

ARTICLE 6

CONSTRUCTION AND INSPECTION PROCEDURES

SECTION 6.1 PURPOSE

The purpose of this Article is to set forth the Planning Commission's construction and inspection procedures. These procedures should create a closer continuity between the Developer, Developer's engineering representative, Contractor, and/or Staff Engineer and representatives of the Planning Commission.

The current Edition of the *Kentucky Transportation Cabinet's Standard Specifications for Road and Bridge Construction* shall be the primary document to determine whether improvements are acceptable. In the event of conflict between City of Bowling Green Standard Drawings or Subdivision Regulations and Engineer's Plan, Subdivision Regulations and City of Bowling Green Standard Drawings govern. Construction materials and methods for streets, storm sewers, and sidewalks shall conform to those of the current edition of the *Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction*, except as herein set forth and described; *Portland cement concrete* for all items of construction shall conform to requirements of Class "A", *Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction, Current Edition*.

SECTION 6.2 PROCEDURES

The following procedures shall extend to all Subdivision construction:

A. **PRE-CONSTRUCTION CONFERENCE** - The Developer, Contractor, and engineering representative shall schedule a pre-construction conference with the Planning Commission staff prior to starting construction. Major items, all appurtenances, and incidental work, which cover the entire scope of work involved, will be discussed. The Developer and Contractor will be requested to outline their proposed construction procedures and magnitude of operations, covering all work as detailed on approved Subdivision Plats. The group in attendance shall include the Developer, Contractor, their Engineering representative, Planning Commission staff, County Road Engineer or City Engineer, and representatives from all utilities to be installed. At the conference, it is the intention of the Planning Commission Staff Engineer to compile sufficient information to prepare an inspection calendar for periodic and routine inspection.

At the Pre-Construction Conference, the Developer shall provide a preliminary schedule for the work items discussed herein. The Developer shall provide a copy of the Encroachment permit from the City/County/State for access to existing roadways.

B. **NOTICE OF INTENT** - The Developer or his representative shall file a notice of intent (NOI) with the Kentucky Division of Water (KyDOW) prior to commencing work. Provide a copy of the NOI to the Planning Commission Engineer. The NOI shall include an Erosion Prevention and Sediment Control Plan and Best Management Practices (BMP) plan, developed based on all applicable City/County/State/Federal ordinances and guidelines.

- C. **PLANNING COMMISSION INSPECTIONS AND OBSERVATIONS** - Planning Commission Staff will provide routine site visits and visual observations of the construction activities throughout the duration of the project. The Developer, the Engineer, Surveyor, Contractors, Third Party Testing Agencies, and Suppliers (collectively known as External Party agents), shall be responsible for all Density Testing (Soil, Aggregate, and Asphalt), Drywell Flow Testing, Concrete Testing, Utility Testing, As-Built Drawings, Asphalt Plant, Aggregate Plant, and Concrete Plant testing, and any other testing and paperwork needed for acceptance. External Party agents shall be properly certified by the Kentucky Transportation Cabinet or the appropriate trade organization for the work they are performing. A Copy of such certification shall be provided to the Planning Commission Engineer prior to performing the work.
- D. **INSPECTION OF INITIAL GRADING OPERATION** - All areas subject to grading operations must have sedimentation and Erosion controls in place prior to commencing work. The Planning Commission and Developer's representatives shall inspect the Erosion controls prior to continuing with grading. The first field inspection will deal with a general review of the area to be graded within the limits of the Roadway with emphasis on the subsoil in particular where any embankment is to be placed. The sod and topsoil shall be removed from the Roadway grading area and stockpiled for revegetation of disturbed areas. The Planning Commission and Developer's representatives will also review the alignment and Grade stakes. The grading operations will be inspected periodically throughout its construction period.
- E. **GRADING AND EMBANKMENTS** - The area on which streets are to be constructed should be cleared of all vegetation and disposed of outside of the limits of the Right-Of-Way. Grading should be done to the extent of the Right-Of-Way or to the back of the sidewalk at a maximum cross Slope of 1/2" per foot. Prior to the construction of embankments, any unsuitable material, on which the embankment will be superimposed, should be removed and the area should be stabilized by conventional methods. Where development is proposed on areas of existing Fill where the composition and Compaction of Fill materials is in doubt test borings may be required by the Planning Commission Engineer before development is permitted to occur. As the minimum, the area will be proof rolled with a loaded Dual Axle Truck to determine suitability of the base material. The embankments shall be formed by placing material in successive horizontal layers of no more than twelve (12) inches in thickness, loose depth. Densities shall be verified at minimum two hundred (200) foot interval and shall meet or exceed ninety-five (95) percent standard proctor. No organic material shall be permitted in the embankments. No rock or similar irreducible material with a maximum dimension greater than twelve (12) inches shall be buried or placed in embankments unless approved by the Planning Commission Engineer. Small boulders or rock layers shall not be deposited within two (2) feet of sub-Grade elevation.
- CUT SECTION EXCAVATION** - Cut sections should be excavated to the required typical section and any unsuitable material encountered shall be removed and the area backfilled in six (6) inch horizontal layers and thoroughly compacted before successive layers are placed. Densities shall be run at minimum two hundred (200) foot intervals and shall meet or exceed ninety-five (95) percent standard proctor.
- SOLID ROCK EXCAVATION** - If solid rock is encountered in connection with the grading operation, the solid rock shall be removed to a depth of six (6) inches below sub-Grade elevation and backfilled to meet the grading and embankment requirements.
- F. **INSPECTION OF CULVERT PIPE AND OTHER DRAINAGE OPERATIONS** - The Planning Commission and Developer's representatives will inspect or be present when the installation of culvert pipe and retention/detention areas are started. The concrete Headwall construction and

