STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

December 21, 2021

Mr. Keith Davis, P.E.
Project Engineer
Hethcoat & Davis, Inc.
e-copy: keith.davis@hdengr.com
278 Franklin Road, Suite 200
Brentwood, TN 37027

Subject: **LAGUARDO UTILITY DISTRICT (PWSID TN0000394)**
Wilson County
Project Number: DW20211398
Standard Technical Specifications

Dear Mr. Davis:

The Tennessee Department of Environment and Conservation, Division of Water Resources, acknowledges the receipt of your engineering documents on December 6, 2021.

Review of these Standard Drinking Water Specifications shows that they are in conformance with our guidelines. Therefore, they have been stamped "APPROVED". This approval will remain in effect until December 20, 2026. This approval shall not be construed as creating a presumption of accuracy or as warranting by the commissioner that the approved specifications are all inclusive.

To expedite matters, please reference the assigned water project number DW20211398 on any future correspondence or plan submittals. If we may be of any assistance, please feel free to contact Ms. Cindy Wheeler, PE at 615-939-0058 or by E-mail at *cindy.wheeler@tn.gov*.

Sincerely,

Angela Jones

Angela Jones, P.E.
Manager, Engineering Services Unit

cc: Mr.Joey Hardin, General Manager, LaGuardo Utility District, jhardin@laguardoutility.com

Mr. Mehdi Sadri, EPS 3, TDEC Division of Water Resources, dwr.nefo@tn.gov

TECHNICAL SPECIFICATIONS AND DESIGN CRITERIA

FOR

WATER DISTRIBUTION FACILITIES

FOR

LAGUARDO UTILITY DISTRICT
WILSON COUNTY, TN

LaGuardo
UTILITY DISTRICT

BOARD OF COMMISSIONERS

MR. LARRY BOWERS
MR. TERRY GRAY
MR. CLARK SAMPSON

MANAGEMENT

MR. JOEY HARDIN, GENERAL MANAGER

APPROVED _____
LAGUARDO UTILITY DISTRICT

DW 20211398

APPROVED WATER SPECIFICATIONS

THE DOCUMENT BEARING THIS STAMP HAS BEEN RECEIVED AND REVIEWED BY THE

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION

DIVISION OF WATER RESOURCES

AND IS HEREBY APPROVED FOR USE IN CONSTRUCTION BY THE COMMISSIONER

Cindy Wheeler

12/20/2021

THIS APPROVAL SHALL NOT BE CONSTRUED AS CREATING A PRESUMPTION OF CORRECT OPERATION OR AS WARRANTING BY THE COMMISSIONER THAT THE APPROVED FACILITIES WILL REACH THE DESIGNED GOALS.

APPROVAL EXPIRES FIVE YEARS FROM ABOVE DATE

Issue Date - November 2021

ENGINEER

HETHCOAT AND DAVIS, INC.

FRED KEITH DAVIS
No. 16626
STATE OF TENNESSEE
11/23/2021

ATTORNEY

SHERRARD ROE VOIGT & HARBISON

INDEX TO PROJECT MANUAL

These specifications give the minimum requirements for installation of water lines in the LaGuardo Utility District of Lebanon, Tennessee. Any special construction problems or conditions not covered under these specifications shall be submitted in writing to the District for approval.

The Standard Drawings are part of these specifications and all construction shall conform to the details shown on these drawings.

STANDARD DRAWINGS

WD-001	¾" Domestic Meter Assembly
WD-001A	¾" Domestic Meter Assembly Lid
WD-002A	2" Domestic Meter Assembly – Plan
WD-002B	2" Domestic Meter Assembly – Section
WD-002C	2" Irrigation Meter Assembly – Plan
WD-002D	2" Irrigation Meter Assembly – Section
WD-003	4" Domestic Meter Assembly
WD-004A	6" and 8" Domestic Meter Assembly, Plan & Section
WD-004B	General Notes and Device Listing
WD-005	Fire Hydrant Setting Detail
WD-006A	Valve Box Setting Detail – Outside Pavement
WD-006B	Valve Box Setting Detail – Inside Pavement
WD-006C	Cast Iron Valve Box Frame & Cover In Pavement
WD-006D	Standard Concrete Valve Box In Pavement
WD-007	Indicator Post Telescoping Barrel UL/FM
WD-008	1" Automatic Air Release Valve with Box
WD-009A	Concrete Thrust Block Details Sheet 1 of 2
WD-009B	Concrete Thrust Block Details Sheet 2 of 2
WD-010	Reverse Thrust Block Detail
WD-011	Storm Pipe Crossing Detail
WD-012	Trench Details
WD-013	Waterline Stream Crossing
WD-014	Casing and Casing Spacer Detail
WD-015	Water Service Line Casting Detail
WD-016A	Double Check Detector Backflow Assembly with Cover (Plan)
WD-016B	Double Check Detector Backflow Assembly with Cover (Section)
WD-017	Megalug Detail
WD-018	Pipe Line Crossing Under Roadway (For Water Lines)
WD-019	Not Used
WD-020	Auto Flusher Detail

1.01 PURPOSE

1.01.01 These Standards are guidelines for Developers, their Engineers and Contractors for the planning, design and construction of water distribution lines and associated appurtenances within the LaGuardo Utility District service areas.

1.01.02 These Standards shall govern the construction materials and installation of water distribution Districts that are, or will become, the responsibility of the LaGuardo Utility District to operate and maintain as part of their District.

1.01.03 These Standards are intended to meet or exceed the requirements of the State of Tennessee, Division of Water Supply and to aid in the design of water distribution Districts. This design should incorporate the highest level of standards of practice and specify materials of highest quality identified in the technical specifications.

1.01.04 The Standards identify a single set of standards, criteria, submittal requirements and approval procedures to be used in the planning, design, and construction of projects within the LaGuardo Utility District service area.

1.01.05 These Standards are not intended to serve as a step-by-step design and construction method nor can this manual address every situation that may arise. The application of sound engineering principles combined with the information contained herein is necessary to complete the planning, design, and construction for water distribution projects.

1.01.06 Nothing herein shall be construed to guarantee or assure any developer or subdivision of the availability of water service to any particular development or subdivision of land. Nor shall anything in this resolution be deemed to abrogate, alter or amend any required fee, charge, or rate previously established for any service of the LaGuardo Utility District.

1.02 DEFINITIONS

1.02.01 Whenever the words, forms, or phrases defined or pronouns used in their stead occur in this document, or any document or instrument herein contemplated or to which these specifications apply, the intent and meaning shall be construed and interpreted as follows:

1.02.02 ABBREVIATIONS: The following organizations are referred to in these Specifications by abbreviations of their titles:

(a)	AASHTO	American Association of State Highway and Transportation Officials.
(b)	ANSI	American National Standards Institute
(c)	ARAP	Aquatic Resource Alteration Permit
(d)	ASA	American Standards Association
(e)	ASTM	American Society for Testing and Materials
(f)	AWWA	American Water Works Association
(g)	COE	Corps of Engineers
(h)	DIP	Ductile Iron Pipe
(i)	EPA	U.S. Environmental Protection Agency
(j)	LUD	LaGuardo Utility District
(k)	NEMA	National Electrical Manufacturer's Association
(l)	NPDES	National Pollution Discharge Elimination District
(m)	OSHA	Occupational Safety and Health Administration
(n)	PVC	Polyvinyl Chloride
(o)	ROW	Right-of-Way
(p)	TDEC	Tennessee Department of Environment & Conservation
(q)	TDOT	Tennessee Department of Transportation
(r)	TOSHA	Tennessee Occupational Safety and Health Administration
(s)	TVA	Tennessee Valley Authority
(t)	USGS	United States Geologic Survey
(u)	WEF	Water Environment Federation

1.02.03 BOARD: The current appointed members of the Board of the LaGuardo Utility District.

1.02.04 BOARD ENGINEER: The professional engineering firm duly authorized by the Board to act on behalf of the District. This entity may be the same as the Design Engineer.

1.02.05 COUNTY: The County of Wilson within the State of Tennessee.

1.02.06 CUL-DE-SAC: A minor street with only one outlet and having an appropriate terminal for the safe and convenient reversal of traffic movement.

1.02.07 DEDICATION: The transfer of property from private to public ownership.

1.02.08 DESIGN ENGINEER: Shall mean the engineer registered and in good standing with the State Board of Registration of Tennessee who is the responsible for the design of all water improvements.

1.02.09 DEVELOPER: The legal or beneficial owner or owners of all the land proposed to be included in a given development or the authorized agent thereof. In addition, the holder of an option or contract to purchase, a lessee having a remaining term of not less than thirty (30) years, or other persons having an enforceable proprietary interest in such land shall be deemed to be a developer for the purpose of these Regulations.

1.02.10 DEVELOPMENT, SUBSTANTIAL COMPLETION OF: Completion and acceptance by the District of all water utilities (which shall be stubbed out to ownership tracts where appropriate); AND certification indicating that all required improvements have been installed or that sufficient bond exists to cover all costs of completion of the improvements; AND additional certificates and dedications necessary to insure adequate access for public protection and utilities as well as conformance to applicable plans and ordinance requirements.

1.02.11 DISTRICT: The LaGuardo Utility District.

1.02.12 EASEMENT: A grant by the property owner of use, by the public, a corporation, or person(s) of a strip of land for specified reasons, or as created by operation of law.

1.02.13 FIRE HYDRANT: A fire hydrant defined as having 2-2.5 inch nozzles and 1-4 ½ inch steamer nozzle and capable of providing fire flows of a minimum of 500 gpm at 20 psi residual pressure.

1.02.14 INSPECTOR: An authorized representative of the District assigned to make all necessary inspections and/or tests of the work performed, or of the materials furnished or being furnished by the Contractor.

1.02.15 LOT: A tract, plot, or portion of a subdivision or other parcel of land intended as a unit for the purpose, whether immediate or future, of transfer of ownership or for building development.

