on Grease Facilities servicing Heavy Equipment, All Off Road Material Handling Equipment, Including Articulating Dump Truck:

HEAVY & HIGHWAY	BASE RATE	$27.68
	FRINGE BENEFITS	14.40

HEAVY HIGHWAY CLASS C:
Bituminous Distributor, Burlap and Curing Machine, Caisson Drill and Core Drill Helper (track or skid mounted), Cement Gun, Concrete Saw, Conveyor, Deckhand Oiler, Grout Pump, Hydraulic Post Driver, Hydro Seeder, Mud Jack, Oiler, Paving Joint Machine, Power Form Handling Equipment, Pump, Roller (earth), Steermen, Tamping Machine, Tractors (under 50 H.P.) and Vibrator:

HEAVY & HIGHWAY	BASE RATE	$26.96
	FRINGE BENEFITS	14.40

Employees assigned to work below ground level are to be paid ten percent (10%) above base wage rate. This does not apply to open cut work.

PAINTERS / BUILDING:

Drywall Finishers & Plasterers:	BASE RATE	$26.70
	FRINGE BENEFITS	13.31
Brush, Roller & Paperhangers:	BASE RATE	$26.45
	FRINGE BENEFITS	13.31

Spray, Sandblast, Power Tools, Waterblast &Steam Cleaning, Brush & Roller of Mastics, Creosotes, Kwinch Koate & Coal Tar Epoxy:

	BASE RATE	$27.45
	FRINGE BENEFITS	13.31
Spray of Mastics, Creosotes, Kwinch Koate & Coal Tar:	BASE RATE	$ 28.45
	FRINGE BENEFITS	13.31

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
PAINTERS / HEAVY HIGHWAY:			
Drywall Finishers & Plasterers:	HEAVY HIGHWAY	BASE RATE FRINGE BENEFITS	$27.45 12.71
Brush, Roller & Paperhangers:	HEAVY HIGHWAY	BASE RATE FRINGE BENEFITS	$27.20 12.71
Spray, Sandblast, Power Tools, Waterblast &Steam Cleaning, Brush & Roller of Mastics, Creosotes, Kwinch Koate & Coal Tar Epoxy:	HEAVY HIGHWAY	BASE RATE FRINGE BENEFITS	$28.20 12.71
Spray of Mastics, Creosotes, Kwinch Koate & Coal Tar:	HEAVY HIGHWAY	BASE RATE FRINGE BENEFITS	$ 29.20 12.71
PLUMBERS & PIPEFITTERS:		BASE RATE FRINGE BENEFITS	$32.00 19.29
PLASTERERS:		BASE RATE FRINGE BENEFITS	$11.81 1.59
ROOFERS:(Excluding metal roofs)		BASE RATE FRINGE BENEFITS	$10.31 3.37
SHEETMETAL WORKERS :(Including metal roofs)		BASE RATE FRINGE BENEFITS	$27.70 13.35
SPRINKLERFITTERS:		BASE RATE FRINGE BENEFITS	$31.35 17.87
TRUCK DRIVERS/BUILDING:			
Truck Drivers:	BUILDING	BASE RATE FRINGE BENEFITS	$10.77 0.00
TRUCK DRIVERS/HEAVY HIGHWAY:			
Greaser, tire changer:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$16.34 7.04
Truck mechanic:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$16.57 7.04

CLASSIFICATIONS RATE AND FRINGE BENEFITS

TRUCK DRIVERS / HEAVY & HIGHWAY (CONTINUED):

Driver-single axle dump and flatbed truck, terrain vehicle when used to haul materials, semi-trailer or pole trailer when used to pull building materials and equipment, tandem axle dump truck, driver of distributors, driver on mixer trucks (all types):

HEAVY & HIGHWAY	BASE RATE	$16.64
	FRINGE BENEFITS	7.04

Driver-Euclid and other heavy earthmoving equipment and low-boy, articulator, cat truck, 5-axle wheel, winch truck and A-Frame truck when used in transporting materials, Ross Carrier, forklift truck when used to transport building materials, driver on pavement breakers:

HEAVY & HIGHWAY	BASE RATE	$16.65
	FRINGE BENEFITS	7.04

END OF DOCUMENT CR 2-032
October 13, 2015
Page 9 of 9

CERTIFICATION OF RELEASE OF CONTRACTOR LIENS

This is to certify that (Contractor's Name) has paid all debts for materials, supplies, labor, and subcontractors relative to the work which was performed on Alvaton Area Sewer Project for Warren County Water District under a Contract dated _____.

The only exceptions are those listed below. If there are no exceptions, write in "None".

	NAME	DOLLAR AMOUNT
1.	_____	$_____
2.	_____	$_____
3.	_____	$_____
4.	_____	$_____

We further certify that to the best of our knowledge there are no litigations either in process or pending in connection with the subject work with the following exceptions. If there are no exceptions, write in "None".

1. _____

2. _____

We further certify that this work was performed in strict conformance with the Drawings, Specifications, and Contract.

_____

DATE: _____ BY: _____

State of Kentucky
County of _____

I, _____, a Notary Public in and for the State of Kentucky at Large, do hereby certify that the foregoing certification from _____ was duly produced before me on this ____ day of _____, 20___.

_____
NOTARY PUBLIC, STATE OF KENTUCKY

My Commission Expires: _____

WARRANTY AGREEMENT

It is hereby agreed on this __ day of _____, 20 ___, that the Warranty Period for the work performed on Alvaton Area Sewer Project. Contract dated _____, 20 ___, with Warren County Water District shall end at midnight on _____, 20 ___.

_____

BY: _____

WARREN COUNTY WATER DISTRICT

BY: _____

State of Kentucky
County of _____

I, _____, a Notary Public in and for the State of Kentucky at Large, do hereby certify that the foregoing certification from _____ was duly produced before me on this _____ day of _____, 20 ___.

_____
NOTARY PUBLIC, STATE OF KENTUCKY

My Commission Expires: _____

State of Kentucky
County of _____

I, _____, a Notary Public in and for the State of Kentucky at Large, do hereby certify that the foregoing certification from _____ was duly produced before me on this _____ day of _____, 20 ___.

_____
NOTARY PUBLIC, STATE OF KENTUCKY

My Commission Expires: _____

CERTIFICATION OF RECEIPT OF FINAL PAYMENT

This is to certify that as of _____, 20___, (Contractor's Name) has accepted full and final payment for all work performed on Alvaton Area Sewer Project, Contract dated _____, 20___, with Warren County Water District (OWNER) and having done so, has released the OWNER in accordance with Section 20 of the General Conditions.

_____

BY: _____

State of Kentucky
County of _____

I, the undersigned, a Notary Public in and for the State of Kentucky, do hereby certify that the above Certification from_____ was on this day sworn before me and acknowledged by him to be a free act and deed.

Witness my hand this _____ Day of _____, 20___

_____
NOTARY PUBLIC

My Commission Expires: _____

STORM WATER POLLUTION PREVENTION PLAN

Project Name: Alvaton Area Sewer Project

Project Location: Bowling Green/Warren County, Kentucky

Owner: Warren County Water District
PO Box 10180
Bowling Green, KY 42102
270-842-0052

1. General

1.1. This Storm Water Pollution Prevention Plan (SWPPP) includes erosion prevention measures, sediment controls measures, and other site management practices necessary to prevent the discharge of sediment and other pollutants into waters of the Commonwealth. It is intended that the site management practices be adequately protective to minimize receiving waters from being degraded and failing to support their designated uses. These sediment control measures may include retention basins, erosion control measures, and other site management practices, as required, based on site-specific conditions. Appropriate installation and maintenance will be provided to effectively minimize such discharges for storm events up to an including a 2-year, 24- hour event.

1.2. Erosion prevention measures have been developed and will be implemented in accordance with sound practices and have been developed specific to the project. The goal of these devices are 80% removal of Total Suspended Solids that exceed predevelopment levels. The Kentucky Erosion Prevention and Sediment Control Field Guide and the Kentucky Best Management Practices Technical Manual shall provide general guidelines for this project.

1.3. The primary sediment control measure for this project is vegetative buffer strips along the pipeline alignment.

2. Site Description

2.1. The project site consists of a twenty (20) foot wide construction easement, centered along a proposed water or sewer pipeline(s).

2.2. Soil disturbing activities will include excavation of a trench along the proposed pipeline alignment, installation of the pipeline, backfill of the excavation, and cleanup/restoration of surface. These activities will be performed concurrently to minimize areas of open excavation.

2.3. The estimated total project area is 13 acres. It is estimated that approximately 50 percent of this project area will be disturbed.

2.4. The water quality classification of the receiving waters for this project is: impaired.

3. Site Map

3.1. A Site Map is attached. Generally, the map includes the following:

3.1.1. Property lines.

3.1.2. Drainage patterns within the project area.

3.1.3. Soil will be disturbed along the proposed pipeline alignment.

3.1.4. Locations of sediment control measures and erosion control measures. Note that the primary sediment control measure is vegetative buffer strips along the entire length of the project (where practical), and stabilization measures will be re-vegetation in all location where vegetation existed prior to construction.

3.1.5. Locations of surface waters within the project area.

3.1.6. Locations of karst features within the project area.

3.1.7. Locations of discharge points.

3.1.8. The location of equipment and material storage areas is to be determined. Once determined by the Contractor, appropriate BMP's will be identified and indicated on the Drawings.

3.1.9. The use of concrete is very limited for this project. Equipment wash out shall occur in the trench, adjacent to the underground locations where concrete is installed.

3.1.10. Areas in which final stabilization has been completed will be shown on the Drawings.

3.1.11. Other potential pollutant sources, as applicable.

4. There are no known industrial discharges in the project area other than construction.

5. Stormwater Controls

5.1. Erosion prevention measures, sediment controls, and other site management practices shall be as described in *Best Management Practices Manual for Erosion Prevention and Sediment Control, City of Bowling Green, KY*, dated December 2004 and as shown on the Drawings.

5.2. The primary sediment control measure for this project is vegetative buffer strips along the pipeline alignment.

5.3. Stabilization will be employed as soon as practicable in critical areas.

5.4. Erosion Control Measures

5.4.1. General

5.4.1.1. The total disturbed area shall be minimized.

5.4.1.2. Trenching, backfill, and restoration shall be performed concurrently along the pipeline alignment so that only a portion of the alignment is disturbed at one time.

5.4.1.3. Clearing and grading should be scheduled to reduce the probability that bare soils will be exposed to rainfall.

5.4.2. Managing Stormwater flows on the Site

5.4.2.1. When practicable, soil from the pipeline trench should be placed on the upslope side of the trench to form diversion berms or conveyance channels.

5.4.2.2. Vegetated buffers shall remain in place whenever practicable.

5.4.2.3. Slope drains or other adequately protective alternate practices may be required.

5.4.3. Energy Dissipation Approaches

5.4.3.1. Vegetated filter strips shall remain in place whenever practicable.

5.4.3.2. Other adequately protective alternate practices may be required.

5.4.4. Minimization of Exposure of Bare Soils

5.4.4.1. Vegetation shall be used as required to stabilize bare soils. Vegetation may include annual grasses, perennial grasses, or other measures.

5.4.4.2. Other measures to minimize exposure to bare soils may include mulch, straw, geotextiles, rolled erosion control mats, etc.

5.5. Sediment Control Measures

5.5.1. General

5.5.1.1. Sediment control measures shall be utilized as required to control and trap sediment that is entrained in stormwater runoff.

5.5.2. Sediment Barriers

5.5.2.1. Sediment barriers shall be utilized as required including: silt fences, fiber rolls, etc.

5.5.3. Slope Protection

5.5.3.1. Slope protection shall be utilized as required including: tread tracking, erosion blankets, mulching, etc.

5.5.4. Conduit/Ditch Protection

5.5.4.1. Conduit/ditch protection shall be utilized as required including: inlet protection, outlet protection, etc.

5.5.5. Stabilizing Drainage Ditches

5.5.5.1. Ditches shall be stabilized as required through the use of check dams, ditch lining, etc.

5.5.6. Sediment Trapping Devices

5.5.6.1. Sediment trapping devices shall be utilized as required to settle out sediment eroded from disturbed areas. These devices include: sediment traps, sediment basins, adequate mechanical or chemical settlement enhancers, etc.

5.5.7. Perimeter Controls

5.5.7.1. Perimeter controls shall be utilized as required including: silt fences, berms, swales, etc. However, due to the nature of this pipeline project's area and associated disturbed areas, perimeter controls are generally impractical to surround the entirely of the site.

5.6. Other Construction Site Management Practices

5.6.1. Construction materials shall be handled, stored, maintained, and disposed of properly to avoid contamination of runoff to the maximum extent practicable.

5.6.2. Construction materials, chemicals, and lubricants shall be protected from exposure to rainfall.

5.6.3. Litter, construction debris, and construction chemicals shall not enter receiving waters.

5.6.4. Exposure of freshly placed concrete rainfall shall be limited.

5.6.5. Stormwaters and other wastewaters from fuels, lubricants, sanitary wastes, and other chemicals such as pesticides, herbicides, and fertilizers shall be segregated to prevent runoff being contaminated.

5.6.6. Chemicals, pesticides, herbicides, fertilizers and fuels shall be stored in a neat, orderly fashion.

5.6.7. Trash and sanitary waste shall be collected and managed promptly.

5.6.8. Spills of liquids and solid materials that could pose a pollutant risk shall be cleaned promptly.

5.6.9. Off-site accumulations of sediment shall be removed regularly to minimize the potential for discharge

5.7. Any alternate protective practices will be described on the Drawings with locations indicated.

5.8. Stormwater controls will be installed, as necessary, for each section of the project as the pipeline construction progresses. Sections will be determined by the direction of natural stormwater flow. Stormwater controls will be removed as final stabilization is completed.

5.9. Permanent stabilization shall occur as soon as practical for each section of the project after sufficient time is allowed for trench line settlement. Allowing for settlement reduces the overall disturbance required. Where required, interim stabilization will be required.

5.10. Proposed off-site locations of equipment and material storage will be marked on the Drawings.

5.11. The estimated construction schedule shall be as indicated on the NOI.

5.12. All materials shall be stored in accordance with manufacturers' recommendations regarding contamination of stormwater. Construction materials consist of polyvinyl chloride or ductile iron pipe and associated appurtenances. Materials for water distribution must be NSF Standard 61 approved for drinking water use.

5.13. There are no known pollutant sources from areas untouched by construction. Therefore, no stormwater controls are anticipated to be required in undisturbed areas.

6. Maintenance of Stormwater Controls

6.1. Erosion prevention measures, sediment controls measures, and other site management practices shall be maintained in accordance with manufacturers' recommendations at an interval as required to maintain effective, operating condition. Sediment control devices shall be maintained at no more than 1/3 capacity to allow for sediment capture.

6.2. If site inspections identify sediment controls measures, erosion control measures, and other site management practices that are not operating effectively or otherwise require maintenance, maintenance shall be performed, prior to the next storm event. If maintenance before the next storm event is impracticable, the required maintenance shall be completed as soon as possible.

7. Non-Stormwater Discharge Management

7.1. The following non-stormwater discharges shall *not* be combined with stormwater discharges.

7.1.1. Discharges from fire-fighting activities.
7.1.2. Fire hydrant flushing.
7.1.3. Waters used for vehicle washing where detergents are not used.
7.1.4. Water used for dust control.
7.1.5. Potable water including uncontaminated water-line flushing.
7.1.6. Routine external building wash down that does not use detergents.
7.1.7. Pavement wash waters where spills or leaks or toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used.
7.1.8. Landscape irrigation.
7.1.9. Clean, non-turbid water-well discharges of groundwater.
7.1.10. Construction dewatering provided the requirements of this permit are met.

8. Inspections

8.1. **The CONTRACTOR shall be responsible for conducting EPSC inspections as indicated herein.**

8.2. Scope

8.2.1. Inspections will generally be conducted at least every seven (7) calendar days. Alternatively, inspections will be conducted at least

every fourteen (14) calendar days and within 24 hours of the end of a rain event resulting in 0.5 inches of precipitation or greater.

8.2.2. For sections of the project area which have undergone temporary or final stabilization, inspections will be performed at least every thirty (30) days.

8.2.3. Inspections shall be performed by personnel knowledgeable and skilled in assessing conditions at the construction site that could impact stormwater quality and assessing the effectiveness of erosion prevention measures, sediment control measures, and other site management practices chosen to control the quality of the stormwater discharges. Inspectors shall have training in stormwater construction management.

8.2.4. Visual inspections will be performed to determine whether erosion prevention measures, sediment controls measures, and other site management practices are properly installed, properly maintained, and effective. Visual inspection will be made to determine if excessive pollutants are entering the drainage system.

8.2.5. Visual inspection shall comprise erosion prevention measures, sediment control measures, other site management practices, points of site egress, and disturbed areas.

8.2.6. Discharge points will be inspected, if accessible, to ascertain whether erosion prevention measures, sediment control measures, other site management practices, and points of site egress are effective in preventing impacts to waters of the Commonwealth by inspecting the receiving water bodies for evidence of new erosion and/or the introduction of newly deposited sediment or other pollutants. If discharge points are not accessible, nearby downstream points can be inspected.

8.2.7. Representative inspections can be made of the project area 0.25 miles above and below each point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the construction site.

8.3. Reporting

8.3.1. **The CONTRACTOR shall be responsible for reporting EPSC inspections as indicated herein.**

8.3.2. Inspection reports shall be prepared for all inspections and shall be retained with the SWPPP. Inspection reports will generally include:

8.3.2.1. The date and of inspection.

8.3.2.2. The name and title of the inspector.
8.3.2.3. A synopsis of weather information for the period since the last inspection (or since start of construction for the initial inspection) including an estimate of the beginning of each storm event, the duration of each storm event, and the approximate amount of rainfall for each storm event (in inches).
8.3.2.4. Weather conditions and a description of any discharges occurring at the time of the inspection.
8.3.2.5. Location(s) of discharges of sediment or other pollutants from the site.
8.3.2.6. Location(s) of sediment controls measures, erosion control measures, or other site management practices that require maintenance.
8.3.2.7. Location(s) of any erosion prevention measures, sediment controls measures, or other site management practices that failed to operate as designed or proved inadequate for a particular location.
8.3.2.8. Location(s) where additional erosion prevention measures, sediment controls measures, or other site management practices are needed that did not exist at the time of the inspection.
8.3.2.9. Identify any actions taken in response to inspection findings.
8.3.2.10. Identify any incidents of non-compliance with the SWPPP.
8.3.2.11. A certification that the site is in compliance with the SWPPP, if no incidents of non-compliance are identified.
8.3.2.12. A signature in accordance with the requirements of 401 KAR 5:065, Section 1(11).

9. Plan Maintenance

9.1. The CONTRACTOR shall maintain the plan Drawings as provided by the OWNER.

9.2. SWPPP will be revised whenever erosion prevention measures, sediment controls measures, or other site management practices are significantly modified in response to a change in design, construction method, operation, maintenance procedure, etc., that may cause a significant effect on the discharge of pollutants to receiving waters or municipal separate storm sewer systems.

9.3. The SWPPP will be amended if inspections or investigations by site staff or by local, state, or federal officials determine that the existing sediment controls measures, erosion control measures, or other site management practices are ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the construction site.

9.4. If an inspection reveals design inadequacies, the site description and sediment controls measures, erosion control measures, or other site management practices identified in the SWPPP will be revised.

9.5. All necessary modifications to the SWPPP will be made within seven (7) calendar days following the inspection unless granted an extension of time by Kentucky Division of Water (DOW).

9.6. If existing sediment controls measures, erosion control measures, or other site management practices need to be modified or if additional sediment controls measures, erosion control measures, or other site management practices are necessary, implementation shall be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, the situation will be documented in an inspection report and the changes shall be implemented as soon as practicable.

10. Plan Availability

10.1. A current copy of the SWPPP will be made readily available to the construction site from the date of project initiation to the date of Notice of Termination.

10.2. The person with day-to-day operational control over the plan's implementation will keep a copy of the SWPPP readily available whenever on site.

10.3. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the plan's location shall be posted in a convent location at the construction site.

10.4. The SWPPP will be made available to DOW or its authorized representative for review and copying during on-site inspections.

10.5. Upon request, the SWPPP will be made available to the Environmental Protection Agency and other federal agencies or their contractor, and local governmental agencies and officials approving sediment and erosion plans, grading plans or stormwater management plans.

11. Critical Areas

11.1. No "critical areas" have been identified in the project area.

12. Stabilization

12.1. Final stabilization for portions of the project where construction has permanently ceased will be initiated within fourteen (14) days of the date of cessation of construction. Final stabilization will be initiated on portions of the project area where construction has been suspended for more than 180 days.

12.2. Temporary stabilization for portions of the project where construction has temporarily ceased will be initiated, as required, within fourteen (14) days of the date of cessation of construction activities.

13. Buffer Zones

13.1. No waters categorized as High Quality Waters or Impaired Waters (Non-construction related impairment) have been identified within the project area.

13.2. No waters categorized as Impaired Waters (Sediment impaired, but no TMDL) have been identified within the project area.

14. Notice of Intent (NOI-SCWA)

14.1. The NOI-SCWA shall be completed and submitted in accordance with the requirements set forth by the DOW. When available, a copy of the Notice of Intent and all attachments with be appended to the SWPPP.

SWPPP APPENDIX A

EPSC INSPECTION REPORT

Project Name: Alvaton Area Sewer Project NOI #: TBD

Date: _____

Inspection Type: ☐ Weekly Inspection
☐ Post Rain Inspection Amount of Rain: _____ inches

	Parameter of Inspection	YES	NO	N/A
1	Is the Erosion Control Plan on site?			
2	Are all modifications and deviations up to date and noted on the Drawings?			
3	Is the Storm Water Pollution Prevention Plan (SWPPP) being followed?			
4	Are required sediment controls in place at storm drain inlets and other required areas?			
5	Are sufficient measures in place to prevent mud from entering roadways and/or is sediment, debris, and/or mud cleaned from public roads as required?			
6	Are required slit fences in place properly and maintained on a regular schedule?			
7	Are required temporary sediment traps maintained according to the Drawings?			
8	Are required inlet protection devices installed and maintained properly?			
9	Are required check dams installed and maintained according to the Drawings?			
10	Are all disturbed areas stabilized according to the Drawings?			
11	Are all temporary stockpiles or construction materials located in approved areas and protected according to the Drawings?			
12	Are dust control measures being appropriately implemented?			
13	Are all discharge points where water is leaving the site maintained properly?			
14	Are all material storage and secondary containment properly maintained and shown on the Drawings?			

For any item marked "NO" above, see corresponding note with matching number below or on additional pages.

Issues of Non-compliance, other comments, and corrective action summary:

_____

_____

_____

_____

_____

By signing below, Inspector certifies that except for items listed hereon, the project site is in compliance with the SWPPP.

_____
Site Foreman's Name (Print)

_____
Site Foreman's Signature

_____
Inspector's Name (Print)

_____
Inspector's Signature

_____
Inspector's Qualifications

SWPPP APPENDIX B

EPSC CERTIFICATION

Project Name: Alvaton Area Sewer Project

Project Location(s): Warren County, Kentucky

Contractor Name: _____

Address: _____

_____

_____

Telephone Number: _____

Check One: ☐ Prime Contractor ☐ Sub-Contractor

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

Signature: _____

Print Name: _____

Title: _____

Date: _____

State of Kentucky
County of _____

I, _____, a Notary Public in and for the State of Kentucky at Large, do hereby certify that the foregoing certification from _____ was duly produced before me on this ____ day of _____, 20___.

_____
NOTARY PUBLIC, STATE OF KENTUCKY

My Commission Expires: _____

NOTICE OF AWARD

TO: _____
_____
_____

Project Description: Alvaton Area Sewer Project.

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated November 13, 2015 and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of $ _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND, and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this ___ day of _____, 2015.

Owner: Warren County Water District

By: _____
John M. Dix

Title: General Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____ this the __ day of _____, 2015.

By: _____ Title: _____

AGREEMENT

THIS AGREEMENT, made this ____ day of _____, 20__, by and between Warren County Water District, hereinafter called "OWNER" and _____ doing business as a corporation hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements herein after mentioned:

1. The CONTRACTOR will commence and complete the Alvaton Area Sewer Project.

2. The CONTRACTOR will furnish all of the materials, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the PROJECT described herein.

3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within 10 calendar days after the date of the NOTICE TO PROCEED and will fully complete the same within 270 calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

4. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of $_____ or as shown in the BID schedule.

5. The term "CONTRACT DOCUMENTS" means and includes the following:
   - (A) Advertisement for Bids
   - (B) Information for Bidders
   - (C) Bid
   - (d) Bid Bond
   - (E) Compliance Statement
   - (F) Affidavit for Bidders Claiming Resident Bidder Status
   - (G) General Conditions
   - (H) Supplemental General Conditions
   - (I) Notice of Award
   - (J) Agreement
   - (K) Performance Bond
   - (L) Payment Bond
   - (N) Notice to Proceed
   - (O) Detailed Specifications prepared or issued by: Warren County Water District dated November 13, 2015.
   - (P) Drawings prepared by: Warren County Water District.
   - (Q) Addenda:
     - No. __, dated _____.
     - No. __, dated _____.
     - No. __, dated _____.
   - (R) Change Order(s)

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.
7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed or caused to be executed by their duly authorized official, this Agreement in three (3) copies each of which shall be deemed an original on the date first above written.

OWNER:

Warren County Water District

By: _____
Name: John M. Dix
Title: General Manager

(SEAL)
Attest:

_____
Name: _____

_____
Title: _____

CONTRACTOR:

_____
By: _____
Name _____
Address: _____

_____
Employer Identification No. _____

(SEAL)
Attest:

_____
Name: _____

_____
Title: _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(NAME OF CONTRACTOR)

_____
(ADDRESS OF CONTRACTOR)

a _____, hereinafter called
(Corporation, Partnership, or Individual)

Principal, a _____
(NAME OF SURETY)

_____
(ADDRESS OF SURETY)

hereinafter called Surety, are held and firmly bound unto

Warren County Water District
(NAME OF OWNER)

P. O. Box 10180, 523 US 31W Bypass, Bowling Green, KY 42102-4780
(ADDRESS OF OWNER)

hereinafter called OWNER, in the total aggregate penal sum of _____ ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the ___ day of _____, a copy of which is hereto attached and made a part hereof for the construction of:

Alvaton Area Sewer Project

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the SURETY and during the one year guaranty period

and if the PRINCIPAL shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in three counterparts, each one of which shall be deemed an original, this the ___ day of _____ . _____.

ATTEST:

_____ (Principal) Secretary

_____ Principal

(SEAL)

By: _____

_____ (Witness as to Principal)

_____ (Address)

_____ (Address)

_____ (Surety)

ATTEST:

_____ Witness to Surety

_____ Attorney-in-Fact

_____ (Address)

_____ (Address)

_____

_____

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(NAME OF CONTRACTOR)

_____
(ADDRESS OF CONTRACTOR)

a _____, hereinafter called
(Corporation, Partnership, or Individual)

Principal, a _____
(NAME OF SURETY)

_____
(ADDRESS OF SURETY)

hereinafter called Surety, are held and firmly bound unto

Warren County Water District
(NAME OF OWNER)

P. O. Box 10180, 523 US 31W Bypass, Bowling Green, KY 42102-4780
(ADDRESS OF OWNER)

hereinafter called OWNER and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the CONTRACT and to their successors and assigns in the total aggregate penal sum of_____ ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain CONTRACT with the OWNER, dated the ___ day of _____, a copy of which is hereto attached and made a part hereof for the construction of:

Alvaton Area Sewer Project

NOW, THEREFORE, if the PRINCIPAL shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such CONTRACT, and any authorized extensions or modifications thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in

connection with the construction of such WORK, and for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms, and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

PROVIDED, FURTHER, that the said SURETY for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the CONTRACT or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contact or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL shall have given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials of which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration of <u>one</u> (1) year following the date of which PRINCIPAL ceased work on said CONTRACT, is being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the CONTRACT not increasing the CONTRACT price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the CONTRACT or the loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three counterparts, each one of which shall be deemed an original, this the ___ day of _____ . _____.