various other concrete items, such as sinkhole boxes, dry wells, etc., will be inspected. The Planning Commission and Developer's representatives shall inspect the drainage devices before backfill of major items occurs. In general reference, the overall proposed drainage pattern of the Subdivision will be reviewed extending from the summit of the drainage area, along the meandering ravines and ditches to their terminus, whether it be to a natural waterway, natural sinkhole, or ponding area and dry well, to determine if the drainage pattern is substantially in accordance with the approved plans. Drainage Operations shall be installed during the initial operations of construction and remain functional throughout construction.

G. UTILITY CONSTRUCTION - Utilities outside of Right-of-Way shall be installed according to the specification of the individual utility provider.

1. Sewer trench shall be installed according to Bowling Green Municipal Utilities'/Warren County Water District specifications including backfilling operations.
2. Water trench shall be installed according to Bowling Green Municipal Utilities'/Warren County Water District specifications including backfilling operations.
3. In the event of a conflict between the Engineer's plan or Planning Commission's Subdivision Regulations and Utilities' specifications, Utilities' specifications govern.

H. UTILITY/STORM SEWER TRENCH BACKFILL REQUIREMENTS - The following requirements shall apply to all utilities, storm sewer, casings, and conduits (collectively known as Pipes) under pavements within Right-Of-Way, and storm sewer within dedicated public easements outside of Right-Of-Way. References to Flexible and Reinforced Concrete Pipe below are for purposes of Storm Sewer installation.

- 1) Flexible Pipe trenches less than 4 feet deep (measured from bottom of Pipe to subgrade elevation)
 - a) Shall be backfilled with #57 Stone, #9 Stone, or flowable fill to subgrade elevation.
- 2) Reinforced Concrete Pipe trenches under pavements less than 4 feet deep (measured from bottom of Pipe to subgrade elevation) or when the top of the pipe is within one pipe diameter of the subgrade elevation
 - a) Shall be backfilled with #57 Stone, #9 Stone or flowable fill to subgrade elevation.
- 3) Flexible Pipe trenches more than 4 foot deep (measured from bottom of Pipe to subgrade elevation)
 - a) Shall be backfilled with #57 Stone, #9 Stone, or flowable fill to an elevation 4 feet above the bottom of the trench or;
 - b) Shall be backfilled with #57 Stone, #9 Stone, or flowable fill to an elevation 1 foot above the top of pipe, whichever provides greater pipe cover.
- 4) Reinforced concrete pipe trenches under pavements more than 4 foot deep (measured from bottom of pipe to subgrade elevation) or when the top of the pipe is not within one pipe diameter of the subgrade
 - a) shall be backfilled with #57 Stone, #9 Stone, or flowable fill up to the spring line (an elevation equal to $\frac{1}{2}$ the pipe diameter) and either granular backfill, flowable fill, or embankment material in 6-inch lifts to an elevation of 1 foot above the top of the pipe.
- 5) The remainder of the Flexible, Reinforced Concrete, and Utility Pipe trench backfill shall be constructed with Stone or unclassified materials soils mixed with shot rock or excavated stone).
 - a) Compaction of Stone backfill shall be 1 foot or less lifts, placed with mechanical effort.
 - b) Placement of unclassified materials shall be placed in lifts not to exceed twice the nominal size diameter (one foot maximum) of the stone material, place with mechanical effort, up to 2 feet below subgrade elevation. When possible, density testing should be

performed at random locations and intervals not to exceed 200 feet and every three feet of fill, or as directed by the Planning Commission Engineer.

