City of Germantown

Engineering Department

STANDARD CONSTRUCTION NOTES

2023

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Standard Construction Notes:

Table of Contents

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City of Germantown
Engineering Department
1920 South Germantown Rd., Germantown, TN 38138 • Phone (901) 751-7520

GENERAL CONSTRUCTION NOTES

1. NOTE: These notes and specifications are not the complete City of Germantown construction standards and specifications. These are SELECTED notes and specifications chosen to represent the ones most likely to be needed and used by the contractor for this type of project. Consult with the City Inspector for any other notes or specifications that may be applicable for this project, and that may not be included in these documents.
2. Verify the exact location of all property lines and limits of construction. Grading, clearing, and the erection and/or removal of fences or other structures along property lines shall be fully coordinated with adjacent property owners.
3. The Contractor MUST notify the City of Germantown Engineering Department at (901) 751-5720, twenty-four (24) hours prior to the start of any construction activities.
4. Contractor shall maintain access to all properties at all times.
5. When a change from approved design is determined to be needed by the contractor, the project design engineer should be notified by the contractor as soon as possible to evaluate the requested change or problem with the plans. The project design engineer should then submit a proposal to the City for review and approval of the design change. After the contractor receives revised drawings signed by the City Engineer, work may proceed with the approved changes and the as-built drawings shall reflect the design changes.
6. Locations of existing underground utilities are approximate. The contractor shall be responsible for contacting the appropriate utility company to determine the exact location of all utilities and underground structures prior to the initiation of any construction. Contractor shall also assume full responsibility for damage to any utilities encountered within construction limits. For site location of existing utilities involving MLG&W, phone (communications), and/or Texas Gas Company, please call 1-800-351-1111. For underground signal cables and detectors, call 528-2844 seventy-two (72) hours prior to construction. For water and sewer call Germantown Public Works Utility Division at (901) 757-7350.
7. Stake all sewer line work on fifty (50') foot stations (max.) (See sewer notes).
8. Stake all curb and gutter work on twenty-five (25') foot (max.) stations.
9. All disturbed grades or any areas in cut or fill where existing vegetation has been removed shall be seeded, mulched, fertilized, and/or sodded as required to prevent erosion or mud/silt runoff. Erosion control must be in place and functional prior to any construction activities.
10. All construction methods, materials and procedures shall be per City of Germantown Standard Specifications and Details unless otherwise approved by the City.

Standard Construction Notes: Section 01 - General Construction Notes

11. Contractor shall verify existing conditions as shown on the plans and any significant discrepancies in existing conditions should be immediately reported to the project design engineer and the City Construction Inspector.
12. No new trees, shrubs, permanent structures or other utilities (except for crossings), shall be allowed within a water, sewer or drain easement.
13. It is the Contractor's responsibility to insure that all required permits, approvals and required bonds and fees are obtained prior to the start of construction.
14. Saw-cut all existing, disturbed asphalt edges and coat sawed edges with "tack-coat" during asphalt-patch street-cut work.
15. Saw-cut all existing, disturbed concrete structures and asphalt pavement for tie-ins or modifications.
16. All existing asphalt pavement, utilities, utility structures, fences, walls, concrete curbs, sidewalks or other City property or utilities damaged as a result of construction activity shall be repaired/replaced by the contractor at no cost to the City.
17. The Contractor shall be responsible for all construction related surveying, horizontal and vertical staking, layout work, soil-density testing, soil-cement testing and concrete testing.
18. It is the Contractor's responsibility to make sure that all new public utilities (water, sewer, and drain) are installed within dedicated public or private utility easements.
19. Use trench boxes where necessary for safety. Contractor MUST comply with all applicable O.S.H.A. safety regulations.
20. Maximum finish grade slopes shall be three (3) foot horizontal to one (1) foot vertical (3:1) unless otherwise noted on the plans or directed by the Engineer.
21. The contractor is required to keep all public streets clear and free of dirt, mud and construction debris.
22. Construction activity is allowed between the hours of 7:00 AM to 6:00 PM Monday through Saturday (ONLY). No work is allowed on Sundays or holidays.
23. Unless specifically stated otherwise, all notes on this sheet apply to both public and private improvements shown on the plans or described in notes or specifications.
24. Contractor shall be responsible for maintaining adequate dust control as determined by the project engineer or the City. The Contractor shall respond as soon possible to complaints from residents or motorists concerning dust problems.
25. All exposed concrete shall be cured and cold weather-protected per City of Germantown Standard Specifications. The method of curing chosen by the contractor and the method of cold weather protection for concrete must be pre-approved by the City of Germantown.
26. NOTE: The City of Germantown's Fire Prevention and Protection Code requires approved fire hydrant availability and at least a base asphalt driving surface around a building before combustible materials can be installed on a building unless specifically otherwise approved by the Germantown Fire Marshall.