ATTEST:

_____ (Principal) Secretary

_____ Principal

(SEAL)

By: _____

_____ (Witness as to Principal)

_____ (Address)

_____ (Address)

_____ (Surety)

ATTEST:

_____ Witness to Surety

_____ Attorney-in-Fact

_____ (Address)

_____ (Address)

_____

_____

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

NOTICE TO PROCEED

TO: _____ DATE: _____

_____ PROJECT: Alvaton Area Sewer Project

_____ _____

_____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, on or before _____, 20__. You are to fully complete the WORK within 270 consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 20__.

Owner: Warren County Water District

By: _____
John M. Dix

Title: General Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged

by _____

_____

this the __ day of _____, 20__

By: _____

Title: _____

Employer Identification Number: _____

SECTION 1
GENERAL SCOPE AND SPECIAL PROVISIONS

1. Scope

The instructions and information set out in the paragraphs of the Detailed Specifications shall supersede the instructions and information set out in the Information for Bidders, General Conditions, and Supplemental General Conditions if and when differences occur.

2. Shop Drawings, Product Data, and Samples

Shop drawings, product data, and samples as discussed in Paragraph 5 of the General Conditions shall be furnished by the CONTRACTOR to the ENGINEER. Unless otherwise set out, all shop drawings shall be furnished in five copies. It shall be clearly understood by the CONTRACTOR that the ENGINEER will examine the shop drawings for general design only, and that his approval stamped on such drawings shall be approval only for general design, and the CONTRACTOR shall in all cases be held responsible for detailed dimensions. In case of discrepancy between the shop drawings and the requirements of the Drawings, Specifications, and Contract Documents, the provisions of the Drawings, Specifications, and Contract Documents shall prevail even though the shop drawings have been approved by the ENGINEER, unless the conflict therein has been specifically waived in writing by a Change Order.

3. Owner's Right to Carry Out the Work

If the CONTRACTOR defaults or neglects to carry out the work in accordance with the Contract Documents and fails within ten days after receipt of written notice from the OWNER to commence and continue correction of such default or neglect with diligence and promptness, the OWNER may, (without prejudice to any other remedy he may have) make good such deficiencies. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the CONTRACTOR the cost of correcting such deficiencies. If the payments then or thereafter due the CONTRACTOR are not sufficient to cover such amount, the CONTRACTOR shall pay the difference to the OWNER.

4. Execution and Coordination of the Work

4.1 It is intended that the work covered by this Contract be done so as to cause the minimum amount of interference with traffic and/or existing utilities. The CONTRACTOR will be required to organize and schedule his work so as to keep the existing facilities in full operation during the construction period insofar as is consistent with the nature of the construction work to be performed. The manner in which shutdowns will be made and the work schedule of the CONTRACTOR during shutdowns will be subject to the approval of the OWNER. The CONTRACTOR shall

schedule a proposed shutdown with the OWNER at least three days prior to the outage. All shutdowns shall be made by employees of the OWNER. Although every effort will be made to cause the minimum amount of interference with the CONTRACTOR's work, the interest of the OWNER in regard to the existing facilities must always take precedence over the construction work. Therefore, the right is reserved by the OWNER to put any lines or other facilities (that may be shut down for the construction work) back into service when an emergency arises.

4.2 The work on the project shall be scheduled so as to expedite service to new customers. The CONTRACTOR shall install meters and perform testing as each section of new water main is constructed. Water lines or sections of lines thus completed shall be placed in service while work proceeds on other lines or sections.

4.3 Following installation of the pipeline, "rough cleanup" work shall be performed. This shall consist of grading the trench to create a neat, low mound of backfill material and disposing of any excavated material, rubbish, etc. (See Section 3, Paragraph 21 and Section 7 Paragraph 13) Crushed stone shall be added to driveways where necessary and fences repaired to the satisfaction of the property owners. After trenches have had adequate time to settle, final grade work and seeding shall be performed as described in Section 3, Paragraph 22 and Section 7 Paragraph 14.

5. Progress Schedule, Construction Records, and Reports

5.1 The CONTRACTOR shall furnish the OWNER with proof that all payrolls for services rendered and invoices for materials supplied have been duly paid as herein required, and such other data as the OWNER may require.

5.2 The CONTRACTOR shall furnish (and keep current) a suitable progress chart or schedule showing the estimated (and actual) progress on the work. The progress chart or schedule shall be subject to the approval of the ENGINEER.

5.3 The CONTRACTOR shall furnish all the necessary information for and prepare the partial payment estimates on forms approved by the ENGINEER.

5.4 The OWNER, or his authorized representatives and agents, shall be permitted to inspect all payrolls, records of personnel, invoices of materials, and other relevant data and records.

6. Lines and Grades

6.1 The CONTRACTOR shall be held totally responsible for construction of the work according to the lines and grades shown on the Drawings. The CONTRACTOR shall also insure that the work is constructed in proper relation to proposed highway construction where applicable.

6.2 The CONTRACTOR shall furnish all labor, equipment, stakes, and grade boards. The CONTRACTOR also shall be required to furnish equipment and aides

when required by the ENGINEER in checking lines and grades. The labor and equipment shall be available to the ENGINEER on call, and the labor shall be fully capable of performing the duties of rodman and/or chainman.

7. Access to and Inspection of the Work

Representatives of the OWNER shall at all time have full access for inspection of the work and the CONTRACTOR shall provide proper facilities for such access and inspection.

8. Work on Private Property

8.1 In connection with work performed on private property, the CONTRACTOR shall take every precaution to avoid damage to the property owners' buildings, grounds, and facilities. Fences, hedges, shrubs, etc., within the construction limits shall be removed carefully, preserved, and replaced when the Construction is completed in accordance with the requirements set out hereinafter in these specifications. When construction is completed, the private property owner's facilities and grounds shall be restored to as good (or better) condition than found as quickly as possible at the CONTRACTOR's expense. The OWNER reserves the right to require the CONTRACTOR to obtain a signed Release from each property owner affected by the work. Said Release shall indicate that the property owner is satisfied with the restoration of his land. However, the execution of such a release shall not relieve the CONTRACTOR from any of his contractual obligations or other claims that may arise at a later date. The widths of construction easements obtained by the OWNER from property owners is normally 15 feet each side of the pipeline and the CONTRACTOR shall confine his activities to the area within the limits of the easements unless specific permission is obtained by the CONTRACTOR from property owners.

8.2 Large trees, or other facilities within the actual construction limits that cannot be preserved and replaced shall be removed by the CONTRACTOR but the OWNER will assume the responsibility for settling with the property owner for the loss of said trees or facilities. However, trees and facilities for which the OWNER has made such settlement will be designated on the Drawings and the CONTRACTOR shall be solely and entirely responsible for any damage to trees and facilities not so designated.

8.3 All trees and brush cleared along the route of the pipeline shall be disposed of by the CONTRACTOR in a manner suitable to the ENGINEER and property owner. If such trees and brush are left on the property the CONTRACTOR shall obtain a release for same from the property owner.

9. Traffic Control and Work in Highway Rights of Way

9.1 The CONTRACTOR shall (before beginning work on any public highway right-of-way) make arrangements for maintaining the traffic on said highways and/or roadways, or rerouting traffic as may be required. The applicable regulations of the

Kentucky Department of Transportation (Ky D.O.T.) must be followed in this regard.

9.2 The CONTRACTOR shall furnish proper equipment which shall be available at all times for maintaining streets and roads upon which work is being performed. All such streets and roads shall be maintained suitable for traffic until complete and final acceptance of the work.

9.3 When the CONTRACTOR is cutting across a street or highway, he is to cut half of the street at one time, lay the pipe, and complete the backfilling operation so that traffic may pass over this trench before the opening of the trench for the other half of the street or highway. In lieu of the above, bridging of the trench may be required. The time and method of making these crossings shall be approved by the ENGINEER, and the agency or legal entity having responsibility for the maintenance of the street or highway.

9.4 The CONTRACTOR shall be responsible for erecting signs, providing flagmen, providing any other such items, and performing all work as required by Kentucky D.O.T. regulations, the Kentucky D.O.T. permit granted to the OWNER for construction of this specific project, and/or regulations of other agencies having jurisdiction over the right-of-way.

9.5 The CONTRACTOR shall plan his operations so as to cause a minimum of inconvenience to property owners and to traffic. No road, street or alley may be closed unless absolutely necessary, and then only if the following conditions are met:

9.5.1 Permit is secured from appropriate, State, County or Municipal authorities having jurisdiction.

9.5.2 Fire and Police Departments are notified before road is closed.

9.5.3 Suitable detours are provided and are clearly marked.

9.6 No driveways shall be cut or blocked without first notifying the occupants of the property. Every effort shall be made to schedule the blocking of drives to suit to occupants' convenience, and except in case of emergency, drives shall not be blocked for a period of more than 8 hours.

10. Shoring, Sheeting, and Bracing of Excavations

10.1 Where unstable material is encountered or where the depth of excavation warrants it, the sides of the trench or excavation shall be supported by substantial sheeting, bracing, and shoring, or the sides sloped to the angle of repose. The design and installation of all sheeting, sheet piling, bracing, and shoring shall be based on computations of pressure exerted by the materials to be retained under existing conditions. Adequate and proper shoring of all excavations and safety of workmen shall be the entire responsibility of the CONTRACTOR; however, the OWNER may require the submission of shoring drawings (accompanied by

supporting computations) for approval prior to the CONTRACTOR undertaking any portion of the work.

10.2 Foundations, adjacent to where the excavation is to be made below the depth of the foundation, shall be supported by shoring, bracing, or underpinning as long as the excavation shall remain open and the CONTRACTOR shall be held strictly responsible for any damage to said foundations.

10.3 Care shall be taken to avoid excessive backfill loads on the completed pipe lines and the requirements regarding the width of the ditch as specified herein be strictly observed.

10.4 Trench sheeting shall not be removed until sufficient backfill has been placed to protect the pipe.

10.5 All sheeting, planking, timbering, bracing, and bridging, shall be placed, renewed, and maintained, as long as is necessary. Sheeting is not a pay item unless the CONTRACTOR is required and/or instructed by the OWNER to leave same in place.

11. Existing Utilities

11.1 Special precautions shall be taken by the CONTRACTOR to avoid damage to existing overhead and underground utilities owned and operated by the OWNER, or by other public or private utility companies.

11.2 With particular respect to existing underground utilities, all available information concerning their location has been shown on the Drawings. While it is believed that the locations shown are reasonably correct, the OWNER cannot guarantee the accuracy or adequacy of this information.

11.3 The location of buried telephone cable often differs from the preliminary information given the OWNER by phone companies and shown on the Drawings. Therefore, in order to construct a pipeline that is parallel to the highway right-of-way as specified, the CONTRACTOR may be required to cross buried telephone cable at various locations not indicated on the Drawings. The CONTRACTOR shall consider these crossings as incidental to the pipeline construction.

11.4 Before proceeding with the work, the CONTRACTOR shall confer with all public or private companies, agencies, or departments that own and operate utilities in the vicinity of the construction work. The purpose of the conference (or conferences) shall be to notify said companies, agencies, or departments of the proposed construction schedule, verify the location of, and possible interference with, the existing utilities that are shown on the Drawings, arrange for necessary suspension of service, and make arrangements to locate and avoid interference with all utilities (including house connections). The OWNER has no objection to the CONTRACTOR arranging for the said utilities companies, agencies, or departments to locate and uncover their own utilities; however, the CONTRACTOR shall bear the

entire responsibility for locating and avoiding, or repairing damage to said existing utilities.

11.5 Where existing utilities or other underground structures are encountered, they shall not be displaced or molested unless necessary and then only with the approval of the respective owner. In such cases they shall be replaced in as good (or better) condition than found as quickly as possible. All such utilities that are so displaced or molested shall be replaced at the CONTRACTOR's expense.

11.6 Should it become necessary to provide additional guying or support of power, lighting, or telephone facilities, the CONTRACTOR shall consult with the authorities of these utilities so that suitable arrangements can be made for the protection of same.

11.7 All costs for temporary or permanent work necessary for the protection of utilities, private or public, shall be included in the contract amount to which the items of work pertain, or may be considered to be incidental thereto. In addition, the CONTRACTOR shall be responsible for any damage to the existing utilities resulting from the construction operations and shall bear the cost of all repair or replacement necessary for correction.

11.8 It is expected that the CONTRACTOR will be diligent in his efforts and use every possible means to locate existing utilities. Any claims for unavoidable damage, based on improper or unknown locations, will be examined thoroughly in the light of the CONTRACTOR's efforts to locate the said utilities or obstructions prior to beginning construction.

12. Utilities Required by CONTRACTOR

All electrical current and/or any utility service required by the CONTRACTOR shall be furnished at his own expense except as noted hereinafter.

13. Supervision of Installation

All special equipment or materials shall be installed under the supervision of a qualified installation engineer and/or representative furnished by the manufacturer of such equipment or materials.

14. Execution of the Contract

The construction Contract and the Performance Bonds shall be executed within the time specified in the Information for Bidders and in at least three (3) copies.

15. Permits, Codes, Etc.

Unless otherwise set out in the Specifications or required by the agencies involved, the CONTRACTOR shall make application for, obtain, and pay for all licenses and permits, and shall pay all fees and charges in connection therewith. The

CONTRACTOR shall be required to comply with all state or municipal ordinances, laws, and/or codes insofar as the same is binding upon the OWNER.

16. Cleaning up and Removal of Rubbish

16.1 The CONTRACTOR shall at all times keep the premises free from accumulations of waste materials or rubbish caused by his employees or work and shall keep the work site in a clean and useable condition satisfactory to the ENGINEER. The CONTRACTOR shall direct his forces to promptly clean up streets, sidewalks, drainage channels, or private property, affected by his construction operations, when in the opinion of the ENGINEER such clean up is needed. At the completion of the work the CONTRACTOR shall remove all his rubbish from and about the site of the work and all of his tools, equipment, and surplus materials.

16.2 The Contract shall not be considered complete until all construction structures, equipment and rubbish from construction are cleaned from the site of the work. All damage to existing paving, grounds, and structures caused by the CONTRACTOR's operations must be repaired or the owners compensated for such damage before the contract will be considered complete. This includes the removal of rock from blasting (1 1/2 inches or larger in size), and the broom sweeping, or water removal, of dirt from pavement.

17. Items Deleted and Quantity Changes

The OWNER reserves the right to delete any bid item or in the case of unit price items, the OWNER may delete, reduce, or increase the quantities involved. BIDDERS shall be aware of this possibility and shall base their BIDS accordingly.

SECTION 2
QUALITY ASSURANCE

1. Approval of Testing Agencies and Reports

When in these Contract Documents inspection and testing services are required, bureaus, laboratories, and/or agencies selected for such inspection and testing shall be approved by the ENGINEER. If inspection and testing services are provided by the OWNER or are performed in accordance with Section 7.8 of the General Conditions, the OWNER shall select the laboratories and/or agencies for such inspection and testing.

2. Suitability of Materials and Test Reports

Where prior inspection and testing of materials is required, documentary evidence in the form of test reports, in the form and number required by the ENGINEER, shall be furnished prior to the time the material is incorporated into the work. All rejected material shall be removed promptly from the premises.

3. Governing Specifications

It is the intention of the ENGINEER in the preparation of these Specifications to define properly the kind and quality of materials to be furnished. The standards of the American Society of Testing Materials (ASTM); standards of the American Water Works Association (AWWA); or other such agencies may be referred to in the Specifications. Where such standards are referred to, said references shall be construed to mean the latest amended and/or revised versions of the said standard specifications. In the selection of samples and the routine testing of materials, the testing laboratory shall follow the standard procedure as outlined by the ASTM, unless otherwise set out.

4. Extent of Inspection and Testing Service

It is intended that materials of construction, particularly those upon which the strength and durability of the work may depend, shall be inspected and tested to establish conformance with specifications and suitability for uses intended. This Section indicates the extent of testing, and requirements and methods of reporting. If it is found that this Section does not cover all items that will require testing, then such materials shall be tested as directed by the ENGINEER.

5. Requirements and Methods of Reporting

In general, four (4) copies of all test reports will be required with two (2) copies to the CONTRACTOR, one (1) to the ENGINEER, and one (1) to the OWNER. All copies shall be forwarded to the ENGINEER.

6. Coarse Aggregate (Backfill and Surfacing)

Regarding coarse aggregates for use in backfill and surfacing, certifications, which state that the aggregates comply with the Specifications and give the gradation for each size used, will be required from the material supplier.

7. Fine Aggregate (For Use In Cement Concrete)

Standard tests shall be made in advance of concreting by an approved independent laboratory per ASTM C33, Paragraphs 2, 3, 4, and 5, and ASTM C40 on each fine aggregate proposed to be used. Other tests being satisfactory, the aggregate may be used pending results of 28 day concrete strength tests.

8. Coarse Aggregate (For Use In Cement Concrete)

Standard tests shall be made in advance of concreting by an approved laboratory on each grading of each coarse aggregate proposed to be used per ASTM C33, Paragraphs 6, 7, 8, 9, 10, and 11.

9. Concrete Tests (For Concrete Used In Structures)

9.1. Standard Slump Tests

Slump tests shall be made per ASTM C143, as specified in Section 6 of these Specifications.

9.2. Concrete Control Tests

9.2.1 During the progress of the Work and for each different mix of concrete, standard 6-inch concrete cylinders shall be made and tested. The testing shall be done per ASTM C39, and ASTM C31 (Paragraphs 7a and 7c). When field curing will be used in lieu of, or supplementing laboratory curing, care shall be exercised to avoid mistreatment of the cylinders in the field and testing shall be the same as specified for laboratory cured samples.

9.2.2 Test cylinders shall be made from each day's pour at the frequency specified by ACI 318 with a maximum of two (2) from each batch or ready-mix truck load. The maximum requirement will be imposed only when the ENGINEER deems necessary due to wide fluctuations in the concrete quality. A minimum of three (3) cylinders will be required for each day's pour if the concrete is used in structures or otherwise in a load-carrying capacity.

9.2.3 Each cylinder shall be numbered and logged, so as to adequately identify the representative concrete in the structure. Where three (3) cylinders are made from each day's pour, one (1) cylinder shall be tested at 7 days and two (2) at 28 days. Where more than three (3) cylinders per day are required, the "break" schedule shall be as requested by ENGINEER.

10. Reinforcing Steel

Reinforcing steel shall undergo a field inspection for section, rust, shape, and dimensions, plus certified test report for heat number(s).

11. Ductile Iron Pipe

Each piece of pipe shall bear the manufacturer's name or trademark and the date manufactured. Each piece of pipe shall also be certified by the manufacturer to have met the requirements of the governing standard specifications. Manufacturer Certifications and test reports shall be forwarded to the ENGINEER. Also, each piece shall be visually inspected in the field for any defects and specification conformance.

12. PVC and PVC(MO) Pipe for Force Mains (Not Applicable to C905 PVC Pipe)

12.1 PVC or PVC (MO) pipe shall be marked in accordance with ASTM D-2241. The manufacturer shall supply certifications indicating that all pipe to be supplied for the project meets the applicable Specification. This information shall be furnished to the ENGINEER with the shop drawings.

12.2 The total quality system of the pipe manufacturer shall meet the requirements set forth in ISO/IEC Guide 25:1990 (E), Sections 4 through 16, and the pipe manufacturer shall be capable of maintaining the specified requirements of both the pipe and material. Pipe manufacturer compliance shall be required prior to approval of any shop drawings for PVC or PVC (MO) pipe.

12.3 Each truckload of pipe delivered to the project shall be subject to whatever field measurements and tests deemed necessary by the OWNER. These tests may be conducted by the OWNER or his representative. The cost of field testing shall be the responsibility of the OWNER, but the cost of any pipe destroyed during such testing shall be the responsibility of the CONTRACTOR.

13. Testing Force Mains

13.1 Following installation of the force main, the pipeline shall be filled with clean water; open ends shall be securely capped and braced; and the pipeline pressure tested. The CONTRACTOR shall be responsible for supplying water and providing whatever means necessary to fill the pipeline, release air from dead-end sections, install temporary kickers, and perform the pressure test.

13.2 Force mains shall be tested at a pressure equal to the rated working pressure of the pipe for a period of 4 hours. Line segments between gate valves shall be tested separately. During the duration of the test, the line segment shall display leakage not exceeding 10 gallons per day per inch of pipe diameter per mile of pipeline. This rate of leakage is given below for 1,000 feet of pipeline and various diameters of pipe:

TABLE 2.1

MAXIMUM LEAKAGE RATE AT RATED PRESSURE
FOR SIZE OF FORCE MAIN INDICATED

Pipe Diameter		Max. Leakage in 4-hrs. for 1,000-Feet of Pipe
2"		0.63 gallons
3"		0.95 gallons
4"		1.26 gallons
6"		1.89 gallons
8"		2.53 gallons
10"		3.16 gallons
12"		3.79 gallons

13.3 Lines which fail to meet these criteria shall be repaired and retested as necessary until requirements are met. Pressure tests shall be performed only after all appurtenances are installed.

13.4 The pressure gauge and/or recorder used for testing pipelines will be supplied by the OWNER. The CONTRACTOR shall supply the necessary taps, connections, water meter, etc., for testing.

14. Testing Gravity Sewer Mains

14.1. Air Testing

14.1.1 Each gravity sewer line section shall be tested between manholes. The line section being tested shall be sealed at each end. The seal at one end shall have an orifice through which to pass air into the pipe. An air supply shall be connected to the orifice at one end of the line. The air supply line shall contain an ON-OFF gas valve and a pressure gauge having a range of from 0 to 5 psi. The gauge shall have minimum divisions of .10 psi and shall have an accuracy of ±.04 psi.

14.1.2 The pipe section under test shall be pressurized to 4 psig. The line shall be allowed to stabilize between 4 psig and 3.5 psig for a period of no less than 5 minutes. If necessary, air shall be added to the line to maintain the pressure above 3.5 psig. After the stabilization period, the gas valve shall be closed. When the line pressure drops to 3.5 psig, timing shall commence with a stopwatch. The stopwatch shall be allowed to run until such time as the line pressure drops to 2.5 psig. Then the watch should be stopped and the time lapse compared with the allowable time lapse shown below in Table A for the pipe size and length of pipe under test. If the time lapse is greater than that specified, the section undergoing test shall have passed, and the test may be discontinued at that time. If the time is less than that specified, the line shall not have passed and the CONTRACTOR will be required to repair the line and retest.

TABLE 2.2

TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015*

Pipe Dia. (in.)	Minimum Time (min:sec)	Length for Minimum Time (ft.)	Time for Longer Length (sec)	Specified Minimum for Length Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.368 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46
42	39:48	57	41.883 L	69:48	104:42	139:37	174:30	209:24	244:19	279:13	314:07
48	45:34	50	54.705 L	91:10	136:45	182:21	227:55	273:31	319:06	364:42	410:17

* Q is the allowable leakage rate in cubic feet per min per square foot of inside surface area of pipe.

14.1.3 If the pipeline to be tested is beneath the ground water level, the test pressure shall be increased .433 psi for each foot the ground water level is above the invert of the pipe, or as directed by the ENGINEER.

14.1.4 The pressure gauge and/or recorder used for testing pipelines will be supplied by the OWNER. The CONTRACTOR shall supply all other equipment necessary to perform the test. All test equipment shall be subject to the approval of the ENGINEER.

14.1.5 If any subsequent tests reveal defects that require repairs, air testing as described above shall be repeated on the repaired section.

14.2. Deflection Testing

Thirty days after completion of backfilling or when in the opinion of the ENGINEER, adequate consolidation of backfill material has occurred, the pipeline shall be tested for deflection. A deflection of more than 5 percent of the inside diameter shall be cause for rejection and the line will be removed and replaced at the CONTRACTOR's expense. A Go, No-Go deflection testing Mandrel shall be used. The Mandrel design shall be approved by the ENGINEER.

14.3. Alignment Inspection

14.3.1 After successful deflection testing, the pipeline shall be visually inspected for proper grade (vertical) and horizontal alignment. Each section of pipeline shall be "lamped" between manholes to determine construction defects and/or if any displacement of pipe has occurred.

14.3.2 Prior to alignment inspection, the pipeline shall be thoroughly flushed with clean water. A visible "full moon" shall be required for grade alignment. A visible "half moon," or greater, shall be required for horizontal alignment. Any significant "ponding" of water in the pipeline or manholes in the opinion of the ENGINEER shall constitute a failure of the alignment inspection. Poor alignment, displaced pipe, significant ponding of water, or other discovered construction defects shall be repaired at the CONTRACTOR's expense.

15. Testing Manholes

15.1 All manholes shall be subject to vacuum testing in accordance with ASTM C1244. Vacuum testing shall be conducted in the presence of the ENGINEER or the ENGINEER's representative after Chimney Seal installation. Manholes shall be capable of holding a vacuum of 5 psi (10 inches of Mercury) without dropping more than 0.5 psi (1 inch of Mercury) for the times stated below:

TABLE 2.3

MINIMUM TEST TIMES FOR TYPICAL WCWD MANHOLES

Depth of Manhole (ft)	≤8	10	12	14	16	18	20	22	24	26	28	30
Time (sec)	20	25	30	35	40	45	50	55	59	64	69	74

15.2 Vacuum testing of manholes exceeding 15-feet in depth shall take groundwater into consideration and the vacuum pressure for testing shall be reduced by 0.5 psi (1 inch of Mercury) for every 5-feet of groundwater depth above the outgoing pipe. The CONTRACTOR shall determine the groundwater elevation immediately prior to vacuum testing. Manholes that do not pass the initial vacuum test shall be repaired and retested at no cost to the OWNER. A 100 percent pass rate shall be achieved.

15.3 The vacuum gauge and/or recorder used for testing pipelines will be supplied by the OWNER. The CONTRACTOR shall supply all other equipment necessary to perform the test. All test equipment shall be subject to the approval of the ENGINEER.

SECTION 3
PRECAST DUPLEX LIFT STATION (Alvaton Station)

1. Scope of the Work

1.1 The work to be accomplished under this section consists of the furnishing of all labor, materials, equipment, and services for the construction of one (1) new duplex sewage lift station, valve vault, controls, electrical, and modifications to existing facilities, complete and in full operating condition. This work is described more fully on the Drawings and is specified herein in further detail.

2. Submittals

2.1. Shop Drawings

2.1.1 All shop drawing submittals shall be made at one time. Shop Drawings shall be detailed to meet the project Specifications. This listing is not intended to be all inclusive. Additional information may be requested for points of clarification. The CONTRACTOR shall submit five (5) sets of the following:

2.1.1.1	Submersible, non-clog pumps
2.1.1.2	Pump bases and lift-out rail assemblies
2.1.1.3	Pre-cast concrete structures
2.1.1.4	Access hatches
2.1.1.5	Access hatch safety grates
2.1.1.6	Ladders
2.1.1.7	Piping, connections, couplings, and fittings
2.1.1.8	Check valves, gate valves and ball valves
2.1.1.9	Flow Meter
2.1.1.10	Pressure gauges and diaphragm seals
2.1.1.11	Vent pipes
2.1.1.12	Penetration seals

2.2. Operation and Maintenance Manual

The Operation and Maintenance Manual (O & M Manual) shall be delivered to and approved by the ENGINEER. The information contained in the O & M Manual shall be specifically for the equipment supplied and shall contain no superfluous materials. The O & M Manual shall be supplied in a single bound volume and provide information for each mechanical and electrical component supplied by the CONTRACTOR. All warranty information shall be included. Three (3) paper copies and one (1) digital copy of the O & M Manual shall be supplied.

3. Excavation, Backfilling, and Restoration

3.1. Excavation

3.1.1 All excavation required for execution of the work shall be done as part of the lump sum price for the precast duplex lift station; no classification of excavation will be made.