1.02.16 MATERIALS: Any substance specified for use in the work and its appurtenances.

1.02.17 OFF-SITE IMPROVEMENTS: Consist of all water improvements and associated appurtenances that are outside the property limits of a new development or subdivision but that are required to achieve water service.

1.02.18 ON-SITE IMPROVEMENTS: Consist of all water improvements and

associated appurtenances that are contained within the confines of a new development or subdivision.

1.02.19 OR EQUAL: Wherever a particular process, material, device, detail, or part is specified herein, followed by these words or by similar or equivalent expressions, such words or expressions shall be understood to mean and permit the use of another process, material, device, detail or part that the District shall determine is fully equal in suitability, equality, durability, performance, and in all other respects, to the process, material, device, detail, or part herein specified for such use, and shall approve for such use in the work.

1.02.20 OWNER: The term “Owner” shall mean any person, group of persons, firm or firms, corporation or corporations, or any other legal entity having legal title to or sufficient proprietary interest in the land sought to be subdivided under these regulations.

1.02.21 PLANS: The official construction drawings or exact reproduction thereof which show and describe the water improvements to be done.

1.02.22 POLICIES: Policies which have been adopted by the District.

1.02.23 REGISTRAR – Registrar of Wilson County, Tennessee.

1.02.24 SANITARY SEWER – A sewer which transports wastewater.

1.02.25 SPECIFICATIONS: A part of the document containing the written directions, provisions, and requirements for completing the work. Standards for specifying material or testing which are cited in the contract Specifications by reference shall have the same force and effect as if included in the contract physically.

1.02.26 STATE: The State of Tennessee.

1.02.27 STORM SEWER: A sewer which carries surface runoff and subsurface waters.

1.02.28 STRUCTURES: Facilities such as bridges, culverts, catch basins, inlets, retaining walls, curbing, storm and sanitary sewer lines, water lines, underdrains, electrical ducts, manholes, lighting fixtures and poles, transformers, flexible and rigid pavements, buildings, vaults, and other manmade features that may be encountered in the work and not otherwise classified herein.

1.02.29 SUBDIVIDER: Any person who (1) having an interest in land, causes it, directly or indirectly, to be divided into a subdivision or who (2), directly or

indirectly, sells, leases, or develops, or offers to sell, lease, or develop, or advertises for sale, lease, or development, any interest, lot, parcel, site, unit, or plat in a subdivision, and who (3) is directly or indirectly controlled by, or under direct, or indirect common control with any of the foregoing.

1.02.30 SUBDIVISION: Shall mean the division of a lot, tract, or parcel of land into two (2) or more lots, plats, sites, or other division of land for the purpose, whether immediate or future, of sale or of building development. It includes re-subdivision and, when appropriate to the context, relates to the process of subdividing or to the land or territory being subdivided. It shall also include all divisions of land involving the dedication of new street(s) or change in existing streets. It shall also include the division of a tract of land into lots all fronting on an existing paved public road and not requiring the construction or extension of new roads or streets, municipal facilities or public improvements.

1.02.31 DISTRICT: LaGuardo Utility District of Wilson County, Lebanon, Tennessee. (LUD)

1.02.32 DISTRICT GENERAL MANAGER: General Manager of the LaGuardo Utility District.

1.02.33 TDEC: The Tennessee Department of Environment and Conservation.

1.02.34 WORK: The furnishing of all labor, materials, tools, equipment and incidental necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, Plans and Specifications.

1.03.00 STANDARDS FOR CONSTRUCTION PLANS

1.03.01 Any person, firm or corporation ("developer") or homeowner desiring to have water service extended for a development shall meet all requirements previously outlined in these Standard Specifications.

1.03.02 All Construction Plan sheets prepared by the Design Engineer must have certain required signatures, including a Tennessee Professional Engineer's seal. The signatures indicate the following:

- "Design/Board Engineer": Indicates approval by the engineer whose stamp appears on the plans.

- "Approved for Construction": Indicates approval to proceed with construction of water facilities by the LaGuardo Utility District.

1.03.03 Water Distribution Construction Plans shall contain the following information:

1. A Title Sheet containing a location map at a scale not smaller than 1”=1,000’; the name of the project/development; and a sheet index.
2. Plan of proposed water system improvements, drawn at no smaller than 1”=50’, with all critical elevations.
3. Location, size, and material of all existing and proposed water mains in the subdivision, (or outside the subdivision if off-site connections are required), with locations of connections to other mains, service connections, valves, fire hydrants, blow-offs and all other appurtenance indicated
4. North arrow on each Plan sheet.
5. Tennessee Professional Engineer’s seal, signature and date of signing on each Plan sheet.
6. All topographic features, both existing and proposed.
7. All Property lines including lot numbers and rights-of-way.
8. Street layouts including names of streets, proposed right-of-ways, road widths, existing and proposed roadway grades, curbs and sidewalk locations.
9. References to applicable Standard Specifications of the District with respect to those required for the construction of water improvements proposed.
10. All proposed water utility easements.
11. Show all existing and proposed utilities including water, wastewater, gas, electricity, telephone, cable TV, and storm sewers.
12. Location of proposed drainage ways, streams, storm inlets, and storm drains, inverts, top of castings, detention ponds, ditches, etc. in the subdivision which might have an impact on water improvements.
13. Location of proposed sanitary sewers, manholes, inverts, top of castings, etc. in the subdivision which might have an impact on water improvements.
14. Location of proposed buried electrical, buried communication and buried natural gas lines in the subdivision which might have an impact on water improvements.
15. Location of easements and right-or-way for drainage ways.
16. All topographic features, both existing and proposed.
17. All property lines including rights-of-way.
18. Special details related to stream, railroad, highway or other type crossings.

1.03.04 Where proposed water improvements are located within or cross easements of another utility, it shall be the responsibility of the developer to provide the District with the letter of approval of the affected utility(ies) permitting the new District improvements.

1.04 WATER MAIN AND APPURTENANCES DESIGN CRITERIA (ON-SITE AND OFF-SITE IMPROVEMENTS)

1.04.01 All water mains shall be designed in accordance with these criteria; the

Technical Specifications contained in Sections 3.01 through 3.03 of this document, and the standards of the Tennessee Department of Environment and Conservation. In cases where similar rules exist, the more stringent rule shall be applied.

1.04.02 Water distribution lines sizing shall be confirmed using the District's Hydraulic Water Model. This function shall be performed by the District Engineer.

1.04.03 In areas where the existing District does not support the minimum residual service pressure of 20 psi and peak service demand for domestic service, offsite improvements will be required to provide this level of service pressure. All costs of the offsite improvements to provide the minimum residual service pressure of 20 psi at the calculated domestic service demand will be borne by the developer or property owner less any costs for increased level of service required to benefit the LaGuardo Utility District.

1.04.04 All residential, commercial and retail developments shall be provided with a minimum of 500 GPM fire flow at 20 psi residual pressure if such capability is available. The District will review the proposed development for fire flow capability based upon their existing water District and with the requirements set forth by the City of Lebanon if development lies within their city limits. If it is determined that offsite improvements of up to one (1) mile can achieve the desired fire flow for the development, then all cost of offsite improvements to provide the fire service will be borne by the developer or property owner. If the District determines offsite improvements within this limit will not provide the minimum fire flow capability, then no fire hydrants will be permitted on the water line.

1.04.05 Maximum designed velocity of flow in water lines shall be 5.0 ft./sec. unless otherwise approved by LaGuardo Utility District.

1.04.06 All water mains will be ductile iron pipe, Class 52. Ductile iron will be required for water lines 12-inch and smaller under and inside roadways, inside bores, beneath creek crossings and in other special circumstances.

1.04.07 Where fire hydrants are installed, hydrants shall be provided at the following intervals:

- For developments located inside the City Limits of the City of Lebanon, fire hydrant spacing shall be at 500-foot intervals in residential areas and 300-foot in commercial/industrial areas.
- For developments located withing Wilson County and not inside the Lebanon City Limits, fire hydrant spacing shall be at 700-foot intervals.

Fire hydrants shall not be permitted on lines small than 6-inch diameter. A 6-inch diameter isolation valve is required for each hydrant. Valve and hydrant shall utilize restrint devices (e.g., Mega-Lug) to the tee or hydrant locking tees.

At the conclusion of installation of new fire hydrants and prior to final acceptance by the DISTRICT, the developer or his contractor shall paint the bonnets of each fire hydrant in accordance with e classification of hydrants as set forth in the *Recommended Practice for Fire Flow Testing and Marking of Hydrants, NFPA 291, latest edition.* Colors shall be as follows:

- Class AA – rated capacity of 1,500 GPM or greater – light blue.
- Class A – rated capacity of 1,000 to 1,499 GPM – green.
- Class B – rated capacity of 500 to 999 GPM – orange.
- Class C – rated capcity of less than 500 GPM – red.
- Fire hydrant body – yellow.

The DISTRICT ENGINEER will provide the color coding for each new hydrant in the development utilizing the DISTRICT'S hydraulic water model.

1.04.08 Water mains shall be shall be installed outside the right-of-way (other than crossings of roads) and inside a dedicated public utility easement (either by plat or by dedication directly to the District). Water line plans shall clearly define the location of all water lines on the drawings. Dead-end mains shall extend to the last lot or parcel being served so that no service lines are installed in front of adjacent lots or parcels. Water lines on cul-de-sacs shall extend around the cul-de-sac and not through the paved area. Water lines shall be extended across the length of entire property being developed so service can be extended in future without disturbing existing property.

1.04.09 Water lines crossing beneath existing County/State roads shall be installed by means of bore and jacking. Casings and appurtenances shall be steel and sized as set forth in the technical specifications. Casing spacers and casing end seals shall be required for all pipes in casings. Crossings of State Highways shall be submitted by the Developer to TDOT for approval. LaGuardo Utility District shall be provided with a copy of TDOT permit prior to approval of construction plans.

1.04.10 All mains shall have a minimum of 30 inches of cover. Where rock is present in the trench, it shall be removed to a point 6-inches below the pipe. A minimum of 6-inches of clearance shall be provided on each side of the pipe as measured from the bell of the pipe.

