



# **Manual of Infrastructure Standards**

**Public Works Dept.  
SEPTEMBER 2019**

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## **Manual of Infrastructure Standards**

### **GENERAL REQUIREMENTS**

As stated in Technical Specifications general provisions Section 1003 of the Spring Hill Municipal Code, all earth, materials, sidewalk, pavement, crossing, storm sewer, utilities, public improvements or improvements of any kind damaged or removed by the service provider shall be fully repaired and replaced promptly by the right-of-way user at its sole expense and the reasonable satisfaction of the City. Upon determination by the Director of Public Works that such repair or replacement is a public safety matter, all such repair or replacement shall be commenced within twenty-four hours of notice from the City, or the Director of Public Works may direct the City to make such repair or replacement and bill the right of way user for the City cost.

All construction work and materials shall conform to the current edition of the Design Criteria or otherwise directed by the Director of Public Works.

After any excavation, the permittee shall restore all portions of the right of way to the same condition or better condition that it was prior to the excavation.

All installation, construction, excavation, backfilling, restoration and replacement work shall be in accordance with the current Design Criteria or Technical Specifications located [www.springhillks.gov](http://www.springhillks.gov). The Standard Details shall be adopted and amended by the City.

All installation, construction, excavation, backfilling, restoration and replacement work shall be in accordance with the current Approved Materials List found at [www.springhillks.gov](http://www.springhillks.gov). The Approved Materials List shall be adopted and amended by the City.

In order to ensure public safety and to protect existing underground facilities, all horizontal directional boring construction work shall conform to the boring guidelines, located at [www.springhillks.gov](http://www.springhillks.gov). Spring Hill has boring guidelines included in Technical Specifications.

All asphaltic concrete shall be constructed as specified in the “Spring Hill Technical Specification for Asphaltic Concrete”, available at [www.springhillks.gov](http://www.springhillks.gov). See Section 1300 Spring Hill Asphaltic Concrete Surface and Intermediate Course, of the Construction Specifications. If specified asphaltic concrete is not available, the Public Works Director, with discretion, may allow the use of an alternate asphaltic concrete mix.

All concrete used in right of way construction shall be in compliance with the Kansas City Metro Materials Board (hereinafter KCMMB.) requirements. Approved

concrete mix designs, including high early concrete mixes can be found on-line at [www.kcmmb.org](http://www.kcmmb.org).

The provisions of the Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation, current edition and special provisions (hereinafter Standard Specifications), are incorporated, except as hereinafter specified.

Failure of permittee to notify Public Works to schedule an inspection at the start of backfilling operations shall result in re-excavation, removal and recompaction of the backfill, and / or repair pavement, at the permittee's expense, to the reasonable satisfaction of the Director of Public Works.

**Definitions:**

**Paved Portion of the Right of Way**

Paved portion of the right of way shall include the area within any existing or future public street pavement, under any existing or future curb and gutter, median, asphalt path, concrete sidewalk, or existing concrete, asphalt, or gravel driveway approach. It shall also include the area under any future driveway approach, when the location is known.

**Unpaved Portion of the Right of Way**

The unpaved portion of the right of way shall include any area outside of the paved portion.

**Notification of Emergency Services**

The Spring Hill Police Department, South Johnson county Fire Department and Johnson County EMS GIS Coordinator shall be notified twenty-four hours in advance of any street closure. The City will allow closing of streets only with prior approval at the time permit is issued.

|                                                         |                     |
|---------------------------------------------------------|---------------------|
| Spring Hill Police Dept. (Non-emergency)                | <b>913-592-2700</b> |
| South Johnson County Fire Department<br>(Non-emergency) | <b>913-592-3926</b> |
| Johnson County EMS GIS Coordinator                      | <b>913-826-1020</b> |

**EXCAVATIONS IN THE UNPAVED PORTION OF THE RIGHT OFWAY**

**Definition:** Unpaved portion of the right of way shall include any area outside of the paved portion. See also definition for paved portion of the right of way.

**Utility Locates**

Prior to commencement of any excavation, the permittee shall identify and locate any buried facilities in accordance with Spring Hill. Permittees shall contact Kansas One-Call at 1-800-DIG-SAFE at least 48 hours prior to commencement of any excavation to allow sufficient time for field locates. The

permittee will be required to provide a Kansas One-Call verification number before a right of way permit is issued by the City.

### **Utility Locates for City of Spring Hill Owned Facilities**

The City of Spring Hill owns, operates, and maintains the following utility systems within the City: Storm Sewer, Sanitary Sewer and Water Lines. The City of Spring Hill is a member of Kansas One-Call. Locates will be scheduled through Kansas One-Call ticket Not the City of Spring Hill.

### **Utility Potholes**

Potholes used for the purpose of locating/accessing/repairing buried utilities under pavement shall be accomplished using the Keyhole Pavement Coring and Reinstatement method. This method involves cutting a circular core and removing from pavement, using vacuum excavation to remove subsoil material until utility in question is found, backfilling excavation with removable flowable fill and reinstating core that had previously been removed.

#### **Coring**

Excavation requires coring a circular hole through the entire depth of the pavement using appropriate drilling/coring equipment and removal of the intact pavement core. The vertical alignment of the coring operation shall be perpendicular to the horizon.

Coring operator shall place a temporary mark (paint or chalk) on the pavement core and adjacent pavement to ensure that the pavement core when replaced will have the same orientation as found in the original pavement.

Pavement cores shall either be removed from the work site or stored in a safe and secure on-site location. These pavement cores shall be made readily available for reinstatement into the pavement.

#### **Excavation**

Soil shall be removed by air/vacuum extraction methods to expose utilities. The zone of soil removal shall remain essentially within a vertical plane extending below the edges of the core hole. The contractor shall dispose of all extracted and excess materials.

#### **Temporary Cover of Core Hole**

In the event that a keyhole cored pavement cannot be immediately reinstated and will be left unattended, the opening shall be covered with an appropriately sized steel plate fitted with a pilot shaft that is no smaller in diameter than the core hole diameter minus 1" and that extends vertically down into core hole no less than 12". The plate construction shall prevent the temporary plate from tipping, tilting, bouncing or spinning out of the hole under traffic conditions and shall be capable of supporting normal traffic loads.



### **Backfilling**

Removable flowable fill, in conformance with the City of Spring Hill Technical Specifications, shall be used for backfill of the core hole.