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EROSION CONTROL and TREE PROTECTION NOTES

1. All erosion control structures (BMP's) shall be in place, functional and inspected by the City prior to grading, excavation, topsoil removal, tree removal or pipe-laying operations.
2. All erosion control structures shall be maintained and monitored throughout the entire time of construction operations and until vegetation is established on all bare, disturbed areas.
3. All Construction Stormwater Inspection Certification reports (Twice-weekly Inspections) must be performed by a certified Level 1 TNEPSC inspector.
4. If NPDES permitted, inspect site at least twice-weekly and document on official forms. Twice-Weekly Inspections must be at least seventy-two (72) hours apart. Daily checking is required during periods of prolonged rainfall. The permittee shall maintain records of inspections, maintenance and repairs per TDEC guidelines.
5. Copies of all Twice-Weekly inspections, a copy of the SWPPP and the Notice of Coverage (NOC) should be maintained on-site. As a reminder the NOC should be posted near the main entrance of the construction site that is accessible to the public. Additional information regarding accessibility of records can be found in Subsection 6.2.1 of the TN Construction General Permit.
6. Keep construction debris, mud/silt from entering ditch channels or leaving the jobsite.
7. Erosion "blankets" or staked sod should be used on slopes to prevent erosion rills from forming.
8. Erosion controls are not limited to what is shown on approved erosion control plans. Additional erosion control structures or measures may be needed as conditions warrant or as directed by the project engineer, City Engineer, Owner/Developer or City Inspector.
9. It is the contractor's responsibility to insure that all required permits have been obtained prior to beginning any construction or other activity on the site and for satisfying the requirements of the State of Tennessee Department of Water Pollution Control as set forth in the Tennessee Erosion Control Handbook.
10. All newly cut or fill areas lacking adequate vegetation shall be fertilized, mulched, seeded, and/or sodded to effectively control soil erosion. Stake sod on slopes three-to-one (3:1) or greater.

Standard Construction Notes: Section 02 - Erosion Control and Tree Protection Notes

11. A temporary gravel construction entrance shall be installed where contractor's vehicles and equipment enters the new development unless otherwise waived by the City. This shall be installed per details on the plans. If there is no detail use two (2) inch to three (3) inch size stone (TDOT standard, AASHTO M-43 size 1 gradation, 3.5 to 1.5 inch stone size), six (6) inches thick on geo-textile fabric underlayment a minimum of twenty (20) feet wide and fifty (50) feet deep. Do not use CR610 limestone for gravel. Large, angular rock works best for removing mud from tires. Additional stone may have to be added periodically to maintain the proper functioning of the pad. If the stone pad does not adequately remove mud from vehicle wheels, the wheels should be hosed (water), off before the vehicle enters a public street. The washing should be done in an area covered with crushed stone, and the wastewater should drain to a sediment trap or sediment barrier.
12. Reduce run-off velocity of storm water in areas of concentrated flow and capture larger sediment particles by using stone check dams for drainage areas not exceeding one acre and rock check dams for drainage areas not exceeding five acres.
13. Use silt fabric fencing with steel stakes at a maximum of four (4) feet spacing with wire mesh backing in areas where large amounts of silt can be expected to accumulate.
14. Use of straw or hay bales is not permitted.
15. All silt/sediment is to be removed from erosion control structures when they reach one-half (½) or fifty (50%) percent capacity.
16. As soon as finish grading is complete, install a continuous silt fence along the backside of all public or private roadway concrete curb and gutters. The silt fence shall be maintained by the developer and/or permit holder until vegetation is established.
17. All erosion control methods, procedures and structure designs shall meet the requirements of all state and local authorities having jurisdiction over storm water runoff.
18. Tree protection fencing, where required, should be in place prior to any construction activity.
19. Wherever possible, install tree protection fencing at the drip line of trees.
20. Contractor and/or developer must receive approval from the City Engineer for any changes in the approved tree protection plan or erosion control plan.
21. Provide the name and phone number of the person or persons responsible for erosion control, tree protection, and/or mud/dirt in the street removal to the City Inspector prior to the start of construction.
22. If applicable, provide the City Inspector with the name and phone number of the designated EPSC Inspector and the NPDES tracking number.
23. If the construction site is NPDES permitted, a copy of the NOC and the location of the SWPPP must be posted at the jobsite in a weatherproof container such as a mailbox or PVC pipe section with capped ends.