3.1.2 Excavation of every description and of whatever substances encountered within the grading limits of the project shall be performed to the lines and grades indicated on the Drawings. All excavation shall be performed in the manner and sequence as required for the work.

3.1.3 All excavated materials that meet the requirements for fill, subgrades or backfill shall be stockpiled within the site for use as fill or backfill, or for providing the final site grades. Where practicable, suitable excavated material shall be transported directly to any place in the fill areas within the limits of the work. All excavated materials which are not suitable for fill, and any surplus of excavated material which is not required for fill shall be disposed of by the CONTRACTOR.

3.1.4 The site shall be kept free of surface water at all times. The CONTRACTOR shall install drainage ditches, dikes and shall perform all pumping and other work necessary to divert or remove rainfall and all other accumulations of surface water from the excavations. The diversion and removal of surface water shall be performed in a manner that will prevent other locations within the construction area where it may be detrimental. The CONTRACTOR shall provide, install and operate sufficient trenches, sumps, pumps, hose piping, wellpoints, deep wells, etc., necessary to depress and maintain the ground water table. The ground water table shall be lowered in advance of excavation and maintained a minimum of two-feet below the lowest excavation subgrade made until the structure has sufficient strength and weight to withstand horizontal and vertical soil and water pressures from natural ground water. The CONTRACTOR shall provide erosion control measures such as silt fences, straw bales, dikes, or other methods to control erosion within the construction limits.

3.1.5 Excavations for concrete structural slabs on existing grade shall extend a minimum of six-inches below the indicated bottom of slabs. The six-inches of over-excavation shall be backfilled with No. 610 crushed stone and compacted. The fill layer shall extend beyond the limits of the concrete slab a minimum of two-feet on all sides or as indicated on the Drawings.

3.1.6 Excavations for the construction shall be carefully made to the depths required. Bottoms for footings and grade beams shall be level,

clean and clear of loose material, and the lower sections true to size. Bottoms of footings and grade beams, in all locations, shall be at a minimum depth of 30-inches below adjacent exterior finished grade or 30-inches below adjacent existing grade, whichever is lower, whether so indicated or not. Footings and grade beam bottoms shall be inspected by the ENGINEER before any concrete is placed thereon.

3.1.7 In excavations for structures where, in the opinion of the ENGINEER, the ground is spongy or otherwise unsuitable for the contemplated foundation, the CONTRACTOR shall remove such unsuitable material and replace it with suitable material properly compacted.

3.1.8 Sheeting and shoring shall be provided as necessary for the protection of the work or existing structures and for the safety of the personnel at the expense of the CONTRACTOR. The clearances and types of the temporary structures, insofar as they affect the character of the finished work, will be subject to the review of the ENGINEER, but the CONTRACTOR shall be responsible for the adequacy of all sheeting, bracing and cofferdamning. All shoring, bracing and sheeting shall be removed as the excavations are backfilled in a manner such as to prevent injurious caving; or, if so directed by the ENGINEER, shall be left in place. Sheeting left in place shall be cut off 18-inches below the surface.

3.1.9 Excavation of structures which have been carried below the depths indicated without specific instructions shall be refilled to the proper grade with suitable material properly compacted, except that in excavation for columns, walls or footings, the concrete footings shall extend to this lower depth. All work of this nature shall be at the CONTRACTOR's expense.

3.1.10 All blasting shall conform to the requirements of Section 5, Paragraph 4, "Blasting."

3.2. Fill

3.2.1 All existing fill below structures or paved areas must be stripped. The upper six-inches of the natural subgrade below shall be scarified and recompacted at optimum moisture to at least ninety-five percent (95%) of Standard Proctor Density ASTM D 698-78.

3.2.2 All vegetation, such as roots, brush, heavy sods, heavy growth of grass and all decayed vegetable matter, rubbish and other unsuitable material within the area upon which fill is to be placed shall be stripped or otherwise removed before the fill is started. In no case will such objectionable material be allowed to remain in or under the fill area.

3.2.3 Existing fill from excavated areas on site shall be used as fill for

open and/or planted areas. Additional fill stockpiled at the site can be used for structural fill if approved by the ENGINEER. Any additional material necessary for establishing the indicated grades shall be furnished by the CONTRACTOR and approved by the ENGINEER. All fill material shall be free from trash, roots and other organic material. The best material to be used in fills shall be reserved for backfilling pipelines and for finishing and dressing the surface. Material larger than 3-inches maximum dimension shall not be permitted in the upper 6-inches of the fill area. Fill material shall be placed in successive layers and thoroughly tamped or rolled in a manner approved by the ENGINEER, each layer being moistened or dried such that the specified degree of compaction shall be obtained. No fill shall be placed or compacted in a frozen condition or on top of frozen material. No fill material shall be placed when free water is standing on the surface of the area where the fill is to be placed and no compaction of fill will be permitted with free water on any point of the surface of the fill to be compacted.

3.2.4 Where concrete slabs are placed on earth, all loam and organic or other unsuitable material shall be removed. Where fill is required to raise the subgrade for concrete slabs to the elevations as indicated on the Drawings or as required by the ENGINEER, such fill shall consist of suitable material and shall be placed in layers. Each layer shall be moistened or dried such that specified degree of compaction shall be obtained. All compaction shall be accomplished in a manner and with equipment as approved by the ENGINEER. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12-inches and compacted as specified of adjacent fill.

3.3. Backfilling

3.3.1 After completion of footings, walls and other construction below the elevation of the final grades and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall be as specified for suitable material, placed and compacted as specified hereinafter. Backfill shall be placed in horizontal layers of the thickness specified and shall have a moisture content such that the required degree of compaction is obtained. Each layer shall be compacted by mechanical tampers or by other suitable equipment approved by the ENGINEER to the specified density. Special care shall be taken to prevent wedging action and eccentric loading upon or against the structure. **In locations where adequate compaction is not practical, the CONTRACTOR shall use crushed stone, as approved by the ENGINEER, for backfill. The CONTRACTOR shall use crushed stone for backfill in the areas under the valve vault and under any piping.**

3.3.2 The trenches shall be backfilled following visual inspection by the ENGINEER and prior to pressure testing. The trenches shall be carefully backfilled with the excavated materials approved for backfilling, or other suitable materials, free from large clods of earth or stones. Each layer shall be compacted to a density at least equal to that of the surrounding earth and in such a manner as to permit the rolling and compaction of the filled trench with the adjoining earth to provide the required bearing value, so that paving can proceed immediately after backfilling is completed.

3.4. Compaction

3.4.1 Suitable material as hereinbefore specified shall be placed in horizontal layers. Compaction shall be performed by rolling with approved tamping rollers, pneumatic-tired rollers, three wheel power rollers or other approved equipment. The degree of compaction required is expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D-698. Laboratory moisture density tests may be performed on all fill material if directed by the ENGINEER. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction. Compaction requirements shall be as specified in Table 3.1.

TABLE 3.1

COMPACTION REQUIREMENTS FOR BACKFILL

Fill Utilized For:	Density (%)	Maximum Permissible Lift Thickness as Compacted (Inches)
Backfill & Utility Trenches Under Foundations & Pavements	95-100	8
Backfill Around Structures	95-100	8
Field and Utility Trench Backfill Under Sidewalks & Open Areas	90-100	8

3.4.2 Field density tests may be performed in sufficient number to insure that the specified density is being obtained. Tests shall be in accordance with ASTM Standards D 1556 or D 2922/D 3017 and shall be performed as authorized by the ENGINEER. Payment for field density tests shall be by the OWNER.

3.5. Site Grading

3.5.1 Where indicated or directed, topsoil shall be removed without contamination with subsoil and spread on areas already graded and prepared for topsoil, or transported and stockpiled convenient to areas for later application, or at locations specified. Topsoil shall be stripped to full depth and, when stored, shall be kept separate from other excavated

materials and piled free of roots, stones, and other undesirable materials.

3.5.2 Following stripping, fill areas shall be scarified to a minimum depth of six-inches to provide bond between existing ground and the fill material. Material should be placed in successive horizontal layers not exceeding 12-inches uncompacted thickness.

3.5.3 In general, layers shall be placed approximately parallel to the finished grade line.

3.5.4 In general and unless otherwise specified, the CONTRACTOR may use any type of earth moving equipment he has at his disposal, provided such equipment is in satisfactory condition and of such type and capacity that the work may be accomplished properly and the grading schedule maintained. The CONTRACTOR shall also furnish, operate and maintain graders, dozers, and other such equipment as is necessary to control uniform layers, section and smoothness of grade for compaction and drainage.

3.5.5 During construction, the CONTRACTOR shall route equipment at all times, both when loaded and empty, over the layers as they are placed, and shall distribute the travel evenly over the entire area.

3.5.6 The material in the layers shall be of the proper moisture content before rolling or tamping to obtain the prescribed compaction. Wetting or drying throughout the layer shall be required. Should the material be too wet to permit proper compaction or rolling, all work on the fill thus affected shall be delayed until the material has dried to the required moisture content. If the material is too dry, it shall be sprinkled with water and manipulated to obtain the uniform moisture content required throughout a layer before it is compacted.

3.5.7 Each layer of the fill shall be compacted by rolling or tamping to not less than 90% maximum density at optimum moisture content as determined by field density tests made by the Standard Proctor method in accordance with ASTM D 698.

3.5.8 In general and unless otherwise specified, the CONTRACTOR may use any type of compaction equipment such as sheepsfoot rollers, pneumatic rollers, smooth rollers an other such equipment he has at his disposal, provided such equipment is in satisfactory condition and is of such design, type, size, weight, and quantity to obtain the required density in the embankment.

3.5.9 If at any time the required density is not being obtained with the equipment then in use by the CONTRACTOR, the ENGINEER may require that different and/or additional compaction equipment be obtained

and placed in use at once to obtain the required compaction.

3.5.10 Samples of all fill and embankment materials, both before and after placement and compaction, may be taken by the ENGINEER, and from the test made on such samples, certain corrections, adjustments, and modifications of methods, material, and moisture content will be directed to obtain uniformity with the governing Specifications for compaction to properly construct the fill and embankment.

3.5.11 The CONTRACTOR shall be responsible for the stability of all embankments and shall replace any portion which, in the opinion of the ENGINEER, has become displaced due to carelessness or negligence on the part of the CONTRACTOR.

4. Wetwell and Valve Vault

4.1. General

The wetwell and valve vault shall be precast according to the Drawings and these Specifications. All concrete used in precast structures shall be designed for a 28-day comprehensive strength of 4,000 psi. Penetration seals shall be used at the inlets and outlets of the structures and the devices shall be approved by the ENGINEER. The wetwell and valve vault shall be constructed completely watertight. Where the wetwell is not constructed on a rock bearing surface or where rock has been undercut to a depth greater than 12-inches below the bottom of the wetwell, the wetwell shall be constructed on a poured in place concrete slab as shown on the Drawings.

4.2. Precast Wetwell and Valve Vault Sections

4.2.1 Precast reinforced concrete sections shall conform in every respect with ASTM C-478 Type B Wall, "Precast Reinforced Concrete Manhole Risers & Tops."

4.2.2 Joints between precast sections shall be sealed with butyl resin sealant, ConSeal CS-202 or equal and polyolefin backed exterior joint wrap, ConSeal CS-212, or approved equal. Following placement of precast section, non-shrink grout shall be spread in joint spaces and other irregularities inside wetwells and vaults and troweled smooth.

4.3. Bottoms

Bottoms shall be constructed of concrete and shall form a smooth section as shown on the Drawings. The bottom shall be precast or otherwise constructed when the wetwell and valve vault is being built. The valve vault floor shall be sloped to provide positive drain to the floor drain.

4.4. Grouting Base Plates

Grout all base plates, anchor bolts, etc. with Ferroso "G" Redi-Mix by W. R. Grace; Embeco (Pre-Mixed) by Master Builders or approved equal. For clearances 1-inch thick, add only water to the grout. For clearances 1- to 2-inch, use Embeco Special or add pea gravel graded 90% passing 3/8-inch screen and 90% retained in No. 4. Follow manufacturer's directions. Mix in hand-turned mortar mixer for 3 minutes. Do no retempering. Place according to manufacturer's approved method.

4.5. Penetration Seals

Wetwell and valve vault penetration seals shall be modular, mechanical seal, consisting of rubber links shaped to continuously fill the annular space between the pipe and the wall opening. Hardware shall be 316 Stainless Steel. Penetration seals shall be Link-Seal S-316 as manufactured by Pipeline Seal & Insulator, Inc., or approved equal.

5. Station Piping and Hardware

5.1. General

Except as described hereinafter station piping and hardware work shall be performed as described in all other applicable Sections of these Detailed Specifications.

5.2. Work Included

CONTRACTOR shall provide all labor, materials, equipment and services required for furnishing and installing all yard piping, hardware, and appurtenances specified herein.

5.3. Ductile Iron Pipe and Fittings

5.3.1 Piping *within* the station and valve pit shall be flanged joint Class 53 cement lined ductile iron with proper bolts and gaskets. All concrete anchor bolts used for any part of this station installation shall be stainless steel. All flange bolts shall be stainless steel.

5.3.2 Flanged fittings shall be ANSI/AWWA C110/A21.10. Mechanical Joint (MJ) fittings shall be ANSI/AWWA C110/A21.10. All flanged pipe and fittings shall be SP10 sandblasted and receive two (2) coats of 46H413 "HiBuild Temetar", Bitumastic, or approved equal with a thickness of 8-10 mils per coat. A detailed and scaled shop drawing of the piping, valves, etc. shall be submitted for approval.

5.3.3 The installed discharge piping, valve system, and force main shall be of such requirements to maintain the testing required in Section 2,

Paragraph 13.

5.3.4 The CONTRACTOR will be required to perform both pressure and leakage tests to ensure conformance to the testing requirements of the preceding paragraph, if the pressure test fails.

5.3.5 Flange bolts shall be stainless steel ASTM A/93, Grade B-8 Type 304, flange gaskets 1/8-inch ring gaskets.

5.3.6 All piping shall be installed plum and without strains or binds. Piping shall be properly supported.

5.4. Gate Valves

All gate valves in the valve vault shall comply with AWWA specification C509 and shall be the resilient seat type, iron body, non-rising stem with handwheel. The rubber covered gate shall not be wedged into a pocket nor slide across the seating surface to obtain tight closure. Valves shall be suitable for water working pressures of 200 psi for sizes 12-inch and smaller. Valves shall be flanged and of the highest quality both as to materials and workmanship. Gate valves shall be Style 3067 by M & H Valve Company, Mueller Model 2370, or approved equal.

5.5. Check Valves

Check valves shall be lever and weight swing type, rubber disk and shall be manufactured by Mueller, or approved equal. The valve design shall be of such to allow for operation when negative heads are encountered. The valve shall be designed to operate at all pressures in the sewer system.

5.6. Gauges & Gauge Taps

A minimum of three 3/4-inch N.P.T. taps shall be supplied in the valve vault as shown on the Drawings. Each tap shall be supplied with a type 304 stainless steel nipple and bronze ball valve. The CONTRACTOR shall provide three gauges and install on the tap assemblies as specified by the ENGINEER. Each gauge assembly shall include one 3/4-inch Type 304 stainless steel nipple, one diaphragm seal, and one pressure gauge. The diaphragm seal shall be Ashcroft Model 100SS, or approved equal, with a 3/4-inch process inlet and a 1/4-inch gauge connection. The gauge shall have a polycarbonate window for shatterproof protection. The lower stem shall have a 1/4-inch connection. The burden tube shall be AISI 316 stainless steel. The gauge shall be a 3 1/2-inch Ashcroft 1009 SWL 02L, 0-100 psi/0-230 feet water, or approved equal.

5.7. Access Hatches - Wetwell and Valve Vault

5.7.1 Aluminum access hatches shall be furnished and installed as shown on the Drawings. Wetwell and valve vault hatches shall be sized as shown on the Drawings. The hatches shall be of non-skid design and designed to withstand a load of 300 pounds per square foot. A locking hasp shall be provided for each hatch. A positive hold open bar shall be provided to secure the hatch in the open position. Stainless steel bolts for mounting each rail support plate shall be furnished so that each set of guide rails can mount directly to the access hatch.

5.7.2 All hinges and hinge bolts shall be stainless steel. All hinge bolt nuts shall be tack welded to prevent removal of bolts. All fasteners used on the hatches shall be non corrosive. All areas of hatch frames that will be in contact with concrete shall be coated with bitumastic paint.

5.7.3 The wetwell hatch shall be furnished with factory installed stainless steel bolts for securing the guide rail support plates, chain hooks and cable strain reliefs. Holes for these bolts shall be drilled and tapped at the factory. Bolts as required shall be threaded into the hatch frame from the concrete side and secured with stainless steel nuts.

5.7.4 All bolts shall be installed to prevent interference when closing the hatch. An adequate offset of the hatch stiffeners shall be made so that field installation of the guide rail top support plates will not interfere with closing of the hatch.

5.7.5 Hatches shall include a permanently installed fall through prevention grate system which provides continuous safety assurance in both its closed and open positions. The system shall be X-Series Retro-Grate as manufactured by Halliday Products, or approved equal.

5.7.6 The fall through prevention system shall be constructed from aluminum "I" bar with 316 stainless steel hardware. The grate shall be designed to withstand a load of 300 lbs. per square foot. The grate shall automatically lock in the upright position. Aluminum pull rods shall be attached to the grate's leafs to assist in the raising of the grate. **The grate and associated hardware shall not interfere with the pump lift out rail assemblies.**

5.8. Vent Pipe

Exterior vent pipes shall be round, schedule 40 steel pipe, ASTM A-53 with butt weld. Standard weight steel fittings, ASTM A-234. A stainless steel insect/bird screen shall be provided on the vent. The vent pipe shall be painted with two (2) coats of white Rustoleum 9800 DTM Urethane Mastic, or approved equal.

5.9. Ladders

Aluminum access ladders shall be provided as shown on the Drawings. The ladder will meet UL and OSHA requirements under the Type I, Heavy Duty Specifications. The ladder shall have 1 1/4-inch diameter, tempered, serrated rungs with 3-inch by 1 1/8-inch full I-Beam side rails. The uppermost ends of the side rails will be protected by plastic caps bolted into place. The complete access ladder will be bolted into place, at a minimum of two (2) points both top and bottom, and shall have intermediate supports for each 8-feet of height. The first step of each ladder shall be located within 12-inches of the top surface of the top slab. All ladders shall be manufactured by U.S.F. Fabrication Inc., or approved equal, and shall be complete with **dual safety extensions**.

6. Pumping Equipment

6.1 The pumps shall be capable of delivering wastewater at the flow rate listed against the total dynamic head for each operating point listed. The minimum acceptable pump and motor efficiencies at this condition shall be as shown on Table 3.2. Due to the energy conservation requirements, the minimum efficiency will be enforced. The maximum allowable speed and the minimum rated horsepower of each pump motor shall be as listed on Table 3.2.

6.2 All station accessories and equipment shall be capable of delivering wastewater at the rated flow, head, and efficiency conditions listed on Table 3.2.

TABLE 3.2

PUMP OPERATIONAL REQUIREMENTS

FLOW (GPM)	HEAD (FT)	SPEED (RPM)	PUMP EFF (%)	MOTOR (HP)	MOTOR VOLTAGE
313	118	1,800	50	30	480

6.3 Pump components such as the submersible motor housing, terminal board cover, casing, impeller, and discharge elbow are to be close-grained, high-grade cast iron, ASTM A-48 Class 30B. All external fasteners shall be stainless steel, grade 304. The pump shall be capable of passing a minimum of 3-inch diameter solid sphere. Impellers shall be keyed to the shaft and held with an o-ring gasket, impeller nut and cover. A close-tolerance, cast iron, casing wear ring is to be fitted between the casing and the impeller wear ring surface at the suction inlet.

6.4 The single, pump and motor shaft is to be high strength, carbon steel, or stainless steel, with a minimum of overhang from the lower, double row, thrust bearing. No intermediate sleeve or other bearings are to be required below the lower, thrust bearing. Radial loads and shaft deflections are to be minimized by

design of the centerline discharge casing and heavy duty, large shaft diameters to result in a lower B-10 bearing life rating of 80,000 hours minimum at the best efficiency point. The upper, single row motor bearing B-10 life is to be a minimum of 200,000 hours. The entire shaft is to be totally isolated from the pumped fluid.

6.5 The mechanical seals are to be double, independent, tandem mounted, and internally oil lubricated from a separate, oil chamber between the casing and motor. The upper seal is to have one (1) carbon face and one (1) stainless steel face, or better, operating totally in oil. The lower seal is to have one (1) tungsten-carbide face and one (1) silicon-carbide face, or better, with Alloy 20 metal parts. No external springs are to be in the pumped fluid.

6.6 The seal shall be self-adjusting, and shall not require the pumped fluid for lubrication. Both the rotor and stator are to be set at a minimum of three (3) points to prevent any possibility of premature wear from "cocking" and solids build-up. Both mechanical seals can be replaced by removing the impeller and single, seal housing, without removing the oil chamber housing or lower, thrust bearing housing. A moisture sensor probe in the motor and oil chamber housing is included to detect moisture accumulation.

6.7 The motors for the pumps shall be Nema Design B, with a minimum 30 HP at 1,800 RPM, 3 phase, 60 Hz, 480 volt, direct start. Motor windings shall include thermal overload sensors for high temperature shutdown. A separate terminal board in a watertight housing will be used to connect the power cable and a separate control cable. Cable entry shall be heavy duty, compression type, with cables sized per NEC specifications.

6.8 Impellers shall be dynamically balanced by grinding on shroud faces. No holes are to be drilled for balancing.

6.9 The volute case shall be cast iron and have a flanged center line discharge. Discharge flange shall be as required on the Drawings and shall be standard with bolt holes straddling centerline. A bronze wear ring shall be pressed into the case for guiding impeller neck and to prevent corrosion freeze-up. The wear ring is to be held from rotating by locking with stainless steel set screw.

6.10 All pump and motor castings shall be of high tensile cast iron and shall be treated with phosphate and chromate rinse. All fasteners shall be 300 series stainless steel.

6.11 Upper motor bearing cap shall be a separate casting for ease of mounting and replacement. All fasteners shall be type 300 series stainless steel.

6.12 Power cord and control cord shall be double sealed and FURNISHED IN A SINGLE UN-SPLICED PIECE FROM THE PUMP TO THE JUNCTION BOX

LOCATION AS SHOWN ON THE DRAWINGS. The power and control cord shall be single strand sealed with epoxy potting compound and then clamped in place with rubber seal bushing to seal outer jacket against leakage and to provide for strain pull. Cords shall withstand a pull of 300 pounds to meet U.L. requirements.

6.13 Insulations of power and control cord shall be type SO or STOW. Both control and power cords shall have a green carrier ground conductor that attaches to motor frame.

6.14 A sealing plate shall be attached to the pump. A simple downward sliding motion of the pump and guide plate on the guide rails shall cause the unit to be automatically connected and sealed to the base. The sealing plate shall provide metal to metal or shall have a machined groove to hold a solid bronze sealing ring in place. The solid bronze sealing ring shall be held in place by water proof, metal to metal epoxy. The pump shall be six inch and shall utilize an appropriate sealing plate for connection to each base.

6.15 The pumps shall be Myers 4VB, Flygt, or approved equal.

7. Rail System and Accessories

7.1 The lift out rail system shall consist of a cast iron discharge base with elbow, and cast iron pump attaching and sealing plate. All exposed nuts, bolts and fasteners shall be of 300 series stainless steel.

7.2 The discharge elbow shall be 4-inch, as indicated on the Drawings and shall have a standard 125# flange.

7.3 Two (2) rail pipes shall be used to guide the pump from the surface to the discharge base connection. The guide rails shall be 2-inch schedule 40 stainless steel pipe. The guide rails shall be firmly attached to the access hatch frame. The system shall have intermediate guide supports as shown on the Drawings and recommended by the Manufacturer.

7.4 An adequate length of 5/16-inch minimum stainless steel lifting chain shall be installed for removing the pump.

7.5 All concrete anchor bolts and flange bolts used for any part of this installation shall be stainless steel. One (1) each aluminum top rail support plate shall be installed for each pump.

8. Flow Meter

8.1 The flow meter shall be the magnetic flow type with a minimum accuracy of ±0.2 percent of rate for velocities greater than 1.64 ft/s, ±0.0032 ft/s for velocities less than 1.64 ft/s. The meter shall be flanged and conform to ANSI Class 125. The electrode material shall be Alloy C, and the liner shall be PTFE.

The meter shall be NEMA 6P rated. Stainless steel grounding rings shall be provided.

8.2 The meter amplifier unit shall be remotely mounted within the pump control panel. The amplifier shall be mounted to the back plate of the panel with appropriate stand-off to allow the front of the amplifier to be flush with the full dead front panel. The full dead front panel shall have an appropriately sized cut-out to allow convenient viewing and control of the amplifier.

8.3 The amplifier shall accept 120V AC input power. The unit shall provide a 4-20 mA analog output and four (4) digital outputs, and two (2) pulse outputs. The unit shall include a LCD display and 3-button control interface. The housing of the amplifier shall be NEMA 4X rated. The cable between the detector and amplifier units shall be supplied with the meter and be of sufficient length. Splicing of the cable shall not be permitted.

8.4 The meter shall be Badger Meter Model M2000, or approved equal.

9. Site Safety

In accordance with General Conditions, Paragraph 11.1, the CONTRACTOR is responsible for all construction site safety. Safety measures shall include, as a minimum, the installation of temporary construction barrier fencing, as shown on the Drawings. The fencing may be removed as necessary during the performance of the Work, however, any time Work is suspended for any reason the fencing shall be restored. Fencing shall be minimum 4-foot tall, and be constructed of thermoplastic. The color shall be safety orange. Fencing shall be properly secured to appropriate posts at intervals recommended by the manufacturer.

10. Start-up

10.1 The CONTRACTOR shall coordinate the start-up of the lift station. The Manufacturer shall provide the services of a factory-trained representative for a maximum period of one day on-site to perform initial start-up and to instruct the OWNER's operating personnel in the operation and maintenance of the equipment.

10.2 The manufacturer or the manufacturer's authorized distributor must provide start-up services which will include: voltage check; amp check; installation check; rotation check; and draw down tests to establish pump capacity. A written report to the ENGINEER must be submitted after start-up. The start-up shall satisfy any and all requirements outlined in the warranty for placing the station in service.

11. Warranty

The pump manufacturer shall provide a full, non-prorated warranty for the pumps covering defects in workmanship and material covering parts and labor for a period of five (5) years.

12. Contract Drawings

The Contract Drawings are intended to show a general arrangement of the pumping equipment, drives, structural supports, foundations, connecting piping, and valves.

SECTION 3A
DUPLEX LIFT STATION UPGRADE (Phil Moore Park Station)

1. Scope of the Work

1.1 The work to be accomplished under this section consists of the furnishing of all labor, materials, equipment, and services for the **upgrade** of one (1) duplex sewage lift station, **new valve vault**, and modifications to existing facilities, complete and in full operating condition. **The existing electrical and controls will be reused as-is.** This work is described more fully on the Drawings and is specified herein in further detail.

2. Submittals

2.1. Shop Drawings

2.1.1 All shop drawing submittals shall be made at one time. Shop Drawings shall be detailed to meet the project Specifications. This listing is not intended to be all inclusive. Additional information may be requested for points of clarification. The CONTRACTOR shall submit five (5) sets of the following:

2.1.1.1	Submersible, **grinder** pumps
2.1.1.2	Pump bases and lift-out rail assemblies
2.1.1.3	Pre-cast concrete structures
2.1.1.4	Access hatches
2.1.1.6	Ladders
2.1.1.7	Piping, connections, couplings, and fittings
2.1.1.8	Check valves, gate valves and ball valves
2.1.1.10	Pressure gauges and diaphragm seals
2.1.1.11	Vent pipes
2.1.1.12	Penetration seals

2.2. Operation and Maintenance Manual

The Operation and Maintenance Manual (O & M Manual) shall be delivered to and approved by the ENGINEER. The information contained in the O & M Manual shall be specifically for the equipment supplied and shall contain no superfluous materials. The O & M Manual shall be supplied in a single bound volume and provide information for each mechanical and electrical component supplied by the CONTRACTOR. All warranty information shall be included. Three (3) paper copies and one (1) digital copy of the O & M Manual shall be supplied.