### **Reinstatement of the Pavement Core**

The pavement surface shall be restored to its original condition by setting the reinstated pavement core flush with surrounding pavement surface and in its original orientation using an approved bonding material. The bonding material to be used is required to securely bond the pavement core to the surrounding parent pavement and to fill all voids between and below the core to include pilot hole in the core center.

### **Bonding Material**

Bonding material shall be a single component cementitious, rapid hardening, high strength waterproof bonding agent formulated specifically for pavement core reinstatement. It shall be non-shrinkable and shall be impervious to water penetration at the joint after curing. Excess bonding material shall be removed from the reinstated surface.

The bonding material shall, within 30 minutes at minimum ambient temperatures of 70 degrees F, allow an 18" diameter core to support a traffic load equivalent to at least three (3) times the AASHTO H-25 standard wheel load.

### **Trenching**

The contractor shall not open more trench in advance than is necessary to expedite the work. One block or 400 feet (whichever is the shorter) shall be the maximum length of open trench permitted on any line under construction.

### **Bracing and Shoring**

Contractor shall provide adequate bracing, sheeting and shoring, as necessary, to provide protection for the workmen and the work. All bracing, sheeting, or shoring shall conform to Section 1108 Sheeting and Shoring Technical Specifications. The contractor shall brace and shore all trenches in full accordance with Occupational Safety and Health Standards - Excavations; Final Rule 29 CFR Part 1926.

### **Inspection Requirements for General Permits**

#### **Unpaved Portion of the Right of Way**

For general permit activity, not associated with a new one / two-family residential home building permit, in unpaved portion of the right-of way; permittee shall notify Public Works to schedule a minimum of one inspection: upon completion of all right-of-way restoration activities, including concrete, sod or seed work. If weather conditions are such that concrete, sod or seed work cannot be performed, permittee shall notify Public Works after work is substantially complete, except for weather dependent work. Permittee shall notify Public Works to schedule a second inspection after all restoration work has been completed, including concrete, sod or seed. When all restoration work is completed to the reasonable satisfaction of the City Inspector, the two-year

maintenance period will begin.

In addition to the required scheduled inspections, the City Inspector may choose to inspect the on-going permitted work at any time and may require compaction testing at the permittee's expense to ensure that all requirements of the approved permit are being met.

**Inspection Requirements for Permits Associated with a Residential Home Building Permit Unpaved Portion of the Right of Way**

For permit activity associated with new one / two-family residential home building permits, in the unpaved portion of the right-of-way; permittee will notify the Public Works to schedule one inspection, a minimum of 24 hours in advance of the start of backfilling operations. When all backfill work is completed to the reasonable satisfaction of the City Inspector, the right of way permit will be closed and the two year maintenance period will begin.

In addition to the required scheduled inspections, the City Inspector may choose to inspect the on-going permitted work at any time and may require compaction testing at the permittee's expense to ensure that all requirements of the approved permit are being met.

If the excavation occurs on the opposite side of the street from the permit location, in front of an existing residence; the permittee will be required to restore the right of way to its original condition. This work shall include clean up, grading and sodding. Permittee shall notify Public Works to schedule a final inspection after all restoration work has been completed. When all restoration work is completed to the reasonable satisfaction of the City Inspector, the right of way permit will be closed and the two-year maintenance period will begin.

**Backfill**

Embedment material under and around pipe or conduit shall be as specified by utility. If not otherwise specified, embedment material around pipe or conduit shall be crushed stone or siliceous gravel meeting the requirements of Section 6015 Pipe Bedding, of the Technical Specifications, Aggregate Designation PB-2.

| <b><u>PB-2</u></b>  | <b><u>Gradation</u></b>  |
|---------------------|--------------------------|
| <b><u>Sieve</u></b> | <b><u>% Retained</u></b> |
| 3/4"                | 0-20                     |
| 3/8"                | 40-70                    |
| No. 4               | 75-100                   |
| No. 8               | 95-100                   |

Embedment material under and around pipe or conduit shall be filled to a maximum of twelve inches above the top of the pipe, except for RCP storm sewer installation. For RCP storm sewer installation, pipe embedment material shall be filled no higher than the pipe spring line elevation. Removable flowable fill may be used in lieu of embedment material.

Tamped soil backfill may be used in the unpaved portion of the right of

way. All unsuitable materials shall be removed and disposed of offsite. Tamped soil backfill shall be finely divided job excavated material, free of debris, organic material, and stones, placed in a maximum of eight-inch loose lifts, compacted, using vibratory equipment for each lift, to a minimum of 95% standard proctor density. Under no circumstances shall any paving material from excavations in the street be used for backfill material.

Removable flowable fill material, in conformance with Section 6017 of the Technical Specifications, may be used in lieu of soil backfill. Removable flowable fill, when used in excavations in proposed roadways, shall be placed up to the existing surface. Removable flowable fill, when used outside the roadway, shall be placed up to within 18 inches of the existing surface. Soil, placed in the top 18 inches, shall be free of clods, rocks, trash and other debris and shall be suitable for supporting vegetation.

If an excavation cannot be backfilled and will be left unattended, the contractor shall adequately cover and/or fence the excavation. No excavation shall be left unattended in excess of 72 hours, without permission of the Director of Public Works.

## **EXCAVATIONS IN THE PAVED PORTION OF THE RIGHT OF WAY**

**Definition:** Paved portion of the right of way shall include the area within any existing or future public street pavement, under any existing or future curb and gutter, median, asphalt path, concrete sidewalk, or existing concrete, asphalt, or gravel driveway approach. It shall also include the area under any future driveway approach, when the location is known.

### **Excavations in Existing Public Streets Utility Locates**

Prior to commencement of any excavation, the permittee shall identify and locate any buried facilities the Permittees shall contact Kansas One-Call at 1-800-DIG-SAFE at least 48 hours prior to commencement of any excavation to allow sufficient time for field locates. The permittee will be required to provide a Kansas One-Call verification number before a right of way permit is issued by the City.

### **Utility Locates for City of Spring Hill Owned Facilities**

The City of Spring Hill owns, operates, and maintains the following utility systems within the City: Storm Sewer, Sanitary Sewer and Water Lines. The City of Spring Hill is a member of Kansas One-Call. Locates will be scheduled through Kansas One-Call ticket Not the City of Spring Hill.

### **Trenching**

The contractor shall not open more trench in advance than is necessary to expedite the work. One block or 400 feet (whichever is the shorter) shall be the maximum length of open trench permitted on any line under construction.