1.04.11 Water mains and storm drains or sanitary sewers shall not be installed in the same trench.

1.04.12 Parallel Installations: Water mains shall be laid at least 10 feet horizontally from any sanitary sewer, storm sewer or sewer manhole, whenever possible; the distance shall be measured edge-to-edge. When local conditions prevent a horizontal separation of 10 feet, a water main may be laid closer to a storm or sanitary sewer provided that:

a. the bottom of the water main is at least 18 inches above the top of the sewer.
b. where this vertical separation cannot be obtained, the sewer shall be constructed of materials with joints that are equivalent to water main standards of construction and shall be pressure tested to assure water-tightness prior to backfilling.

1.04.13 Water Line Crossings: Water mains crossing house sewers, storm sewers or sanitary sewers shall be laid to provide a separation of at least 18 inches between the bottom of the water main and the top of the sewer, whenever possible. When local conditions prevent a vertical separation as described above, the following requirements shall be met.

a. Sewers passing over or under water mains shall be constructed as described in 1.04.13.b.
b. Water mains passing under sewers shall, in addition, be protected by providing a vertical separation of at least 18 inches between the bottom of the sewer and the top of the water main and adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking the water main.
c. The length of the water pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the sewer.
d. Both the sewer and the water mains shall be constructed of water pipe and tested to water main hydrostatic test standards.

1.04.14 All water service lines which cross under streets, highways, or any other paved roads must be placed individually inside a HDPE casing pipe, 2-inch minimum size for ¾-inch service line, to 2 ft. behind the curb or edge of pavement. All service lines shall be a minimum of 3/4-inch. Each lot shall be provided with a service line. No single service line arrangements providing service to two lots will be permitted. No single family lots (house, townhomes, cottages, villas, etc. developments will be allowed to utilize a master meter installation. All residential developments will be required to utilize individual metered water connections. Metering of apartment complexes and commercial developments will be considered on a case-by-case basis for master metering.

1.04.15 An “n-1”, where “n” is the number of intersecting pipes, valve arrangement shall be required at every water main intersection, where feasible.

1.04.16 Adequate thrust blocking shall be designed for the expected pressures, including the required test pressure. If location prohibits thrust blocking, all fittings, valves, and hydrants shall include the use of restraint devices (e.g., Mega-Lug) or rodding as directed by LaGuardo Utility District.

1.04.17 Where fire hydrants are installed, hydrants shall be provided at 1,000 feet maximum spacing so that any lot is no further than 500 feet from the nearest

hydrant. Fire hydrants shall not be permitted on lines smaller than 6" diameter. A 6-inch isolation valve is required for each fire hydrant. Valve and hydrant shall utilize restraint devices (e.g., Mega-Lug) to the tee or hydrant locking tees.

1.04.18 Pressure regulators for individual services are required by the District in areas of pressure exceeding 80 psi. They **are not** part of the District's portion of the service line for operation and maintenance. Pressure regulators shall be installed on the customer side of the water meter and are the responsibility of the property owner.

1.04.19 Any water facilities not specifically covered herein shall be presented to the District for its approval. It is recommended the District be contacted prior to detailed design to discuss specific requirements.

1.04.20 The LaGuardo Utility District reserves the right to utilize the District's Board Engineer to design off-site and/or on-site water improvements. The Developer will be responsible for all engineering costs related to the design of these off-site and/or on-site improvements. Design fees for the improvements will be estimated by the District's Board Engineer and approved by the District and Developer prior to commencement of design. Developer shall be required in these cases, to provide to the Board Engineer an electronic base file in CAD format (.dwg or .dgn) showing the layout of the proposed development including roads, rights-of-way, and property lines. In addition, construction plans for storm sewers and sanitary sewers and other underground utilities shall be provided in order to facilitate the water line design. Developer shall be required to pay costs of off-site and/or on-site design improvements to the District prior to Board Engineer beginning design. Board Engineer will provide completed design back to the District who will in turn release it to the Developer for construction after TDEC approval is received.

1.05 CONSTRUCTION DRAWINGS APPROVAL

1.05.01 When construction plans are approved by the District, the Design Engineer will submit four (4) paper sets of final construction drawings to TDEC, Division of Water Supply for State approval. The Developer will be responsible for all applicable TDEC review fees.

1.05.02 Upon receipt of TDEC approved plans by the Design Engineer, a minimum of two (2) State approved copies bearing the date of approval, the "RED" approval stamp and the approval TDEC project number shall be returned to District.

1.05.03 A copy of the approved construction plans showing the TDEC approval shall remain on site at all times during construction activities.

1.06 EASEMENTS

1.06.01 Water mains to be dedicated to the District shall be constructed within dedicated, utility easements, at least 20 feet in width unless otherwise directed. All easements shall be prepared, signed and recorded in the office of the Registrar of Wilson County, Tennessee. Easement shall include a written description of the metes and bounds of the easement and include the square footage of the easement. Easement shall also include an exhibit drawing which outlines the easement layout. Easements may also be dedicated by recording of plat where applicable.

1.06.02 Off Site Easements – Where off-site easements are required to achieve water service, the District may assist in the acquisition of off-site easements but the developer shall reimburse the District for all costs associated with acquiring any easements or rights-of-ways necessary for the installation of said off-site water mains including legal fees, engineering fees and acquisitions costs.

1.06.03 All easements shall be obtained, signed and recorded in the Wilson County Registrar's office prior to start of construction activities.

1.07 APPLICABILITY, LIMITATIONS AND VARIANCES

1.07.01 Applicability

This policy shall apply to all water main extensions from existing facilities. This policy shall not be applicable to requests for water services in areas where, because of elevation and remoteness, service cannot be extended from existing facilities of the District. Request for service to such areas should be presented to the District for its consideration.

1.07.02 Limitations

Service – Due to availability to service (elevation) or the availability of capacity within the service area of the District, water extensions to new developments or customers may be provided only when the District deems suitable capacity are available with existing facilities. Developers, prior to submission of any proposed development, should obtain necessary information regarding capacity options from the District.

1.07.03 Variances From and Effect of Preceding Policy as to Water Main Extensions

Whenever the District is of the opinion that it is to the best interest of the District to construct a water main extension without requiring strict compliance with its extension policy, such extensions may be constructed upon such terms and conditions as shall be approved by a majority of the members of the District's Board.

The District to make water main extensions pursuant to this policy is permissive only, and nothing contained herein shall be construed as requiring the District extend service to any entity, person, or persons, even though such prospective customers meet all the requirements contained in the policy necessary to authorize the District to make such extensions.

1.08 BONDS FOR WATER IMPROVEMENTS

1.08.01 Performance Bond for Water Improvements: The District may accept cash, a letter of credit (good for not less than thirteen (13) months), or surety from a corporate surety licensed in the State of Tennessee, provided the security offered is deemed acceptable by the District's attorney. The amount of the bond shall be estimated by the District General Manager in an amount equal to at least 100% of the cost of the water improvements provided. All costs to the District incurred in connection with review associated with fixing the amount of and approving the performance bond must be reimbursed by the developer as a condition precedent to approval and acceptance of the bond. The water performance bond must be posted with the submittal of the plat if improvements are not already in place. The performance bond must be received by the District at time of fee payment and prior to release of approved construction plans. The bond shall include an automatic thirty (30) day renewal notice from the surety to the District advising of pending expiration date.

Improvements must be completed within one (1) year of final plat approval unless this time is extended by agreement of the District.

The responsibility for timely seeking an extension of time to complete improvements rests entirely with the developer. Failure to seek and obtain an extension (for a period not to exceed on (1) year) shall void the District's approval. Any extension granted by the District will be granted only upon renewal of the bond. No reduction or removal of performance bond will be considered until all water improvements are completed and accepted for service.

In the event of failure by the developer to comply with conditions of the bond, the District may declare the security for the bond forfeited and use the receipts of such security to complete the improvements. Unused portions of the security, if any, will be returned as appropriate. The District shall not be limited to the amount of the bond if the costs of completing the developer's agreement exceeds said amount.

1.08.02 Maintenance Bond for Water Improvements. At the time of completion of subdivision improvements, including the water improvements (both onsite and offsite), the developer shall apply in writing (by letter) for acceptance of the

improvements into the water distribution District of the District. The letter must be accompanied by the following:

a. A statement signed by the developer and his contractor, including a notarized affidavit that the required water improvements are complete, the total construction costs of said improvements, a certification that the improvements were constructed in accordance with standard specifications of the District and that they have successfully passed all testing required by the District and TDEC. The statement shall also include a certification that the developer and his contractor know of no defects from any cause in the improvements, and that the improvements are free and clear from any encumbrance or lien;

b. An agreement properly dedicating said improvements to the District;

c. One (1) copy of as-built drawings of the improvement in paper/hard copy format and one (1) copy in electronic format (.pdf).

d. A Water Improvements Maintenance Bond together with sufficient security deemed acceptable by the District's attorney. The District may accept a letter of credit or surety from a corporate surety licensed in the State of Tennessee, provided the security offered is deemed acceptable by the District's attorney.

e. The amount of this bond shall be fixed by the District's General Manager in an amount not less than 15% of the cost of the water improvements. All costs to the District incurred in connection with review associated with fixing the amount of and approving maintenance bonds must be reimbursed to the District as a condition precedent to acceptance of the bond and the water improvements.

f. Prior to closure of the Performance Bond and implementation of the Maintenance Bond, the District will complete a Final Inspection of all water improvements. All deficiencies must be corrected. Upon correction of any deficiencies, the District will provide an Acceptance of Utilities letter to the Developer.

g. The Maintenance Bond shall secure the District against defects or damage to the improvements arising out of defective or inferior materials or defective or negligent workmanship arising, occurring, or becoming apparent within one (1) year from the date of acceptance of the improvements. Inspection or acceptance of the water improvements by the District shall in no way affect the developer's obligation under the bond.