3. Excavation, Backfilling, and Restoration

3.1. Excavation

3.1.1 All excavation required for execution of the work shall be done as part of the lump sum price for the precast duplex lift station; no classification of excavation will be made.

3.1.2 Excavation of every description and of whatever substances encountered within the grading limits of the project shall be performed to the lines and grades indicated on the Drawings. All excavation shall be performed in the manner and sequence as required for the work.

3.1.3 All excavated materials that meet the requirements for fill, subgrades or backfill shall be stockpiled within the site for use as fill or backfill, or for providing the final site grades. Where practicable, suitable excavated material shall be transported directly to any place in the fill areas within the limits of the work. All excavated materials which are not suitable for fill, and any surplus of excavated material which is not required for fill shall be disposed of by the CONTRACTOR.

3.1.4 The site shall be kept free of surface water at all times. The CONTRACTOR shall install drainage ditches, dikes and shall perform all pumping and other work necessary to divert or remove rainfall and all other accumulations of surface water from the excavations. The diversion and removal of surface water shall be performed in a manner that will prevent other locations within the construction area where it may be detrimental. The CONTRACTOR shall provide, install and operate sufficient trenches, sumps, pumps, hose piping, wellpoints, deep wells, etc., necessary to depress and maintain the ground water table. The ground water table shall be lowered in advance of excavation and maintained a minimum of two-feet below the lowest excavation subgrade made until the structure has sufficient strength and weight to withstand horizontal and vertical soil and water pressures from natural ground water. The CONTRACTOR shall provide erosion control measures such as silt fences, straw bales, dikes, or other methods to control erosion within the construction limits.

3.1.5 Excavations for concrete structural slabs on existing grade shall extend a minimum of six-inches below the indicated bottom of slabs. The six-inches of over-excavation shall be backfilled with No. 610 crushed stone and compacted. The fill layer shall extend beyond the limits of the concrete slab a minimum of two-feet on all sides or as indicated on the Drawings.

3.1.6 Excavations for the construction shall be carefully made to the depths required. Bottoms for footings and grade beams shall be level, clean and clear of loose material, and the lower sections true to size. Bottoms of footings and grade beams, in all locations, shall be at a

minimum depth of 30-inches below adjacent exterior finished grade or 30-inches below adjacent existing grade, whichever is lower, whether so indicated or not. Footings and grade beam bottoms shall be inspected by the ENGINEER before any concrete is placed thereon.

3.1.7 In excavations for structures where, in the opinion of the ENGINEER, the ground is spongy or otherwise unsuitable for the contemplated foundation, the CONTRACTOR shall remove such unsuitable material and replace it with suitable material properly compacted.

3.1.8 Sheeting and shoring shall be provided as necessary for the protection of the work or existing structures and for the safety of the personnel at the expense of the CONTRACTOR. The clearances and types of the temporary structures, insofar as they affect the character of the finished work, will be subject to the review of the ENGINEER, but the CONTRACTOR shall be responsible for the adequacy of all sheeting, bracing and cofferdamning. All shoring, bracing and sheeting shall be removed as the excavations are backfilled in a manner such as to prevent injurious caving; or, if so directed by the ENGINEER, shall be left in place. Sheeting left in place shall be cut off 18-inches below the surface.

3.1.9 Excavation of structures which have been carried below the depths indicated without specific instructions shall be refilled to the proper grade with suitable material properly compacted, except that in excavation for columns, walls or footings, the concrete footings shall extend to this lower depth. All work of this nature shall be at the CONTRACTOR's expense.

3.1.10 All blasting shall conform to the requirements of Section 5, Paragraph 4, "Blasting."

3.2. Fill

3.2.1 All existing fill below structures or paved areas must be stripped. The upper six-inches of the natural subgrade below shall be scarified and recompacted at optimum moisture to at least ninety-five percent (95%) of Standard Proctor Density ASTM D 698-78.

3.2.2 All vegetation, such as roots, brush, heavy sods, heavy growth of grass and all decayed vegetable matter, rubbish and other unsuitable material within the area upon which fill is to be placed shall be stripped or otherwise removed before the fill is started. In no case will such objectionable material be allowed to remain in or under the fill area.

3.2.3 Existing fill from excavated areas on site shall be used as fill for open and/or planted areas. Additional fill stockpiled at the site can be used for structural fill if approved by the ENGINEER. Any additional

material necessary for establishing the indicated grades shall be furnished by the CONTRACTOR and approved by the ENGINEER. All fill material shall be free from trash, roots and other organic material. The best material to be used in fills shall be reserved for backfilling pipelines and for finishing and dressing the surface. Material larger than 3-inches maximum dimension shall not be permitted in the upper 6-inches of the fill area. Fill material shall be placed in successive layers and thoroughly tamped or rolled in a manner approved by the ENGINEER, each layer being moistened or dried such that the specified degree of compaction shall be obtained. No fill shall be placed or compacted in a frozen condition or on top of frozen material. No fill material shall be placed when free water is standing on the surface of the area where the fill is to be placed and no compaction of fill will be permitted with free water on any point of the surface of the fill to be compacted.

3.2.4 Where concrete slabs are placed on earth, all loam and organic or other unsuitable material shall be removed. Where fill is required to raise the subgrade for concrete slabs to the elevations as indicated on the Drawings or as required by the ENGINEER, such fill shall consist of suitable material and shall be placed in layers. Each layer shall be moistened or dried such that specified degree of compaction shall be obtained. All compaction shall be accomplished in a manner and with equipment as approved by the ENGINEER. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12-inches and compacted as specified of adjacent fill.

3.3. Backfilling

3.3.1 After completion of footings, walls and other construction below the elevation of the final grades and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall be as specified for suitable material, placed and compacted as specified hereinafter. Backfill shall be placed in horizontal layers of the thickness specified and shall have a moisture content such that the required degree of compaction is obtained. Each layer shall be compacted by mechanical tampers or by other suitable equipment approved by the ENGINEER to the specified density. Special care shall be taken to prevent wedging action and eccentric loading upon or against the structure. **In locations where adequate compaction is not practical, the CONTRACTOR shall use crushed stone, as approved by the ENGINEER, for backfill. The CONTRACTOR shall use crushed stone for backfill in the areas under the valve vault and under any piping.**

3.3.2 The trenches shall be backfilled following visual inspection by the ENGINEER and prior to pressure testing. The trenches shall be carefully

backfilled with the excavated materials approved for backfilling, or other suitable materials, free from large clods of earth or stones. Each layer shall be compacted to a density at least equal to that of the surrounding earth and in such a manner as to permit the rolling and compaction of the filled trench with the adjoining earth to provide the required bearing value, so that paving can proceed immediately after backfilling is completed.

3.4. Compaction

3.4.1 Suitable material as hereinbefore specified shall be placed in horizontal layers. Compaction shall be performed by rolling with approved tamping rollers, pneumatic-tired rollers, three wheel power rollers or other approved equipment. The degree of compaction required is expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D-698. Laboratory moisture density tests may be performed on all fill material if directed by the ENGINEER. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction. Compaction requirements shall be as specified in Table 3.1.

TABLE 3.1

COMPACTION REQUIREMENTS FOR BACKFILL

Fill Utilized For:	Density (%)	Maximum Permissible Lift Thickness as Compacted (Inches)
Backfill & Utility Trenches Under Foundations & Pavements	95-100	8
Backfill Around Structures	95-100	8
Field and Utility Trench Backfill Under Sidewalks & Open Areas	90-100	8

3.4.2 Field density tests may be performed in sufficient number to insure that the specified density is being obtained. Tests shall be in accordance with ASTM Standards D 1556 or D 2922/D 3017 and shall be performed as authorized by the ENGINEER. Payment for field density tests shall be by the OWNER.

3.5. Site Grading

3.5.1 Where indicated or directed, topsoil shall be removed without contamination with subsoil and spread on areas already graded and prepared for topsoil, or transported and stockpiled convenient to areas for later application, or at locations specified. Topsoil shall be stripped to full depth and, when stored, shall be kept separate from other excavated materials and piled free of roots, stones, and other undesirable materials.

3.5.2 Following stripping, fill areas shall be scarified to a minimum depth of six-inches to provide bond between existing ground and the fill material. Material should be placed in successive horizontal layers not exceeding 12-inches uncompacted thickness.

3.5.3 In general, layers shall be placed approximately parallel to the finished grade line.

3.5.4 In general and unless otherwise specified, the CONTRACTOR may use any type of earth moving equipment he has at his disposal, provided such equipment is in satisfactory condition and of such type and capacity that the work may be accomplished properly and the grading schedule maintained. The CONTRACTOR shall also furnish, operate and maintain graders, dozers, and other such equipment as is necessary to control uniform layers, section and smoothness of grade for compaction and drainage.

3.5.5 During construction, the CONTRACTOR shall route equipment at all times, both when loaded and empty, over the layers as they are placed, and shall distribute the travel evenly over the entire area.

3.5.6 The material in the layers shall be of the proper moisture content before rolling or tamping to obtain the prescribed compaction. Wetting or drying throughout the layer shall be required. Should the material be too wet to permit proper compaction or rolling, all work on the fill thus affected shall be delayed until the material has dried to the required moisture content. If the material is too dry, it shall be sprinkled with water and manipulated to obtain the uniform moisture content required throughout a layer before it is compacted.

3.5.7 Each layer of the fill shall be compacted by rolling or tamping to not less than 90% maximum density at optimum moisture content as determined by field density tests made by the Standard Proctor method in accordance with ASTM D 698.

3.5.8 In general and unless otherwise specified, the CONTRACTOR may use any type of compaction equipment such as sheepsfoot rollers, pneumatic rollers, smooth rollers an other such equipment he has at his disposal, provided such equipment is in satisfactory condition and is of such design, type, size, weight, and quantity to obtain the required density in the embankment.

3.5.9 If at any time the required density is not being obtained with the equipment then in use by the CONTRACTOR, the ENGINEER may require that different and/or additional compaction equipment be obtained and placed in use at once to obtain the required compaction.

3.5.10 Samples of all fill and embankment materials, both before and after placement and compaction, may be taken by the ENGINEER, and from the test made on such samples, certain corrections, adjustments, and modifications of methods, material, and moisture content will be directed to obtain uniformity with the governing Specifications for compaction to properly construct the fill and embankment.

3.5.11 The CONTRACTOR shall be responsible for the stability of all embankments and shall replace any portion which, in the opinion of the ENGINEER, has become displaced due to carelessness or negligence on the part of the CONTRACTOR.

4. Wetwell and Valve Vault

4.1. General

The existing Wetwell will be modified and re-used. A new Valve Vault will be constructed.

The wetwell and valve vault shall be precast according to the Drawings and these Specifications. All concrete used in precast structures shall be designed for a 28-day comprehensive strength of 4,000 psi. Penetration seals shall be used at the inlets and outlets of the structures and the devices shall be approved by the ENGINEER. The wetwell and valve vault shall be constructed completely watertight. Where the wetwell is not constructed on a rock bearing surface or where rock has been undercut to a depth greater than 12-inches below the bottom of the wetwell, the wetwell shall be constructed on a poured in place concrete slab as shown on the Drawings.

4.2. Precast Wetwell and Valve Vault Sections

4.2.1 Precast reinforced concrete sections shall conform in every respect with ASTM C-478 Type B Wall, "Precast Reinforced Concrete Manhole Risers & Tops."

4.2.2 Joints between precast sections shall be sealed with butyl resin sealant, ConSeal CS-202 or equal and polyolefin backed exterior joint wrap, ConSeal CS-212, or approved equal. Following placement of precast section, non-shrink grout shall be spread in joint spaces and other irregularities inside wetwells and vaults and troweled smooth.

4.3. Bottoms

N/A

4.4. Grouting Base Plates

Grout all base plates, anchor bolts, etc. with Ferroso "G" Redi-Mix by W. R. Grace; Embeco (Pre-Mixed) by Master Builders or approved equal. For clearances 1-inch thick, add only water to the grout. For clearances 1- to 2-inch, use Embeco Special or add pea gravel graded 90% passing 3/8-inch screen and 90% retained in No. 4. Follow manufacturer's directions. Mix in hand-turned mortar mixer for 3 minutes. Do no retempering. Place according to manufacturer's approved method.

4.5. Penetration Seals

Wetwell and valve vault penetration seals shall be modular, mechanical seal, consisting of rubber links shaped to continuously fill the annular space between the pipe and the wall opening. Hardware shall be 316 Stainless Steel. Penetration seals shall be Link-Seal S-316 as manufactured by Pipeline Seal & Insulator, Inc., or approved equal.

5. Station Piping and Hardware

5.1. General

Except as described hereinafter station piping and hardware work shall be performed as described in all other applicable Sections of these Detailed Specifications.

5.2. Work Included

CONTRACTOR shall provide all labor, materials, equipment and services required for furnishing and installing all yard piping, hardware, and appurtenances specified herein.

5.3. Ductile Iron Pipe and Fittings

5.3.1 Piping *within* the station and valve pit shall be flanged joint Class 53 cement lined ductile iron with proper bolts and gaskets. All concrete anchor bolts used for any part of this station installation shall be stainless steel. All flange bolts shall be stainless steel.

5.3.2 Flanged fittings shall be ANSI/AWWA C110/A21.10. Mechanical Joint (MJ) fittings shall be ANSI/AWWA C110/A21.10. All flanged pipe and fittings shall be SP10 sandblasted and receive two (2) coats of 46H413 "HiBuild Temetar", Bitumastic, or approved equal with a thickness of 8-10 mils per coat. A detailed and scaled shop drawing of the piping, valves, etc. shall be submitted for approval.

5.3.3 The installed discharge piping, valve system, and force main shall be of such requirements to maintain the testing required in Section 2,

Paragraph 13.

5.3.4 The CONTRACTOR will be required to perform both pressure and leakage tests to ensure conformance to the testing requirements of the preceding paragraph, if the pressure test fails.

5.3.5 Flange bolts shall be stainless steel ASTM A/93, Grade B-8 Type 304, flange gaskets 1/8-inch ring gaskets.

5.3.6 All piping shall be installed plum and without strains or binds. Piping shall be properly supported.

5.4. Gate Valves

All gate valves in the valve vault shall comply with AWWA specification C509 and shall be the resilient seat type, iron body, non-rising stem with handwheel. The rubber covered gate shall not be wedged into a pocket nor slide across the seating surface to obtain tight closure. Valves shall be suitable for water working pressures of 200 psi for sizes 12-inch and smaller. Valves shall be flanged and of the highest quality both as to materials and workmanship. Gate valves shall be Style 3067 by M & H Valve Company, Mueller Model 2370, or approved equal.

5.5. Check Valves

Check valves shall be lever and weight swing type, rubber disk and shall be manufactured by Mueller, or approved equal. The valve design shall be of such to allow for operation when negative heads are encountered. The valve shall be designed to operate at all pressures in the sewer system.

5.6. Gauges & Gauge Taps

A minimum of three 3/4-inch N.P.T. taps shall be supplied in the valve vault as shown on the Drawings. Each tap shall be supplied with a type 304 stainless steel nipple and bronze ball valve. The CONTRACTOR shall provide three gauges and install on the tap assemblies as specified by the ENGINEER. Each gauge assembly shall include one 3/4-inch Type 304 stainless steel nipple, one diaphragm seal, and one pressure gauge. The diaphragm seal shall be Ashcroft Model 100SS, or approved equal, with a 3/4-inch process inlet and a 1/4-inch gauge connection. The gauge shall have a polycarbonate window for shatterproof protection. The lower stem shall have a 1/4-inch connection. The burden tube shall be AISI 316 stainless steel. The gauge shall be a 3 1/2-inch Ashcroft 1009 SWL 02L, 0-100 psi/0-230 feet water, or approved equal.

5.7. Access Hatches - Wetwell and Valve Vault

5.7.1 Aluminum access hatches shall be furnished and installed as shown on the Drawings. Wetwell and valve vault hatches shall be sized as shown on the Drawings. The hatches shall be of non-skid design and designed to withstand a load of 300 pounds per square foot. A locking hasp shall be provided for each hatch. A positive hold open bar shall be provided to secure the hatch in the open position. Stainless steel bolts for mounting each rail support plate shall be furnished so that each set of guide rails can mount directly to the access hatch.

5.7.2 All hinges and hinge bolts shall be stainless steel. All hinge bolt nuts shall be tack welded to prevent removal of bolts. All fasteners used on the hatches shall be non corrosive. All areas of hatch frames that will be in contact with concrete shall be coated with bitumastic paint.

5.7.4 All bolts shall be installed to prevent interference when closing the hatch. An adequate offset of the hatch stiffeners shall be made so that field installation of the guide rail top support plates will not interfere with closing of the hatch.

5.8. Vent Pipe

Exterior vent pipes shall be round, schedule 40 steel pipe, ASTM A-53 with butt weld. Standard weight steel fittings, ASTM A-234. A stainless steel insect/bird screen shall be provided on the vent. The vent pipe shall be painted with two (2) coats of white Rustoleum 9800 DTM Urethane Mastic, or approved equal.

5.9. Ladders

Aluminum access ladders shall be provided as shown on the Drawings. The ladder will meet UL and OSHA requirements under the Type I, Heavy Duty Specifications. The ladder shall have 1 1/4-inch diameter, tempered, serrated rungs with 3-inch by 1 1/8-inch full I-Beam side rails. The uppermost ends of the side rails will be protected by plastic caps bolted into place. The complete access ladder will be bolted into place, at a minimum of two (2) points both top and bottom, and shall have intermediate supports for each 8-feet of height. The first step of each ladder shall be located within 12-inches of the top surface of the top slab. All ladders shall be manufactured by U.S.F. Fabrication Inc., or approved equal, and shall be complete with **dual safety extensions**.

6. Pumping Equipment

6.1 The pumps shall be capable of delivering wastewater at the flow rate listed against the total dynamic head for each operating point listed. The

minimum acceptable pump and motor efficiencies at this condition shall be as shown on Table 3.2. ~~Due to the energy conservation requirements, the minimum efficiency will be enforced~~. The maximum allowable speed and the minimum rated horsepower of each pump motor shall be as listed on Table 3.2.

6.2 All station accessories and equipment shall be capable of delivering wastewater at the rated flow, head, and efficiency conditions listed on Table 3.2.

TABLE 3.2

PUMP OPERATIONAL REQUIREMENTS

FLOW (GPM)	HEAD (FT)	SPEED (RPM)	PUMP EFF (%)	MOTOR (HP)	MOTOR VOLTAGE
40	150	3,450	N/A	7.5	480

6.3 Pump components such as the submersible motor housing, terminal board cover, casing, impeller, and discharge elbow are to be close-grained, high-grade cast iron, ASTM A-48 Class 30B. All external fasteners shall be stainless steel, grade 304. Impellers shall be keyed to the shaft and held with an o-ring gasket, impeller nut and cover. A close-tolerance, cast iron, casing wear ring is to be fitted between the casing and the impeller wear ring surface at the suction inlet.

6.4 The single, pump and motor shaft is to be high strength, carbon steel, or stainless steel, with a minimum of overhang from the lower, double row, thrust bearing. No intermediate sleeve or other bearings are to be required below the lower, thrust bearing. Radial loads and shaft deflections are to be minimized by design of the centerline discharge casing and heavy duty, large shaft diameters to result in a lower B-10 bearing life rating of 80,000 hours minimum at the best efficiency point. The upper, single row motor bearing B-10 life is to be a minimum of 200,000 hours. The entire shaft is to be totally isolated from the pumped fluid.

6.5 The mechanical seals are to be double, independent, tandem mounted, and internally oil lubricated from a separate, oil chamber between the casing and motor. The upper seal is to have one (1) carbon face and one (1) stainless steel face, or better, operating totally in oil. The lower seal is to have one (1) tungsten-carbide face and one (1) silicon-carbide face, or better, with Alloy 20 metal parts. No external springs are to be in the pumped fluid.

6.6 The seal shall be self-adjusting, and shall not require the pumped fluid for lubrication. Both the rotor and stator are to be set at a minimum of three (3) points to prevent any possibility of premature wear from "cocking" and solids build-up. Both mechanical seals can be replaced by removing the impeller and single, seal housing, without removing the oil chamber housing or lower, thrust bearing housing. A moisture sensor probe in the motor and oil chamber housing

is included to detect moisture accumulation.

6.7 The motors for the pumps shall be Nema Design B, with a **maximum 7.5 HP** at 3,450 RPM, 3 phase, 60 Hz, 480 volt, direct start. Motor windings shall include thermal overload sensors for high temperature shutdown. A separate terminal board in a watertight housing will be used to connect the power cable and a separate control cable. Cable entry shall be heavy duty, compression type, with cables sized per NEC specifications.

6.8 Impellers shall be dynamically balanced by grinding on shroud faces. No holes are to be drilled for balancing.

6.9 The volute case shall be cast iron and have a flanged center line discharge. Discharge flange shall be as required on the Drawings and shall be standard with bolt holes straddling centerline. A bronze wear ring shall be pressed into the case for guiding impeller neck and to prevent corrosion freeze-up. The wear ring is to be held from rotating by locking with stainless steel set screw.

6.10 All pump and motor castings shall be of high tensile cast iron and shall be treated with phosphate and chromate rinse. All fasteners shall be 300 series stainless steel.

6.11 Upper motor bearing cap shall be a separate casting for ease of mounting and replacement. All fasteners shall be type 300 series stainless steel.

6.12 Power cord and control cord shall be double sealed and FURNISHED IN A SINGLE UN-SPLICED PIECE FROM THE PUMP TO THE JUNCTION BOX LOCATION AS SHOWN ON THE DRAWINGS. The power and control cord shall be single strand sealed with epoxy potting compound and then clamped in place with rubber seal bushing to seal outer jacket against leakage and to provide for strain pull. Cords shall withstand a pull of 300 pounds to meet U.L. requirements.

6.13 Insulations of power and control cord shall be type SO or STOW. Both control and power cords shall have a green carrier ground conductor that attaches to motor frame.

6.14 A sealing plate shall be attached to the pump. A simple downward sliding motion of the pump and guide plate on the guide rails shall cause the unit to be automatically connected and sealed to the base. The sealing plate shall provide metal to metal or shall have a machined groove to hold a solid bronze sealing ring in place. The solid bronze sealing ring shall be held in place by water proof, metal to metal epoxy. The pump shall be six inch and shall utilize an appropriate sealing plate for connection to each base.

6.15 The pumps shall be Myers WG75HH, Flygt, or approved equal.

7. Rail System and Accessories

7.1 The lift out rail system shall consist of a cast iron discharge base with elbow, and cast iron pump attaching and sealing plate. All exposed nuts, bolts and fasteners shall be of 300 series stainless steel.

7.2 The discharge elbow shall be **3.0-inch**, as indicated on the Drawings and shall have a standard 125# flange.

7.3 Two (2) rail pipes shall be used to guide the pump from the surface to the discharge base connection. The guide rails shall be 2-inch schedule 40 stainless steel pipe. The guide rails shall be firmly attached to the access hatch frame. The system shall have intermediate guide supports as shown on the Drawings and recommended by the Manufacturer.

7.4 An adequate length of 5/16-inch minimum stainless steel lifting chain shall be installed for removing the pump.

7.5 All concrete anchor bolts and flange bolts used for any part of this installation shall be stainless steel. One (1) each aluminum top rail support plate shall be installed for each pump.

8. Flow Meter

N/A

9. Site Safety

In accordance with General Conditions, Paragraph 11.1, the CONTRACTOR is responsible for all construction site safety. Safety measures shall include, as a minimum, the installation of temporary construction barrier fencing, as shown on the Drawings. The fencing may be removed as necessary during the performance of the Work, however, any time Work is suspended for any reason the fencing shall be restored. Fencing shall be minimum 4-foot tall, and be constructed of thermoplastic. The color shall be safety orange. Fencing shall be properly secured to appropriate posts at intervals recommended by the manufacturer.

10. Start-up

10.1 The CONTRACTOR shall coordinate the start-up of the lift station. The Manufacturer shall provide the services of a factory-trained representative for a maximum period of one day on-site to perform initial start-up and to instruct the OWNER's operating personnel in the operation and maintenance of the equipment.

10.2 The manufacturer or the manufacturer's authorized distributor must provide start-up services which will include: voltage check; amp check;

installation check; rotation check; and draw down tests to establish pump capacity. A written report to the ENGINEER must be submitted after start-up. The start-up shall satisfy any and all requirements outlined in the warranty for placing the station in service.

11. Warranty

The pump manufacturer shall provide a full, non-prorated warranty for the pumps covering defects in workmanship and material covering parts and labor for a period of five (5) years.

12. Contract Drawings

The Contract Drawings are intended to show a general arrangement of the pumping equipment, drives, structural supports, foundations, connecting piping, and valves.

SECTION 4
ELECTRICAL AND CONTROLS
PRECAST DUPLEX LIFT STATION

1. General

1.1 The work to be accomplished under this section of the Specifications consists of the furnishing of labor, materials, equipment, and services associated with the electrical and control work for one (1) precast duplex lift station. This work is described more fully on the Drawings and specified herein.

1.2 Inspection of electrical work must be performed and approved by all required electrical inspectors. All electrical permits, electrical service fees, inspection fees are to be paid by the electrical contractor. A certificate of inspection and acceptance must be submitted to the OWNER before final payment is made. Bracing and interrupting capacity are to be adequate to withstand fault currents expected at these locations. Available fault current values can be obtained from the electric service provider.

1.3 All work shall be done in a neat workmanlike manner. Electrical codes of the utility involved, as well as the National Electric Code shall be observed. All materials and equipment installed shall be guaranteed for a period of one year. Replacement of any such items that fail to operate properly in this period of time shall be replaced at no added cost to the OWNER.

2. Shop Drawing Submittal

2.1 All electrical shop drawing submittals shall be made at one time. Submittals shall be detailed to meet the project Specifications. This listing is not intended to be all inclusive. Additional information may be requested for points of clarification. The CONTRACTOR shall submit five (5) sets of the following:

2.1.1 Pump power panel including: enclosure, breakers, fuses, contactors, motor starters, thermal overloads, relays, conductor, wireways, terminals, lugs, lamacoid identification plates, panel schematic, and panel layout.

2.1.2 Junction box including: enclosure, pedestals, wireways, terminals, lugs, box schematic, and box layout.

2.1.3 SCADA Remote Terminal Unit (RTU)/Control Panel

2.1.4 Conductor

2.1.5 Conduit

2.1.6 Conduit end sealing devices

2.1.7 Receptacles and covers

2.1.8 Electrical equipment support frame with enclosure layout

2.1.9 Pressure transducer

2.1.10 Float switches

3. Pump Power Panel

3.1 The pump supplier shall furnish and install a pump power panel as shown on the Drawings and described herein. This panel shall house all high voltage components required for the operation of the pump motors specified. The pump power panel shall be mounted beside the RTU/control panel enclosure on an aluminum frame. The pump power enclosure shall accommodate all required components specified herein.

3.2. Enclosure

3.2.1 The enclosure used to house all pump control components shall be a Hoffman 304 stainless steel, NEMA 4X enclosure or approved equal. The CONTRACTOR shall furnish the enclosure with all high voltage components mounted onto a separate back plate onto which din rails and wire ways are to be installed.

3.2.2 The enclosure shall incorporate hidden hinges with clip-style hinge pins. Quarter-turn latches shall be provided with slotted inserts. One latch shall incorporate a padlockable handle. The enclosure shall incorporate four (4) mounting tabs to facilitate mounting of the enclosure.