### **Sawing and Benching a Street Cut**

Prior to replacement of any type of pavement, the pavement shall be sawed on each side of the required excavation to its full depth. The size of the saw cut shall be 12 inches greater in all directions than the size of the excavation. This is to provide a minimum of a 12-inch bench of undisturbed subgrade surrounding the excavation. All broken pavement shall be removed from the site.

### **Sawing Concrete Curb**

Concrete curb shall be sawed to its full depth and removed and replaced to the nearest contraction or expansion joint. If an adjacent section of curb and gutter is cracked, chipped, or otherwise damaged in the process of removal, it shall also be removed and replaced to the nearest joint. See also Concrete Construction/Replacement in Technical Specifications.

### **Bracing and Shoring**

Contractor shall provide adequate bracing, sheeting, and shoring, as necessary, to provide protection for the workmen and the work. All bracing, sheeting, or shoring shall conform to Section 1108 Technical Specifications. The contractor shall brace and shore all trenches in full accordance with Occupational Safety and Health Standards - Excavations; Final Rule 29 CFR Part 1926.

### **Inspection Requirements for General Permits Paved Portion of the Right of Way**

For general permit activity in the paved portion of the right-of-way, permittee will notify Public Works to schedule a minimum of two inspections. One a minimum of 24 hours in advance of the start of backfilling operations in any cut in an existing street or excavation under future public street; or under any existing or future curb and gutter, median, asphalt path, concrete sidewalk, or driveway approach and a second inspection upon completion of all right-of-way restoration activities, including concrete, asphalt, sod, or seed. If weather conditions are such that concrete, asphalt, sod, or seed work cannot be performed, permittee shall notify Public Works after work is substantially complete, except for weather dependent work. Permittee shall notify Public Works to schedule a third inspection after all restoration work has been completed, including concrete, asphalt, sod, or seed. When all restoration work is completed to the reasonable satisfaction of the City Inspector, the right of way permit will be closed and the two-year maintenance period will begin.

If permitted activity includes concrete work, such as replacement of curbs, new construction or replacement of sidewalks and/or driveway approaches; an additional inspection shall be required. This inspection shall include form locations and grades, and subgrade prior to the placement of any concrete. Contractor shall notify Public Works to schedule an inspection a minimum of 24 hours in advance of concrete placement. Permittee shall notify Public Works to schedule a final inspection after all restoration work has been completed, including backfill, right of way grading, clean up and sod.

Except in the event of an emergency, permittee shall notify Public

Works a minimum of 3 days in advance of any street closure. No such closure shall take place without notice and prior authorization from the City. See also Notification Emergency Services and Traffic Control.

**Inspection Requirements for Permits Associated with a Residential Home Building Permit Paved Portion of the Right of Way**

For permit activity associated with a new one / two family residential building permit, in the paved portion of the right-of-way; permittee will notify the Director of Public Works to schedule one inspection, a minimum of twenty-four hours in advance of the start of backfilling operations. When all backfill work is completed to the reasonable satisfaction of the City Inspector, the right of way permit will be closed and the two year maintenance period will begin.

The builder, under the building permit, shall be responsible for constructing the future sidewalk and driveway entrance and complete restoration work, including clean up, grading, and sodding.

If permitted activity includes concrete work, such as replacement of curbs, new construction or replacement of sidewalks and/or driveway approaches; an additional inspection shall be required. This inspection shall include form locations and grades, and subgrade prior to the placement of any concrete. Contractor shall notify Public Works to schedule an inspection a minimum of 24 hours in advance of concrete placement. Permittee shall notify Public Works to schedule a final inspection after all restoration work has been completed, including backfill, right of way grading, clean up and sod.

If the excavation occurs on the opposite side of the street from the permit location, in front of an existing residence; the permittee will be required to restore the right of way to its original condition. This work shall include any clean up, grading, and sodding. Permittee shall notify Public Works to schedule a final inspection after all restoration work has been completed. When all restoration work is completed to the reasonable satisfaction of the City Inspector, the right of way permit will be closed and the two-year maintenance period will begin.

**Backfill**

Embedment material around pipe or conduit shall be as specified by utility. If not otherwise specified, embedment material around pipe or conduit shall be crushed stone or siliceous gravel meeting the requirements of Section 6017 Trench Backfill Technical Specifications, Aggregate Designation PB-2.

| <b><u>PB-2</u></b>  | <b><u>Gradation</u></b>                 |
|---------------------|-----------------------------------------|
| <b><u>Sieve</u></b> | <b><u>Percent passing by weight</u></b> |
| 3/4"                | 85-100                                  |
| 3/8"                | 50-80                                   |
| No. 4               | 15-30                                   |
| No. 8               | 5-10                                    |

Embedment material under and around pipe or conduit shall be filled to a maximum of 12 inches above the top of the pipe, except for RCP storm sewer installation. For RCP storm sewer installation, pipe embedment material shall be filled no higher than the pipe spring line elevation. Removable flowable fill, in conformance with Section 6017 Trench Backfill of the Technical Specifications, may be used in lieu of embedment material. No soil backfill shall be used in the paved portion of the right of way. Above embedment material, removable flowable fill shall be placed up to the bottom of the surrounding existing pavement.

If authorized by the City Inspector, aggregate base material, Type AB-3, Spring Hill Modified may be used in lieu of removable flowable fill. AB-3, Spring Hill Modified backfill shall be placed in a maximum of eight-inch loose lifts, using vibratory equipment for each lift, to a minimum of 95% of standard proctor density. At the time of compaction, AB-3, Spring Hill Modified, shall be within zero to minus 2% of optimum moisture. If AB-3, Spring Hill Modified is used, permittee shall employ a testing laboratory approved by Public Works which shall certify the proper backfilling of any existing street cut, or excavation under existing curb and gutter. See also Compaction Testing.

Authorization to substitute AB-3, Spring Hill Modified for removable flowable fill will be given only due to special circumstances related to weather conditions, availability of materials, or duration of street closure.

### **Compaction Testing**

Permittee shall employ a testing laboratory approved by the Director of Public Works which shall certify the proper backfilling of any excavation in the paved portion of the right of way. The permittee shall pay all costs associated with such testing. A list of approved testing laboratories shall be on file in the office of the Director of Public Works. The compaction testing provision shall be waived when removable flowable fill is used as backfill, or with the permission of the Director of Public Works. The permittee shall provide a copy of the compaction test results to the Public Works office prior to the final inspection. Start of the two-year maintenance period shall not commence until the compaction test results have been received and approved by the Director of Public Works. If test results do not meet specified compaction requirements, the permittee, at his own expense, shall be required to re-excavate, remove and recompact backfill, and repair pavement to the reasonable satisfaction of the Director of Public Works.