1.09 OWNERSHIP OF WATER FACILITIES

1.09.01 All new water lines, pumping stations, tanks, and other appurtenances related to water shall be deeded and ownership transferred to the District. **No private water facilities will be permitted inside the District service area.**

1.09.02 Upon completion of such extensions and their acceptance by the District, such water improvements shall become the property of the District. The persons paying the cost of constructing such utilities shall execute any written instrument requested by the District to provide evidence of the District's title to such utilities. In consideration of such water utilities being transferred to the District, the District shall incorporate said utilities as an integral part of the District's water District and shall furnish service in accordance with the District's rules, regulations, and rate schedules, subject always to such limitation as may exist because of the size, elevation, and capacity of said utilities.

1.09.03 The District will not accept any existing water facilities that are not constructed to current District standards or new improvements that were not approved for construction following District requirements.

1.10 PRIOR TO START OF CONSTRUCTION OF WATER IMPROVEMENTS

1.10.01 Prior to start of construction of water improvements, the following shall have occurred:

a. Payment of all fees.
b. Approval of construction plans from Tennessee Department of Environment and Conservation.
c. Submittal and approval of shop drawings by the District for project materials. The contractor for the developer shall provide submittals and shop drawings as set forth in Section 2.06 of this Manual for all materials proposed to be included in the installation of water appurtenances for approval by the District. No construction installation of water appurtenances shall occur until the submittals have been reviewed and approved by the District.
d. Attend and participate in a Pre-construction meeting with the District. Prior to start of construction, the developer or the developer's contractor shall notify the District ten (10) working days in advance of beginning work, by letter or email addressed to the District Superintendent, requesting a pre-construction conference.
e. All necessary permits from TDEC, TDOT, or other applicable governing agencies shall be submitted to the District.

1.10.02 A properly licensed general contractor approved by the District shall perform the work in extending the on-site and off-site District's water mains lines. For projects in excess of $25,000, the contractor must be

licensed in the State of Tennessee. This license must also declare a major classification of Municipal and Utility (MU); or MU-A3; MU-B ;BC; BC-B.

1.10.03 The District will send the Start of Construction Notification to the State of Tennessee before start of construction activities.

1.11 CONSTRUCTION INSPECTION

1.11.01 The District will provide inspection of all water installations to insure compliance with the provisions of this Manual.

1.11.02 No installation shall be covered until such time that the designated representative of the District has performed the appropriate inspection. The developer or his contractor is responsible for coordination with the inspector for timing of inspections. Cost of uncovering installation which was not inspected shall be borne by the developer or his contractor.

1.11.03 All materials being installed shall meet the requirements of the District and shall also be in compliance with the technical requirements of this Manual. Inferior, damaged or unapproved materials will not be installed and shall be removed from the site.

1.11.04 All testing required for approval of water mains shall be performed in the presence of the District inspector. Failure to perform tests in the presence of the inspector will result in re-testing. Contractor shall provide all equipment for testing of water lines.

1.11.05 The District inspector shall be allowed access to the site at any time as required to perform inspection of water mains. The District inspector shall not be responsible for interpretation of plans for areas of work other than related to the installation of water mains. No construction layout will be performed by the District inspector. No supervision or direction in the means and methods of installation by the Contractor will be provided by the District inspector. The District, its inspector nor its Engineer will not be responsible for any safety requirements and protocols of the Contractor.

1.11.06 Upon completion of installation of water improvements, the District will conduct a final inspection. Any deficiencies will be noted and a written deficiency list will be provided to the Contractor for correction prior to acceptance of the improvements.

1.11.07 The District inspector shall insure that all new mains are isolated from existing water mains. Only District personnel are authorized to operate valves.

1.12 START OF WATER SERVICE

1.12.01 The District will not accept nor allow potable water supply connection on any new water main construction, until all pressure testing, bacteriological testing and approved documentation has been performed. All testing shall be documented with proof of results.

1.12.02 There will be no customer meters installed on a service tap before all testing has been completed and approved. The only use of the water permitted will be for filling, sampling, testing and flushing of the new water line.

1.13 SAFETY

1.13.01 The Contractor is responsible for meeting all safety requirements as set forth by Federal, State and local statutes. Contractor shall insure that all applicable OSHA and TOSHA requirements are met for installation of water lines and appurtenances. The LaGuardo Utility District, nor its Engineer are responsible for the safety of the Contractor's work force or the work environment.

END OF SECTION

1. SMOKING AND FIRE PRECAUTIONS

1.1 No smoking, fire or use of any fire- or explosion-producing tools or equipment will be permitted on the properties of oil companies or other concerns prohibiting same on their premises or at any locations where such may endanger said premises or the current operations thereon.

2. MANUFACTURERS QUALIFICATIONS

2.1 The manufacturers of all materials and equipment used must be reputable and regularly engaged in the manufacture of the particular material or equipment for the use and service to which it will be subjected.

3. DEVELOPER SHALL PAY FOR ALL LABORATORY INSPECTION SERVICE

3.1 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Developer and approved by the Owner and DISTRICT. The Developer shall pay for all laboratory inspection services as a part of the Contract. Submit all material test reports to the DISTRICT in triplicate.

4. COMPLIANCE WITH STATE AND LOCAL LAWS

4.1 Comply with all applicable requirements of state and local laws and ordinances to the extent that such requirements do not conflict with federal laws or regulations.

5. MARKERS

5.1 Preserve all Corps of Engineers, USGS, TVA, State of Tennessee, and private markers; do not remove or disturb any such markers without prior approval from the DISTRICT. Any removal and replacement of such markers shall be at the expense of the Developer.

6. PAVEMENT REPAIR AND/OR REPLACEMENT

6.1 Whenever pipe trenches are cut across or along existing pavement or shoulders, backfill same and restore traffic over the cuts as quickly as possible by constructing a temporary twelve-inch (12") surface of Class A, Grade D crushed stone. Add material and otherwise maintain such surface until the permanent pavement is restored or until the entire project is accepted. All final

roadway pavement shall be in compliance with the Wilson County Road Commission or the City of Lebanon.

7. APPROVED CHEMICALS

7.1 All chemicals used during project construction or furnished for project operation, whether lubricant, herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either EPA or USDA. The use of all such chemicals and the disposal of residues shall be in strict conformance with all applicable instructions and regulations.

8. DEPARTMENT OF TRANSPORTATION PERMITS

8.1 The Developer will secure any permits and provide bond as required by the Tennessee Department of Transportation for the installation of permanent facilities on State highway rights-of-way. All such work shall be coordinated with and be subject to the approval of the Tennessee Department of Transportation, in addition to the approval of the DISTRICT. Any costs involved with the preparation and obtaining permits will be paid or reimbursed by the Developer.

8.2 The Developer will secure any permits as required by the Wilson County Road Commission for the installation of water lines within the rights-of-way of county roads. The Developer shall be responsible for complying with the requirements of the Commission, and all such work shall be coordinated with and be subject to the approval of the Wilson County Road Commission, in addition to the approval of the Owner.

9. STORMWATER/CONSTRUCTI ON/ARAP PERMITS

9.1 The Developer shall be responsible for obtaining all stormwater and Aquatic Resource Alteration Permits (ARAP) permits required by the State of Tennessee and Wilson County. A copy of the approved permits shall be submitted to the LaGuardo Utility District prior to the state of construction.

10. INSTALLATION, TESTING, AND GUARANTEE

10.1 The completely installed system shall be guaranteed against any and all defects of manufacture, materials, workmanship, or installation for a period of one (1) year from the date of acceptance. Refer to Section XX.XX for bonding requirements for maintenance bonds.

11. DRAWINGS OF RECORD

11.1 The Developer shall provide and keep up-to-date a complete record set of blueline prints, which shall be corrected daily to show every change, and the approved shop drawings. Keep this set of prints at the job site, and use only as

a record set. This shall not be construed as authorization for the Developer to make changes in the approved layout without definite instructions in each case. Turn the set over to the Owner upon completion of the project.

11.2 DETECTION WIRE

11.3 For detection purposes, a 12 gauge solid strand copper tracing wire (shielded) and an approved metallic tape shall be installed as per the manufacturer's instructions. Connections between wires shall be connected with non-corrosive wire nut fasteners and wrapped at connections. The tracing wire must be attached to the type of the water line with approved tape. Wire shall be terminated in valve boxes as shown on the drawings or as otherwise directed by the District. The tracing wire and tape shall be installed in the trenches for water and service lines.

11.4 For location purposes, a two (2) inch metallic tape eighteen (18) inches above the water lines. Connection of the tape shall be performed by tying together.

12. UTILITIES

12.1 The Developer shall contact the owner of all underground utilities before beginning construction in the area. Carefully protect from damage all utilities in the vicinity of the work at all times. If it is necessary to repair, remove, and/or replace any such utility in order to complete the work properly, do so in compliance with the rules and regulations of the particular utility involved. Any such work shall be considered incidental to the construction of the project, and no additional payment will be allowed therefore.

13. WATER LINE MATERIALS

13.1 It is the sole discretion of the LaGuardo Utility District representative to determine the type of water line material to be used for the project.

END OF SECTION

General Requirements & Criteria For Reduced Pressure Principle Assemblies

1.01 GENERAL

1.01.01 The Cross-Connection Coordinator (CCC) of the Lagaurdo Utility (LUD) must approve all new installation and repairs prior to any backflow device being placed into service. The CCC must meet with the Contractor or plumber for any of the following situations:

a. A new unit installation is required.
b. Changes are being made within the facility to the plumbing system (High risk or commercial customers only).

1.01.02 All units will be inspected when installed to verify that they meet the installation and performance requirements as set forth in the *"Manual for Cross Connection Control",* published by the Foundation for Cross-Connection Control and Hydraulic Research – University of Southern California. No test report will be accepted until the installed unit has been inspected and approved.

1.01.03 Once inspected by LUD, each new or repaired device must be tested by a State certified Backflow tester. Once the device has been tested, the results must be sent to LUD by the Owner or the tester. Test reports will not be accepted by LUD until the credentials of the tester have been received by LUD. This includes Backflow Testing Certification and Test Kit Certification.