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GRADING and DRAINAGE NOTES

1. NOTE: These notes and specifications are not the complete City of Germantown construction standards and specifications. These are SELECTED notes and specifications chosen to represent the ones most likely to be needed and used by the contractor for this type of project. Consult with the City Inspector for any other notes or specifications that may be applicable for this project, and that may not be included in these documents.
2. Minimum compaction requirements for fill in all areas shall be achieved by placing the fill in six (6) inch thick loose lifts and compacting to minimum of ninety-five (95%) percent of standard proctor density with moisture content of cohesive fill material maintained within two percent of optimum as defined by the standard proctor test. Compaction requirements for lawn areas (outside of paved or buildable areas) shall be eighty-five (85%) percent of standard proctor.
3. GEOTECHNICAL TESTING AND FREQUENCY: Test fill materials to verify suitability for use, gradation of material, moisture-density relation by ASTM D698 standard proctor method, Atterberg limits, bearing value, and percent of organic materials. Test frequency will be at least one (1) test for each twenty-five-hundred ($2500ft^2$) square feet of filled area. Each lift will be tested to verify compaction meets requirements. Reports of testing results will be sent to the City with copies of all proctors. Test every building pad to assure minimum compaction requirements.
4. All proposed precast concrete drainage pipes shall be reinforced concrete minimum Class III.
5. TRENCH BACKFILL: All trenches excavated for the installation of drainage in proposed paved areas shall be compacted as follows:
    A. Backfill under, around and over pipe: Immediately after laying pipe, backfill the trench with approved fill to an elevation of twelve (12) inches above the top of pipe, making certain that the fill is compacted around the haunches of the pipe. Grade at twelve (12) inches above pipe to be Compacted to seventy (70%) percent relative density (ASTM D4254). From twelve (12) inches above top of pipe to finished grade or pavement subgrade, backfill with a clean suitable fill material in loose lifts of not more than eight (8) inches in thickness.
    B. Backfill to be compacted to ninety-five (95%) percent of material's maximum dry density as determined by the standard proctor compaction test (ASTM D698). The material's moisture content will be maintained to within plus or minus (±2%) percent of its optimum moisture.
6. TRENCH BACKFILL TESTING: In-place density tests should be performed at fill grade (12" above top of pipe) and at every eight (8) inch lift of fill to finished grade for every fifty (50) lineal feet of pipe.

Standard Construction Notes: Section 03 – Grading and Drainage Notes

7. SITE PREPARATION: All topsoil, vegetation, roots, and any soft, unsuitable soils shall be stripped from the ground surface and either hauled off or stockpiled as directed by the Engineer for later use.
8. Prior to placement of base material in a roadway, the area to be paved shall be proof- rolled. Any subgrade failing the proof-roll shall be tested, and if test results fall below the specified level, the subgrade in that area shall be re-worked to achieve the density specified. All such rework shall be at the expense of the contractor or developer.
9. When field test indicate that installed compacted material does not meet requirements, the contractor will provide additional compaction until specified density is achieved, or remove and replace defective material as directed by soils engineer at no cost to the City.
10. When construction installation is complete, provide as-built information to City. Joints for radial, elliptical and arched reinforced concrete pipe shall be poured Portland Cement Mortar joints using continuous diapers attached to the pipe with steel wires or bands of adequate strength to hold the loaded diaper without stretching or slipping.
11. Joints for straight reinforced concrete pipe (RCP) shall be rubber wedge-shaped, sliding seal, pre-lubricated (ASTM C443), flexible plastic rope (AASHTO M 198-Type B), flexible butyl rope (AASHTO M 198-Type B), or Portland Cement Mortar.
12. Pipe bedding shall conform to the requirements given herein for Class A, B, or C bedding, whichever is shown on the plans. If the class of bedding is not shown, a minimum of Class C bedding shall be provided.
13. CLASS A BEDDING: (Concrete Cradle) Consist of a continuous concrete cradle up to spring line constructed in conformity with the details shown on the plans or as directed by the Engineer.
14. CLASS B: (Crushed Limestone) Consist of bedding the drain pipe on a six inch thickness of crushed limestone and sufficient additional crushed limestone which is accurately shaped by a template to fit the lower part of the pipe exterior for at least ten (10%) percent of its overall height. After pipe installation, crushed limestone shall then be rammed under the haunches and tamped in layers not over six (6) inches in loose thickness around the pipe to the spring-line. The remaining depth of trench shall then be backfilled and compacted as specified in TRENCH BACKFILL notes herein. When bell and spigot pipe is to be placed, recesses shall be dug in the bedding material of sufficient width and depth to accommodate the bell without its resting on the bottom of the recess. The width of the recess shall not exceed the width of the bell by more than two (2) inches.
15. CLASS C (Natural Subgrade) Consist of bedding the drain pipe on a natural earth subgrade shaped by a template to fit the lower part of the pipe exterior for at least ten (10%) percent of its overall height. After pipe installation, select earth material shall then be rammed and tamped in layers not over six (6) inches in loose thickness around the pipe to the spring-line. The remaining depth of trench shall then be backfilled and compacted as specified in TRENCH BACKFILL notes herein. When bell and spigot pipe is to be placed, recesses shall be dug in the subgrade of sufficient width and depth to accommodate the bell without its resting on the bottom of the recess. The width of the recess shall not exceed the width of the bell by more than two (2) inches.