### **Plating a Street Cut**

Any excavation left overnight on any thoroughfare or collector street shall be adequately covered with a steel plate. The plate shall be securely anchored, and all edges of the plate shall be ramped with hot mix asphaltic concrete. If cold weather prohibits the availability of hot mix asphaltic concrete, cold mix may be used, so long as it is maintained in a smooth and drivable condition. Permittee shall be required to post a WB-1 "Bump" advance warning sign with flashing light a minimum of 250 feet ahead of a steel plate. See also Traffic Control. Any

excavation left overnight on any residential street shall either be plated as stated above or backfilled up to the surface of the street. Under extenuating circumstances, if an excavation cannot be backfilled, and must be left unattended overnight, the excavation shall be adequately covered. If temporary surfacing material is used, it shall be maintained in a smooth and drivable condition. No excavation shall be left unattended in excess of 72 hours, without permission of the Director of Public Works. The permittee assumes the sole responsibility for maintaining proper barricades, plates, safety fencing and/or lights as required from the time of opening of the excavation until the excavation is surfaced and opened for travel.

**Repairing a Street Cut**

The permittee must also restore any area within 5 feet of the new street cut that has been previously excavated, including the paving and its aggregate foundations. In the event of lengthy longitudinal street cuts, the Director of Public Works may require the entire lane to be repaved.

The majority of streets in the City of Spring Hill are constructed of bituminous materials, consisting of: full depth asphaltic concrete, asphaltic concrete over aggregate base, asphaltic concrete over cement treated base, or asphaltic concrete over aggregate base with surface treatment (Chip seal or UBAS (Ultra-thin Bonded Asphaltic Concrete Surface)). Therefore, asphaltic concrete street repair shall be performed by either Type I or Type II method, unless otherwise approved by the City Engineer. See also Standard Details, Street Repair Details.

**Asphaltic Concrete Street Repair**

Asphaltic concrete street repair and restoration shall be performed by one of following methods:

**Type I            Asphaltic Concrete Street Repair  
High Early Strength Concrete Base with  
Asphaltic Concrete Surface Course**

**Type II            Asphaltic Concrete Street Repair  
Full Depth Asphaltic Concrete**

**Type I            Asphaltic Concrete Street Repair**

### **High Early Strength Concrete Base with Asphaltic Concrete Surface**

The minimum 12-inch bench shall be excavated to a point not less than 8 inches below the existing street surface or to the depth of the existing pavement thickness, whichever is greater.

Across the backfilled excavation and resting on the 12-inch bench shall be poured a minimum of 6 inches of High Early Strength Concrete (AE), having a minimum compressive strength of 4000 pounds per square inch in 24 hours. High early strength concrete (AE) shall conform to KCMMB requirements. After 24 hours, or when specified strength is achieved, high early strength concrete shall be tack coated and 2 inches of hot asphaltic concrete surface course shall be placed and compacted to 95% of standard density. For residential streets, asphaltic concrete intermediate course shall be used in lieu of asphaltic concrete surface course. All asphaltic concrete mixes and tack coat shall conform to Section 1300 Asphaltic Concrete Pavement of Technical Specifications. The concrete surface shall receive tack coat not more than 6 hours prior to placing asphaltic concrete. Approved mix designs for asphaltic concrete shall be on file in the Director of Public Works office prior to placement. This new asphaltic concrete surface shall be flush with existing street surface. Traffic shall not be permitted on any new asphaltic concrete surface until it is sufficiently cooled and will not rut.

### **Type II Asphaltic Concrete Street Repair Full Depth Asphaltic Concrete**

If removable flowable fill is used, and the excavation width exceeds 6 feet, a minimum of 6 inches of hot asphaltic concrete intermediate course may be placed in lieu of the high early strength concrete (AE). Tack coat shall be applied between all lifts of asphaltic concrete. Surfaces shall receive tack coat not more than 6 hours prior to placing asphaltic concrete.

Two inches of hot asphaltic concrete surface course shall be placed and compacted to 95% of standard density. For residential streets, asphaltic concrete intermediate course shall be used in lieu of asphaltic concrete surface course. All asphaltic concrete mixes and tack coat shall conform to Section 1300 Asphaltic Concrete Pavement Technical Specifications. Approved asphaltic concrete mix designs shall be on file in the office of the Director of Public Works prior to placement. This new asphaltic concrete surface shall be flush with existing street surface. Traffic shall not be permitted on any new asphaltic concrete surface until it is sufficiently cooled and will not rut. The Director of Public Works, at his discretion, may allow street repair with full depth asphaltic concrete, if the size of the excavation prohibits plating.

### **Portland Cement Concrete Street Repair Full Depth High Early Strength Concrete**

This option shall only be used for the repair of an existing full depth Portland Cement Concrete street. The minimum 12-inch bench shall be excavated to a point not less than 6 inches below the existing street surface or to the depth of the existing pavement thickness, whichever is greater. Across the backfilled



excavation and resting on the 12-inch bench shall be poured a minimum of 6 inches of High Early Strength Concrete (AE), having a minimum compressive strength of 4000 pounds per square inch in 24 hours. High early strength concrete shall conform to KCMMB requirements. This new concrete pavement surface shall be flush with the existing street surface.

### **Permanent Pavement Markings**

Permittee shall be responsible for the replacement of permanent pavement markings on thoroughfare or collector type streets, which have been removed or disturbed as a result of any street cut. Permittee will be required to place temporary pavement markings immediately after placing pavement surface, until permanent pavement markings can be installed.

Permanent pavement markings shall be replaced with like materials, in accordance with the latest edition of the "Manual on Uniform Traffic Control Devices", within 14 days after the pavement surface has been placed, unless otherwise authorized by the Director of Public Works.

### **Excavations for Utility Relocation Work for Publicly Funded Street Projects**

Excavations for utility relocation work for Public Works street projects shall conform to the requirements for excavations in existing public streets in the paved portion of the right of way shall conform to the City of Spring Hill Technical Specifications Section 6000 – Excavation, Trenching, and Backfilling: Limits of flowable fill backfill shall conform to the City of Spring Hill technical specifications Section 6000 – Excavation, Trenching, and Backfilling.