1.01.04 The State of Tennessee, Department of Environment and Conservation requires that each device be tested annual once installed. It is the customer's responsibility to have the device tested and at the customer's expense. LUD will notify each backflow customer by mail to set a deadline for the annual testing occurrence.

1.01.05 The CCC can be contacted with questions regarding approved units. Double check valves are only allowed on fire lines (see Section 01200). Every other situation requires a Reduced Pressure Backflow Preventer.

1.02 INSTALLATION REQUIREMENTS FOR REDUCED PRESSURE BACKFLOW DEVICES

1.02.01 The unit must never be subject to flooding. Therefore:

a. It must never be located in a pit or other area subject to flooding.
b. Provisions must be made for discharging water directly through the wall of the enclosure housing the unit at a slightly higher elevation than surround ground level or maximum flood level.
c. The lowest part of the relief valve discharge port must set a minimum of 12 inches plus the nominal size of the discharge opening of the assembly above either:
    1. the ground,
    2. the maximum flood level,
    3. the top of opening in discharge pipe or enclosure wall.
d. If the unit is installed inside a building, the drain line must be a minimum of six (6) times the diameter of the unit, e.g., a 1 inch unit must have a 6 inch drain line. Air gap funnels are allowed for catching and directing small leaks to the drain, but adequate drainage for maximum discharge is still required to prevent flooding. Typically, units installed outside in an enclosure have adequate drainage from the enclosure itself.

1.02.02 The unit must be installed where it can be easily accessed, tested and repaired.

a. All units should be installed in accordance with the manufacturer's installation guidelines.
b. Removable enclosures should be removable with little effort.
c. Units installed in non-removable enclosures must have a minimum of 18 inches clearance on each side of the device to facilitate testing and repairs.
d. Units must be placed in the upright position in a horizontal run of pipe, unless otherwise specified by the manufacturer. In addition, the unit must be adequately supported.
e. Provisions must be made to protect the unit from freezing. The CCC must approve enclosures. Electricity to operate a heater for the enclosure is at the expense of the customer.
f. If not otherwise provided by the unit manufacturer, the device shall include two (2) shut-off valves with one installed immediately before and after the unit.
g. The unit shall not be painted, or the test cocks impaired. Each device should have test cocks installed with caps on each cock.
h. It is required that each device have a Y-strainer installed immediately upstream of the device unless servicing a fire line. The Y-strainer shall be equipped with a blowdown valve.
i. Unless otherwise approved, reduced pressure assemblies must have a PVC union located before and after the device for removal during winterization.

1.03 FAILURE TO COMLY WITH REQUIREMENTS

1.03.01 If all guidelines for the installation, repair and testing are not met in a timely manner, LUD will be forced to discontinue water service to the meter until such time all conditions and requirements are met.

END OF SECTION

General Requirements & Criteria
For Double Detector Check Assemblies

1.01 GENERAL

1.01.01 All backflow prevention assemblies will be inspected to verify that the unit meets the following requirements set forth herein. The Contractor is responsible for having the unit tested by a certified tester approved by the Laguardo Utility District (LUD) in order to verify that the installed unit meets the performance requirements as set forth in the latest edition by the *Foundation for Cross-Connection and Hydraulic Research of the University of Southern California* **before** they will be accepted.

1.01.02 Double Check Valve assemblies and Double Check Detector assemblies may only be used for Class 1-3 fire protection systems that do not contain any contaminants (at the discretion of the water provider to even allow). The customer or installer is cautioned to obtain prior approval from LUD before purchasing and installing double check valve and double check detector assemblies for each intended application.

1.02 INSTALLATION REQUIREMENTS FOR DOUBLE CHECK AND DOUBLE CHECK DETECTOR ASSEMBLIES

1.02.01 A Double Check Detector Assembly (DCDA) must be in an accessible location with adequate space to facilitate maintenance and testing, and must be in accordance with the manufacturer's recommendations.

1.02.02 The DCDA must be located within 10 feet of the Post Indicator Valve (PIV), with the PIV being located on the inlet side of the DCDA, off the road right-of-way, and must be located within 100 feet of the water main unless otherwise approved. Except where a unit is located inside a heated building, the DCDA must be located in an approved, aboveground insulated box.

1.02.03 Only Class 52 Ductile Iron pipe may be installed from the tapping valve om the water main to the double check detector assembly.

1.02.04 No strainer is to be used in a fire line without LUD approval.

1.02.05 Pipelines shall be thoroughly flushed to remove foreign material and debris before installing the device.

1.02.06 All DCDA shall be installed in a horizontal position unless approved by LUD

and noted in the latest edition by the *Foundation for Cross-Connection and Hydraulic Research of the University of Southern California.*

1.02.07 The device should be adequately supported to prevent the assembly from sagging. Special supports are usually needed for 4-inch up to 10-inch diameter devices.

1.02.08 The lowest part of the device should be a minimum of 18 inches above the concrete base or maximum flood level, whichever is highest, in order to prevent any part of the assembly from becoming submerged.

1.02.09 In some instances, a Reduced Pressure Detector Assembly (RDPA) may be required. All regulations apply herewith. It is advised the customer obtain prior approval from the LUD for the device prior to purchase of one.

1.02.10 There shall be an approved backflow assembly on the bypass line.

1.02.11 The DCDA shall be installed prior to any branching and/or fire department connections (including the Siamese).

1.02.12 All fittings and fitting caps required for testing the device shall be installed on the device.

1.02.13 The bypass meter shall be purchased from LUD by the Owner or Developer. The bypass line on the assembly shall include a double check valve and shall be fitted to accept a ⅝" x ¾" water meter with male couplings on both ends and a laying length of 7¾". Only ⅝" x ¾" Neptune® meter, Model T-10 R900i with a plastic bottom is acceptable. If the assembly is purchased with a bypass water meter, the meter shall be as described above and calibrated to register in gallons.

1.02.14 Specifications and detailed drawings shall be submitted to and approved by LUD prior to installation of any device.

1.03 ENCLOSURE SPECIFICATIONS

1.03.01 Backflow prevention devices subject to vandalism, potential freezing conditions, or other potential damage must be protected with an insulated enclosure. The following specifications shall be followed when an enclosure is used.

a. Access must be provided so LUD personnel may enter the enclosure when necessary.
b. Adequate space must be provided for the purpose of testing and repair to the assembly.

1. Units located in stationary enclosures should have at least two (2) feet clearance on each side of the assembly.
2. Units located in a constructed “hot box” enclosure should be a minimum of twelve (12) inches from all walls.

c. Provide and install manufactured backflow prevention assembly enclosure. The backflow prevention assembly enclosure manufacturer shall be a company specializing in the manufacture of backflow prevention assembly enclosures. Enclosures shall be assembled and mounted to a six (6) inch, wire reinforced, concrete pad (minimum 4,000 psi concrete) according to the manufacturer’s specifications.

d. If a heater is provided with the enclosure, the customer is responsible for the power feed to the enclosure and all costs related to recurring power bills.

END OF SECTION

PART 1. GENERAL

1.1 DESCRIPTION

A. This work shall consist of erosion control on all cut and fill operations, excavation, backfill, or other construction activities within the limits of the construction site, within any temporary or permanent easements, and within any borrow site used during the period of construction. The protection of these sites shall continue throughout the construction period. During flood seasons, protect the sites by sandbagging, the pumping of water, and any other means appropriate to restrain flooding of plant and equipment. During dry weather, sprinkle the sites with water or use other means as necessary to provide dust control. In case of abnormally cold weather, any construction such as excavation work may be delayed until warmer weather or covered to prevent freezing.

B. The temporary pollution control provisions contained herein shall be co-ordinated with the permanent erosion control features, to ensure economical, effective, and continuous erosion control throughout the construction and post-construction period.

PART 2. PRODUCTS

2.1 TEMPORARY BERMS

A. A temporary berm is constructed of compacted soil, with or without a shallow ditch, at the top of fill slopes or transverse to centerline on fills.

B. These berms are used temporarily at the top of newly constructed slopes to prevent excessive erosion until permanent controls are installed or slopes stabilized.

2.2 TEMPORARY SLOPE DRAINS: A temporary slope drain is a facility consisting of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half round pipe, metal pipe, plastic pipe, sod, or other material that may be used to carry water down slopes to reduce erosion.

2.3 SEDIMENT STRUCTURES: Sediment basins, ponds, and traps, are prepared storage areas constructed to trap and store sediment from erodible areas in order to protect properties and stream channels below the construction areas from excessive siltation.

2.4 CHECK DAMS

A. Check dams are barriers composed of large stones, sand bags, or other non-corrodible materials placed across or partially crossing a natural or constructed drainway.

2.5 TEMPORARY SEEDING AND MULCHING: Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing, and matting utilized to reduce erosion. All cut and fill slopes including waste sites and borrow pits shall be seeded when and where necessary to eliminate erosion.

2.6 BALED HAY OR STRAW CHECKS

A. Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing 5 cubic feet or more of material.

B. Baled hay or straw checks shall be used where the existing ground slopes toward or away from the embankment along the toe of slopes, in ditches, or other areas where siltation erosion or water runoff is a problem.

2.7 TEMPORARY SILT FENCES: Silt fences are temporary measures utilizing woven wire or other approved material attached to posts with filter cloth composed of burlap, plastic filter fabric, etc., attached to the upstream side of the fence to retain the suspended silt particles in the runoff water.

PART 3. EXECUTION

3.1 PROJECT REVIEW: Prior to the Preconstruction Conference the Contractor shall meet with the governing storm water authority and go over in detail the expected problem areas in regard to the erosion control work. Different solutions should be discussed so that the best method might be determined. It is the basic responsibility of the Contractor to develop an erosion control plan acceptable to the governing stormwater authority. The approved plan is then to be incorporated into all permit requests and submitted by the Contractor to the appropriate regulatory agencies.