16. SUBGRADE PREP FOR ROADS: Prior to the installation of soil cement or other roadway base material, the subgrade shall be proof-rolled to determine soft areas not having adequate compaction. All areas failing a proof-roll shall be excavated to remove unsuitable materials in the presence of a certified soils engineer or technician who will determine the limits of excavation horizontally and vertically, and the methods and materials of backfilling. The technician will then approve final compaction in all areas that had originally failed a proof-roll.
17. Begin laying each pipe run at the lowest point with the bell end upgrade.
18. The maximum allowable joint width measured on the inside surface of concrete pipe shall not be more than three-quarters (¾) inch for pipe sizes fifteen inches through twenty-one (15” - 21”) inches in inside diameter; one (1) inch for pipe sizes twenty-four inches through forty-five (24” - 45”) inches in inside diameter; and one and one-quarter (1¼) inch for pipe sizes forty-eight (48) inches and larger.
19. Drain manholes shall be five (5) foot inside diameter (Ø) unless noted otherwise and shall have three-to-one (3:1) benches and smooth, rounded inverts conforming to the shape of the outlet pipe.
20. The placing of concrete and forming of inverts as indicated for brick manholes shall apply in like manner for precast manholes.
21. All brick used for inlets and manholes shall be concrete brick.

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SEWER NOTES

1. NOTE: These notes and specifications are not the complete City of Germantown construction standards and specifications. These are SELECTED notes and specifications chosen to represent the ones most likely to be needed and used by the contractor for this type of project. Consult with the City Inspector for any other notes or specifications that may be applicable for this project, and that may not be included in these documents.
2. The Contractor MUST notify the City of Germantown Engineering Department at (901) 751-5720, twenty-four (24) hours prior to the start of any construction activities.
3. All methods, materials, installations and specifications shall meet or exceed City of Germantown Standard Specifications. Sewer mains shall be SDR 26 pipe materials.
4. Provide stakes for sewer line installations every fifty (50) feet on center.
5. "As-built" information must be submitted on the original reproducible drawing that was approved by the City Engineer and shall include depths at ends of service lines. See sample as-built drawing in the "Redbook".
6. Horizontal "as-built" information must be submitted to the City and must include "Pluses" for manholes and services.
7. The location where services cross street curbs shall be marked by stamping a four (4) inch tall letter "S" in the concrete during pouring of curb & gutter and stencil-painting a four (4) inch tall, black "S" on a six-inch by six-inch (6"x6") white background on the face of the curb.
8. The sewer service line and any water service line shall have a minimum ten (10) foot horizontal separation.
9. Install all services per City typical service connection detail.
10. Install all pipe bedding and trench backfilling per City typical pipe bedding detail. Water settling, puddling and/or jetting of backfill materials, as a compaction, these methods are <u>not acceptable</u>.
11. The Developer or Contractor shall furnish a certified testing technician to conduct all required trench backfill testing per City standards or as required in these "SEWER NOTES".
12. <u>TESTING</u>: In-place trench backfill compaction density test shall be performed at fill grade (12" above top of pipe) and at every six (6) inch lift of fill to finished grade for every fifty (50) lineal feet of pipe.
13. <u>TRENCH BACKFILL</u>: Immediately after laying pipe, backfill the trench with sand to a minimum elevation of twelve (12) inches above top of pipe, making certain that the fill is compacted around the haunches of the pipe. Grade at twelve (12) inches above the pipe to be compacted to seventy (70%) percent relative density (ASTM D4254).

From twelve (12) inches above top of pipe to finished grade or pavement subgrade, backfill with a clean, suitable fill material in loose lifts of not more than six (6) inches in thickness. Backfill to be compacted to ninety-five (95%) percent of material's maximum dry density as determined by the standard proctor compaction test (ASTM D698). The material's moisture content will be maintained to within plus or minus (±2%) of its optimum moisture.