3.3.3 The enclosure shall be Hoffman Concept Series, or approved equal.

3.3. Contactors

3.3.1 The contactors for motor starting shall be Square D Type S, Non-Reversing, NEMA 1 rated, full voltage starters. The supplier shall size and provide the starters appropriate for the approved pumps.

3.3.2 Contactor coil voltage shall be 120 VAC, 60 Hz. Each contactor shall be supplied with one, contactor mounted, auxiliary NO and one NC contact for run and fail indication.

3.3.3 Contactors shall be supplied with thermal overload relays. Thermal overload relays shall be sized in accordance with motor current requirements for the approved motors. Overloads shall be supplied with a NC contactor for indication of trip condition.

3.4. Circuit Breakers

3.4.1 Each pump circuit shall be supplied with separate Square D, Type HJL (or approved equal) branch circuit breakers. Supplier shall size the circuit breakers for the pump requirements and the lift station's supply voltage.

3.4.2 Additional Square D, Type QO, or approved equal, 120 VAC, 1 pole. Tandem style breakers shall not be acceptable. Circuit breakers shall be provided as required and specifically for the following:

3.4.2.1 RTU/Control Panel (20 amp)
3.4.2.2 GFCI receptacle (20 amp)
3.4.2.3 Panel Heater (20 amp)
3.4.2.4 Flow Meter (20 amp)
3.4.2.5 Control Circuits (15 amp)
3.4.2.6 Spare (20 amp)
3.4.2.7 Spare (15 amp)

3.4.3 Each circuit breaker shall be clearly identified.

3.5 Control relays shall be Square D Class 8501 Type KP, or approved equal.

3.6 The pump power panel shall be equipped with one phase failure and undervoltage monitor. This relay shall incorporate an internal set of contacts that will either open or close in the event that one or more supply power phases are lost, if an undervoltage situation occurs, or a phase reversal occurs. The phase monitor relay shall be Diversified Electronics, SLA Series, Type A enclosure with base or approved equal.

3.7 Current Transformers (CT's) shall be provided to measure the current for each pump. The CT's shall be installed on the 'A' phase on load side of each motor starter. The CT's shall be 24V loop powered with 4-20 mA output and selectable input current range. The CT's shall be Eaton EACR Series, or approved equal.

3.7 The pump control enclosure shall be equipped with a hard wired, secondary surge arrestor, Square D Type SDSA or approved equal. The surge suppressor shall be appropriately sized for the lift station's supply power.

3.8 The pump control panel enclosure shall be equipped with a 120 – 650 VAC lightning arrestor. The lighting arrestor shall be GE Tranquell Type, P/N 9L18BBB301 or approved equal.

3.9 The pump control enclosure shall be supplied with heater for freeze and condensation protection. The heater shall contain an integral factory set thermostat.

4. Junction Box

4.1 Each wire entering the wetwell shall terminate at a pedestal mounted junction box, as shown on the Drawings. Each wire or cable shall be sealed in the junction box with a properly sized Thomas and Betts Type 2500 connector, or approved equal, to prevent gas entering the junction box or panels. All conduits between the pump control panel and the terminal junction box shall be sealed using an approved seal off to prevent gas from entering the conduits. The seal offs shall be the poured compound type, explosion proof.

4.2 The junction box shall be a Hoffman Concept Series enclosure with features as indicated for the power panel. The CONTRACTOR shall furnish the enclosure with all components mounted onto a separate back plate onto which din rails, wire ways, and lugs are to be installed. The junction box shall be 30"W x 30"L x 12"D.

4.3 The junction box shall be mounted on two (2) fabricated 304 stainless steel vented pedestals. Pedestals shall be manufactured by USF Fabrication, or approved equal, and be sized to adequately support the junction box.

5. Service Entrance Breaker

The service entrance breaker shall be installed in a NEMA 3R enclosure adjacent to the electrical meter. Breaker shall be rated as required for the station and be Square D Type HDL, or approved equal.

6. Conduit

All conduit shall be new and rigid. All buried conduit shall be coated with a bitumastic sealant to inhibit corrosion and water seepage around threaded joints. All conduit installed above grade shall be aluminum GRC. Conduit bends shall be free from dents and kinks and shall not disturb the protective coating. Radii of the bends shall not be less than those allowed in the NEC. Conduit shall be continuous from box to box or panel to panel. All wireways shall be non-corrosive. THHN-THWN insulation with 600V rating is required on all wire. Sizes #10 AWG or larger must have stranded conductors.

7. Level Control

7.1. Pressure Transducer

7.1.1 The CONTRACTOR shall install one submersible pressure transmitter mounted in the wetwell at the location shown on the Drawings. The transmitter shall be located approximately one foot from the bottom slab of the wetwell to provide full range depth indication. The body of the transmitter shall be weighted as necessary to maintain depth and location during pump run and maximum inflow conditions. The transmitter shall be installed in a PVC stillwell as shown on the Drawings. The transmitter cable

shall be protected by a non-corrosive jacket and shall be of sufficient unspliced length to connect to the junction panel above the wetwell as shown on the Drawings. The transmitter shall be 0-30 ft range and shall provide a 4-20 ma output with an excitation voltage of 15-45 VDC. The pressure transmitter shall be manufactured by MJK, Model 2100, or approved equal.

7.1.2 Supply of the pressure transducer shall also include the supply of one aneroid bellows assembly (Pressure Systems, Inc. Series 815) that is to be mounted in the junction box and connected the pressure transducer vent tube.

7.2. Float Switches

Sealed mercury-free float switches, MJK Model 7030 or approved equal, shall be provided and installed as shown on the Drawings. Floats shall be provided with a sufficient length of cable as required for an unspliced length to the junction box above the wetwell from positions shown on the Drawings. All floats shall have the same length of cable to allow for full height adjustment and interchangeability. Stainless steel float mounting brackets with strain relief grommets shall be provided and installed as shown on the Drawings, to allow for easy adjustment of the float levels. Additional float wire supports shall be provided to prevent float wires from crossing hatch openings. The function of the two (2) float switches shall be as shown on the Drawings.

8. External Electrical Outlet

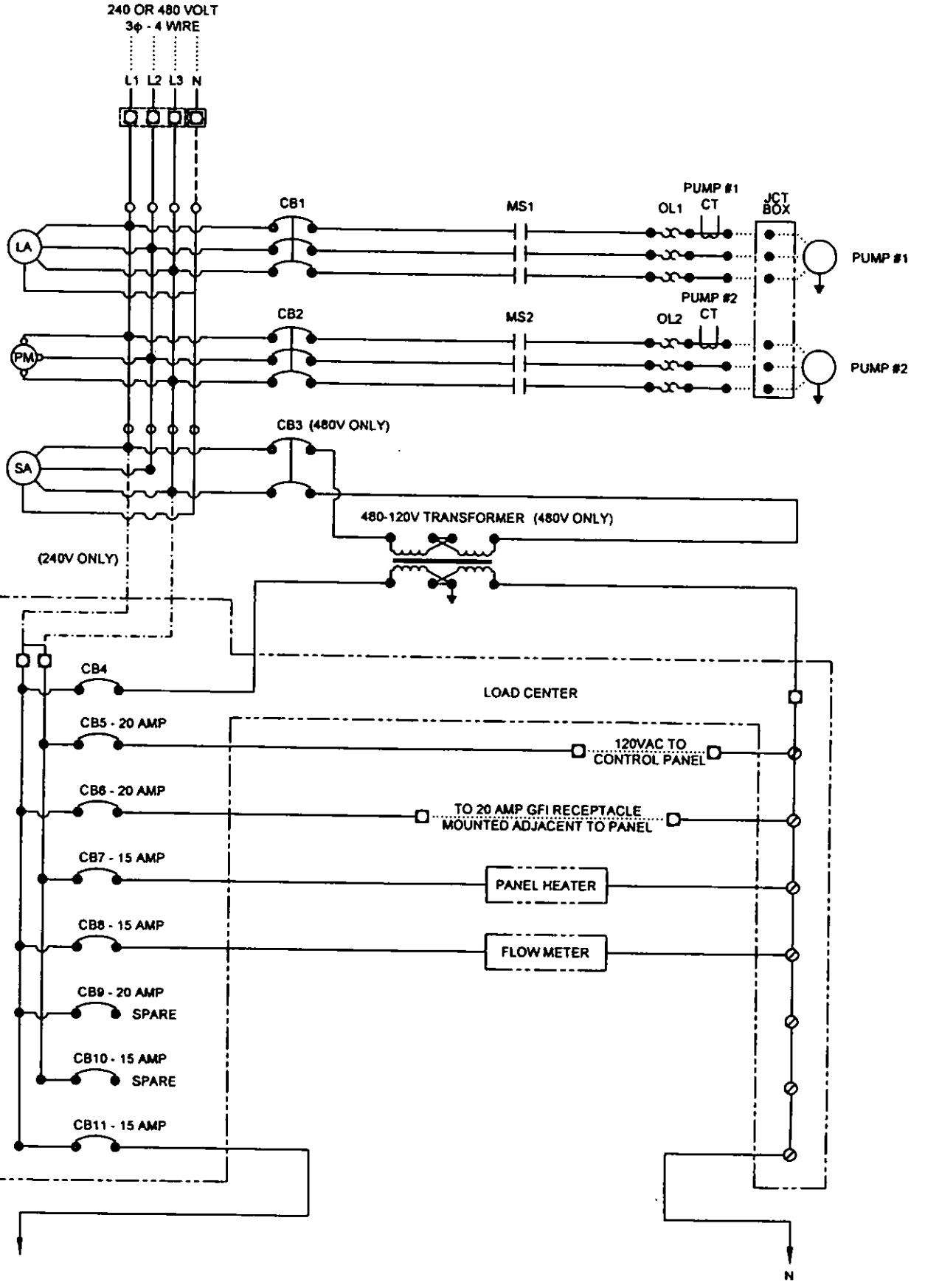
The lift station shall be equipped with a GFI protected duplex receptacle. The receptacle shall be installed adjacent to the RTU in an enclosure with a cover designed to allow weatherproof operation with both receptacles in use.

9. SCADA Remote Terminal Unit and Control Panel **(WCWD Generation 2.0)**

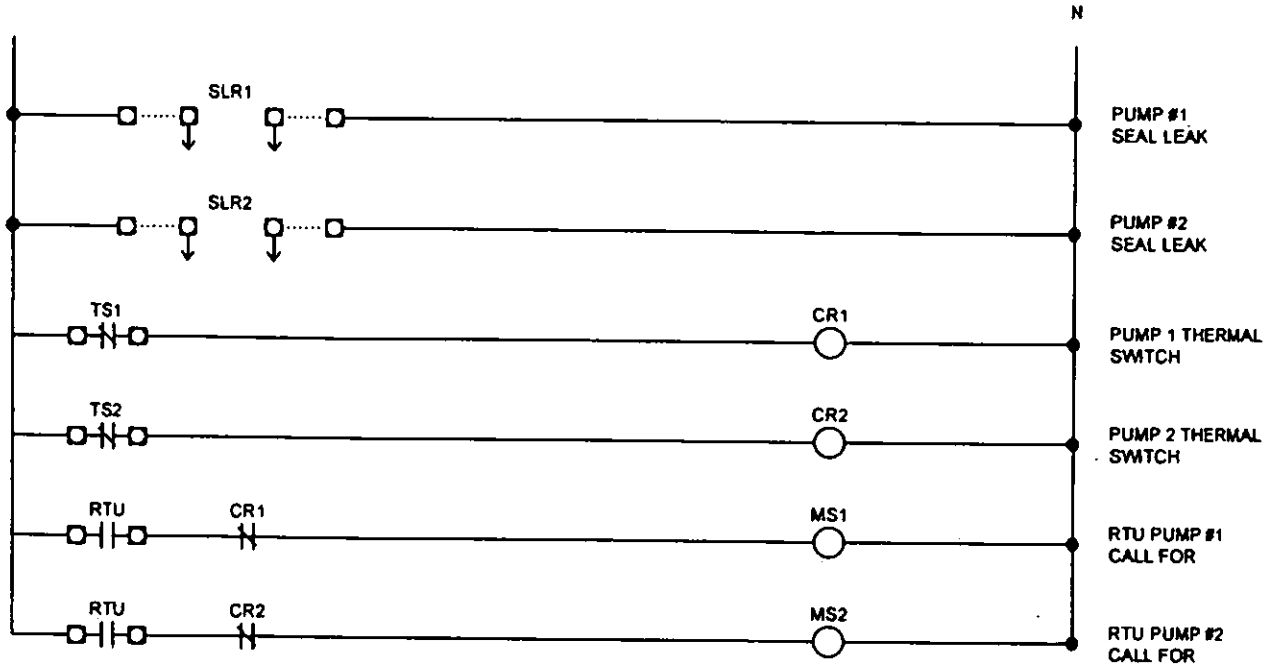
9.1 The CONTRACTOR shall furnish and install the Remote Terminal Unit (RTU)/Control Panel for mounting, and power wiring. A 2-inch and a 1-inch conduit shall be installed between the RTU enclosure and the Power Panel for control interface wiring. The on-site electrical contractor shall complete the wiring of the system with the assistance of the OWNER. The RTU shall be as manufactured by HTI, Inc. of Horse Branch, Kentucky. Contact information for HTI, Inc. is as follows:

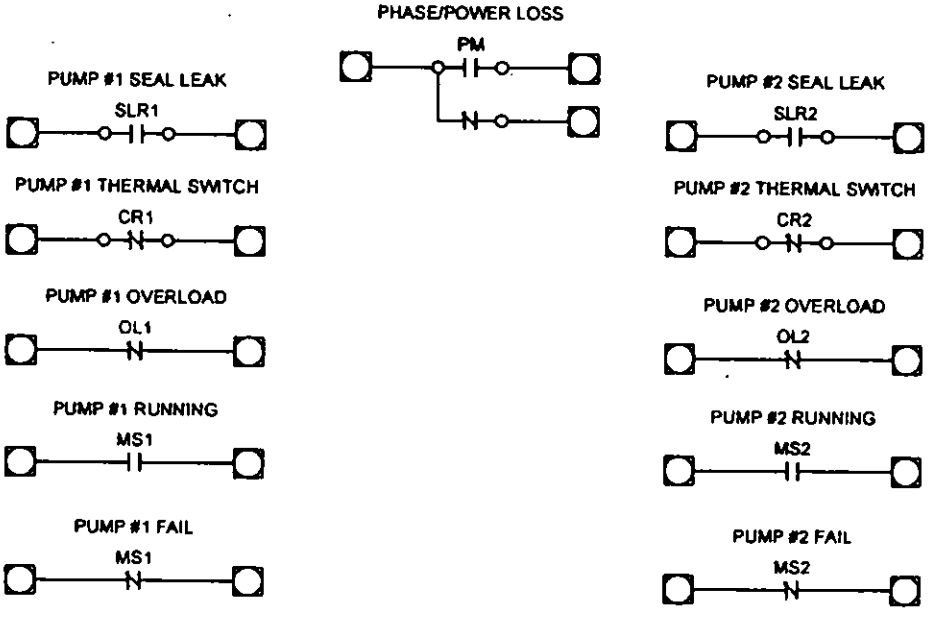
HTI, Inc.
Attn: Jeff Morris
9560 Hwy 62 E.
Horse Branch, KY 42349
Phone: 270-274-4632
Fax: 270-274-9885

DUPLEX LIFT STATION
CONTROL SCHEMATIC

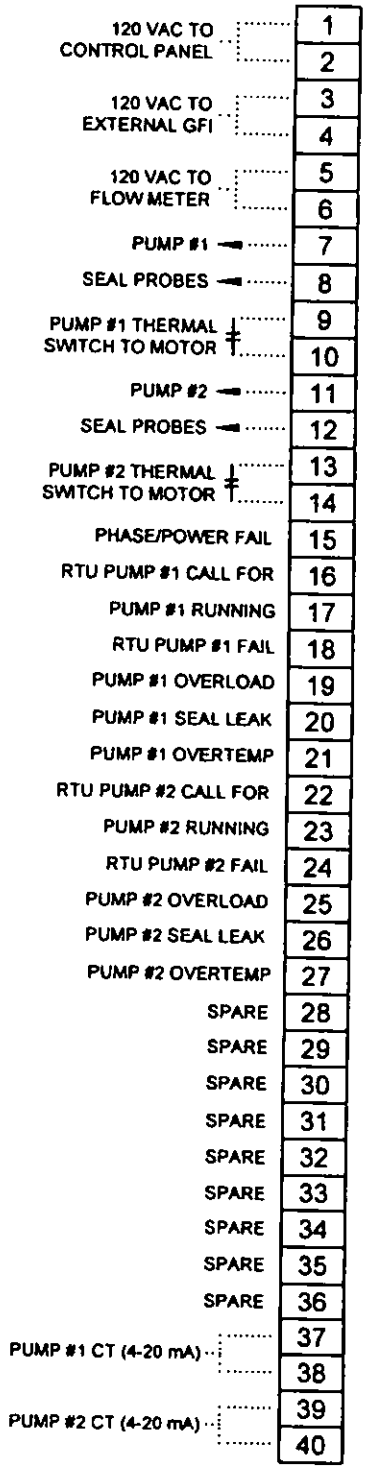


DUPLEX LIFT STATION
CONTROL SCHEMATIC





DUPLEX LIFT STATION
CONTROL SCHEMATIC



SECTION 5
FORCE MAIN SEWER LINES AND APPURTENANCES

1. Scope of the Work

The work to be accomplished under this section of the Specifications consists of the furnishing of all materials and labor necessary for the construction of wastewater force mains, including all fittings, valves, accessories, and appurtenances in strict accordance with the Specifications and the applicable Drawings.

2. Location of Force Mains

2.1 The approximate location of force mains in relation to the limits of rights-of-way, pavement, etc. is shown on the Drawings but is not guaranteed. The location shown was chosen to minimize the overall project cost with respect to rock excavation, pavement replacement, crushed stone for traffic bound roadway, etc.

2.2 The final location (as constructed) may be varied upon approval by the ENGINEER, provided: (1) the proposed location is approved by the Kentucky Department of Transportation (Bureau of Highways), the County Highway Department, or other agency, legal entity or property owner having jurisdiction, and (2) the effect reduces the project cost. The final location may be varied by necessity due to construction conditions at the direction of the ENGINEER, or due to the requirements of the Kentucky Department of Transportation (Bureau of Highways), the County Highway Department, or other agency, legal entity or property owner having jurisdiction. The construction of pipelines in the highway, road, or street right-of-way will not be allowed except where shown on the Drawings.

3. Excavation of Force Main Trenches

3.1 Unless otherwise directed by the ENGINEER or as shown on the Drawings, trenches in which pipes less than 12 inches in diameter are to be laid, shall be excavated in open cut to a depth which will allow a minimum of 3 feet 0 inches of cover above the top of the pipe for pipe installed on private easement and 3 feet 6 inches of cover above the top of the pipe for pipe installed in public right-of-way. For pipes 12 inches and greater in diameter, the trenches shall be excavated in open cut to a depth which will allow a minimum of 4 feet of cover above the top of the pipe. The diameter of the pipe, proper bedding and construction of bell holes must be considered in determining the depth of excavation. Extra depth excavation may be required by the Kentucky Department of Transportation (Bureau of Highways) or as shown on the Drawings. Typical locations for extra depth as shown in profile on the Drawings include sloping the

pipeline into air release stations, extra depth required to eliminate potential air pockets, and at road crossings.

3.2 Trenches shall be of sufficient width to provide free working space on each side of the pipe and to permit proper backfilling around the pipe, but unless specifically authorized by the ENGINEER, trenches shall in no case be excavated or permitted to become wider (as measured at the top of the pipe) than 2 feet plus the nominal diameter of the pipe. The desired width shall be the nominal diameter of the pipe plus 16 inches. The minimum allowable trench width in rock excavation shall be the nominal diameter of the pipe plus 12 inches. Trenching equipment that cannot maintain these minimum widths will not be allowed for use on the project.

3.3 Trench excavation shall proceed far enough ahead of pipe laying to reveal any obstructions that might necessitate changing the line or grade of the pipeline. The trench shall be reasonably straight and uniform in grade. Trenches shall be kept free of water during the construction of the pipeline and removal of water shall be at the CONTRACTOR's expense. Trench excavation shall proceed in a continuous manner from the beginning of the pipeline to the end.

3.4 Unless specifically authorized by the ENGINEER, no skipping by obstacles such as rock, road crossings, existing utilities, etc. shall be permitted. If skips are authorized by the ENGINEER and the CONTRACTOR does not close the resulting gaps in the pipeline in a timely manner, the ENGINEER may require the CONTRACTOR to discontinue all other operations until the gaps are closed.

3.5 Unless specifically directed otherwise by the ENGINEER, not more than 500 feet of trench shall be opened ahead of the pipe laying, and not more than 500 feet of open ditch shall be left behind the pipe laying. All barricades, lanterns, watchmen, and other such signs and signals as may be necessary to warn the public of the dangers in connection with open trenches, excavations, and other obstructions, shall be provided by and at the expense of the CONTRACTOR.

3.6 At the close of each working day all trenches that have been excavated shall be refilled unless exceptions are granted by the ENGINEER. All public or private drives shall be promptly backfilled or bridged at the direction of the ENGINEER.

3.7 All excavation shall be "unclassified" and therefore there will be no separate payment for rock excavation. The cost of all excavation should be merged into the cost of constructing the sewer line.

4. Blasting

4.1. General

4.1.1 All blasting operations shall conform to Kentucky Department of Mines and Minerals code for explosive disintegration of rock.

CONTRACTOR shall obtain permits from local authorities having jurisdiction before explosives are brought to site or drilling is started.

4.1.2 The CONTRACTOR shall keep explosives on the site only in such quantity as may be needed for the Work under way and only during such time as they are being used. He shall notify the ENGINEER, in advance, of his intention to store and use explosives. Explosives shall be stored in a secure manner and separate from all tools. Caps or detonators shall be safely stored at a point over 100 feet distance from the explosives. When the need for explosives has ended, all such materials remaining on the Work shall be promptly removed from the premises.

4.1.3 The CONTRACTOR shall observe all state, federal and municipal laws, ordinances and regulations relating to the transportation, storage, handling and use of explosives. In the event that any of the above-mentioned laws, ordinances or regulations require a licensed blaster to perform or supervise the Work of blasting, said licensed blaster shall, at all times have his license on the Work and shall permit examination thereof by the ENGINEER or other officials having jurisdiction.

4.1.4 No explosives shall be used within 20 feet of buildings and/or structures existing, constructed or under construction; or underground and/or overhead utilities whether existing or partially constructed.

4.1.5 Permission for any deviation from the restriction set forth above shall be secured from the ENGINEER, in writing; however, permission for any such deviations shall not relieve the CONTRACTOR from any responsibility in the event of damage to buildings, structures or utilities.

4.1.6 All operations involving explosives shall be conducted with all possible care to avoid injury to persons and property. Blasting shall be done only with such quantities and strengths of explosives and in such a manner as will break the rock approximately to the intended lines and grades and yet will leave the rock not to be excavated in an un-shattered condition. Care shall be taken to avoid excessive cracking of the rock upon or against which any structure will be built, and to prevent injury to existing pipes or other structures and property above or below ground. Rock shall be well covered with logs or mats, or both, where required. Sufficient warning shall be given to all persons in the vicinity of the Work before a charge is exploded.

4.1.7 The CONTRACTOR shall be solely responsible for his blasting operations. The CONTRACTOR shall not hold the OWNER and/or the ENGINEER liable for any damages resulting from his blasting operations on this project.

4.1.8 Blasting will not be permitted under or on CSXT's right-of-way.

4.2. Pre-blast Structure Survey

4.2.1 CONTRACTOR shall perform a pre-blast survey to determine and document with pictures the condition of adjacent structures, utilities, wells, buried cables, and other features within a minimum of 400 ft. of the blast area unless otherwise required by applicable regulatory authorities. Determine safe distances to structures or other facilities according to NFPA 495, Appendix B. Where facilities are closer than these distances, and natural barriers are not present, or when the amount of explosive cannot be reduced economically, blasting mats shall be used. Provide mats to protect environmentally sensitive areas, trees within 20 feet from the blasting area, streams, and rock formations from throw rock.

4.2.2 Purpose of survey is to document existing condition of structures prior to blasting, and is intended to be used as evidence in ascertaining whether and to what extent damage may have occurred as result of blasting. Survey shall be conducted prior to start blasting operations.

4.2.3 CONTRACTOR shall record information for each structure surveyed including:

4.2.3.1 Age and type of construction.
4.2.3.2 Location and character of cracks.
4.2.3.3 Evidence of settlement and leakage.
4.2.3.4 Other pertinent information.

4.2.4 Record pre-blast survey information on forms prepared specifically for pre-blast surveys. Supplement written records with photographs or videotape recordings. Submit copies of written records and photographs or videotapes to OWNER, and ENGINEER, prior to start of blasting.

4.3. Blast Design

4.3.1 Design each blast to avoid damage to existing facilities, adjacent property, and completed Work. Consider effects of blast-induced vibrations, air blast, and fly rock potential in design of each blast.

4.3.2 Establish appropriate maximum limit for vibration for each structure or facility that is adjacent to or near blast sites. Base maximum limits on expected sensitivity of each structure or facility to vibration, and federal, state, or local regulatory requirements, but not to exceed 1.25 in/sec. Whenever peak particle velocity exceeds vibration limits, change design of subsequent blasts, as necessary to reduce peak particle velocity to within limits established by Blaster-in-charge (BIC).

4.3.3 Establish appropriate maximum limit for air blast for each structure or facility that is adjacent to or near blast sites. Base maximum limits on expected sensitivity of each structure or facility to air blast, and federal,

state, or local regulatory requirements, but not to exceed 0.015 psi peak overpressure (133 decibels). Whenever air blast exceeds limits, change design of subsequent blasts or provide controls necessary to reduce air blast to within specified limits.

4.4. Fly Rock Containment

Where fly rock may damage existing facilities, adjacent property, or completed Work, cover area to be blasted with blasting mats or provide other means that will contain and prevent scattering of blast debris.

4.5. Vibration and Air-Blast Monitoring

4.5.1 Monitor and record blast-induced vibrations and air blast using suitable sensors and recording equipment for each blast.

4.5.2 CONTRACTOR shall provide two (2) seismographs during blasting operations capable of the following:

4.5.2.1 Designed for monitoring blast-induced vibrations and air blast. Capable of recording particle velocity in three mutually perpendicular directions in range from 0 to 6 inches per second.
4.5.2.2 Flat vibration frequency response between 4 and 200-Hz.
4.5.2.3 Capable of recording air-blast overpressure up to 140 decibels.
4.5.2.4 Flat air-blast frequency response between 2- and 500-Hz.

4.5.3 Monitor on, or at, structures or other facilities that are closest to point of blasting. Monitoring more distant facilities that are expected to be sensitive to blast-induced vibrations and air blast.

4.5.4 BIC shall supervise establishment of monitoring programs and initial operation of equipment; review interpretation of records and recommend revisions of blast designs.

4.5.5 Include following information in blasting plan:

4.5.5.1 Vibration and air-blast limits as recommended by BIC.
4.5.5.2 Name of qualified BIC who will be responsible for monitoring program and interpretation of records.
4.5.5.3 Types and models of equipment proposed for monitoring.
4.5.5.4 Numbers and locations of proposed monitoring stations.
4.5.5.5 Procedures to be used for coordinating recording of each blast.
4.5.5.6 Steps to be taken if blasting vibrations or air blast exceed limits.