### **Excavations under Existing Concrete Sidewalks or Driveway Entrances**

Excavation in areas under existing concrete sidewalks or concrete driveway entrances shall conform to the requirements for excavations in existing public streets in the paved portion of the right of way with the following modifications:

### **Sawing Concrete Sidewalks or Driveway Entrances**

Existing concrete sidewalk or concrete driveway entrances shall be sawed to their full depth and removed and replaced to the nearest contraction or expansion joint. If an adjacent section of sidewalk or driveway is cracked, chipped, or otherwise damaged in the process of removal, it shall also be removed and replaced to the nearest joint. See also 2109 Repairs to Defective Work.

### **Excavations in Future Public Residential or Collector Streets**

This section applies to the full width of proposed and existing public street right of way where residential or collector streets are not in place at the time of utility installation but will be constructed at a future date. Excavations in areas where future public residential or collector street pavement will be constructed shall conform to the requirements for excavation in existing public streets, in the paved portion of the right of way, with the following modifications:

## **Backfill**

### **FOR SANITARY SEWER CONSTRUCTION ONLY**

Allowable backfill materials shall include tamped soil backfill. Tamped soil backfill shall be finely divided job excavated material, free of debris, organic material, and stones, placed in a maximum of eight-inch loose lifts, compacted, using vibratory equipment for each lift, to a minimum of 95% standard proctor density. All unsuitable materials shall be removed and disposed of offsite.

Tamped soil backfill shall be placed in maximum of 8-inch loose lifts, and shall be compacted, using vibratory equipment for each lift, to a minimum of 95% of standard proctor density. The permittee shall employ a testing laboratory approved by the City, which shall certify the proper backfilling of all trenches under future street pavement. Testing shall be completed for each lift. The permittee shall provide a copy of the compaction test results to the City prior to the final subgrade preparation. If test results do not meet specified compaction requirements, the permittee at his expense, shall be required to re-excavate, remove and re-compact backfill, and repair pavement to the reasonable satisfaction of the City.

## **CONCRETE CONSTRUCTION / REPLACEMENT**

All concrete construction shall meet the requirements of Section 2000 of the Technical Specifications.

### **Materials**

#### **Concrete Mix**

All concrete used in construction of curbs, sidewalks, sidewalk ramps, and driveway entrances shall be classified as KCM MB 4K Section 2003 Materials Technical Specifications having a minimum 28-day compressive strength of 4000 pounds per square inch. Approved concrete mix designs can be found on-line at [www.kcmmb.org](http://www.kcmmb.org) prior to placement.

#### **Curing Materials**

All concrete curbs, sidewalks, sidewalk ramps, or driveway entrances shall be cured either by wet covering, waterproof covering, or liquid membrane seal. The curing period shall be a minimum of 5 days. Curing shall be commenced as soon as possible after the finishing operation and when the concrete has set sufficiently so that it will not be damaged in the process. Concrete curing materials shall conform to Section 2000 of the Technical Specifications.

#### **Reinforcing Steel**

All reinforcing steel bars shall be in conformance with Section 20 of the Construction Specifications. All reinforcing bars shall be held in place and positioned by pins or bar chairs. Reinforcing bars for curbs or driveway entrances (if required) shall be new billet ASTM A615 Grade 40.

Welded wire fabric, if used, shall be in conformance with Section 2003 Materials of the Technical Specifications, meeting ASTM A815, Grade 60. Welded wire fabric shall be in sheet form. Rolled wire mesh shall not be allowed. Per Technical Specification Section 21-5: 16 gage wire mesh or 2 no. 4-rebar used for driveway entrance and sidewalks.

### **Construction Requirements**

#### **Subgrade**

All subgrade for curbs, sidewalks, sidewalk ramps, and driveway entrances shall be uniformly compacted and evenly graded to the required subgrade elevation. All loose or extraneous material shall be removed from the subgrade and soft spots shall be uniformly recompact prior to placement of concrete. The permittee shall have available adequate vibratory compaction equipment to accomplish the compaction as set forth above.

#### **Forms**

Forms used in concrete construction shall be of steel or wood, free from warp and shall be sufficiently strong and rigid and securely staked and braced to obtain a finished product correct to the dimensions, lines and grades required. All forms must be cleaned and oiled before each use. A slip-form machine, with electronic controls, may be used in lieu of forms for long sections of curb or sidewalk.

### **Special Weather Conditions**

#### **Cold Weather**

The Contractor shall comply fully with the provisions of ACI 306.1-90, as modified below:

- Average daily temperatures as defined in ACI 306.1-90 will be determined and recorded by the Director of Public Works.
- Concrete temperatures will be determined through the use of high-low thermometers placed and operated by the City below insulated blankets, or where the concrete is uncovered, by checking air temperatures.
- Uncovered concrete, which has been subjected to freezing temperatures of any duration during the first 24 hours will be considered “frozen,” and shall be rejected.
- Unless authorized in writing by the City Engineer, mixing and concreting operations shall be discontinued when the descending air temperature in the shade and away from artificial heat reaches 40 degrees F or when forecast to drop below 40 degrees F within 24 hours of placement, and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F (see full tech. specs. 2009 Cold Weather Concreting).
- Concrete shall reach 75% of its design strength prior to backfilling. This strength can be determined through the use of field-cured cylinders, made and tested at contractor’s expense.

- Concrete must have 5 days where the average daily temperature is above 50 degrees F prior to backfilling unless field cured cylinders are taken. These days do not need to be consecutive.

### **Hot Weather**

Concrete operations in hot weather shall conform to Section 401, Table 401.9 of the Standard Specifications.

### **Concrete Curb**

Concrete curb shall be constructed or removed and replaced in accordance with the requirements of Section 21 of the Technical Specifications.

The surface shall be shaped by use of a steel tool to produce the sections shown in the Standard Details. The edges shall be rounded with edger's to form the radii as indicated in the Standard Details. The surface shall be finished with a wooden or steel float and brushed.

One half inch pre-molded bituminous, non-extruding, and resilient expansion joints shall be placed at points of curvature, curb returns, curb inlet transitions, and at intervals not to exceed 250 feet. The material shall extend through the full curb section. After curing, the joints shall be sealed with urethane sealant meeting ASTM C920. The sealant shall be Class 35 (+35% Joint Movement), Type S and Grade NS and to a depth of 1/2 inch.