- c) Clean Soil (without rock) backfill shall be compacted to 95% Std. Proctor Density to within 1 feet of the subgrade elevation. Nuclear Density Testing shall be performed at random locations and intervals not to exceed 200 feet and every 3 feet of fill, or as directed by the Planning Commission Engineer.
- 6) All reinforced concrete pipe trenches outside of pavements shall be placed on 3-inches of uncompacted granular bedding material and then backfilled according to Section 6.2.H.5
- 7) Trench width shall be that necessary to lay the Pipe and properly compact the backfill material and to meet other industry requirements.
- 8) Utility Pipe bedding and the utility pipe envelope (backfill immediately adjacent to the Pipe) shall meet the specification of the utility company and/or the pipe manufacturer's recommendation if different from #57 Stone, #9 Stone, or flowable fill. Careful attention shall be given to backfilling below the pipe spring line.

Acceptance of Trench backfill shall be by the Planning Commission Engineer or his representative and Density testing. The Planning Commission Engineer reserves the right for additional specifications and/or requirements as site conditions exist.

- I. **INSPECTION OF SUBGRADE PREPARATION** - The Planning Commission and Developer's representatives will inspect the preparation of, and the completion of Subgrade. A copy of the proctor test shall be supplied to the Planning Commission Staff Engineer prior to start of grading operations. The Subgrade shall meet the density requirement of ninety-seven (97) percent of standard proctor density. Test results shall be submitted to the Planning Commission Staff Engineer for approval. As the minimum, the area will be proof rolled with a loaded Dual Axle Truck to determine suitability of the base material. Nuclear density testing is preferred when material permits and must be done in the presence of the Planning Commission's Engineer or engineer's representative. Density tests will be required on the compacted subgrade at random locations and intervals not to exceed 200 feet. Sampling and Testing is further defined in Appendix F. The roadway cross-section (including crown and sidewalk areas) shall be checked for proper cross-slope on 50 foot intervals. The Planning Commission and Developer's representatives must be scheduled and present for the density and cross-section tests. Must give 24 hour notice. The Contractor shall stop operations until approved by the Planning Commission Engineer.
- J. **INSPECTION OF CURB AND GUTTER CONSTRUCTION** - Concrete Curb and Gutter materials and construction shall be per requirements of the current edition of the Kentucky Transportation Cabinet's Standard Specifications for Road and Bridge Construction. The Planning Commission and Developer's representatives must be scheduled and present for the tests. Must give 24 hour notice. The Contractor shall stop operations until approved by the Planning Commission Engineer.
- K. **INSPECTION OF DENSE GRADED AGGREGATE BASE / CRUSHED STONE BASE CONSTRUCTION** - Prior to commencing DGA/CSB base construction, the Developer's Representative shall provide, at a minimum, a Gradation Test for the Stone base. The Planning Commission and Developer's representatives will inspect the applying, shaping, and Compaction of the Dense Graded Aggregate base / Crushed Stone base construction. DGA/CSB shall be placed with a mechanical paver. A box spreader may be used as long as the Contractor can demonstrate that it can be placed without segregation and can meet Kentucky specifications for compaction. Tailgating is not acceptable. Before the course will be considered acceptable, the course shall meet the required eighty-four (84) percent of solid density or a Control Strip shall be constructed to obtain target density (historically in Warren County, Kentucky, Aggregate sources have produced mixes that had a Specific Gravity of 2.65 and solid density of 165 pcf) with