4.6. Blasting Records

4.6.1 For each blast, document the following:

4.6.1.1 Location of blast in relation to Project stationing or state plane coordinate system and elevation.
4.6.1.2 Date and times of loading and detonation of blast.
4.6.1.3 Name of person in responsible charge of loading and firing.
4.6.1.4 Details of blast design, as previously specified.
4.6.1.5 Vibration records including location and distance of seismograph geophones to blast and to nearest structure, and measured peak particle velocity. Report peak particle velocity in units of inches per second.
4.6.1.6 Air-blast records. Report peak air blast values in units of pounds per square inch overpressure above atmospheric or in decibels at linear response.
4.6.1.7 Comments by BIC regarding damage to existing facilities, adjacent property, or completed Work, misfires, fly rock occurrences, unusual results, or unusual effects as required.

4.7. Suspension of Blasting

4.7.1 In event damage to existing facilities, adjacent property, or completed Work occurs due to blasting, immediately suspend blasting and report damage to ENGINEER and OWNER. CONTRACTOR shall be responsible for all costs of repairs or replacement due to damage from blasting.

4.7.2 Before resuming blasting operations, adjust design of subsequent blasts, or take other appropriate measures to control effects of blasting, and submit complete description of proposed changes for reducing potential for future damage.

4.7.3 Do not resume blasting until authorized by OWNER and applicable regulatory authorities.

5. Pipe Bedding and Initial Backfill

For all pipe 14 inches in diameter and larger, or where rock excavation is encountered or in rocky soil as directed by the ENGINEER, the pipe shall be bedded with six (6) inches of crushed stone under the pipe. Crushed stone shall be used in the initial backfill from the bottom of the pipe to the centerline of the pipe. Initial backfill material shall be placed and thoroughly compacted by hand tamping. Initial backfill material shall be deposited in the trench for its full width on each side of pipe, fittings and appurtenances simultaneously. Care must be taken to compact fill along the sides of the pipe and appurtenances adjacent to pipe wall. Crushed stone shall be No. 9-M or #57 as described in the *Standard*

Specifications for Road and Bridge Construction as published by the Kentucky Department of Transportation, Bureau of Highways. In certain cases the CONTRACTOR may be required to move earth of good quality from previous trench excavation for use as bedding material.

6. Pipe Laying

6.1. General

6.1.1 The CONTRACTOR shall notify the ENGINEER as to the date and time of all pipe deliveries and shall not unload any pipe except in the presence of the ENGINEER. Pipe shall be transported and handled in strict conformance with the manufacturer's recommendations.

6.1.2 The CONTRACTOR will be required to stockpile all pipe in central locations. Pipe strung along the route of the pipeline, shall be limited to the current day's expected production.

6.1.3 Pipe laying shall be in strict accordance with the manufacturer's recommended practice. Special tools, lubricant and equipment for proper laying shall be provided by the manufacturer. If the CONTRACTOR proposes a method of installation not covered by the manufacturer's recommended procedures, the CONTRACTOR shall obtain written certification from the manufacturer that installation by this proposed method will in no way affect the manufacturer's warranty of the pipe.

6.1.4 Pipe shall not be rolled, or dropped, into the trench.

6.1.5 All angles or bends in the pipe lines, either vertical or horizontal shall be satisfactorily braced or anchored against the tendency of movement with concrete anchors to the satisfaction of the ENGINEER.

6.1.6 Open ends of unfinished pipelines shall be securely plugged or closed at the end of each day's work, or when the line is left temporarily at any other time.

6.1.7 The trench shall be excavated to the required depth and width, bell holes and/or joint holes, as applicable, shall be dug in advance of the pipe laying.

6.1.8 The beds of each piece of pipe shall be prepared carefully so that each individual piece of pipe shall have a uniform bearing. Pipe shall be laid in a straight line and grade without kinks or sags, and shall be laid in a workmanlike manner. Bell holes and/or jointing holes shall be large enough so that the bell or hub will clear the ground and leave ample room for making and inspection of joints.

6.1.9 Before each piece of pipe is lowered into the trench, it shall be swabbed out thoroughly to insure its being clean. Each piece of pipe shall be lowered into the trench separately.

6.2. Ductile Iron Pipe

Care shall be taken to prevent injury to the pipe coating both inside and outside. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fittings shall be discovered after the pipe line is laid, they shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.

6.3. Plastic Pipe

Plastic pipe shall be installed in accordance with manufacturer's recommendations. A representative who is a direct employee of the pipe manufacturer shall conduct training sessions for CONTRACTOR's personnel regarding proper pipe installation. The manufacturer's representative shall certify to the ENGINEER the names of CONTRACTOR's personnel who have attended such training. Pipe laying and assembly work shall be performed only by personnel who appear on the manufacturer's certified list.

7. Backfilling Pipeline Trenches

7.1 Backfilling shall be conducted at all times in a manner to prevent damage to the pipe and the exterior protection on the pipe. Placing of backfill shall be done only in the presence of the ENGINEER after his final inspection and acceptance of the pipe in place. If material for backfilling is not available at the construction site, the CONTRACTOR shall "import" earth of good quality from a site approved by the ENGINEER. This will not be a separate pay item.

7.2 In areas of earth excavation of the pipeline trench, earthen material reasonably free from rock and acceptable to the ENGINEER shall be used in the backfilling of the trench. Backfill material free of rock over one inch in diameter shall be placed around the pipe up to the point where the pipe is thoroughly covered with at least one foot of material. Walking or working on the completed pipe (except as may be necessary in backfilling) shall not be permitted until the trench has been backfilled to a height of at least one foot above the top of the pipe. The filling of the trench shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipeline will not be disturbed and injurious side pressures do not occur.

7.3 In areas of rock excavation of the pipeline trench, crushed stone as used for bedding shall be used as backfill material to a level 6 inches above the top of the pipe. Placement of this backfill material shall be performed as described

above. In certain cases in lieu of or in addition to the crushed stone backfill the CONTRACTOR may be required to use earth of good quality as backfill material to a depth of 12 inches above the pipe as described above.

7.4 In filling the remainder of the trench above the initial backfill described above, whether in earth or rock excavation, earth backfill material reasonably free of rock may be shoved into the trench without compacting and heaped over, then compacted by rolling with the wheel of a grader or front-end loader. Earth backfill material containing rocks greater than 6 inches in diameter shall not be acceptable.

7.5 The final step in the backfill operation shall be to windrow good quality earthen material over the top of the ditch. The windrow shall be no higher than one foot and no wider than the width of the ditch plus 4 feet. All other excavated material except that required for the above described windrow shall be considered excess and shall be disposed of as described hereinafter.

7.6 Where street, driveway and highway crossings are made and where streets or highways are proposed, the CONTRACTOR will be required to tamp all backfill as described hereinafter and backfill the trench with No. 9-M or #57 crushed stone to within 6-inches of stone section and DGA in top 6-inches of stone section.

7.7 Where tamping is required, the backfilling shall all be done in layers not exceeding 6 inches and firmly tamped into place by tampers or rammers. The ENGINEER may permit puddling of ditches to compact the backfill in lieu of tamping with mechanical tampers except where street paving is to be replaced immediately after the backfilling is completed. The ENGINEER may also require puddling where (in his opinion) it is necessary for proper compaction.

8. Disposition of Excess Excavated Material

Excavated materials not used for backfill, including "shot rock" and boulders, shall be disposed of within one week of the adjacent trench being backfilled. Disposal of excavated material shall be performed so as to cause the least interference with the completed pipeline and operations of the OWNER, property owners, etc. and in a manner satisfactory to the ENGINEER.

9. Replacing Streets and Roadways

9.1 The CONTRACTOR shall replace all streets, alleys, driveways, and roadways which may be removed, disturbed, or damaged in connection with his operations under this Contract. CONTRACTOR shall reconstruct same to the satisfaction of the Kentucky Department of Transportation, the County Highway Department, or other legal entity or property owner having jurisdiction. The reuse of materials removed in making excavations will be permitted, provided said materials are in good condition and acceptable to the ENGINEER.

9.2 The CONTRACTOR will be paid for street replacement only where the line is constructed within the paved surfaces. Care shall be exercised to minimize damage to graveled shoulders and paved surfaces.

9.3 Gravel, crushed limestone, bituminous materials, or other materials used in the resurfacing of streets, shall meet the current requirements of the Kentucky Department of Transportation (Bureau of Highways) Specifications.

9.4. Traffic-Bound Base Course

9.4.1 On all trenches where replacing streets or drives is required, it shall be handled in the following manner:

9.4.2 After the backfill has been compacted (by mechanical tamping) and brought up to approximately finish grade, the CONTRACTOR then shall place crushed stone when and as directed by the ENGINEER as a traffic-bound base course, at the proper elevation to allow for settlement but not in such a way as to prevent traffic from using it. Crushed stone shall be Kentucky Department of Transportation, dense graded aggregate.

9.4.3 The CONTRACTOR may be required by the ENGINEER to maintain the traffic-bound base course (by adding crushed stone as specified hereinbefore) in a safe and passable condition for a period of 60 days (or until such time as sufficient settlement has taken place in the opinion of the ENGINEER) and the trenches are ready for final resurfacing. Crushed stone will be paid for at the unit bid price specified in the Contract.

9.5. Subgrade for Final Resurfacing

9.5.1 The traffic-bound course hereinbefore described shall comprise the base course for all types of resurfacing.

9.5.2 Prior to resurfacing, the CONTRACTOR shall saw-cut any chipped or broken edges such that the seams of the existing paved surface shall have a straight and uniform edge.

9.5.3 When, in the opinion of the ENGINEER, the trench has reached a condition of settlement satisfactory for final resurfacing, the CONTRACTOR shall first strip the base course or backfill with crushed stone (size as specified hereinbefore) to obtain the proper subgrade elevation. The subgrade then shall be rolled with an approved type roller or tamped until thoroughly compacted. Any depressions shall be filled with crushed stone (as specified hereinbefore) and the process of rolling or tamping continued until the subgrade has a smooth and uniform surface.

9.6. Portland Cement Concrete Pavement

Where Portland Cement Concrete Pavement is to be replaced, or is required under bituminous pavement replacement, it shall conform to the existing pavement and/or the ENGINEER'S instructions (not less than 6 inches thickness), and the type concrete required by the Kentucky Department of Transportation shall be used.

9.7. Asphaltic Concrete Pavement

9.7.1 Where asphaltic concrete pavement is to be replaced, the subgrade shall be prepared as hereinbefore specified, and this subgrade shall comprise the base course upon which the concrete subslab and/or the bituminous pavement shall be laid. Asphaltic concrete shall be as required by the Kentucky Department of Transportation.

9.7.2 Where no Portland cement concrete subslab is required, the subgrade or base shall be cleaned and broomed thoroughly and a prime coat of medium tar shall be applied uniformly at the rate of 0.20 to 0.25 gallons per square yard. Where Portland cement concrete subslab is required, the prime shall be applied at the rate of approximately 0.05 gallons per square yard. The prime shall be applied by a pressure distributor or other approved pressure spray method.

9.8. Bituminous Surfacing (Surface Treatment)

9.8.1 Where bituminous surfacing is to be replaced as shown on the Drawings, or as directed by the ENGINEER, the traffic-bound base shall comprise the subgrade upon which the bituminous surfacing shall be constructed. After the subgrade or base has been prepared, thoroughly cleaned and broomed, a prime coat of medium tar shall be applied at the rate of 0.30 to 0.35 gallons per square yard.

9.8.2 When the prime coat has become tacky but not hard, the bituminous material (asphalt of the grade directed by the ENGINEER) shall be applied in two applications at the rate of 0.35 to 0.45 gallons per square yard for each application. The CONTRACTOR shall apply approximately 50 pounds of crushed stone chips per square yard between the two applications of bituminous material, and 35 to 40 pounds of chips per square yard after the final application of bituminous materials.

9.9. Untreated Surface

9.9.1 Where the existing surface is untreated gravel or stone, the CONTRACTOR shall reuse all native materials possible using crushed stone as required, replacing the surfacing that is disturbed or removed with crushed stone equal to the grade present prior to construction.

9.9.2 Prior to final acceptance, the CONTRACTOR shall fill in all depressions with crushed stone as hereinbefore specified, and shall thoroughly roll and grade to the existing surface.

9.10. General

The CONTRACTOR shall be held responsible for any and all damage occurring to street and road paving due to his operations outside the actual limits of his work, and shall replace any such damage to as good, or better, condition than that which existed prior to the CONTRACTOR's operations and at no additional expense to the OWNER.

10. Concrete Kickers, Anchors, Cradles, and/or Encasement

10.1 Concrete kickers, anchors, cradles, and/or encasement of force mains shall be placed where and as shown on the Drawings, or as directed by the ENGINEER.

10.2 Concrete for anchors, kickers, cradle, and/or encasement shall be 2,500 psi concrete and shall be mixed sufficiently wet to permit it to flow under the pipe to form a continuous bed. In tamping concrete, care shall be taken not to disturb the grade or line of the pipe, or to injure the joints. Concrete placed outside the specified limits or without authorization from the ENGINEER will not be subject to payment.

10.3 Thrust blocks shall be provided in accordance with details shown on Drawings and must bear against an undisturbed trench face. Thrust blocks must be used even when special locked-joint fittings, anchoring fittings, or pipe clamps with tie rods are employed. Fitting bolts shall be protected from the concrete being poured for thrust blocks by using plastic sheeting to cover the area of the bolts.

11. Pipe and Fittings for Force Mains

11.1. General

Pipe for force mains shall be nominal diameter and material indicated on the Drawings.

11.2. Fittings

11.2.1 Ductile iron mechanical joint fittings shall be required for all sizes of PVC and ductile iron pipe. Ductile iron mechanical joint fittings shall conform to AWWA specification C 153 and shall have a rated working pressure of 350 psi up to 24-inch diameter and 250 psi above 24-inch. Ductile iron fittings shall be furnished with an epoxy coating on the interior and exterior in accordance with AWWA specification C 116.

11.2.2 Only high strength low alloy steel T-bolts shall be used with all mechanical joints including fittings, valves, etc. All glands, T-bolts and other accessories shall be manufactured and provided by the same manufacturer as the fittings on which the accessories are used.

11.2.3 Fittings shown on the Drawings are intended to convey the general configuration only. The CONTRACTOR shall be required to furnish fittings at each abrupt change (vertical or horizontal) in the pipeline alignment, as determined by the ENGINEER. The CONTRACTOR shall also be required to furnish any special gaskets, adaptors, etc. necessary for construction.

11.2.4 All vertical bends shall include approved restraining devices. Approved restraining devices are Megalug by EBBA Iron, Inc., Smith-Blair Model 120, GripRing by Romac Industries, or approved equal.

11.2.5 Fittings and accessories manufactured in the United States and shall be Union/Tyler, ACIPCO, U.S. Pipe, or approved equal. Fittings and accessories manufactured outside the United States shall be by either Sigma Corporation or Star Products, Inc.

11.3. Ductile Iron Pipe

11.3.1 Ductile iron pipe shall conform to AWWA specifications C 150 and C 151 with a rated working pressure of 350 psi under the laying conditions and depth of cover specified herein. Thickness Class 350 shall be required for 4-inch diameter pipe through 12-inch. Thickness classes for larger sizes of pipe shall be as shown on the Drawings.

11.3.2 Ductile iron pipe shall be furnished with an outside bituminous coating approximately one mil thick.

11.3.3 The joints for ductile iron pipe shall be in accordance with AWWA specification C 111 and shall be the "push-on" type. The allowable deflection in each joint shall be a minimum of 3 degrees and gasket lubricant shall be used as recommended by the pipe manufacturer. Ductile iron pipe shall be "Fastite" as manufactured by American, "Tyton" as manufactured by U.S. Pipe Corp., or approved equal.

11.3.4 The pipe for river crossings, as shown on the Drawings, shall be boltless, fully restrained ball-and-socket pipe. The joints of the pipe shall allow a 15 degree deflection. The pipe shall be Flex-Lok by American Ductile Iron Pipe, or approved equal.

11.3.5. Ductile Iron Pipe Interior Coating

11.3.5.1 The interior coating shall be Protecto 401 Ceramic Epoxy, or approved equal. The material shall be an amine cured

novalac epoxy containing at least 20% by volume of ceramic quartz pigment.

11.3.5.2 The lining shall be applied in strict conformance with manufacture's recommendations by a certified firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

11.3.5.3 The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the manufacturer's requirements, and that the material used was as specified.

11.3.5.4 Ceramic expoxy lined pipe must be handled only from the outside of the pipe. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying. The pipe shall not be dropped or unloaded by rolling.

11.4. Polyvinyl Chloride (PVC) Pipe

11.4.1 Polyvinyl chloride (PVC) pipe shall meet the requirements set forth by ASTM D1784 for Type 1, Grade 1. All PVC pipe shall bear the National Sanitation Foundation Testing Laboratory seal for potable water. The pipe shall also meet the requirements of AWWA C905, and all other specifications referred to therein.

11.4.2 In general and unless indicated otherwise on the Drawings, PVC pipe for force mains shall be Class 160 (DR 26).

11.4.3 Provision shall be made for contraction and expansion at each joint with either twin gasketed couplings or integral bell joints. Gasket systems shall be Reiber or other locked-in type as approved by the ENGINEER. Twin gasketed couplings shall be rated for working pressure equal to that of pipe and shall be as manufactured by the pipe manufacturer.

11.4.4 PVC pipe shall be manufactured by a company that has made pipe in accordance with ASTM D-2241 under the brand name to be supplied on this project continuously over the previous eight (8) year period. Pipe shall be manufactured at a plant that has been owned, operated and controlled by the same manufacturing company and has produced PVC pipe in accordance with ASTM D-2241 as a routine standard procedure for the last three (3) years. The plant shall be certified in accordance with NSF/ANSI 14 – 2012 for the PVC pipe specified. PVC pipe shall be Vulcan, National, Royal, Pipelife-Jetstream, or North American.

11.4.5 Pipe manufactured with Molecular Oriented Poly (vinyl) Chloride, PVC (MO), may be substituted for the PVC pipe described above. PVC (MO) pipe shall conform to ASTM F1483 and shall be Ultra Blue as manufactured by JM Eagle.

11.4.6 Note special PVC and PVC (MO) pipe testing requirements, Section 2, Paragraph 13.

11.5. Polyethylene Pipe

11.5.1 Polyethylene (PE) pipe shall be of high density, high molecular weight polyethylene and conform to the requirements of AWWA specification C 906 and ASTM D 3350. PE pipe shall have dimensions and workmanship in accordance with ASTM F 714. PE pipe shall be IPS sized and have a pressure rating of DR 17 (126 psi) unless otherwise stated on the drawings.

11.5.2 PE pipe shall be marked with the manufacturer's name, production lot number, ASTM designation, and nominal diameter.

11.5.3 PE pipe shall be joined by the butt-fusion technique utilizing controlled temperature and pressure to produce a fused, leak-free joint. The joint shall be stronger than the pipe itself in both tension and hydrostatic loading.

11.5.4 For all locations that PE pipe is connected to another pipe material, mechanical joint adaptors shall be used.

11.5.5 PE pipe shall be Performance Pipe, by Chevron Phillips Chemical, HDPE Water Pressure Pipe by JM Eagle, or approved equal.

12. Inspection of the Lines

Before the CONTRACTOR backfills any of the lines, they first shall be inspected by the ENGINEER's Representative and the ENGINEER's Representative shall give the CONTRACTOR permission to proceed with the backfilling. If any joints, pipes, fittings, or materials or workmanship are found to be defective, they shall be removed and replaced by the CONTRACTOR without any additional compensation.

13. Gate Valves and Boxes

13.1 Gate valves shall comply with AWWA specification C 509 and shall be of the resilient wedge type, epoxy coated, iron body, non-rising stem and fully bronze mounted. Valves shall be suitable for water working pressures of 250 psi. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship. Gate valves shall be either the A-2360 series by Mueller Company or Style 3067 by M & H Valve Company.

13.2 All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working water pressure cast on the body of the valve. Unless otherwise indicated on the

Drawings, all gate valves shall be provided with a 2-inch square operating nut and shall open by turning counterclockwise.

13.3 All gate valves and butterfly valves installed on Ductile Iron sewer mains shall be restrained against movement by either rodding the valve to adjacent fittings or use of "Megalugs" or approved equal.

13.4 Valve boxes shall be cast iron, two piece, screw type extension with depth as required and drop covers marked "WATER" or "SEWER" as appropriate. They shall be set vertically, properly adjusted so that the cover will be in the same plane as the finished surface of the street or ground. The box shall have a 5 1/4-inch shaft. Valve boxes shall be as manufactured by Mueller, Clow, M & H, or an approved equal.

13.5 **Any valve that is installed at a depth to the operating nut greater than 3 feet below the final elevation of the valve box top shall be fitted with a valve operator extension**. The length of the extension shall place the operating nut 12 to 24 inches from the valve box top. The extension shall be secured to the valve nut with a set screw. The extension shall include a 1-inch solid steel shaft, 2-inch square top nut, and centering ring near the top. Valve operator extensions shall be manufactured by an entity regularly engaged in the manufacture of such equipment, and be Water Key Model VE-XX, or approved equal.

14. Tapping Sleeves and Valves

14.1 Tapping sleeves for cast iron or ductile iron pipe shall be mechanical joint and shall be Mueller H615 or M & H Style 1174. Tapping sleeves for A.C. pipe shall be mechanical joint and shall be Mueller H-619 or approved equal. Tapping sleeves for 4-inch through 8-inch PVC pipe shall be Mueller H-612 or Clow #F-6342. Tapping sleeves for 10-inch and 12-inch PVC pipe shall be Smith-Blair No. 622 fabricated steel sleeves, epoxy coated with stainless steel bolts and nuts.

14.2 Tapping valves shall meet the same general specifications as described herein for gate valves.

15 Highway and/or Railroad Crossings

15.1 All sewer line crossings of County, State and United States Highways, and/or railroads, shall be in smooth wall steel casing pipe (0.25-inch minimum wall thickness). Joints in casing pipe shall be welded continuously all around. The minimum depth of cover shall be 42 inches for highway and road crossings, as measured from the top of the casing pipe to the low point of the crossing cross section. The minimum depth of cover shall be 48 inches, as measured from the top of the casing pipe to the low point of the crossing cross section and 66 inches as measured from the top of the casing pipe to the bottom of the rails for railroad crossings. Carrier pipe used inside steel casing shall generally be the material

shown on the Drawings and the Bid Schedule. Where PVC carrier pipe is used, and for bores beneath railroads the carrier pipe shall be supported on casing spacers (Advance, Calpico, CCI, or approved equal) inside the casing at intervals that are in accordance with the spacer manufacturer's recommendations.

15.2 The spacer manufacturer shall be supplied the following information when ordering the spacers: carrier pipe O.D., carrier pipe bell O.D., casing pipe I.D., type of pipe being used and SDR information. All carrier pipe shall be centered with maximum clearance of 1-inch between spacer runner and casing. For PVC carrier, the spacer shall be a polyethylene spacer and for DIP carrier the spacer shall be a steel spacer. The CONTRACTOR shall also supply end seals for all steel casings. End seals may be pull-on or wrap around types with stainless steel bands.

16. Concrete Kickers, Anchors, Cradles, and/or Encasement

16.1 Concrete kickers, anchors, cradles, and/or encasement of sewer lines shall be placed where and as shown on the Drawings, or as directed by the ENGINEER.

16.2 Concrete for anchors, kickers, cradle, and/or encasement shall be 2,500 psi concrete and shall be mixed sufficiently wet to permit it to flow under the pipe to form a continuous bed. In tamping concrete, care shall be taken not to disturb the grade or line of the pipe, or to injure the joints. Concrete placed outside the specified limits or without authorization from the ENGINEER will not be subject to payment.

16.3 Thrust blocks shall be provided in accordance with details shown on Drawings and must bear against an undisturbed trench face. Thrust blocks must be used even when special locked-joint fittings, anchoring fittings, or pipe clamps with tie rods are employed. Fitting bolts shall be protected from the concrete being poured for thrust blocks by using plastic sheeting to cover the area of the bolts.

17. Air/Vac Release Stations

17.1 Air/Vac Release Stations shall be located and constructed as shown on the Drawings and the Standard Detail Sheet. The Air/Vac Release Stations shall include A.R.I. Model D025-2T, or approved equal. The valve shall be complete with a removable vacuum guarding attachment which allows air discharge only. The body of the valve shall be constructed from reinforced nylon. The above valve shall be supplied with 2-inch NPT inlets, inlet and blowoff valves, quick disconnect couplings and minimum 10-feet of hose for flushing. Inlet valves shall be 2-inch ball valves as specified below.

17.2 Manual Air Release Stations shall include a 2-inch, **full-port** ball valve and 10-feet of polybutylene tubing. The tubing shall be connected to the ball valve by

a Mueller IP x PE Adaptor. Ball valves shall be Apollo, or approved equal with bronze body and 316 stainless steel ball and stem.

17.3 All piping, nipples and fittings used in air release stations shall be **stainless steel**. Saddles shall be Power Seal model 3416AS.

18. Service Fittings

The necessary service clamps, corporation stops, and all other such fittings and accessories for force main taps for testing or other purposes shall be Mueller. Service clamps shall be Mueller Series H-134 and corporation stops shall be Mueller #H-15008, or approved equal.

19. Rough Grade Work and Cleanup

19.1 Rough Grade Work and Cleanup (Rough Cleanup) shall be defined to include the final backfill and windrowing of the ditch line, disposal of excess excavated material, level grading of the disturbed areas adjacent to the ditch line, filling and leveling street and driveway cuts, cleaning up and removal of rubbish, repair of fences and structures, and any other such work that may be required to result in a neat, orderly project area. Rough Cleanup shall be performed as other construction progresses and must be completed within one week of the adjacent pipeline construction.

19.2 Rough Cleanup is not a separate pay item. The cost for this work shall be included in the unit bid price for force mains. If Rough Cleanup is not performed as specified, the OWNER will require deductions from partial payment estimates in accordance with the Supplemental General Conditions, Sections 3.3 and 18.

20. Final Cleanup

20.1 Final cleanup, grade work and seeding shall be performed on each line when backfilled trenches have had adequate time to settle, but at least within 2 months from the date each line is constructed. Disturbed areas shall be restored original or satisfactory condition. Final grade work and seeding on Kentucky Bureau of Highways rights-of-way shall be done in accordance with said Bureau's specifications and the permit granted to the OWNER specifically for this project.

20.2 Where work was performed on private property in lawns, earth of good quality, free from rock shall be spread over the disturbed area and graded and compacted to match adjacent ground contours. The graded area shall be hand raked until smooth and free from rock, potholes, and humps. The disturbed area shall then be seeded with the seed variety used on the original lawn (e.g., a bluegrass lawn shall be reseeded with bluegrass seed) and the seed raked in lightly. The seeded area shall be fertilized and then uniformly covered with straw to a depth of approximately 1 1/2 inches.

20.3 Where work was performed on private property and not in lawns the trench line shall be graded and filled if necessary to match adjacent contours. All rock larger than 1 1/2 inches in diameter shall be removed from the disturbed area. In general, pasture and fallow land shall be fertilized and seeded with Kentucky 31 Fescue and plowed fields shall be left unseeded, however, the desire of each property owner shall govern regarding seeding.

20.4 In all cases on private property the rate of seed and fertilizer application shall be that recommended by the University of Kentucky Cooperative Extension Service for new plantings of the variety of grass seed used.

20.5 If the trench line settles following final grade work or if grass seed fails to germinate within a reasonable time, the CONTRACTOR shall regrade or reseed the area in question as specified above and as directed by the ENGINEER.

20.6 Final cleanup is a separate pay item (not applicable if sewer main is paid as part of a lump sum bid item).

SECTION 6
GRAVITY SANITARY SEWER LINES AND APPURTENANCES

1. Scope of the Work

The work to be accomplished under this section of the Specifications consists of the furnishing of all materials and labor necessary for the construction of gravity sewer lines, including all manholes, service laterals, accessories, and appurtenances in strict accordance with the Specifications and the applicable Drawings.

2. Trenching

2.1 Unless otherwise directed by the ENGINEER, trenches in which pipes are to be laid shall be excavated in open cut to the elevations shown on the Drawings. Trench depth shall allow for a minimum of 6-inches of pipe bedding as specified herein but shall not be deeper than 12-inches below the invert elevation of the sewer.