Contraction joints shall be 2 inches deep and placed at 15 feet intervals. If sawed, the sawing shall begin as soon as the concrete hardens sufficiently to prevent excessive raveling along the saw cut, and shall finish before conditions induce uncontrolled cracks, regardless of the time or weather.

Curbs shall be accurately placed according to the line, grade, and cross section of the existing adjoining curbs. All replacement curbs must have sufficient grade to achieve positive drainage. The City Engineer may require removal and replacement of additional sections of curb in order to achieve positive drainage.

### **Concrete Sidewalks and Sidewalk Ramps**

The width of any sidewalk repair shall be the same as that being replaced. The minimum allowable thickness shall be four inches, except within a driveway entrance or sidewalk ramp, where the minimum allowable thickness shall be six inches. The curb section through a sidewalk ramp shall conform to the Standard Details.

All concrete sidewalks shall be constructed or replaced in accordance with Section 2100 of the Technical Specifications and the Standard Details.

All sidewalk ramps shall be constructed or replaced in accordance with Section 2100 of the Technical Specifications, and the Standard Details. If sidewalk and curb replacement is required at a street crossing, which has no sidewalk ramp, permittee shall be required to construct a sidewalk ramp. If an existing sidewalk ramp is damaged or removed, the permittee shall be required to construct a new sidewalk ramp, in accordance with the current Standard Details. All sidewalk ramps shall be constructed with a detectable warning surface as specified in the Standard Details, except ramps at non-signalized driveway

entrances. Type M Mortar shall be used for the setting bed and grouted joints for the detectable warning surface paver bricks, meeting ASTM C270, Table 1 (Masonry Cement Type only).

The permittee shall provide adequate tools and equipment to produce quality workmanship in placing and finishing concrete. The sidewalk surface finish shall be a coarse texture wood float and broom finish.

The sidewalk surface shall be marked off into nominal squares of dimensions equal to the width of the sidewalk with a maximum distance between joints of 7 feet. A standard joint tool having a width of 1/8 inch and depth of 1/4 of the sidewalk thickness, having a lip radius of 1/8 inch to 1/4 inch shall be used in forming the joints. All contraction joints in the sidewalk shall be tooled. Contraction joints shall be retooled after brooming. Expansion joints shall be constructed at locations where new sidewalk is longer than 250 feet; sidewalk abuts existing concrete curbs or driveway entrances. Expansion joints shall be formed with 1/2-inch-wide bituminous, non-extruding, and resilient filler and shall extend the full depth of the slab.

### **Concrete Driveway Entrances**

All concrete driveway entrances shall conform to Section 2100 of the Technical Specifications. Where construction requires the removal and replacement of existing concrete driveway entrances, such removal shall be accomplished by first sawing the existing driveway entrance full depth and removing all material to be replaced. Expansion joints shall be constructed at the back of curb and where the driveway entrance abuts existing sidewalk. Expansion joints shall be formed with 1/2-inch-wide bituminous, non-extruding, and resilient filler and shall extend the full depth of the slab. Concrete driveway entrances shall be constructed or replaced to a minimum thickness of 6 inches. If the contractor chooses not to provide laboratory testing of subgrade compaction, as defined in Technical Specifications Section 1200, then 16 gage 6 x 6 wire mesh or two (2) no. 4 rebars shall be used for sidewalk. Concrete driveway entrances shall receive a non-slip finish obtained by a wood float and hairbrush or broom applied transverse to the centerline of the driveway. All contraction joints in concrete driveway entrances shall be tooled. Contraction joints shall be tooled after brooming to provide a "picture frame" appearance.

### **Concrete Paver Stone Medians, Sidewalks, and Driveway Entrances**

All concrete paver stones shall conform to Section 2100 of the Technical Specifications. Where construction requires the removal of concrete paver stones in medians, sidewalks, or driveway entrances, replacement brick shall be red cobblestone-style concrete paver stones. Concrete paver stones shall meet the requirements of ASTM C936. A minimum of 4 inches of KCMMB 4K concrete base, must be placed and sufficiently cured prior to placement of any paver brick. Concrete used in this work shall conform to KCMMB requirements. An approved concrete mix design shall be online at [www.kcmmb.org](http://www.kcmmb.org) prior to placement.

## **STREETLIGHTS**

All streetlights, including those constructed to support wireless communications facilities, shall comply with the City's Streetlighting Design 9000 Technical Specifications.

## **CONSTRUCTION AND REPLACEMENT OF TOWERS, POLES AND RELATED FACILITIES**

This Section of the Manual ("Construction and Replacement of Towers and Poles") shall not apply to any existing towers or poles within the City of Spring Hill.

### **Towers and Poles**

#### **Location**

Shall conform with City of Spring Hill Street Lighting Construction Design Criteria.

#### **Height**

Shall conform with City of Spring Hill Street Lighting Construction Design Criteria.

#### **Design**

Shall conform with City of Spring Hill Street Lighting Construction Design Criteria. Furthermore, all towers and poles must be designed in compliance with all current applicable technical, safety, and safety-related codes adopted by the City.

Provided, if existing streetlight poles along the right-of-way surrounding the proposed pole have been painted, the new pole shall be painted to match said streetlight poles. This paragraph shall not prohibit the installation of wood poles that replace existing wood poles, or poles installed along existing service lines.

### **Antennas on Towers and Poles**

All antennas installed on towers or poles shall be internal or shall be panel antennas of slim-line design be mounted parallel with the tower, or alternatively, an omni-directional antenna may be placed at the top of the tower when it gives the appearance of being a similarly sized extension of the tower. Antenna bridges and platforms are not allowed on towers or poles. Antennas and related visible facilities installed on a tower or alternative structure shall be of materials and

color that are consistent with the surrounding elements so as to blend architecturally with said tower or structure. The antennas and related visible facilities shall be of a neutral color that is identical to, or closely compatible with, the color of the tower or alternative tower structure so as to make the antennas and related facilities as visually unobtrusive as possible.

#### **Wires Connected to Towers and Poles**

To the extent possible, cable or fiber that connects transmission equipment to an equipment box shall be contained inside the pole. If cables or fiber cannot be installed internally, it shall be flush mounted to the pole and covered with a metal, plastic, or similar material cap that matches the color of the pole and is properly secured and maintained by the provider, or cable or fiber shall be enclosed within conduit or a similar cable cover which should be painted to match the pole.

#### **Backhaul Connected to Towers and Poles**

All new wired backhaul shall be installed underground. Providers using backhaul that utilizes wireless technology shall not disturb any trees or vegetation without approval by, or complying with any conditions set by, the Director of Public Works.