3.2 The project drawings show the minimum erosion and siltation control measures required for this job. If the Contractor desires to stockpile construction materials, stone, earth, etc., the location of same and protection thereof shall be outlined in an Erosion and Siltation Control Plan to be submitted to the governing storm water authority for review.

3.3 The Contractor shall submit a spill prevention plan to the governing stormwater authority for review. The contents of this spill prevention plan shall depend on what types of chemicals, lubricants and fuels will be used and if these will be stored on site. As a minimum, if no fuel or lubricants or other chemicals are stored on site, either temporarily in vehicular tanks or in skid or trailer mounted tanks, a plan shall be supplied which directs all employees of the Contractor in the proper procedures to be followed should a spill occur. For more complex chemical storage requirements, a more complex plan will be required.

3.4 PRECONSTRUCTION CONFERENCE: At the Preconstruction Conference, the Contractor shall submit for acceptance his schedule for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing, grading, bridges, and other structures at watercourses, construction, and paving. He shall also submit for acceptance his proposed method of erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be started until the erosion control schedules and methods of operations have been accepted by the governing storm water authority.

3.5 CONSTRUCTION REQUIREMENTS

A. The governing stormwater authority has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, the surface of erodible earth material exposed by excavation, borrow and fill operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats seeding or other control devices or methods as necessary to control erosion. Cut and fill slopes shall be seeded and mulched as the excavation proceeds to the extent directed by the governing stormwater authority.

B. The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in his accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction that were not foreseen during the preconstruction stage; that are needed prior to installation of permanent pollution control

features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project. Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise erosion control measures may be required between successive construction stages. Under no conditions shall the surface area of erodible earth material exposed at one time by clearing and grubbing, exceed 750,000 square feet.

C. The governing stormwater authority may limit the area of excavation, borrow, and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent pollution control measures current in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

D. The governing stormwater authority may decrease the amount of surface area or erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations as determined by his analysis of project conditions.

E. In the event of conflict between these requirements and pollution control laws, rules or regulations, or other Federal, State, or Local agencies, the more restrictive laws, rules, or regulations shall apply.

F. The contractor is solely responsible for providing and maintaining proper erosion control. Any liability that may arise from erosion control or lack thereof is totally the responsibility of the Contractor.

3.6 CONSTRUCTION OF STRUCTURES

A. Temporary Berms

1. A temporary berm shall be constructed of compacted soil, with a minimum width of 24 inches at the top and a minimum height of twelve (12) inches, with or without a shallow ditch, constructed at the top of fill slopes or transverse to centerline on fills. Temporary berms shall be graded so as to drain to a compacted outlet at a slope drain. The area adjacent to the temporary berm in the vicinity of the slope drain must be properly graded to enable this inlet to function efficiently and with only minimum ponding in this area. All transverse berms required on the downstream side of a slope drain shall extend

across the grade to the highest point at approximately a ten (10) degree angle with a perpendicular to centerline. The top width of these berms may be wider and the side slope flatter on transverse berms to allow equipment to pass over these berms with minimal disruptions. When practical and until final roadway elevations are approached, embankments should be constructed with a gradual slope to one side of the embankment to permit the placement of temporary berms and slope drains on only one side of the embankment.

B. Temporary Slope Drains

1. Temporary slope drains shall consist of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half round pipe, metal pipe, plastic pipe, flexible rubber, or other materials which can be used as temporary measures to carry water accumulating in the cuts and on the fills down the slopes prior to installation of permanent facilities or growth of adequate ground cover on the slopes.

2. Fiber matting and plastic sheeting shall not be used on slopes steeper than 4:1 except for short distances of 20 feet or less.

3. All temporary slope drains shall be adequately anchored to the slope to prevent disruption by the force of the water flowing in the drains. The base for temporary slope drains shall be compacted and concavely formed to channel the water or hold the slope drain in place. The inlet end shall be properly constructed to channel water into the temporary slope drain. Energy dissipators, sediment basins, or other approved devices shall be constructed at the discharge end of the slope drains to reduce erosion downstream. An ideal dissipator would be dumped rock or a small sediment basin which would slow the water as well as pick up some sediment. All temporary slope drains shall be removed when no longer necessary and the site restored to match the surroundings.

C. Sediment Structures

1. Sediment structures shall be utilized to control sediment at the foot of embankments where slope drains discharge; at the bottom as well as in the ditch lines atop waste sites; in the ditch lines or borrow pits. Sediment structures may be used in most drainage situations to prevent excessive siltation of pipe structures. All sediment structures shall be at least twice as long as they are wide.

2. When use of temporary sediment structures is to be discontinued, all sediment accumulation shall be removed, and all excavation

backfilled and properly compacted. The existing ground shall be restored to its natural or intended condition.

D. Check Dams

1. Check dams shall be utilized to retard stream flow or restrict stream flow within the channel. Materials utilized to construct check dams are varied and should be clearly illustrated or explained in the Contractor's erosion control plan.

2. All check dams shall be keyed into the sides and bottom of the channel. A design is not needed for check dams.

E. Temporary Seeding and Mulching: Seeding and mulching shall be performed in accordance with the Section 02485 Seeding.

F. Baled Hay or Straw Erosion Checks: Hay or straw erosion checks shall be embedded in the ground four (4) to six (6) inches to prevent water flowing under them. The bales shall also be anchored securely to the ground by wooden stakes driven through the bales into the ground. Bales can remain in place until they rot, or be removed after they have served their purpose, as determined by the governing stormwater authority. The Contractor shall keep the checks in good condition by replacing broken or damaged bales immediately after damage occurs. Normal debris cleanout will be considered routine maintenance.

G. Temporary Silt Fences

1. Temporary silt fences shall be placed on the natural ground, at the bottom of fill slopes, in ditches, or other areas where siltation is a problem. Silt fences are constructed of wire mesh fence with a covering of burlap or some other suitable material on the upper grade side of the fence and anchored into the soil.

2. The Contractor shall be required to maintain the silt fence in a satisfactory condition for the duration of the project or until its removal is requested by the governing stormwater authority. The silt accumulation at the fence may be left in place and seeded, removed, etc., as directed by the governing stormwater authority. The silt fence becomes the property of the Contractor whenever the fence is removed.

H. Under no circumstances will spent oil wastes be discharged anywhere on the site.

3.7 MAINTENANCE

A. The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or permanent erosion control methods are installed. Any materials removed shall become the property of the Contractor.

3.8 EROSION CONTROL OUTSIDE PROJECT AREA: Temporary pollution control shall include construction work outside the project area where such work is necessary as a result of construction such as borrow pit operations, haul roads, and equipment storage sites.

END OF
SECTION

PART 1. GENERAL

1.1 The work called for by this section shall consist of clearing and grubbing, loosening, loading, removing, and disposing of, in the specified manner, all wet and dry materials (including rock) encountered that must be removed for construction purposes; furnishing, placing, and maintaining all sheeting, shoring, bracing, and timbering necessary for the proper protection and safety of the work; the workmen, the public, and adjacent property and improvements; the dewatering of trenches and other excavations; the preparation of satisfactory pipe beds; the backfilling and tamping of trenches, foundations, and other structures; the preparation of fills and embankments; the removal of unsuitable material from outside the normal limits of excavation and, where ordered by the District, their replacement with suitable materials; and all other grading or excavation work incidental to or necessary for the work. This work shall be performed as specified below.

PART 2. PRODUCTS

Not Used.

PART 3. EXECUTIONS

3.1 PREPARATION OF THE SITE

A. Before starting construction, remove from the work site all vegetable growth (except as hereinafter excluded), debris, and/or other objectionable matter as well as any buildings and/or other structures that the drawings and/or the DISTRICT specifically indicate are to be removed. Dispose of this refuse material in a manner acceptable to the DISTRICT.

B. In certain areas it may be desirable for existing trees, shrubs, or other vegetation on the site to be preserved for the permanent landscape. Such vegetation may be shown on the drawings, specifically listed in the specifications, marked on the site, or identified by the DISTRICT. In no case damage or remove such growth without written permission from the Owner.

C. If the area to be excavated is occupied by trees, brush, or other vegetable growth, clear such growth, grub the excavated area, and remove all large roots to a depth of not less than two (2) feet below the bottom of the proposed construction.

Dispose of the growth removed in a manner satisfactory to the District. Fill all holes or cavities created during this work that extend below the subgrade elevation with suitable material, and compact to the same density as the surrounding material.

D. Trees, cultivated shrubs, etc., that are situated within public rights-of-way and/or construction easements through private property but not directly within the excavation area shall remain undisturbed unless it is necessary to remove them so that the work can be performed safely. Take special precautions to protect and preserve such growth throughout all stages of the construction.

E. Preparation of the site shall be considered an integral part of the excavation and one for which no separate payment shall be allowed.

3.2 UNSUITABLE MATERIALS

A. Wherever muck, quicksand, soft clay, swampy ground, or other material unsuitable for foundations, subgrade, or backfilling is encountered, remove it and continue excavation until suitable material is encountered. The material removed shall be disposed of in the manner described below. Refill the areas excavated for this reason with one (1) inch to two (2) inch lifts of crushed stone up to the level of the lines, grades, and/or cross sections shown on the drawings. The top six (6) inches of this refill shall be No. 67 (TDOT) crushed stone for bedding.

3.3 ROCKS AND BOULDERS

A. Any material that is encountered within the limits of the required excavation that cannot be removed except by drilling and/or blasting, including rock, boulders, masonry, hard pan, chert, shale, street and sidewalk pavements, and/or similar materials, shall be considered as unclassified excavation, and no separate payment will be made therefore.

B. Should rock be encountered in the excavation, remove it by blasting or otherwise. Where blasts are made, cover the excavation with enough excavation material and/or timber or steel matting to prevent danger to life and property. The Contractor shall secure, at his own expense, all permits required by law for blasting operations and the additional hazard insurance required. Observe all applicable laws and ordinances pertaining to blasting operations.