2.2 All excavated material from the trench excavation shall be placed on the up-gradient side of the trench, when possible, to minimize erosion and sediment loss.

2.3 The trenches shall be straight and uniform so as to permit laying pipe to the lines and grades given on the Drawings, and in general so that the pipe will be constructed along the centerline designated on the Drawings.

2.4 All blasting shall conform to the requirements of Section 5, Paragraph 4, "Blasting."

3. Bedding

Crushed stone bedding is required for both PVC and ductile iron pipe gravity sewers. Following excavation of the trench to the proper depth and width, No. 9 crushed stone, as defined by KY D.O.T. *Standard Specifications for Road and Bridge Construction*, shall be placed in the bottom of the trench and compacted to a minimum depth of 6-inches. The surface of this material shall be smoothed, bell holes shall be dug, and the bedding otherwise prepared so that the entire load of the backfill on the pipe will be carried evenly on the barrel of the pipe.

4. Pipe Laying and Initial Backfill

4.1. General

4.1.1 Gravity sewers shall be constructed with true, straight horizontal alignment and on true, constant vertical grade between manholes as shown on the Drawings. All pipes shall be fitted and matched so that

when laid in the Work they form a sewer with a smooth and uniform invert. Sewers will be thoroughly inspected during and after construction and pipe segments not meeting these criteria, in the opinion of the ENGINEER, shall be repaired or rebuilt.

4.1.2 The laying of gravity sewer pipes in finished trenches shall be commenced at the lowest point, so that the spigot ends point in the direction of the flow. Supporting of pipes shall be as set out hereinbefore under Bedding and in no case shall the supporting of PVC pipe on blocks or earth mounds be permitted.

4.1.3 Branches, fittings, and specials for gravity sewer lines shall be provided and laid as and where directed by the ENGINEER or shown on the Drawings. All open ends of pipe and of branches shall be sealed with plugs firmly held in place in a manner acceptable to the ENGINEER.

4.1.4 When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plug approved by the ENGINEER, fitted into the pipe bell. Precautions shall also be taken to prevent flotation of pipe due to runoff or ground water entering the trench.

4.2. PVC Pipe

4.2.1 PVC pipe shall be installed in accordance with ASTM standard recommended practice for underground installation of flexible thermoplastic sewer pipe, ASTM D-2321.

4.2.2 After the pipe is laid on the prepared bedding, material consisting of No. 9 crushed stone shall be placed and consolidated under the haunch of the pipe and up to the pipe spring line. This material shall be placed equally on both sides of the pipe to avoid displacing the pipe.

4.2.3 Initial backfill over PVC pipe shall in all cases consist of No. 9 stone to a level at least 12-inches above the top of the pipe. Only light consolidation of initial backfill is required.

4.3. Ductile Iron Pipe

Ductile iron pipe shall be laid in accordance with the manufacturer's recommendations and these Specifications. After the pipe is in place on the bedding, selected initial backfill material free from rock larger than one inch in diameter shall be placed and consolidated on each side of the pipe up to 12-inches above the top of the pipe.

5. Pipe and Fittings

5.1. PVC Sewer Pipe for Gravity Sewers

5.1.1 Pipe and fittings shall meet and/or exceed all of the requirements of ASTM D3034. The bell shall consist of an integral wall section with solid cross section rubber ring factory assembled and securely locked in place to prevent displacement and shall conform to Uni-Bell UNI-B-4 specifications. Gaskets shall conform to ASTM F 477. Standard lengths shall be approximately 12.5-feet or less. All fittings and accessories shall have bell and spigot configurations identical to that of the pipe. The SDR shall be 35 for segments installed up to 20-feet below grade, and the SDR shall be 26 if any portion of the segment is to be installed at a depth greater than 20-feet, or as shown on the Drawings.

5.1.2 Minimum "Pipe Stiffness" (F/ Y) at 5 percent deflection shall be 46 psi for all sizes when calculated in accordance with ASTM D-2412.

5.2. Ductile Iron Pipe for Gravity Sewers

5.2.1 In the locations called out on the Drawings, ductile iron pipe for gravity sewers shall be bell and spigot Class 350 Ductile Iron Pipe. Ductile iron pipe for gravity sewers shall be furnished bituminous coated outside and ceramic epoxy coated inside.

5.2.2. Ductile Iron Pipe Interior Coating

5.2.2.1 The interior coating shall be Protecto 401 Ceramic Epoxy, or approved equal. The material shall be an amine cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment.

5.2.2.2 The lining shall be applied in strict conformance with manufacture's recommendations by a certified firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

5.2.2.3 The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the manufacturer's requirements, and that the material used was as specified.

5.2.2.4 Ceramic expoxy lined pipe must be handled only from the outside of the pipe. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying. The pipe shall not be dropped or unloaded by rolling.

6. Manholes

6.1. General

Manholes shall be precast according to the standard detail sheet and

these Specifications. All concrete used in manholes shall be designed for a 28-day comprehensive strength of 4,000 psi. Adequate water stop devices shall be incorporated into the Work at the inlets and outlet of the manhole and the devices shall be approved by the ENGINEER. All manholes shall be constructed completely watertight. Eccentric cone sections shall be typical.

6.2. Precast Manholes

6.2.1 Precast concrete manholes shall be constructed on a poured in place concrete slab if the manhole is be constructed on a bearing surface of native soil. If solid rock is excavated at the manhole bearing surface, the poured in place concrete slab is not required. However, No. 9 crushed stone shall be placed for leveling the precast bottom. Precast reinforced concrete manhole sections shall conform in every respect with ASTM C-478 Type B Wall, "Precast Reinforced Concrete Manhole Risers & Tops."

6.2.2 Joints between precast sections shall be sealed with butyl resin sealant, ConSeal CS-202 or equal and polyolefin backed exterior joint wrap, ConSeal CS-212, or approved equal. The minimum width of the joint wrap shall be 6-inches. Following placement of precast section, non-shrink, water plug type grout approved by the ENGINEER shall be spread in joint spaces and other irregularities inside manholes and troweled smooth.

6.3. Manhole Inverts

Inverts shall be constructed of concrete and shall form a smooth, even half-pipe section as shown on the standard detail sheet. The inverts shall be constructed when the manhole is being built or precast in the manhole bottom.

6.4. Manhole Steps

Manhole steps shall be resistant to rust and corrosion and shall be made of either high-grade aluminum or polypropylene coated steel or cast iron. Steps shall be approved by the ENGINEER.

6.5. Manhole Frames and Covers

6.5.1 Manhole frames and covers will be furnished and thoroughly grouted in place with cement mortar. The frame and cover shall be of the type and dimension shown on the Drawings and shall weigh not less than 415 pounds. Standard manhole lids shall have at least one pick hole and shall be similar to John Bouchard & Sons Co. No. 1150. Watertight manholes shall be installed where indicated on the Drawings. Watertight manholes shall be similar to John Bouchard & Sons Co. No. 1123 and

shall weigh not less than 535 pounds.

6.5.2 All watertight manholes shall incorporate a water stop device to seal between the cone section and the casting. The water stop device shall be a minimum of 8 1/2-inches in length, and be NPC FlexRib, or approved equal.

6.5.3 **All manhole covers shall be bolted to the frames. All frames shall be bolted to the concrete cone section.**

7. Sewer Service Laterals

7.1 During the construction of gravity sewers, the ENGINEER's inspector will designate the location of the points on the lines where wyes are to be installed for service laterals. The CONTRACTOR shall lay the sewer lateral line from this point to a point designated by the ENGINEER (typically to the customer's property line.)

7.2 If the sewer main is installed in an easement or private property, unless otherwise directed by the ENGINEER, the lateral will be extended 5-feet from the wye serving that property. The responsibility for providing for meeting existing service lines insofar as practical and feasible shall be the CONTRACTOR's. In no case shall the grade on a service lateral line be less than one foot per 100-feet (approximately 1/8-inch per foot). Depth of service laterals shall be as required to serve each respective property and minimum cover over service laterals shall be 3-feet unless otherwise authorized by the ENGINEER. When the sewer main is relatively deep, the ENGINEER may require a riser pipe as shown on the standard detail sheet.

7.3 Service laterals shall be 6-inch pipe, conforming to the Specifications set out for sewer main hereinbefore. Laterals shall be bored under the pavement of all State highways, and any other locations when directed by the ENGINEER. Laterals in other locations shall be by open cut. Trenching, pipe laying, joints, and backfilling shall conform to the requirements set out hereinbefore. All open ends shall be sealed with an approved plug to the satisfaction of the ENGINEER.

7.4 The end of the house connection at the property line shall be marked on the ground as shown on the standard detail sheet.

7.5 Where it is necessary to tap service laterals into manholes, the invert of the service lateral shall not be higher than 3-inches below the top of the bench in the manhole and suitable trough shall be provided in the bench to prevent the accumulation of solids on the bench. If necessary, a standard drop connection shall be provided for a house service tapped into a manhole.

7.6 In general, the installation of service lateral laterals shall be concurrent with the construction of the main sewer. This requirement shall apply particularly where traveled streets are involved so that the said streets will be disturbed only

once during the construction period. This method of construction will permit more advantageous handling of backfilling and street paving replacement and also will avoid possible damage to the main sewer by subsequent exposure for connection of the service lines.

8. Connecting to and Plugging of Existing Sewers

8.1 Connection of new sewer lines and/or manholes to existing sewer lines and/or manholes shall be performed so as to maintain service to existing customers. In order to accommodate existing customers, the ENGINEER may require that connections be made at night or on weekends and no extra payment shall be due the CONTRACTOR for such schedule. Where existing lines in or out of new or existing manholes are to be abandoned, they shall first be cut and plugged and then the inlet or outlet paved over with concrete to fashion the new invert. The Work of connecting new lines or cutting and plugging existing lines is not a separate pay item.

8.2 Adequate water stop devices, approved by the ENGINEER, shall be installed in the sides of existing manholes when new sewers are connected.

9. Piers for Sewer Lines

When required, piers for supporting gravity sewer lines shall be constructed of 4,000 psi concrete in accordance with the details shown on the Drawings.

10. Casing Pipe for Sewers

Casing pipe for sewers shall be smooth wall steel pipe having a minimum wall thickness of 0.25-inches. Casing pipe shall be installed either by open cut or by boring as indicated on the Drawings. Joints in casing pipe shall be welded continuously all around. For gravity sewer lines the CONTRACTOR is cautioned to take particular care to install the casing pipe with respect to the required grade of the proposed carrier pipe. The carrier pipe shall be supported on casing spacers (Advance, Calpico or equal) so as to center the carrier inside the casing pipe in accordance with the manufacturer's recommendations. End seals shall be installed.

12. Final Inspection

Prior to accepting a gravity sewer, and placing it in service, the ENGINEER will make a final internal and above ground inspection. At this time all lines shall have been flushed clear of mud, gravel, or other foreign material, the specified tests will have been run, and construction substantially complete. The CONTRACTOR will provide any necessary equipment or assistance required by the ENGINEER for this inspection.

13. Rough Grade Work and Cleanup

13.1 Rough Grade Work and Cleanup (Rough Cleanup) shall be defined to include the final backfill and windrowing of the ditch line, disposal of excess excavated material, level grading of the disturbed areas adjacent to the ditch line, filling and leveling street and driveway cuts, cleaning up and removal of rubbish, repair of fences and structures, and any other such work that may be required to result in a neat, orderly project area. Rough Cleanup shall be performed as other construction progresses and must be completed within one week of the adjacent pipeline construction.

13.2 Rough Cleanup is not a separate pay item. The cost for this work shall be included in the unit bid price for sewer lines. If Rough Cleanup is not performed as specified, the OWNER will require deductions from partial payment estimates in accordance with the Supplemental General Conditions, Sections 3.3 and 18.

14. Final Cleanup (Also See Basis of Payment)

14.1 Final cleanup, grade work and seeding shall be performed on each line when backfilled trenches have had adequate time to settle, but at least within 2 months from the date each line is constructed. Final grade work and seeding on Kentucky Bureau of Highways rights-of-way shall be done in accordance with said Bureau's specifications and the permit granted to the OWNER specifically for this project.

14.2 Where work was performed on private property in lawns, earth of good quality, free from rock shall be spread over the disturbed area and graded and compacted to match adjacent ground contours. The graded area shall be hand raked until smooth and free from rock, potholes, and humps. The disturbed area shall then be seeded with the seed variety used on the original lawn (e.g., a bluegrass lawn shall be reseeded with bluegrass seed) and the seed raked in lightly. The seeded area shall be fertilized and then uniformly covered with straw to a depth of approximately 1 1/2 inches.

14.3 Where work was performed on private property and not in lawns the trench line shall be graded and filled if necessary to match adjacent contours. All rock larger than 1 1/2 inches in diameter shall be removed from the disturbed area. In general, pasture and fallow land shall be fertilized and seeded with Kentucky 31 Fescue and plowed fields shall be left unseeded, however, the desire of each property owner shall govern regarding seeding. Disturbed areas not in lawns are not required to be strawed unless erosion problems are anticipated by the ENGINEER.

14.4 In all cases on private property the rate of seed and fertilizer application shall be that recommended by the University of Kentucky Cooperative Extension Service for new plantings of the variety of grass seed used.

14.5 If the trench line settles following final grade work or if grass seed fails to germinate within a reasonable time, the CONTRACTOR shall regrade or reseed

the area in question as specified above and as directed by the ENGINEER.

14.6 Final cleanup is a separate pay item (not applicable if sewer main is paid as part of a lump sum bid item).

SECTION 7
WATER LINES AND WATER SERVICES

1. Scope of the Work

The work to be accomplished under this section of the Specifications consists of the furnishing of all materials and labor necessary for the construction of water lines, including all services, meters, fittings, blow-offs, valves, accessories, and appurtenances in strict accordance with the Specifications and the applicable Drawings.

2. Location of Water Lines

The approximate location of water lines in relation to the limits of rights-of-way, pavement, etc. is shown on the Drawings but is not guaranteed. The location shown was chosen to minimize the overall project cost with respect to rock excavation, pavement replacement, crushed stone for traffic bound roadway, customer water services, etc.

3. Excavation of Pipeline Trenches

All excavation shall conform to the requirements of Section 5, Paragraph 3, "Excavation of Force Main Trenches."

4. Blasting

All blasting shall conform to the requirements of Section 5, Paragraph 4, "Blasting."

5. Pipe Bedding and Initial Backfill

For all pipe 14 inches in diameter and larger, or where rock excavation is encountered or in rocky soil as directed by the ENGINEER, the pipe shall be bedded with six (6) inches of crushed stone under the pipe. Crushed stone shall be used in the initial backfill from the bottom of the pipe to the centerline of the pipe. Initial backfill material shall be placed and thoroughly compacted by hand tamping. Initial backfill material shall be deposited in the trench for its full width on each side of pipe, fittings and appurtenances simultaneously. Care must be taken to compact fill along the sides of the pipe and appurtenances adjacent to pipe wall. Crushed stone shall be No. 9-M or #57 as described in the *Standard Specifications for Road and Bridge Construction* as published by the Kentucky Department of Transportation, Bureau of Highways. In certain cases the CONTRACTOR may be required to move earth of good quality from previous trench excavation for use as bedding material.

6. Pipe Laying

6.1. General

6.1.1 The CONTRACTOR shall notify the ENGINEER as to the date and time of all pipe deliveries and shall not unload any pipe except in the presence of the Inspector. Pipe shall be transported and handled in strict conformance with the manufacturer's recommendations.

6.1.2 The CONTRACTOR will be required to stockpile all pipe in central locations. Pipe strung along the route of the pipeline, shall be limited to the current day's expected production.

6.1.3 Pipe laying shall be in strict accordance with the manufacturer's recommended practice. Special tools, lubricant and equipment for proper laying shall be provided by the manufacturer. If the CONTRACTOR proposes a method of installation not covered by the manufacturer's recommended procedures, the CONTRACTOR shall obtain written certification from the manufacturer that installation by this proposed method will in no way affect the manufacturer's warranty of the pipe.

6.1.4 Pipe shall not be rolled, or dropped, into the trench.

6.1.5 All angles or bends in the pipe lines, either vertical or horizontal shall be satisfactorily braced or anchored against the tendency of movement with concrete anchors to the satisfaction of the ENGINEER.

6.1.6 Open ends of unfinished pipelines shall be securely plugged or closed at the end of each day's work, or when the line is left temporarily at any other time.

6.2. Plastic Pipe

6.2.1 Plastic pipe shall be installed in accordance with manufacturer's recommendations. A representative who is a direct employee of the pipe manufacturer shall conduct training sessions for CONTRACTOR's personnel regarding proper pipe installation. The manufacturer's representative shall certify to the ENGINEER the names of CONTRACTOR's personnel who have attended such training. Pipe laying and assembly work shall be performed only by personnel who appear on the manufacturer's certified list.

6.2.2 Backfilling shall be done in accordance with Paragraph 7, Backfilling Pipeline Trenches, where not in conflict with manufacturer's recommendations.

7. Backfilling Pipeline Trenches

7.1 Backfilling shall be conducted at all times in a manner to prevent damage to

the pipe and the exterior protection on the pipe. Placing of backfill shall be done only in the presence of the ENGINEER after his final inspection and acceptance of the pipe in place. If material for backfilling is not available at the construction site, the CONTRACTOR shall "import" earth of good quality from a site approved by the ENGINEER. This will not be a separate pay item.

7.2 In areas of earth excavation of the pipeline trench, earthen material reasonably free from rock and acceptable to the ENGINEER shall be used in the backfilling of the trench. Backfill material free of rock over one inch in diameter shall be placed around the pipe up to the point where the pipe is thoroughly covered with at least one foot of material. Walking or working on the completed pipe (except as may be necessary in backfilling) shall not be permitted until the trench has been backfilled to a height of at least one foot above the top of the pipe. The filling of the trench shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipeline will not be disturbed and injurious side pressures do not occur.

7.3 In areas of rock excavation of the pipeline trench, crushed stone as used for bedding shall be used as backfill material to a level 6 inches above the top of the pipe. Placement of this backfill material shall be performed as described above. In certain cases in lieu of or in addition to the crushed stone backfill the CONTRACTOR may be required to use earth of good quality as backfill material to a depth of 12 inches above the pipe as described above.

7.4 In filling the remainder of the trench above the initial backfill described above, whether in earth or rock excavation, earth backfill material reasonably free of rock may be shoved into the trench without compacting and heaped over, then compacted by rolling with the wheel of a grader or front-end loader. Earth backfill material containing rocks greater than 6 inches in diameter shall not be acceptable.

7.5 The final step in the backfill operation shall be to windrow good quality earthen material over the top of the ditch. The windrow shall be no higher than one foot and no wider than the width of the ditch plus 4 feet. All other excavated material except that required for the above described windrow shall be considered excess and shall be disposed of as described hereinafter.

7.6 Where street, driveway and highway crossings are made and where streets or highways are proposed, the CONTRACTOR will be required to tamp all backfill as described hereinafter and backfill the trench with No. 9-M crushed stone.

7.7 Where tamping is required, the backfilling shall all be done in layers not exceeding 6 inches and firmly tamped into place by tampers or rammers. The ENGINEER may permit puddling of ditches to compact the backfill in lieu of tamping with mechanical tampers except where street paving is to be replaced immediately after the backfilling is completed. The ENGINEER may also require puddling where (in his opinion) it is necessary for proper compaction.

8. Disposition of Excess Excavated Material

Excavated materials not used for backfill including "shot rock" and boulders shall be disposed of within one week of the adjacent trench being backfilled. Disposal of excavated material shall be performed so as to cause the least interference with the completed pipeline and operations of the OWNER, property owners, etc. and in a manner satisfactory to the ENGINEER.

9. Concrete Kickers, Anchors, Cradles, and/or Encasement

9.1 Concrete kickers, anchors, cradles, and/or encasement of water lines shall be placed where and as shown on the Drawings, or as directed by the ENGINEER.

9.2 Concrete for anchors, kickers, cradle, and/or encasement shall be 2,500 psi concrete and shall be mixed sufficiently wet to permit it to flow under the pipe to form a continuous bed. In tamping concrete, care shall be taken not to disturb the grade or line of the pipe, or to injure the joints. Concrete placed outside the specified limits or without authorization from the ENGINEER will not be subject to payment.

9.3 Thrust blocks shall be provided in accordance with details shown on Drawings and must bear against an undisturbed trench face. Thrust blocks must be used even when special locked-joint fittings, anchoring fittings, or pipe clamps with tie rods are employed. Fitting bolts shall be protected from the concrete being poured for thrust blocks by using plastic sheeting to cover the area of the bolts.

10. Pipe and Fittings for Water Lines

10.1. General

Pipe for water mains shall be nominal diameter and material indicated on the Drawings. The pipe shall be as specified herein and shall be either PVC or ductile iron.

10.2. Fittings

10.2.1 Ductile iron mechanical joint fittings shall be required for all sizes of PVC and ductile iron pipe. Ductile iron mechanical joint fittings shall conform to AWWA specification C 153 and shall have a rated working pressure of 350 psi up to 24-inch diameter and 250 psi above 24-inch. Ductile iron fittings shall be furnished with a bituminous coating outside in accordance with AWWA specification C 153 and shall be cement mortar lined inside in accordance with AWWA specification C 104.

10.2.2 Only high strength low alloy steel T-bolts shall be used with all mechanical joints including fittings, valves, etc. All glands, T-bolts and other accessories shall be manufactured and provided by the same manufacturer as the fittings on which the accessories are used.

10.2.3 Fittings used in pipeline sections noted on the Drawings to be restrained shall be slip joint type fittings that incorporate the specified type of restraining system used with ductile iron pipe or mechanical joint type fittings with approved restraining devices listed below.

10.2.4 Fittings shown on the Drawings are intended to convey the general configuration only. The CONTRACTOR shall be required to furnish fittings at each abrupt change (vertical or horizontal) in the pipeline alignment, as determined by the ENGINEER. The CONTRACTOR shall also be required to furnish any special gaskets, adaptors, etc. necessary for construction.

10.2.5 All vertical bends shall include approved restraining devices. Approved restraining devices are Megalug by EBBA Iron, Inc., GripRing by Romac Industries, Inc., or approved equal.

10.2.6 Fittings and accessories manufactured in the United States and shall be Union/Tyler, ACIPCO, U.S. Pipe, or approved equal. Fittings and accessories manufactured outside the United States shall be by either Sigma Corporation or Star Products, Inc.

10.3. Plastic (PVC) Pipe

10.3.1 Plastic pipe shall be polyvinyl chloride (PVC) and shall meet the requirements set forth by ASTM D1784 for Type 1, Grade 1. All plastic pipe shall bear the National Sanitation Foundation Testing Laboratory seal for potable water. The pipe shall also meet the requirements of ASTM D-2241, ASTM D-3139, and all other specifications referred to therein.

10.3.2 In general and unless indicated otherwise on the Drawings, PVC pipe shall be Class 200 (SDR-21). However, in certain areas Class 250 (SDR-17) or Class 160 (SDR-26) PVC pipe may be required.

10.3.3 Provision shall be made for contraction and expansion at each joint with either twin gasketed couplings or integral bell joints. Gasket systems shall be Reiber or other locked-in type as approved by the ENGINEER. Twin gasketed couplings shall be rated for working pressure equal to that of pipe and shall be as manufactured by the pipe manufacturer.

10.3.4 PVC pipe shall be manufactured by a company that has made pipe in accordance with ASTM D-2241 under the brand name to be supplied on this project continuously over the previous eight (8) year period. Pipe shall be manufactured at a plant that has been owned, operated and controlled by the same manufacturing company and has produced PVC pipe in accordance with ASTM D-2241 as a routine standard procedure for the last three (3) years. PVC pipe shall be Certainteed, Vulcan, or North American.

10.3.5 Pipe manufactured with Molecular Oriented Poly (vinyl Chloride), PVC (MO), may be substituted for the PVC pipe described above. PVC (MO)

pipe shall conform to ASTM F1483 and shall be Ultra-Blue as manufactured by JM Eagle, Inc.

10.3.6 Note special PVC and PVC (MO) pipe testing requirements, Section 2 Paragraph 13.

11. Gate Valves, Butterfly Valves, and Boxes

11.1 Gate valves shall comply with AWWA specification C 509 and shall be of the resilient wedge type, epoxy coated, iron body, non-rising stem and fully bronze mounted. Valves shall be suitable for water working pressures of 250 psi. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship. Gate valves shall be either the A-2360 series by Mueller Company or Style 3067 by M & H Valve Company.

11.2 All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working water pressure cast on the body of the valve. Unless otherwise indicated on the Drawings, all gate valves shall be provided with a 2-inch square operating nut and shall open by turning counterclockwise.

11.3 Valve boxes shall be cast iron, two piece, screw type 24-inch to 36-inch extension with drop covers marked "WATER" and they shall be set vertically, properly adjusted so that the cover will be in the same plane as the finished surface of the street or ground. The box shall have a 5 1/4-inch shaft. Valve boxes shall be as manufactured by Mueller, Clow, M & H, or an approved equal.

11.4 **Any valve that is installed at a depth to the operating nut greater than 3 feet below the final elevation of the valve box top shall be fitted with a valve operator extension**. The length of the extension shall place the operating nut 12 to 24 inches from the valve box top. The extension shall be secured to the valve nut with a set screw. The extension shall include a 1-inch solid steel shaft, 2-inch square top nut, and centering ring near the top. Valve operator extensions shall be manufactured by an entity regularly engaged in the manufacture of such equipment, and be Water Key Model VE-XX, or approved equal.

12. Tapping Sleeves and Valves

12.1 Tapping sleeves for cast iron or ductile iron pipe shall be mechanical joint and shall be Mueller H615 or M & H Style 1174. Tapping sleeves for A.C. pipe shall be mechanical joint and shall be Mueller H-619 or approved equal. Tapping sleeves for 4-inch through 8-inch PVC pipe shall be Mueller H-612 or Clow #F-6342. Tapping sleeves for 10-inch and 12-inch PVC pipe shall be Smith-Blair No. 622 fabricated steel sleeves, epoxy coated with stainless steel bolts and nuts.

12.2 Tapping valves shall meet the same general specifications as described

herein for gate valves.

13. Post and Flush Type Fire Hydrants

13.1 Post and Flush hydrants shall be "dry barrel," cast iron bodied, fully bronze mounted, suitable for a working pressure of 150 psi, and shall meet all requirements of the latest AWWA C502 specifications. Each hydrants shall be given a 300 psi hydrostatic test in the shop. Post hydrants shall be Mueller Model A-411, or approved equal. Flush Hydrants shall be Mueller Model A-412, or approved equal.

13.2 The waterways of post and flush hydrants shall be as free as possible of obstructions, sharp turns, corners, or other causes for resistance. The base of the flush hydrant shall have a bell connection to admit a proper connection with a standard mechanical joint. Bury depth shall be 3 feet 6 inches minimum or as required to bring the hydrant to the proper grade. The distance from the ground line of the post hydrant to the top of the flush hydrant head shall be not less than 30 inches.

13.3 Post and flush hydrants shall have a 3-inch connection to the main and one (1) 2 1/2-inch brass nozzle with cap fastened securely. The main valve of the hydrant shall be not less than 2 1/8 inches in diameter. All connection threads shall comply with standard specifications of the National Board of Fire Underwriters.

13.4 The hydrant main valve shall be of the compression type, closing with pressure. The valve shall be faced with heavy impregnated waterproof balata or other approved material.

13.5 **Post Hydrants shall be supplied with factory applied paint. The color shall be Safety Yellow.** The factory applied paint shall be protected during transport and installation. Any hydrants which have excessive chips, scratches, or other abrasions, in the opinion of the ENGINEER, shall be subject to rejection. After installation, exposed surfaces of hydrants shall be painted with two (2) coats of Rustoleum 9800 System DTM Mastic. Barrel color shall be Safety Yellow.