14. Service lines shall extend at least past the Right-of-way line and/or sidewalk (see sewer service connection standard detail), unless otherwise noted.
15. Conduct all PVC pipe sewer system tests per City standards including, but not limited to, manhole vacuum test, low pressure air test on mains and services and five (5%) percent deflection test using a nine (9) sided mandrel.
16. Pre-cast structures must be pre-approved by the City Engineer.
17. All manhole top elevations (off street), in open areas shall be one and one-half (1.5) feet above finish grade.
18. All manhole top elevations shall be one (1.0) foot above the one-hundred (100) year flood elevation.
19. All manhole top elevations in residential yards shall be 0.5" above finish grade.
20. Contractor must maintain uninterrupted sewer service on all existing, active sewer systems. Where necessary, provide ample temporary wastewater pumping and/or bypassing pre-approved by the City Engineer.
21. All sewer mains and services having less than one and one-half (1.5) feet of vertical clearance with water and drain pipes shall be ductile-iron pipe Class 50 or concrete encased extending ten (10) feet on each side of crossing. All ductile-iron pipes shall be polyethylene-lined or shall be treated with Protecto 401 or an approved equivalent.
22. All manholes in reverse-crown streets, alleys or drives (Public or Private) shall be provided with waterproof gaskets and plugs for vent holes in manhole tops to prevent drainage inflow into sewer system.
23. All sewer manholes shall be four (4) feet in diameter unless otherwise noted.
24. Brick manholes up to twelve (12) feet deep shall have nine (9) inch thick walls, twelve-to-twenty (12- 20) feet deep shall have thirteen (13) inch thick walls and over twenty (20) feet deep shall have seventeen (17) inch thick walls.
25. Precast manholes over twenty (20) feet deep shall have a steel reinforced concrete footing per City standard detail.
26. No other utilities, services, trees, shrubs or permanent structures shall be located within Public Utility Easements.
27. The City, prior to construction, shall approve methods and materials used to install a new service on an existing sewer main.
28. All sewer manhole benches, whether pre-cast or brick, must have three-to-one (3:1) slopes on benches at manhole bottoms.
29. All sewer manhole bottom inverts must be shaped to a "half pipe" rounded form without flat bottoms and should be no wider than the outflow pipe diameter.

Standard Construction Notes: Section 04 – Sewer Notes

30. Manhole bottom inverts must be shaped (in Plan view) with “sweeping-T” intersections, not ninety (90°) degree-shaped intersections. Other invert angles should be shaped to achieve flows of least resistance using curves rather than straight angles (Plan view).
31. Manhole inverts and benches must have a smooth surface. Achieve a smooth surface by using a wide brush to smooth all surfaces while cement mortar is still “wet” or not set.
32. On manholes deeper than four (4) feet, install manhole steps at sixteen (16) inch on center maximum vertically and stagger steps twelve (12) inches on center laterally. Manhole steps to begin eighteen (18) inches above the bench and one additional step shall be placed on the side opposite the ladder three and one-half (3½) feet from the top at all conical top sections (back step).
33. Precast manholes must be coated on the outside with two coats of approved bituminous waterproofing material with a total minimum dry film thickness of twelve (12) mils. Any waterproof coating damaged during installation or backfill operations shall be cleaned of all dirt and two coats of waterproofing reapplied.
34. Brick manholes shall be coated on interior and exterior surfaces (excluding interior surface of sloping top cone section), with one-half (½) inch minimum thick plaster mortar.
35. The placing of concrete and the forming of inverts as indicated for brick manholes shall apply in like manner for precast manholes.
36. As part of final inspection requirements, the contractor shall run a video camera through all new sewer mains and shall provide the City with a digital DVD or electronic copy of the video inspection containing manhole numbers and on-screen footage counts between manholes. All defects discovered by the video inspection shall be corrected/repaired by the contractor and the pipe lines repaired shall be re-videoed for repair approvals. Video equipment shall be “IBAK T66 camera tractor” or equal. Video equipment must be pre-approved by the City.