C. Excavate rock over the horizontal limits of excavation and to a depth of not less than 6 inches below the bottom of pipe up to 30 inches in diameter

and not less than 12 inches below the bottom of larger pipes if rock extends to such depth. Then backfill the space below grade with No. 67 (TDOT) crushed stone or other approved material, tamp to the proper grade, and make ready for construction. For brick or monolithic concrete sewers and for structures, excavate rock to the outside bottom of the structure or sewer.

3.4 DISPOSAL OF MATERIALS

A. Whenever practicable, all materials removed by excavation that are suitable for backfilling pipe trenches or for other purposes shown on the drawings or directed by the NE shall be used for these purposes. Any materials not so used shall be considered waste materials and disposed of by the Contractor as specified below.

B. Waste materials may be deposited in spoil areas at locations approved by the District. Do not leave in unsightly piles but instead spread in uniform layers, neatly level, and shape to drain. Seed as specified in Section 02485, Seeding.

C. Once any part of the work is completed, properly dispose of all surplus or unused materials (including waste materials) left within the construction limits of that work. Leave the surface of the work in a neat and workman like condition, as described below.

D. The disposal of waste materials shall be considered an integral part of the excavation work and one for which no separate payment shall be allowed.

3.5 EXCAVATION FOR TRENCHES, MANHOLES, AND STRUCTURES

A. Unclassified excavation for pipelines shall consist of the excavation necessary for the construction of water, sewer, and other pipes and their appurtenances (including manholes, inlets, outlets, headwalls, collars, concrete saddles, and pipe protection) that are called for by the drawings. It shall include clearing and grubbing where necessary, backfilling and tamping pipe trenches and around structures, and disposing of waste materials, all of which shall conform to the applicable provisions set forth elsewhere in these specifications.

B. The Contractor may, if he chooses, use a motor-powered trenching machine. If he does, however, he shall be fully responsible for the preservation or repair of existing utility service connections.

C. Unless the construction of lines by tunneling, jacking, or boring is called for by the drawings or specifically authorized by the District , make excavation for pipelines in open cut and true to the lines and grades

shown on the drawings. Cut the banks of trenches between vertical parallel planes equidistant from the pipe centerline. The horizontal distance between the vertical planes (or, if sheeting is used, between the inside faces of that sheeting) shall vary with the size of the pipe to be installed, but shall not be less than the distance determined by the following formula: d + 24 inches, where "d" represents the internal diameter of the pipe in inches. The pipe shall be installed in the center of the trench. When approved in writing by the DISTRICT, the banks of trenches from the ground surface down to a depth not closer than 1 foot above the top of the pipe may be excavated to non-vertical and nonparallel planes, provided the excavation below that depth is made with vertical and parallel sides equidistant from the pipe centerline in accordance with the formula given above. Any cut made in excess of the formula d + 24 inches shall be at the expense of the Contractor and may be cause for the DISTRICT to require that stronger pipe and/or a higher class of bedding be used at no cost to the Owner.

D. For rigid pipe, shape the bottom of all trenches to provide uniform bearing for the bottom of the pipe barrel. For plastic sewer lines, provide a minimum of 6 inches of No. 67 (TOOT) crushed stone for bedding.

E. Excavate bell holes for bell and spigot pipe at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bell holes shall be large enough to permit proper jointing of the pipe. Do not excavate bell holes more than two (2) joints ahead of pipe laying.

F. Excavation for manholes, inlets, and other incidental structures shall not be greater in horizontal area than that required to allow a two (2) foot clearance between the outer surface of the structure and the walls of the adjacent excavation or of the sheeting used to protect it. The bottom of the excavation shall be true to the required shape and elevation shown on the drawings. No earth backfilling will be permitted under manholes, inlets, headwalls, or similar structures. Should the Contractor excavate below the elevations shown or specified, he shall, at his own expense, fill the void with either concrete or granular material approved by the DISTRICT.

G. Do not excavate pipe trenches more than 200 feet ahead of the pipe laying, and perform all work so as to cause the least possible inconvenience to the public. Construct temporary bridges or crossings when and where the DISTRICT deems necessary to maintain vehicular or pedestrian traffic.

H. In all cases where materials are deposited along open trenches, place them so that in the event of rain no damage will result to the work and/or to adjacent property.

I. Excavation for other structures may be performed with non-vertical banks except beneath pavements or adjoining existing improvements. Do not permit the horizontal area of the excavation to exceed that required to allow a 2 foot clearance between the outer surface of the structure and the banks of the excavation or the sheeting used to protect the embankments. The bottom of the excavation shall be true to the required shape and elevation shown on the drawings.

3.6 SHEETING, SHORING, AND BRACING

A. Take special care to avoid damage wherever excavation is being done. Sufficiently sheet, shore, and brace the sides of all excavations to prevent slides, cave-ins, settlement, or movement of the banks and to maintain the specified trench widths. Use solid sheets inwet, saturated, or flowing ground. All sheeting, shoring, and bracing shall have enough strength and rigidity to withstand the pressures exerted, to keep the walls of the excavation properly in place, and to protect all persons and property from injury or damage. Separate payment will not be made for sheeting, shoring, and bracing, which are considered an incidental part of the excavation work.

B. Wherever employees may be exposed to moving ground or cave-ins, shore and lay back exposed earth excavation surfaces more than 5 feet high to a stable slope, or else provide some equivalent means of protection. Effectively protect trenches less than 5 feet deep when examination of the ground indicates hazardous ground movement may be expected. Guard the walls and faces of all excavations in which employees are exposed to danger from moving ground by a shoring system, sloping of the ground, or some equivalent protection.

C. Comply with all OSHA standards in determining where and in what manner sheeting, shoring, and bracing are to be done. The sheeting, shoring, and bracing system shall be designed by a professional engineer licensed in the State of Tennessee and shall be subject to approval by the DISTRICT. However, such approval does not relieve the Contractor of the sole responsibility for the safety of all employees, the effectiveness of the system, and any damages or injuries resulting from the lack or inadequacy of sheeting, shoring, and bracing.

D. Where excavations are made adjacent to existing buildings or structures or in paved streets or alleys, take particular care to sheet, shore, and brace the sides of the excavation so as to prevent any undermining of or settlement beneath such structures or pavement. Underpin adjacent structures wherever necessary, with the approval of the DISTRICT.

E. Do not leave sheeting, shoring, or bracing materials in place unless this is called for by the drawings, ordered by the DISTRICT, or deemed necessary or advisable for the safety or protection of the new or existing work or features. Remove these materials in such a manner that the new structure or any existing structures or property, whether public or private, will not be endangered or damaged and that cave-ins and slides are avoided.

F. Fill and compact all holes and voids left in the work by the removal of sheeting, shoring, or bracing as specified herein.

G. The Contractor may use a trench box, which is a pre-fabricated movable trench shield composed of steel plates welded to a heavy steel frame. The trench box shall be designed to provide protection equal to or greater than that of an appropriate shoring system.

3.7 THE DEWATERING OF EXCAVATION

A. Provide and keep in operation enough suitable pumping equipment whenever necessary or whenever directed to do so by the District. Give special attention to excavations for those structures that, prior to proper backfilling, are subject to flotation from hydrostatic uplift.

3.8 BORROW EXCAVATION

A. Whenever the backfill of excavated areas or the placement of embankments requires more material than is available from authorized excavations, or whenever the backfill material from such excavations is unsuitable, then obtain additional material from other sources. This may require the opening of borrow pits at points accessible to the work. In such cases, make suitable arrangements with the property owner and pay all incidental costs, including any royalties, for the use of the borrowed material. Before a borrow pit is opened, the quality and suitability of its material shall be approved by the District. All state and local regulations concerning borrow pits, drainage and erosion control shall be strictly followed.

B. Excavate borrow pits in such a way that the remaining surfaces and slopes are reasonably smooth and that adequate drainage is provided over the entire area. Construct drainage ditches wherever necessary to provide outlets for water to the nearest natural channel, thus preventing the formation of pools in the pit area.

C. Property clear and grub borrow pits, and remove all objectionable matter from the borrow pit material before placing it in the backfill.

D. The taking of materials from borrow pits for use in the construction of backfill, fills, or embankments shall be considered an incidental part of the work; no separate payment shall be made for this.

3.9 BACKFILLING

A. Begin backfilling after the line construction is completed and then inspected and approved by the DISTRICT. On each side of the line, from the bottom of barrel to eighteen (18) inches above the top of the pipe, the backfill material shall consist either of fine, loose earth like sandy soil or loam or of granular material that is free from clods, vegetable matter, debris, stone, and/or other objectionable materials and that has a size of no more than 2 inches. Place this backfill simultaneously on either side of the pipe in even layers that before compaction are no more than 6 inches deep. Thoroughly and completely tamp each layer into place before placing additional layers. If no material meeting these requirements is available onsite, the Contractor shall provide and import at no additional expense, suitable backfill material meeting these requirements. Backfill shall, at locations beneath or closely adjacent to pavement (driveways, streets and roadways), consist of No. 67 (TDOT) crushed stone.

B. If plastic water pipe is used, install No. 67 (TDOT) crushed stone in a 12 inch envelope on all sides of the pipe, then add the remaining backfill up to 1 foot above the top of the pipe as described in the previous paragraph.

C. From 1 foot above the pipe upward, the backfill material may contain broken stones that make up approximately 3/4 of the backfill's total volume. However, if this type of backfill is used, there must be enough spalls and earth materials to fill all voids completely. The maximum dimension of individual stones in such backfill shall not exceed 6 inches, and the backfill material shall be placed and spread in even layers not more than 12 inches deep. At locations beneath or closely adjacent to pavement or at locations of improvements subject to damage by displacement, tamp and thoroughly compact the backfill in layers that, before compaction, are 6 inches deep. In other areas, the backfill for the upper portion of the trenches may be placed without tamping but shall be compacted to a density equivalent to that of adjacent earth material as determined by laboratory tests. Use special care to prevent the operation of backfilling equipment from causing any damage to the pipe.

D. If earth material for backfill is, in the opinion of the DISTRICT, too dry to allow thorough compaction, then add enough water so that the backfill can be properly compacted. Do not place earth material that the DISTRICT considers too wet or otherwise unsuitable.