### **SMALL CELL AESTHETIC STANDARDS**

See the standards as set forth in Appendix A.

### **MISCELLANEOUS DRIVEWAY CONSTRUCTION /REPLACEMENT**

#### **General Requirements**

All asphalt, decorative, or gravel driveways that are damaged or removed shall be constructed to the same widths and with the same material that existed prior to right-of-way work.

All subgrade for driveway entrances shall be uniformly compacted and evenly graded to the required subgrade elevation. All loose or extraneous material shall be removed from the subgrade and soft spots shall be uniformly re-compacted prior to placement of concrete. The permittee shall have available adequate vibratory compaction equipment to accomplish the compaction as set forth above.

#### **Asphalt Driveway Entrances**

Where right-of-way activities require the removal and replacement of existing asphalt driveway entrances, such removal shall be accomplished by first sawing the existing driveway full depth and removing all material to be replaced. In no case shall it be less than that section being replaced. Placing and compaction of the asphalt driveway pavement shall be in accordance with the Technical Specifications Section 7000.

#### **Decorative Driveway Entrances**

Where right-of-way activities require the removal of existing

decorative rock driveway entrances, such removal shall be accomplished by first sawing the existing driveway full depth and removing all material to be replaced.

Additionally, the exposed edge of the decorative rock treatment on the portion of the drive not removed must be protected before and after placement of adjacent concrete. In the event that the edge is damaged, the decorative rock treatment shall be resawed, removed and replaced at a point where a straight line can be obtained at no additional expense to the City. Replacement and the finish may be modified to insure subsequent bonding of the decorative rock treatment. Prior to placement of the surface treatment, the concrete base must have cured for a minimum of 7 days. Aggregate used in the surface treatment must match the existing aggregate in size, shape, gradation, and color, and placement must conform to the procedures used when the original treatment was placed. The permittee should contact the homeowner to ascertain the source of the materials used and should use duplicates of those materials wherever possible. Any noticeable difference between the existing treatment and the replacement will be grounds for the rejection of the work.

#### **Gravel Driveway Entrances**

No new construction of gravel driveway entrances will be allowed. Existing gravel driveway entrances may be replaced at existing width but may not be widened. The replacement material shall conform with City of Spring Hill Technical Specifications Section 7000.

### **RESTORATION**

#### **Suitable Soil**

Soil shall be free of clods, rocks, trash, and other debris and shall be suitable for supporting vegetation. The area shall be prepared such that sodding may be placed on bare soil. This will consist of cultivating, smoothing, removing of clods, surface stones of one inch in diameter or larger, and weeds.

#### **Fertilizer**

Fertilizer for sod, shall conform with Technical Specifications Section 7200. Fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer, which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted. Fertilizer shall be placed prior to seeding at not less than 1 pound of actual phosphorus per 1000 square feet of sodding or seeding area.

#### **Sodding**

Disturbed turf in developed areas shall be sodded in accordance with the Technical Specifications Section 7300. Seeding will be allowed and shall conform with the Technical Specifications Section 7300. Sod shall be reasonably free of disease, nematodes, and soil-borne insects. Sod shall also be free of



objectionable grassy and broad leaf weeds.

A clean edge shall be established at the outer limits of the area to be sodded, so that good contact can be made between with the ends staggered in a running bond pattern. Each successively laid strip shall be pressed firmly up against the one next to it or up against the edge of the existing turf, to ensure good contact with no overlapping. Sod shall be staked in places where the slope exceeds 3:1. After placing sod, the area shall be tamped with a hand tamp or rolled with a lawn roller half filled with water. Rolling shall be done in a direction perpendicular to the direction in which the sod lengths were laid.

The permittee shall be responsible for watering sod daily or as often as necessary until it is firmly rooted and secure in place. Sod shall be sufficiently rooted and growing prior to the restoration inspection and the commencement of the two-year maintenance period.

### **Sodding Season**

Bluegrass or fescue sod may be planted and shall conform to the Technical Specifications Section 7200.

### **Seeding**

Seeding, shall conform with Technical Specifications Section 7200.

All seeding materials, bed preparation, and planting shall conform to the applicable requirements of Section 7000 of the Technical Specifications. All disturbed areas shall be seeded as soon as practical after construction. The seedbed should be uniform and well packed. Seed shall be applied with an acceptable seed drill and shall conform with the Technical Specifications Section 7200. Broadcasting and hand raking to a depth of 1/2 inch will only be used on areas where it is impossible to operate a seed drill. The seed shall be covered to a depth of 1/4 to 1/2 inch with a shallow-set spike tooth harrow or other approved methods. After covering, the areas shall be firmed by rolling.

Mulch shall be spread uniformly in a continuous blanket. The mulch shall be anchored in the soil to a depth of 2 to 3 inches into the soil surface. Two or more passes may be required to anchor the mulch. No mulch shall be placed unless it can be anchored on the same day.

The seed mixture shall conform with the Technical Specifications Section 7200.

If buffalo grass seeding is required at other times of the year, temporary seed shall be used, and the areas shall be fertilized and reseeded with buffalo grass during the above time period.

For temporary seeding, the seed mixture shall be annual ryegrass. The rate of application shall conform with Technical Specifications Section 7300.

Seeding shall be maintained by the permittee until satisfactory growth is established, prior to the restoration inspection and the commencement of the two-year maintenance period.

## **Seeding Season**

Seeding Season shall conform with Technical Specifications Section 7200.

## **Protection of Trees**

All trees and plants shall be protected against injury from construction operations. The permittee shall take extra measures to protect trees, such as erecting barricades or fences around the drip line and trimming low hanging branches to prevent damage from construction equipment. Trees shall not be endangered by stockpiling excavated material or storing equipment within the drip line of the tree. No backfill material exceeding four inches in depth shall be placed within the drip line area of any tree. When excavation is required within the drip line of any tree, the permittee shall take extra measures to protect as many roots as possible. All roots to be cut or removed shall be cut with a chain saw, trencher, or other methods that will leave a smooth cut surface. All roots exposed during excavation shall be protected to prevent the roots from drying out by covering the exposed area with canvas or burlap, peat moss, or mulch, and kept damp until the area has been backfilled.

The Director of Public Works may grant permission by permit to any right-of-way user to trim trees upon or overhanging the right of way so as to prevent the branches of such trees from coming in contact with the facilities of the right-of-way user. In the event that any right-of-way user severely disturbs or damages the health and safety of any tree, the right-of-way user will be required to remove and replace the tree with like species at the right-of-way user's cost.