Standard Construction Notes: Section 05 – Water Notes

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WATER NOTES

1. NOTE: These notes and specifications are not the complete City of Germantown construction standards and specifications. These are SELECTED notes and specifications chosen to represent the ones most likely to be needed and used by the contractor for this type of project. Consult with the City Inspector for any other notes or specifications that may be applicable for this project, and that may not be included in these documents.
2. The Contractor MUST notify the City of Germantown Engineering Department at (901) 751-5720, twenty-four (24) hours prior to the start of any construction activities.
3. Contact the City of Germantown Water Department to locate existing water and/or sewer lines prior to construction (901-757-7350).
4. All methods and materials used shall conform to the standard specifications of the City of Germantown and must meet requirements of the State of Tennessee.
5. New water lines must be disinfected and tested for bacterial contamination per City of Germantown standards. The City will collect the sample, deliver it to the testing laboratory, and pay for the test.
6. After passing the bacteria test, the new water lines (mains, services and fire hydrants) shall be hydrostatically pressure-tested at one-hundred fifty (150) psi for two hours during which time the leakage shall not exceed that permitted by AWWA Specification C600-77 for mechanical joint and push- on joint pipe. Obtain a copy of AWWA Specification C600-77, and keep it on the job in good condition for use in computing the permissible leakage in each section to be tested.
7. The water service line and any sewer service line shall have a minimum ten (10) foot horizontal separation.
8. The location where a water service line crosses a street curb shall be marked on the face of the curb with a four (4) inch stamped or chiseled “W” and a black, four (4) tall stenciled-painted “W” on a six-inch by six-inch (6”x6”) painted white background.
9. See City of Germantown standard Water Service Detail for service line installations.
10. See City of Germantown standard Fire Hydrant Detail for fire hydrant installations.
11. Thrust blocks shall be installed at all “T’s”, bends (horizontal & vertical) and fire hydrants. See details for concrete thrust block installations (must be poured-in-place).
12. Unless otherwise noted on the plans or directed by the Engineer, all water service lines three (3) inch diameter (Ø) and smaller shall be one-piece, soft copper (Type K).
13. Unless otherwise noted on the plans or directed by the Engineer, the Developer/Owner or Contractor is responsible for all installations on the street side of the meter.
14. Trace Wire & underground detectable tape shall be installed with all water mainlines.

Standard Construction Notes: Section 05 – Water Notes

15. Meters two (2) inch diameter (Ø) and smaller are paid for by Owner/Developer and installed by the City (unless otherwise noted). Meters and meter boxes/vaults over two (2) inch diameter (Ø) in size are furnished and installed by the Owner/Developer.
16. Meter boxes (for 2"Ø and smaller meters) are paid for by Owner/Developer, delivered to job site by the City, and installed flush with the finish grade by the contractor.
17. Irrigation systems must have their own meters with a backflow preventer.
18. All water mains and services three (3) inch diameter (Ø)" and larger to be maintained by the City shall be ductile iron, minimum pressure class 350 minimum, ANSI/AWWA Specification C151 mechanical or push-on type with plain rubber gaskets.
19. Fittings for ductile iron pipe shall be AWWA Specification C110 cast iron or ductile iron short body pattern, class 250, bituminous coated inside and outside, with ends as required for the types of joints specified above for the various pipe locations and services.
20. Tees for connecting fire hydrants to mains shall be mechanical joint, anchoring type, each with a six (6) inch spigot outlet and a locked-on rotating mechanical joint gland ring.
21. All joints within bored casing pipes shall be installed with "Field-Lok" joint gaskets approved by the City.
22. Gate valves MUST open counter-clockwise and conform to AWWA Specification C519 with manufacturer approved by the City.
23. Valve Boxes shall be standard cast iron two-piece 5-1/4" inside shaft diameter screw-adjustable type, each consisting of a cover marked "WATER", an upper telescoping section and a lower section. Where necessary to provide extra depth, provide cast iron extension pieces as required.
24. Fire hydrants shall be Mueller A-423 Super Centurion 250 (lubricated dry-top, break-away traffic type), conforming to the AWWA Specification C502. Substitutions are allowed ONLY with approval from the Germantown Water Department.
25. Each hydrant shall be complete with a five (5) inch minimum valve opening, a six (6) inch AWWA Specification C111 mechanical joint inlet connection, a three (3) or four (4) foot bury, two (each) - two and one half (2½) inch National Standard fire hose thread nozzle, one - four (4) inch City of Germantown, TN standard pumper connection nozzle with 15/16" (square cross section), 1⅛" high operating nut and cap nuts. Each hydrant shall be opened by turning in a CLOCKWISE direction of rotation (right hand open).
26. Wedge Type Retainer Glands: These shall be "Megalug" as manufactured by EBAA Iron, Inc., Eastland, Texas, or as approved, consisting of a specifically designed ductile iron mechanical joint follower gland with multiple wedging action restraining mechanisms with a minimum working pressure of two-hundred fifty (250) psi. Gland shall be suitable for use with a standard mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11. Twist off nuts shall be used to indicate proper torque of the restraining wedges. Glands shall be installed in accordance with manufacturers written instructions and directions. This type of anchorage MAY be used at any location instead of concrete anchorage subject to City approval, and SHALL be used where concrete anchorage is not practicable.
27. Service lines shall have a Mueller B-25008 series corporation stop with straight coupling nut at the tap on the main and a Mueller No. B-21570R series inverted key

curb stop at the meter location with two Mueller H-15403 meter couplings and gaskets. No substitutions from the Mueller brand are allowed without specific approval from the Germantown Water Department.