subsequent compaction meeting 95% of target density. The Planning Commission Engineer may allow deviation from this standard or target density if field conditions are justified. A representative sampling of Nuclear density testing shall be done in the presence of the Planning Commission and Developer's representatives. At a minimum, Density tests will be required on the compacted DGA/CSB at random locations and intervals not to exceed 200 feet. Test results shall be submitted to the Planning Commission Staff Engineer for approval. Periodic inspection will be made during the construction of this item. Sampling and Testing is further defined in Appendix F. The roadway cross-section shall be checked for proper cross-slope on 50 foot intervals. The Planning Commission and Developer's representatives must be scheduled and present for the density and cross-section tests. Must give 24 hour notice. Immediately after the Dense Graded Aggregate base / Crushed Stone base has been applied, the quantity used will be compiled to determine if the quantity per square yard has been constructed. Weigh tickets and summary shall be submitted to the Planning Commission Staff Engineer for approval. The Contractor shall stop operations until approved by the Planning Commission Engineer. When the Planning Commission and Developer's representatives determine the attained density requirement and the Dense Graded Aggregate / Crushed Stone base appears surface dry, the asphalt prime material may be applied.

- L. **INSPECTION OF ASPHALT BASE CONSTRUCTION** - Prior to commencing asphalt base construction, the Developer's Representative shall provide, at a minimum, a job mix formula for the asphalt base, which includes tests and calculations for percent air voids, VMA, max. specific gravity, bulk specific gravity, and percent liquid asphalt content. The Planning Commission and Developer's representatives will review the beginning of the asphalt base application and check the truck to determine if they are equipped with heavy canvas covers to protect the material from the elements and retain the heat in the mix while in transit. At a minimum, the temperature of the material will also be checked when it arrives on the project site. The course shall meet the required minimum ninety-two (92) percent of solid volume and maximum ninety-six (96) percent of solid volume before it will be acceptable. A representative sampling by PQI, Coring, or Nuclear density testing shall be done in the presence of the Planning Commission and Developer's representatives. At a minimum, Density tests will be required on the compacted asphalt base at random locations and intervals not to exceed 200 feet. Test results shall be submitted to the Planning Commission Staff Engineer for approval. Periodic inspections will be made as the operations progress. Sampling and Testing is further defined in Appendix F. The Planning Commission and Developer's representatives must be scheduled and present for the density test. Must give 24 hour notice. If a deficiency develops in the asphalt base course of any consequence, adjustments will be made in the overlying or succeeding asphalt surface course to compensate for the deficiency. The Developer's representative or Contractor shall obtain for the information of the Planning Commission Staff Engineer the test reports showing, at a minimum, the test results and calculations for percent air voids, VMA, max. specific gravity, bulk specific gravity, and percent liquid asphalt content. Liquid asphalt shall be from a State approved source. Weigh tickets and summary shall be submitted to the Planning Commission Staff Engineer for approval. At this time, the Contractor shall check manholes, valve boxes, and other obstacles within the pavement and adjust them to match the finished cross section, if needed. The Contractor shall stop operations until approved by the Planning Commission Engineer. The Planning Commission Staff Engineer reserves the right to require core samples of the finished asphalt base if insufficient thickness, poor Compaction or other deficiencies are suspected.
- M. **INSPECTION OF ASPHALT TACK COAT AND ASPHALT SURFACE APPLICATION** - Prior to commencing asphalt surface construction, the Developer's Representative shall provide, at a minimum, a job mix formula, which includes tests and calculations for percent air voids, VMA, max. specific gravity, bulk specific gravity, and percent liquid asphalt content for the asphalt surface.

The Planning Commission and Developer's representatives shall review the application of asphalt tack coat and the application of the asphalt surface course. In like manner as the base construction, the trucks will be reviewed to determine if they are equipped with canvas covers to protect the material while in transit. At a minimum, the temperature of the mix when it arrives on the project site will be checked. The Developer's representative or Contractor shall obtain for the information of the Planning Commission Staff Engineer the test reports showing, at a minimum, the test results and calculations for percent air voids, VMA, max. specific gravity, bulk specific gravity, and percent liquid asphalt content. Liquid asphalt shall be from a State approved source. Weigh tickets and summary shall be submitted to the Planning Commission Staff Engineer for approval. Periodic inspection will be made of this construction. Sampling and Testing is further defined in Appendix F. The Planning Commission and Developer's representatives must be scheduled and present for the construction. Must give 24 hour notice. The Planning Commission Staff Engineer reserves the right to require core samples of the finished asphalt surface if insufficient thickness, poor Compaction or other deficiencies are suspected.