14. Inspection of the Lines

Before the CONTRACTOR backfills any of the lines, they first shall be inspected by the ENGINEER's Representative and the ENGINEER's Representative shall give the CONTRACTOR permission to proceed with the backfilling. If any joints, pipes, fittings, or materials or workmanship are found to be defective, they shall be removed and replaced by the CONTRACTOR without any additional compensation.

15. Connecting to the Existing Lines

15.1 Work under this item shall include the connecting of new water lines to the existing water lines in the manner shown on the Drawings, and as directed by the ENGINEER. The work of connecting new lines to existing lines is not a separate pay item under this Contract.

15.2 Where such a connection will result in an interruption of service, the CONTRACTOR shall propose the schedule for such a connection to the ENGINEER several days in advance. The ENGINEER will present the proposal to the OWNER for approval. The interest of the OWNER in regards to service to existing customers shall take precedence over the new construction. The CONTRACTOR's schedule shall permit the OWNER to provide notification to customers at least 24 hours before the suspension of service.

16. Disinfection and Flushing of the Lines

16.1 The new water lines shall not be placed in service either temporarily or permanently until they have been disinfected thoroughly in accordance with the following requirements to the satisfaction of the ENGINEER.

16.2 After pressure testing procedures have been completed, the CONTRACTOR shall flush the line thoroughly, removing all foreign material, dirt, etc. Then a solution of hypochlorite using HTH or equal, sufficient to insure a chlorine dosage of at least 50 parts per million through the entire length of the line, shall be introduced into the line.

16.3 The chlorine solution shall remain in the line for 24 hours and a residual of at least 25 parts per million should be present in the pipe at the end of the 24-hour period. The line shall be flushed until 2 parts per million chlorine residual remains, then bacteriological samples taken. One sample shall be taken per mile of pipeline with a minimum of 2 samples per line. Each sample shall be collected from a different point along the line. If negative samples are obtained, the lines may be put into service. If a positive sample is obtained however, the disinfection procedure shall be repeated until negative samples are obtained. Bacteriological test costs shall be paid by the CONTRACTOR.

16.4 Disinfection, pressure testing, other required testing and flushing are not pay items. The CONTRACTOR shall pay for all water used for testing, disinfection, and flushing, except the amount required to fill the pipelines twice. This amount will be computed and deducted from the total amount metered.

16.5 The CONTRACTOR shall install a temporary bypass with a meter around a valve at the point of connection to the existing water system. This meter will be for the purpose of measuring water used by the CONTRACTOR for flushing, testing, and disinfecting the new water lines. The meter shall be large enough to pass the required flows. It shall be tested for accuracy before being installed.

17. Rough Grade Work and Cleanup

17.1 Rough Grade Work and Cleanup (Rough Cleanup) shall be defined to include the final backfill and windrowing of the ditch line, disposal of excess excavated material, level grading of the disturbed areas adjacent to the ditch line, filling and leveling street and driveway cuts, cleaning up and removal of rubbish, repair of fences and structures, and any other such work that may be required to

result in a neat, orderly project area. Rough Cleanup shall be performed as other construction progresses and must be completed within one week of the adjacent pipeline construction.

17.2 Rough Cleanup is not a separate pay item. The cost for this work shall be included in the unit bid price for water lines. If Rough Cleanup is not performed as specified, the OWNER will require deductions from partial payment estimates in accordance with the Supplemental General Conditions, Sections 3.3 and 18.

18. Final Cleanup (Also See Basis of Payment)

18.1 Final cleanup, grade work and seeding shall be performed on each line when backfilled trenches have had adequate time to settle, but at least within 2 months from the date each line is constructed. Final grade work and seeding on Kentucky Bureau of Highways rights-of-way shall be done in accordance with said Bureau's specifications and the permit granted to the OWNER specifically for this project.

18.2 Where work was performed on private property in lawns, earth of good quality, free from rock shall be spread over the disturbed area and graded and compacted to match adjacent ground contours. The graded area shall be hand raked until smooth and free from rock, potholes, and humps. The disturbed area shall then be seeded with the seed variety used on the original lawn (e.g., a bluegrass lawn shall be reseeded with bluegrass seed) and the seed raked in lightly. The seeded area shall be fertilized and then uniformly covered with straw to a depth of approximately 1 1/2 inches.

18.3 Where work was performed on private property and not in lawns the trench line shall be graded and filled if necessary to match adjacent contours. All rock larger than 1 1/2 inches in diameter shall be removed from the disturbed area. In general, pasture and fallow land shall be fertilized and seeded with Kentucky 31 Fescue and plowed fields shall be left unseeded, however, the desire of each property owner shall govern regarding seeding. Disturbed areas not in lawns are not required to be strawed unless erosion problems are anticipated by the ENGINEER.

18.4 In all cases on private property the rate of seed and fertilizer application shall be that recommended by the University of Kentucky Cooperative Extension Service for new plantings of the variety of grass seed used.

18.5 If the trench line settles following final grade work or if grass seed fails to germinate within a reasonable time, the CONTRACTOR shall regrade or reseed the area in question as specified above and as directed by the ENGINEER.

18.6 Final cleanup is a separate pay item (not applicable if water main is paid as part of a lump sum bid item).

SECTION 8
HORIZONTAL DIRECTIONAL DRILLING (HDD) / HDPE PIPE

1. General

1.1 It is the intent of this specification to define the acceptable methods and materials for installing sanitary sewer and water mains by the horizontal directional drilling method and the requirements for high density polyethylene (HDPE) pipe installed by horizontal directional drilling (HDD).

2. Installation Plan

2.1 At least 7 days prior to mobilizing equipment Contractor shall submit his detailed installation plan to the Engineer. The plan shall include a detailed plan and profile of the bores and be plotted at a scale no smaller than 1 inch equals 20 feet horizontal and vertical.

2.2 The plan shall also include a listing of major equipment and supervisory personnel and a description of the methods to be used.

3. Variations in Plan or Profile

3.1 The Contractor may request changes to the proposed vertical and horizontal alignment of the installation and the location of the entry and exit points. Proposed changes shall be submitted in writing to the Engineer and receive approval of the Engineer prior to construction.

4. Alignment

4.1 The proposed plan and profile installation locations are based on alignments to accommodate acquired easements, to avoid obstructions, and to properly maintain operational flow velocities.

5. Qualifications

5.1 Directional drilling and pipe installation shall be done only by an experienced Contractor specializing in directional drilling and whose key personnel have at least five (5) years' experience in this work. Furthermore, the Contractor shall have installed directionally drilled pipe at least as large as 12 inches in diameter, have performed crossings at least 1,500 feet in length, and successfully installed at least 20,000 feet in length.

6. Materials

6.1 General

6.1.1 All piping system components shall be the products of one manufacturer and shall conform to the latest edition of ASTM D1248, ASTM D3350, and ASTM F714.

7. Piping and Bends

7.1 Piping and Bends shall be extruded from a polyethylene compound and shall conform to the following requirements:

7.1.1 The polyethylene resin shall meet or exceed the requirements of ASTM D3350 for PE 3408 material with a cell classification of 335434C, or better.

7.1.2 The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black, well dispersed by pre-compounding in a concentration of not less than 2 percent.

7.1.3 The maximum allowable hoop stress shall be 800 psi at 73.4 degrees F.

7.1.4 The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements of the resin manufacturer for the resin used to manufacture the pipe in this project.

7.1.5 The pipe and bends shall have a minimum standard dimension ratio (SDR) wall thickness as specified by the Engineer.

7.1.6 Joining shall be performed by thermal butt-fusion in accordance with the manufacturer's recommendations.

7.1.7 Sanitary sewer pipe exterior shall be green in color or contain green striping.

7.1.8 Water pipe exterior shall be blue in color or contain blue striping.

8. Procedures

8.1 General

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8. Procedures

8.1 General

8.1.1 All polyethylene pipe shall be cut, fabricated, and installed in

strict conformance with the pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with polyethylene pipe. The pipe supplier shall certify in writing that the Contractor is qualified to join, lay, and pull the pipe or a representative of the pipe manufacturer shall be on site to oversee the pipe joining. Expense for the representative shall be paid for by the Contractor.

8.2 Transportation

8.2.1 Care shall be taken during transportation of the pipe to ensure that it is not cut, kinked, or otherwise damaged.

8.3 Storage

8.3.1 Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

8.4 Handling Pipe

8.4.1 The handling of the joined pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Ropes, fabric, or rubber- protected slings and straps shall be used when handling pipes. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rocky or unprepared ground. Slings for handling the pipeline shall not be positioned at butt-fused joints. Sections of the pipes with cuts and gouges exceeding 10 percent of the pipe wall thickness or kinked sections shall be removed and the ends rejoined.

8.4.2 The open ends of all sections of joined and/or installed pipe (not in service) shall be plugged at night to prevent animals or foreign material from entering the pipe line or pipe section.

8.4.3 Waterproof nightcaps of approved design may be used but they shall also be so constructed that they will prevent the entrance of any type of natural precipitation into the pipe and will be fastened to the pipe in such a manner that the wind cannot blow them loose.

8.4.4 The practice of stuffing cloth or paper in the open ends of the pipe will be considered unacceptable.

8.4.5 Where possible, the pipe shall be raised and supported at a suitable distance back from the open end such that the open end will be below the level of the pipe at the point of support.

9. Installation

9.1 General

9.1.1 The Contractor shall install the pipelines by means of horizontal directional drilling. The Contractor shall assemble, support, and pretest the pipeline prior to installation in the directional drill tunnel.

9.1.2 Horizontal directional drilling shall consist of the drilling of a small diameter pilot hole from one end of the alignment to the other, followed by enlarging the hole diameter for the pipeline insertion. The exact method and techniques for completing the directionally drilled installation will be determined by the Contractor, subject to the requirements of these Specifications.

9.1.3 The Contractor shall prepare and submit a plan to the Engineer for approval for insertion of the HDPE pipe into the opened bore hole. This plan shall include pullback procedure, ballasting, use of rollers, side booms and side rollers, coating protection, internal cleaning, internal gauging, hydrostatic tests, dewatering, and purging.

9.1.4 The required piping shall be assembled in a manner that does not obstruct adjacent roadways or public activities. The Contractor shall erect temporary fencing around the entry and exit pipe staging areas.

10. Joining Pipe Sections

10.1 Each length of pipe shall be inspected and cleaned as necessary to be free of debris immediately prior to joining.

10.2 Pipes shall be joined to one another by means of thermal butt-fusion. Polyethylene pipe lengths to be joined by thermal butt- fusion shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.

10.3 Mechanical connections of the polyethylene pipe to auxiliary equipment shall be through mechanical joint adaptors.

10.4 Butt-Fusion Joining: Butt-fusion of pipes shall be performed in

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10.4 Butt-Fusion Joining: Butt-fusion of pipes shall be performed in

accordance with the manufacturer's recommendations as to equipment and technique. Butt-fusion joining shall be 100% efficient offering a joint weld strength equal to or greater than the tensile strength of the pipe.

11. Testing

11.1 The pipe shall be hydrostatically tested after joining into continuous lengths, prior to installation and again after installation. Pressure and temperature shall be monitored with certified instruments during the test.

11.2 Hydrostatic testing shall be performed in accordance with the Owner's Standard Specifications.

12. Tolerances

12.1 Pipe installed by the directional drilled method must be located in plan as shown on the Drawings, and must be no shallower than shown on the Drawings unless otherwise approved. The Contractor shall plot the actual horizontal and vertical alignment of the pilot bore at intervals not exceeding 30 feet. This "as built" plan and profile shall be updated as the pilot bore is advanced. The Contractor shall at all times provide and maintain instrumentation that will accurately locate the pilot hole and measure drilling fluid flow and pressure. The Contractor shall grant the Engineer access to all data and readouts pertaining to the position of the bore head and the fluid pressures and flows.

12.1.1 When requested, the Contractor shall provide explanations of this position monitoring and steering equipment. The Contractor shall employ experienced personnel to operate the directional drilling equipment and, in particular, the position monitoring and steering equipment. No information pertaining to the position or inclination of the pilot bores shall be withheld from the Engineer.

12.2 Each exit point shall be located as shown with an over-length tolerance of 20 feet for directional drills of 1,000 linear feet or less and 40 feet for directional drills of greater than 1,000 linear feet and an alignment tolerance of 10 feet left/right with due consideration of the position of the other exit points and the required permanent easement. For gravity sanitary sewer installations, sags in the pipeline shall not exceed 25 percent of the nominal pipe diameter. Sags will only be allowed where the entering and exiting grades are adequate to provide velocities through the sag area sufficient for moving solids. No more than one (1) sag area shall occur between two (2) manholes. The alignment of each pilot bore must be approved by the Engineer before pipe can be pulled. If the pilot bore fails to conform to the above tolerances, the Engineer may, at his option, require a new pilot boring to be made.

12.3 After the pipe is in place, cleaning pigs shall be used to remove residual water and debris. After the cleaning operation, the Contractor shall provide and run a sizing pig to check for anomalies in the form of buckles, dents, excessive out-of-roundness, and any other deformations. The sizing pig run shall be considered acceptable if the survey results indicate that there are no sharp anomalies (e.g. dents, buckles, gouges, and internal obstructions) greater than 2 percent of the nominal pipe diameter, or excessive ovality greater than 5 percent of the nominal pipe diameter. For gauging purposes, dent locations are those defined above which occur within a span of five feet or less. Pipe ovality shall be measured as the percent difference between the maximum and minimum pipe diameters. For gauging purposes, ovality locations are those defined above which exceed a span of five feet.

13. Ream and Pullback

13.1 **Reaming:** Reaming operations shall be conducted to enlarge the pilot after acceptance of the pilot bore. The number and size of such reaming operations shall be conducted at the discretion of the Contractor.

13.2 **Pulling Loads:** The maximum allowable pull exerted on the HDPE pipelines shall be measured continuously and limited to the maximum allowed by the pipe manufacturer so that the pipe or joints are not over stressed.

13.3 **Torsion and Stresses:** A swivel shall be used to connect the pipeline to the drill pipe to prevent torsional stresses from occurring in the pipe.

13.4 The lead end of the pipe shall be closed during the pullback operation.

13.5 **Pipeline Support:** The pipelines shall be adequately supported by rollers and side booms and monitored during installation so as to prevent over stressing or buckling during the pullback operation. Such support/rollers shall be spaced at a maximum of 60 feet on centers, and the rollers to be comprised of a non-abrasive material arranged in a manner to provide support to the bottom and bottom quarter points of the pipeline allowing for free movement of the pipeline during pullback. Surface damage shall be repaired by the Contractor before pulling operations resume.

13.6 The contractor shall at all times handle the HDPE pipe in a manner that does not over stress the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed 50% of yield stress for flexural bending of the HDPE pipe. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the Contractor at his expense. The Contractor shall take appropriate steps during pullback to ensure that the HDPE pipe will be installed without damage.

14. Handling Drilling Fluids and Cuttings

14.1 During the drilling, reaming, or pullback operations, the Contractor shall make adequate provisions for handling the drilling fluids, or cuttings at the entry and exit pits. To the greatest extent possible, these fluids must not be discharged into the waterway. When the Contractor's provisions for storage of the fluids or cuttings on site are exceeded, these materials shall be hauled away to a suitable legal disposal site. The Contractor shall conduct his directional drilling operation in such a manner that drilling fluids are not forced through the sub-bottom into the waterway. After completion of the directional drilling work, the entry and exit pit locations shall be restored to original conditions. The Contractor shall comply with all permit provisions.

14.2 Pits constructed at the entry or exit point area shall be so constructed to completely contain the drill fluid and prevent its escape to the beach or waterway.

14.3 The Contractor shall utilize drilling tools and procedures which will minimize the discharge of any drill fluids. The Contractor shall comply with all mitigation measures listed in the required permits and elsewhere in these Specifications.

14.4 To the extent practical, the Contractor shall maintain a closed loop drilling fluid system.

14.5 The Contractor shall minimize drilling fluid disposal quantities by utilizing a drilling fluid cleaning system which allows the returned fluids to be reused.

14.6 As part of the installation plan specified herein before, the Contractor shall submit a drilling fluid plan which details types of drilling fluids, cleaning and recycling equipment, estimated flow rates, and procedures for minimizing drilling fluid escape.

15. Drilling Operations

15.1 General

15.1.1 The Contractor shall prepare a plan to be submitted for Engineer approval which describes the noise reduction program, solids control plant, pilot hole drilling procedure, the reaming operation, and the pullback procedure. All drilling operations shall be performed by supervisors and personnel experienced in horizontal directional drilling. All required support, including drilling tool suppliers, survey systems, mud cleaning, mud disposal, and other required support systems used during this operation shall be provided by the Contractor.

15.1.2 Drill pipe shall be API steel drill pipe, Range 2, Premium Class or higher, Grade S-135 in a diameter sufficient for the torque and longitudinal loads and fluid capacities required for the work. Only drill pipe inspected under API's Recommended Practice Specification API RP 7G within 30

days prior to start and certified as double white band or better shall be used.

15.1.3 A smoothly drilled pilot hole shall follow the design centerline of the pipe profile and alignment described on the construction drawings.

15.1.4 The position of the drill string shall be monitored by the Contractor with the downhole survey instruments. Contractor shall compute the position in the X, Y and Z axis relative to ground surface from downhole survey data a minimum of once per length of each drilling pipe (approximately 31 foot interval). Deviations from the acceptable tolerances described in the Specifications shall be documented and immediately brought to the attention of the Engineer for discussion and/or approval. The profile and alignment defined on the construction drawings for the bores define the minimum depth and radius of curvature. At no point in the drilled profile shall the radius of curvature of the bore be less than 320 feet. The Contractor shall maintain and provide to the Engineer, upon request, the data generated by the downhole survey tools in a form suitable for independent calculation of the pilot hole profile.

15.1.5 Between the water's edge and the entry or exit point the Contractor shall provide and use a separate steering system employing a ground survey grid system, such as "TRU-TRACKER" or equal wherever possible. The exit point shall fall within a rectangle 10 feet wide and 20 feet long centered on the planned exit point.

15.1.6 During the entire operation, waste and leftover drilling fluids from the pits and cuttings shall be dewatered and disposed of in accordance with all permits and regulatory agencies requirements. Remaining water shall be cleaned by Contractor to meet permit requirements.

15.1.7 Technical criteria for bentonite shall be as given in API Spec. 13A, Specification for Oil Well Drilling Fluids Material for fresh water drilling fluids. Any modification to the basic drilling fluid involving additives must describe the type of material to be used and be included in Contractor's drilling plan presented to the Engineer. The Owner retains the right to sample and monitor the waste drilling mud, cuttings and water.

16. Environmental Provisions

16.1 The Horizontal Directional Drilling operation is to be operated in a manner to eliminate the discharge of water, drilling mud and cuttings to the adjacent creek or land areas involved during the construction process. The Contractor shall provide equipment and procedures to maximize the recirculation or reuse of drilling mud to minimize waste. All excavated pits used in the drilling operation shall be lined by Contractor with heavy duty

plastic sheeting with sealed joints to prevent the migration of drilling fluids and/or ground water.

16.2 The Contractor shall visit the site and must be aware of all structures and site limitations at the directional drill crossing and provide the Engineer with a drilling plan outlining procedures to prevent drilling fluid from adversely affecting the surrounding area.

16.3 The general work areas on the entry and exit sides of the crossing shall be enclosed by a berm to contain unplanned spills or discharge.

16.4 Waste cuttings and drilling mud shall be processed through a solids control plant comprised as a minimum of sumps, pumps, tanks, desalter/desander, centrifuges, material handlers, and haulers all in a quantity sufficient to perform the cleaning/separating operation without interference with the drilling program. The cuttings and excess drilling fluids shall be dewatered and dried by the Contractor to the extent necessary for disposal in offsite landfills. Water from the dewatering process shall be treated by the Contractor to meet permit requirements and disposed of locally. The cuttings and water for disposal are subject to being sampled and tested. The construction site and adjacent areas will be checked frequently for signs of unplanned leaks or seeps.

16.5 Equipment (graders, shovels, etc.) and materials (such as groundsheets, hay bales, booms, and absorbent pads) for cleanup and contingencies shall be provided in sufficient quantities by the Contractor and maintained at all sites for use in the event of inadvertent leaks, seeps or spills.

16.6 Waste drilling mud and cuttings shall be dewatered, dried, and stock piled such that it can be loaded by a front end loader, transferred to a truck and hauled offsite to a suitable legal disposal site. The maximum allowed water content of these solids is 50% of weight.

16.7 Dewatering and disposal work shall be concurrent with drilling operations. Treatment of water shall satisfy regulatory agencies before it is discharged.

END OF SECTION

SECTION 9
BASIS OF PAYMENT

1. General

The CONTRACTOR shall furnish all necessary labor, machinery, tools, apparatus, materials, equipment, services, and other necessary supplies and do and perform all work including all excavation and backfilling (without additional compensation except where specifically set out in these Specifications) at the unit or lump sum prices for the following items.

2. Valves and Boxes

Payment for furnishing and installing gate and/or butterfly valves and boxes in the pipelines of the sizes shown on the Bid Form will be made at the Contract unit price per valve and box, complete in place, as shown on the Standard Detail Sheet.

3. Air Release Valve Stations

Payment for automatic air release stations for sewer, as described on the Drawings and in the Specifications, shall be made at the Contract price per each station, complete in place.

4. Flushing Stations

Payment for manual flushing stations for sewer, as described on the Drawings, as shown on the Standard Detail Sheet shall be made at the Contract price per each station, complete in place.

5. Epoxy Coated Ductile Iron Fittings

5.1 Payment for ductile iron fittings will be made at the Contract unit price per pound, complete in place, and shall constitute compensation in full for furnishing and installing the fittings together with all incidental and related work.

5.2 Payment for pipe fittings for sewer mains will be based in the manufacture's published weight tables as approved by the ENGINEER. Weights of fittings shall be inclusive of bolts, gaskets, or other appurtenances and shall be as shown in the approved weight tables rather than invoice weights. The bid price for fittings shall apply to both mechanical joint and restrained joint fittings.

6. Asphaltic Concrete Pavement

Asphaltic concrete pavement shall be paid for at the Contract unit price per ton, complete in place, including primer. The CONTRACTOR shall furnish the

ENGINEER with a duplicate weigh slip for all such material delivered at the job, but the pay quantities may be computed at the discretion of the ENGINEER using unit weight of asphalt and the following pavement cross-section. Payment for asphaltic concrete shall be limited to a maximum cross-section having a width of one-half the trench depth and a thickness equal to the existing pavement being replaced.

7. Crushed Stone for Pipe Bedding, Backfill, and Surface

Crushed stone for pipe bedding, backfill, and surface will be paid for at the Contract unit price per ton, furnished and placed as specified. The CONTRACTOR shall furnish the ENGINEER with a duplicate weigh slip for all such material delivered at the job, but the pay quantities may be computed at the discretion of the ENGINEER using unit weight of stone and trench cross-section shown on Standard Detail Sheet.

8. Concrete Cradles, Surface, Anchors, and Kickers

Concrete as specified for cradles, surface, anchors, and kickers shall be paid for at the Contract unit price per cubic yard complete in place.

9. Cased Highway and Railroad Crossings

Payment for furnishing and installing (by boring or open cut) as shown on the Bid Form casing pipe for highway and railroad crossings will be made at the Contract unit price per linear foot, complete in place, and shall include the carrier pipe for the crossings as shown on the Drawings and on the Bid Form.

10. Uncased Crossings by Bore

Payment for furnishing and installing, by bore, as shown on the Bid Form pipe for crossings will be made at the Contract unit price per linear foot, complete in place, and shall include the carrier pipe for the crossings as shown on the Drawings and on the Bid Form.

11. Force Main

11.1 Payment for the construction of new sewage force main of the size and material shown on the Bid Form will be made at the Contract unit price per linear foot, complete in place and in operating condition, testing, and rough cleanup work.

11.2 The cost of the specified crushed stone bedding and backfill is a separate pay item and shall NOT be included in the Contract unit price for force main lines.

12. Gravity Sewer

12.1 Payment for gravity sewer lines will be made at the Contract unit price per linear foot, complete in place, which will include compensation for pipe, trenching, jointing, backfilling, connections to existing sewers, and all plugs that are required. The quantity of sewer to be paid for shall be the length of the pipe measured along the center line of the completed pipe lines without deducting the length of branches and fittings.

12.2 The cost of the specified crushed stone bedding and backfill is a separate pay item and shall NOT be included in the Contract unit price for gravity sewer lines.

13. Service Wye & Plug

Payment for furnishing and installing service wyes and plug as shown on the Bid Form will be made at the Contract unit price each, complete in place, as shown on the standard detail sheet.

14. 4' Standard Manhole

Standard manhole is defined as a manhole which is 6'-0" or less in depth measured from the top of the cover frame to the invert. Standard manholes will be paid for at the Contract unit price each, and will include the manhole (complete with footing, precast concrete sections, cast iron frame and cover, invert, and step – all as shown on the Drawings and as more fully described herein) and all excavation.

15. 4' Manhole Barrel Extension

For standard manholes greater than 6'-0" in depth, the additional manhole barrel measured as hereinbefore set out shall be paid for at the Contract unit price per vertical foot of additional depth. No special payment shall be made for additional steps that are required.

16. Alvaton Lift Station

Payment for all labor, equipment, and materials for the precast duplex lift station, as shown on the Drawings and as specified, shall be paid for at the Contract lump sum price; including, the precast wet well, crushed stone, water line and appurtenances, piping, fittings, precast valve vault, force main connection, gravity connection, final grade and site work, erosion prevention and sediment control, electrical, controls, fence, and all other appurtenant items to result in a complete installation, operating as described in these Specifications.

17. Phil Moore Park Lift Station Upgrade & Yard Piping

Payment for all labor, equipment, and materials for the upgrade to the existing duplex lift station, as shown on the Drawings and as specified, shall be paid for at the Contract lump sum price; including, the new pumps, guide rails, crushed stone, piping, fittings, precast valve vault, force main connection, yard piping

modifications, septic tank abandonment, any sewage removal that may be required, final grade and site work, erosion prevention and sediment control, and all other appurtenant items to result in a complete installation, operating as described in these Specifications.

18. Drakes Creek Directional Bore

Payment for all labor, equipment, and materials for the crossing of Drakes Creek via Horizontal Directional Drilling with an 8" SDR 11 HDPE carrier pipe as shown on the Drawings will be made at the Contract Lump Sum Price; including, the piping, fittings, force main connection, final grade and site work, erosion prevention and sediment control, and all other appurtenant items to result in a complete installation, operating as described in these Specifications.

19. Rip-Rap Check Dam

Payment for furnishing, installing, maintaining and removing rip rap check dams as shown on the Bid Form will be made at the Contract unit price per ton, complete in place, as shown on the Drawings and specified herein.

20. Silt Fence

Payment for furnishing, installing, maintaining and removing silt fencing as shown on the Bid Form will be made at the Contract unit price per linear foot, complete in place, as shown on the Drawings and specified herein.

21. SWPPP Inspection & Reporting

Payment for the performance of SWPPP inspection & reporting shall be made at the Contract lump sum price as specified herein and shall include inspection and reporting for the entirety of the project.

22. Final Cleanup

Payment for the performance of final cleanup work for water and sewer mains shall be made at the Contract unit price per linear foot as specified on the Bid Form. Payment for final cleanup shall not be made where the water and sewer mains are constructed in paved streets, driveways, sidewalks, or other areas where final cleanup is not performed.

23. Summary

The above items, 2 through 22 inclusive, refer to and are the same items as listed on the Bid Form, and constitute all of the pay items for this Contract. Any other items of work listed in the Specifications, or shown on the Drawings, shall be considered to be incidental to the above items or other items listed in the Bid Form.

2016-0035

CONTAINS

LARGE OR OVERSIZED

MAPS

RECEIVED ON:
Jan. 26th, 2016