28. Where trench conditions are unsuitable for pipe support, lay pipe on washed gravel bedding as authorized by the City. The City shall approve gradation of gravel bedding material.
29. Minimum pipe cover on water mainlines and fire hydrant leads shall be thirty-six (36) inches.
30. TRENCH BACKFILL: Under areas proposed to be paved, except for sand backfill, compact fill material around the haunches of the pipe, fill the trenches from six (6) inches above pipe tops in eight (8) inch maximum thickness loose layers up to paving sub grade. Compact each backfill layer using pneumatic or other approved mechanical tampers until the backfill is compacted to ninety-five (95%) percent of the materials maximum dry density as determined by the standard proctor compaction test (ASTM D698). The material's moisture content will be maintained to within plus or minus (±2%) percent of its optimum moisture. At the end of each day's work, do not leave more than two-hundred (200) feet of trench without compacted backfill, unless otherwise approved by the City of Germantown. PUDDLING, JETTING OR WATER SETTLING WILL NOT BE PERMITTED.
31. After completion of all water line work and before the work will be accepted, make a final check of each valve installed and hydrant installed or relocated, and of each existing valve that has been operated in connection with the work under this project. Make this final valve check in the presence of the City inspector. Demonstrate that each valve is in fully open position and that each Fire Hydrant operates properly.
32. All valve boxes (in pavement or off pavement), shall have concrete collars installed as shown on the fire hydrant detail.
33. Tapping sleeves shall be 304 L stainless, full circle, split drop-in-bolt design at least fifteen (15) inches long. Once inserted, the bolts shall be "captured" to prevent them from spinning during tightening. The sleeve design shall allow the bolts to be reversed to ease installation. The tapping sleeve outlet shall be at least twelve (12) gauge material and one-half (½) inch oversized to allow the use of a full size cutter. (A ½" undersized shell cutter should always be used on a size on size tapping sleeve). The outlet shall be provided with a one-quarter (¼) inch NPT test plug with a square head for quick and easy removal. The plug shall be brass or 304 stainless steel.
34. The tapping sleeve shall have a working pressure of two-hundred fifty (250) psig in sizes four-to-twelve (4-12) inches and two-hundred (200) psig in sizes fourteen-to-twenty-four (14-24) inches. The tapping sleeve shall have a complete circle gasket on the interior of the shell. The shell gasket shall be composed of NBR (Nitrile Butadiene Rubber) virgin rubber and be of the waffle design. The shell gasket shall provide a complete 360 degree seal. The outlet gasket shall be provided with a minimum of two concentric raised surfaces to maximize sealing on the pipe surface. The tapping sleeve bolts, nuts and washers shall be type-304 stainless steel. The nuts shall be of the heavy hex type. The bolts shall be a rolled thread, drop-in style, coated with an anti-galling compound.
35. Unless otherwise noted on the plans or directed by the Engineer All pipe sleeves shall be a "HY-MAX", 2-bolt sleeve instead of a ductile iron sleeve.
36. All service lines three (3) inch Diameter in size and over shall be ductile iron pipe.

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SOIL CEMENT and CEMENT TREATED BASE NOTES

1. On all public streets to be maintained by the City of Germantown and any other streets/roads as noted on the plans or specifications having a soil cement road base, these notes shall apply to the methods, materials and procedures used for soil cement operations.
2. Contractor shall submit a soil-cement mix design to the City Engineer for review and approval prior to the start of soil cement operations.
3. Curb and gutter installations must be certified and approved by the City prior to soil cement or base installation work. Also compaction test results of all utility trenches within pavement areas must be submitted to the City for review and approval prior to soil cement operations. It is the developer's responsibility to ensure his contractors backfill and compact trenches to ninety-five (95%) percent standard proctor density.
4. A certified soils test technician must be present at the job site for the duration of all soil cement or base material operations to conduct the entire test as described in these notes. A copy of all test results shall be submitted to the City after final test are completed.
5. The contractor along with the City Inspector will "string-line" the cross-section of the roadway (from top of curb to top of curb), to check the subgrade "crown". This is done to make sure that dirt will not have to be added or removed to achieve the correct soil cement final grades. The sub-base is to be notched down the total thickness of the base and surface asphalt.
6. Prior to soil cement operations or installation of any asphaltic base material, the sub grade shall be proof-rolled with a fully loaded dump truck in the presence of the City Inspector and a certified soil test technician. The dump truck shall have a minimum cargo weight of twenty-two (22) tons. The proof-roll vehicle shall be driven over the areas to be tested at a speed, pattern, and number of cycles to be field determined by the Soil test technician. All areas failing the proof-roll shall be excavated to remove the unsuitable material. This must be done under the direction of a certified soils technician who will determine the vertical and horizontal limits of unsuitable soils to be removed. The soils technician will also oversee the methods and materials of replacement of the unsuitable materials. The contractor will compact and proof rolls these failed areas until a proof roll test is passed.
7. During entire soil cement operations the on-site soils technician will test for the following:
   a) Spread rate/volume of cement (per approved mix design)
   b) Depth of mixture (as noted on plans and/or specs)
   c) Moisture content (when cement is mixed & before compaction - between optimum & 2% above)
   d) Compaction density (of finished product), one test per two-thousand (2000yd^2) square yards with minimum of three (3) tests.