- N. **RIGID PAVEMENT CONSTRUCTION** - See requirements in Appendix F.
- O. **CONSTRUCTION REVISIONS** - Changes to the Construction Plans shall be submitted to the Planning Commission for Approval prior to continuing work affected by the changes. Review will be performed in a timely manner to minimize delay.
- P. **PLANNING COMMISSION AUTHORITY** - The Planning Commission reserves the right to stop work being performed improperly on this project by the Contractor or any Subcontractor until conditions can be agreed upon which work can proceed.
- Q. **CITY / COUNTY ENGINEER AUTHORITY** - The county road Engineer and / or city Engineer will inspect the active construction occasionally, if and when time will permit them away from their routine duties.
- R. **INSPECTION OF FINAL DRESSING** - The Planning Commission and Developer's representatives will review the final dressing of shoulder, ditches, buffer areas, the back-Slopes in cuts, embankment Slopes, and all other disturbed areas within the Subdivision. Soils and amendments suitable for vegetation must be placed on any Slopes that are to be seeded. Improvements will not be accepted until a good stand of grass is achieved and it appears unlikely that damages will occur due to heavy rain.
- S. **STREET NAME SIGNS AND TRAFFIC CONTROL DEVICES** - Refer to Section 5.7.M
- T. **INSPECTION AT COMPLETION OF CONSTRUCTION** - When all items, appurtenances and incidentals have been completed in compliance with the approved Subdivision Construction Plans, the Planning Commission Staff Engineer will request the City and/or County Engineer to attend a semi-final inspection of the Subdivision in its entirety, and if in their opinion, it is prepared for final inspection, it will be scheduled as soon as it can be arranged. The Subdivision will, of course, be subject to additional work when the final inspection is made. The final inspection will be made by the Planning Commission Staff Engineer, the County Road Engineer or City Engineer, the **Developer's Engineer**, and the Contractor.
 - 1. **ACCEPTANCE OF DRYWELLS** - Once constructed, the drywell shall be tested for functionality. The Planning Commission and Developer's representatives shall be present for the test. The flow rate shall be determined as the volume of the basin (in gallons) being drained, divided by 24 hours. Minimum flow rate shall be 160 GPM. A test shall be

considered successful if the drywell takes the water discharged at the calculated flow rate for a 10 minute duration, or until the water source has been depleted. Any ponding water shall drain into the drywell over the next 24-hour period or the drywell will not be approved for use.

Permit application to the Environmental Protection Agency is required for all Class V Injection Wells. Provide copy of application to the Planning Commission Staff Engineer for inventory purposes.

2. **ACCEPTANCE OF SIDEWALKS** – Sidewalks shall be inspected by the City, County, or Planning Commission engineering representative prior to, and during, concrete placement. Sidewalk installation must be complete prior to the issuance of the Certificate of Occupancy on any Lot by the Building Inspector. Sidewalks that are constructed in conformance with these regulations will be accepted by the City or County when the Certificate of Occupancy is issued. Sidewalk ramps and transition areas shall be the responsibility of the Developer and included in the Construction contract, not the separate sidewalk contract.

U. **“AS-BUILT” PLANS** - When all Improvements have been made and approved, two (2) sets of “As-built” plans shall be submitted to the Planning Commission Staff Engineer. The plans shall show the finished plan and profile of all streets, finished contours and volume of all Retention/Detention Basins and profiles of all major drainage ditches, inlet/outlet elevations of all pipe and storm sewer, and all other pertinent construction. As-built of the gutter flow lines, edges of pavement, and centerline of road shall be done prior to the surface course or as directed by the Planning Commission Engineer. Adjustments to the grade shall be made, if needed, prior to proceeding with surface pavement construction. The “As-built” plans shall be dated and signed by a licensed civil Engineer or Surveyor. State statutes and regulations shall govern the division of work performed by each profession.

V. **CONSTRUCTION REVIEW FEES** - A fee for review and verification shall be paid prior to the commencement of construction or recordation of Plat, whichever shall first occur. This review and verification is not a release of the responsibility of the Developer’s Engineer and Surveyor to certify that the Improvements have been completed according to design drawings and specifications. The purpose of the Planning Commission’s review and verification is a review for compliance and verification of methods and adherence to plans for the accepting agency. Review fees are established by the Planning Commission Fee Schedule.

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