E. Wherever excavation has been made within easements across private property, the top 1 foot of backfill material shall consist of fine loose earth free from large clods, vegetable matter, debris, stone, and/or other objectionable materials.

F. Wherever trenches have been cut across or along existing pavement, temporarily pave the backfill of such trenches by placing Class A, Grade D, crushed stone as the top 12 inches of the backfill. Maintain this temporary pavement either until the permanent pavement is restored. On heavily traveled roadways, cold mix or leveling course binder 2 inches thick shall be installed and maintained until permanent pavement is installed.

G. Conduct backfilling around manholes, inlets, outfalls, and/or structures in the same manner as specified above for pipelines except that even greater care is necessary to prevent damage to the utility structure.

H. Wherever pipes have diameters of 15 inches or less, do not use power operated tampers to tamp that portion of the backfill around the pipe within 1 foot above the pipe.

I. Perform backfilling so as not to disturb or injure any pipe and/or structure against which the backfill is being placed. If any pipe or structure is damaged and/or displaced during backfilling, open up the backfill and make whatever repairs are necessary, whenever directed to do so by the DISTRICT.

J. Backfilling and clean-up operations shall closely follow pipe laying; failure to comply with this provision will result in the DISTRICT's requiring that the Contractor's other activities be suspended until backfilling and clean-up operations catch up with pipe laying.

K. Compaction Requirements: Unless specified otherwise elsewhere, under buildings and 2 times the depth of pipe beyond, and under roads and 2 times the depth beyond the shoulder, compact to 95% maximum density in accordance with ASTM C698. In all other locations, compact to 90% maximum density.

3.10 MAINTENANCE

A. Seed and maintain in good condition all excavated areas, trenches, fills, embankments, and channels until final acceptance by the Owner.

B. Maintain trench backfill at the approximate level of the original ground surface by periodically adding backfill material wherever necessary and whenever directed to do so by the DISTRICT. Continue such maintenance until final acceptance of the project, or until the DISTRICT issues a written release.

3.11 SLOPES

A. Neatly trim all open cut slopes, and finish to conform either with the slope lines shown on the drawings or the directions of the DISTRICT. Leave the finished surfaces of bottom and sides in reasonably smooth and uniform planes like those normally obtainable with hand tools, though the Contractor will not be required to use hand methods if he is able to obtain the required degree of evenness with mechanical equipment. Conduct grading operations so that material is not removed or loosened beyond the required slope.

END OF SECTION

PART 1. GENERAL

1.1 This work shall be performed in all disturbed areas not receiving such site improvements as buildings, roads, walks, sod, planting, etc., and shall include, but not necessarily be limited to, all seed bed preparation; the supplying and placing of soil additives, seed, and mulch wherever required by the drawings or directed by the DISTRICT; and maintenance.

1.2 Unless otherwise approved inwriting by the DISTRICT, seeding operations shall be limited to the following planting periods:

A. Spring - March 1 through May 30
B. Fall - August 15 through October 31

1.3 Refer to other sections for items affecting seeding. Coordinate this work with that specified by other sections for timely execution.

PART 2. PRODUCTS

2.1 GRASS SEED: Kentucky 31 Fescue (Festuca elatior) and/or annual rye meeting the requirements of the State Department of Agriculture and furnished in new bags or bags that are sound and not mended; no "below standard" seed will be accepted.

2.2 FERTILIZER: commercially manufactured; Grade 10-10-10; furnished in standard containers that are clearly marked with the name, weight, and guaranteed analysis of the contents and that ensure proper protection in transportation and handling; and in compliance with all local, state, and federal fertilizer laws.

2.3 AGRICULTURAL LIMESTONE: containing a minimum of 85% calcium carbonate and magnesium carbonate combined, 85% of which passes a No. 10 mesh sieve.

2.4 MULCH: stalks of rye, oats, wheat, or other approved grain crops properly cured prior to bailing, air dried, and reasonably free of noxious weeds and weed seeds or other material detrimental to plant growth.

PART 3. EXECUTION

3.1 Perform all seeding and related work as a continuous operation. Sow seed as soon as the seed bed has been prepared, and perform subsequent work in a continuous manner.

3.2 Before beginning seeding operations in any area, complete the placing of topsoil and final grading, and have the work approved by the DISTRICT.

3.3 Scarify, disk, harrow, rake, or otherwise work each area to be seeded until the soil has been loosened and pulverized to a depth of not less than 2 inches. Perform this work only when the soil is in a tillable and workable condition.

3.4 Apply fertilizer and agricultural limestone uniformly over the seed bed, and lightly harrow, rake, or otherwise incorporate them into the soil for a depth of approximately 1 inch at the following rates:

Fertilizer: 15 pounds per 1,000 square feet
Agricultural Limestone: 40 pounds per 1,000 square feet

3.5 Sow seed uniformly with a rotary seeder, wheelbarrow seeder, hydraulic equipment or by other satisfactory means.

3.6 The seeding rate shall be 5 pounds per 1,000 square feet for Kentucky 31 Fescue (Festuca elatior).

3.7 When seeding during March 1 through April 1 and October 1through November 20, add an additional 3 pounds per 1,000 square feet of annual rye grass.

3.8 Perform no seeding during windy weather or when the ground surface is frozen, wet, or otherwise untillable.

3.9 Spread mulch material evenly over the seeded areas immediately following the seeding operation. Mulch Rate: 2 bales (100 pound minimum) per 1,000 square feet

3.10 The mulch rate may be varied by the DISTRICT, depending on the texture and condition of the mulch material and the characteristics of the area seeded. Cover all portions of the seeded areas with a uniform layer of mulch so that approximately 25% of the ground is visible.

3.11 No equipment, material storage, construction traffic, etc., will be permitted on newly seeded ground.

3.12 Dispose of all surplus materials as directed by the District.

PART 4. INSPECTIONS

The District shall inspect the seeding within 60 days after planting and determine if it is acceptable.

PART 5. GUARANTEE

5.1 Secure an acceptable growth of grass in all areas designated for seeding.

5.2 An area is considered acceptable if it is represented by a minimum of 100 seedlings per square foot of the permanent species of grass representative of the seed mixture. If an acceptable growth is not obtained on the first planting, reseeding and re-mulching will be required.

5.3 If the planting is less than 50% successful, rework the ground, re-fertilize, reseed, and re-mulch.

END OF SECTION

PART 1. GENERAL

1.1 This work shall include all soil preparation and the storage, transportation, placing, and maintenance of sod at all locations having a slope greater than or equal to 3.1 to 1 or as directed by the District.

1.2 Temporary storage of sod is permitted, however, take care to maintain the sod in a live, growing condition. Sod shall be rejected if it is permitted to decay or dry out to the extent that, in the judgment of the District, its survival is doubtful. Dispose of rejected sod as directed by the District at no expense to the Owner.

1.3 Set sod between March 1 and October 15 and when the soil is in a workable condition.

1.4 Do not set sod out of season unless soil conditions are favorable and written permission is obtained from the DISTRICT.

1.5 Refer to other sections for items affecting sodding. Coordinate this work with that specified by other sections for timely execution. The Contractor shall be wholly responsible for the scheduling, ordering, receiving, storing and installing of all sodding materials.

PART 2. PRODUCTS

2.1 SOD: Kentucky 31 Fescue (Festuca Elatior); new sod consisting of live, dense, well rooted growth; well suited for the intended purpose and soil conditions; completely free of noxious weeds and grasses (Bermuda grass, quack grass, Johnson grass, Canada thistle); and containing less than five (5) plants of objectionable weeds per 100 square feet if nursery grown or ten (10) such plants if field grown.

2.2 FERTILIZER: commercially manufactured, Grade 10-10-1O; furnished in standard containers that are clearly marked with the name, weight, and guaranteed analysis of the contents and that ensure proper protection in transportation and handling; and in compliance with all local, state and federal fertilizer laws.

2.3 AGRICULTURAL LIMESTONE: containing a minimum of 85% calcium carbonate and magnesium carbonate combined; 85% of which passes a No. 10 mesh sieve.

PART 3. EXECUTION

3.1 Before beginning sodding operations in any area, complete the placing of topsoil and final grading, and have the work approved by the NE.

3.2 Scarify each area to be sodded a minimum of two (2) inches.

3.3 Apply fertilizer and agricultural limestone uniformly over the sod bed at the rates shown below. Immediately prior to placing sod, water the sod bed until it is saturated to a depth of one (1) inch, and keep it moist until the sod is placed.

Fertilizer: 15 pounds per 1,000 square feet of 10-10-10
Agricultural Limestone: 40 pounds per 1,000 square feet

3.4 Place sod as soon as practical after its removal from point of origin. Keep it moist while displaced.

3.5 Place sod by hand so that the edges are in close contact and in a position to break joints with the long dimension perpendicular to the slope. Fit and pound the sod into place with a ten (10) inch by ten (10) inch wood tamp or other similar implements.

3.6 Immediately after placing the sod, thoroughly wet and roll it.

3.7 Two weeks after the sod is installed, top dress and thoroughly water it. Top dressing shall consist of the following:

1/2 to 1 pound: 38% urea formaldehyde per 1,000 square
feet 20 pounds: 6-12-12 per 1,000 square feet

3.8 No equipment, material storage, construction traffic, etc., will be permitted on newly sodded areas.

3.9 Dispose of all surplus material as directed by the District.

3.10 The District will review the sod for acceptance 30 days after installation, at which time the maintenance period will begin as stated in these specifications. This acceptance by the District is for the purposes of payment only.

PART 4. INSPECTIONS

The DISTRICT shall inspect the sod within 30 days after installation and determine if it is acceptable.

PART 5. GUARANTEES

Establish an acceptable growth of the specified sod on all areas indicated on the drawings or as directed by the DISTRICT. An area is considered acceptable if the majority of each piece of sod is alive and healthy and generally free from weeds, insects and disease.

END OF SECTION