Standard Construction Notes: Section 06 - Soil Cement & Cement Treated Base Notes

8. After approved final compaction and finish grading, the contractor and City Inspector shall check the cross-section “crown” of the soil cement by using a string line across the top of the curbs.
9. The temperature must be forty (40°) degrees Fahrenheit and rising before cement is applied to the sub grade.
10. The cement spreader equipment used by the contractor must be approved by the City.
11. After the soil-cement has been finished as specified herein, it shall be protected against drying for seven (7) days by the application of a bituminous sealer applied as soon as possible, but not less than two (2) hours after the completion of finishing operations. The bituminous sealer shall be uniformly applied to the surface at the rate of approximately zero-point-two (0.2) gallons per square yard with approved heating and distributing equipment.
12. Should it be necessary for construction equipment or other traffic to use the bituminous covered surface before the bituminous material has dried sufficiently to prevent pickup, sufficient granular cover shall be applied before such use. Otherwise the street(s) shall be blocked-off or barricaded during the seven (7) day curing period to prevent vehicular traffic.
13. During the curing period, when the air temperature may be expected to reach the freezing point sufficient protection from freezing shall be given the soil-cement for seven (7) days after its construction and until it has hardened.
14. At the end of the seven (7) day curing period, all pavement surfaces shall be proof-rolled in the presence of the contractor’s superintendent and the certified soil test technician. All areas failing the proof-roll shall be dug out to remove the unsuitable material at the direction of the project soils engineer. These excavated areas shall be backfilled with compacted cement treated base (CTB), prior to the asphalt base installation.
15. Cement Treated Base (CTB) may be used in areas of proof roll failures, areas too small or confined for soil cement equipment, areas specified on approved design plans, or other areas pre-approved by the City Engineer or City Inspector. CTB material shall be pug-milled, ten (10%) percent by volume cement content (8½ % by weight). The CTB mix design shall be pre-approved by the City Engineer at least fourteen (14) days prior to the date of intended installation. The installed CTB shall be blocked off from vehicular traffic for a minimum seven (7) day period, then the CTB shall be proof rolled as specified under the soil cement proof-roll guidelines (see note number 13). CTB thickness shall be as specified on approved plans or as pre-approved by the City Engineer. Note: CTB is a cement product and has a “shelf-life”. It shall be compacted in place as soon as possible after delivery to the jobsite, and shall not be stored on site more than three (3) hours before being installed in the roadway.
16. Curb and gutter installations must be certified and approved by the City prior to soil cement or base installation work. Also compaction test results of all utility trenches within pavement areas must be submitted to the City for review and approval prior to soil cement operations. It is the developer’s responsibility to ensure his contractors backfill and compact trenches to ninety-five (95%) percent standard proctor density.

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HORIZONTAL DIRECTIONAL DRILLING NOTES

1. Contractor MUST notify the City of Germantown, Department of Engineering, 901-751-5720, 24 Hours prior to any work commencing.
2. No Operations may occur between the hours of 12:00 PM Friday to 7:00 AM Monday, or between 6:00 PM to 7:00 AM Monday through Friday.
3. Work requiring traffic control may only be performed, 9:00 AM to 4:00 PM, Monday through Thursday, and from 9:00 AM to 12:00 PM on Friday.
4. All directional drilling/boring work that crosses a sanitary or stormwater sewer utility requires a CCTV video in accordance with the City of Germantown Specifications prior to and after completion of the directional drilling/boring work.
5. Contractor MUST provide the City of Germantown the active 811 ticket number for the project.
6. Contractor is responsible for repairing any damages to Public and Private Property as a result of this work.
7. All Traffic Control MUST be MUTCD compliant.
8. All materials to complete work MUST be present before work commences.