## **Temporary Erosion and Sediment Control**

The permittee shall utilize temporary erosion control methods on the project site to prevent mud or debris from entering the roadway or the storm sewer system, and to prevent damage to existing residential yards. Temporary Erosion and Sediment Control shall conform with the Technical Specifications Section 7300. The forms of temporary erosion control shall include, but not be limited to sediment fence, installation of staked straw bales, temporary seeding, mulching, erosion control fabrics, and protection of storm drain inlets. Where land disturbance activities have temporarily or permanently ceased on a portion of the project site for over 21 days, the disturbed area shall be stabilized with mulch or other similarly effective soil stabilizing BMP's. The permit holder must perform self-inspections of sediment and erosion control devices on a monthly basis and after every rain event of 1/2 inch or greater in a 24-hour period. Records must be kept of all self-inspections and be produced upon request by the City Inspector. Care shall be taken to avoid damaging erosion and sediment control devices installed by other parties. Where utility work unavoidably damages other installations, the contractor shall promptly make repairs. Failure to promptly repair damaged BMP's installed by other parties shall be cause for suspension or revocation of the Right of Way work permit.

## **PUBLIC SAFETY**

### **General Requirements**

If an excavation cannot be backfilled immediately and will be left unattended, the excavation shall be enclosed with good substantial and sufficient barricades and drums equipped with the appropriate type warning lights and orange safety fencing material which is properly secured around the excavation. No excavation shall be left unattended in excess of 72 hours, without permission of the Director of Public Works.

The right-of-way construction site shall be kept clean, neat and orderly. Stockpiling of debris and unsuitable materials beyond normal working hours shall not be permitted. Immediately after construction operations have been completed for the day, all equipment, debris, and unsuitable materials shall be completely removed from the site in order to minimize the damage to finished work and inconvenience to the public and adjoining property owners.

### **Public Access**

In conformance with the Technical Specifications General Provisions I. Traffic Control, whenever a right-of-way user shall excavate the full width of any street, sidewalk, alley, driveway approach or other right-of-way, it shall be its duty to maintain an adequate passage for vehicles and pedestrians across or around the excavation until it is refilled as specified.

If a section of sidewalk is removed as a result of an excavation, temporary aggregate surfacing shall be placed level with the surface of adjacent sidewalk, or sidewalk shall be closed by installing advance warning signs and barricades until the sidewalk can be reconstructed, backfilled, and reopened. Sidewalk shall be reconstructed in as timely a manner as possible. Special emphasis shall be placed on the timely replacement of sidewalks adjacent to schools, public facilities, or commercial areas with high volume pedestrian traffic.

### **Traffic Control**

When working on City streets, the permittee shall provide adequate and suitable barriers, signs, warning lights, flaggers, and all other equipment necessary to direct and reroute traffic and protect the public from moving or stationary vehicles, equipment, and materials, and other obstructions. Also, adequate protective warning lights and signs shall be provided to warn of any obstruction or excavation in the street, sidewalk, or parkway. All barricades, signs, and lights shall conform to the latest edition of the "Manual on Uniform Traffic Control Devices", and the current edition of the City of Spring Hill Technical Specifications.

Non-emergency work on thoroughfare or collector streets may not be accomplished per the Technical Specifications F. Hours of Work, Weekend or Holiday Work.

All workers in construction zones shall wear shirt, vest, or jacket that is orange, yellow, strong yellow green or fluorescent versions of these colors. For

nighttime work, similar outside garments shall be retro-reflective. The retro-reflective material shall be orange, yellow, white, silver, strong yellow green or a fluorescent version of one of these colors and shall be visible at a minimum distance of one thousand feet. Flaggers shall be equipped with sign paddles.

A detailed traffic control plan shall be required prior to issuance of permit, for any lane closure on a thoroughfare or collector street. All personnel involved in the preparation of construction traffic control plans and the installation of all traffic control devices shall be certified by The American Traffic Safety Services Association (ATSSA) as a "Traffic Control Supervisor" or by the International Municipal Signal Association (IMSA) as a "Work Zone Safety Specialist" or other equivalent certification for the design and installation of construction traffic control devices. The certification must be current and readily available for verification at any time as requested by the City Inspector. Minimum requirements for the certification shall include attending training sessions and successful completion of a written examination proctored by a nationally recognized and qualified agency. Permittee shall be required to notify emergency services in the event of any street closure.

### **Facility Separation Requirements**

The following are minimum vertical and horizontal separation requirements for facilities in the right-of-way. The Director of Public Works reserves the right to modify or require higher standards if deemed necessary to protect the public's health, safety or welfare. The City may also enforce additional standards promulgated by the Kansas Department of Health and Environment, the Kansas Corporation Commission, and within the National Electrical Standards Code.

#### **Water/Wastewater**

The minimum separation between any water service or wastewater line and other facility shall be three feet (3'), and a minimum of ten feet (10') of separation from any parallel water or wastewater line, unless otherwise approved by the applicable water/wastewater authority.

#### **Gas**

Natural gas lines are subject to DOT 192.325, Federal Pipeline Safety Standards. The minimum separation distance from any existing gas main will be thirty-six inches (36") horizontally, and twelve inches (12") vertically. Lines must cross at a ninety (90) degree angle.

#### **Telephone, Cable, Fiber, and Power**

All telephone, cable, and fiber lines shall be installed at a minimum depth of twenty-four inches (24") under unpaved surfaces, and forty-eight inches (48") under paved surfaces. Required separation distances shall be twenty-four inches (24") from natural gas lines, power lines, or other nearest utility.

**Depth of Facilities**

A minimum depth of forty-two inches (42") shall be maintained from the street surface to the top of any boring. No facilities shall be installed less than forty-two inches (42") below the street surface of any right-of-way. The minimum depth for any facilities installed underground outside the street surface is twenty-four inches (24"); provided that underground telecommunications or cable drop lines are exempt from this requirement but shall be buried at a reasonably safe depth. Any facilities installed less than forty-two inches (42") under the street surface or thirty-six inches (36") outside of the street surface is done so at the risk of the facility user, and the City shall not be responsible for any damage to the same.

**APPENDIX A**

**SMALL CELL AESTHETIC STANDARDS**

## Small Cell Aesthetic Standards<sup>1</sup>

The following Small Cell Aesthetic Standards (the “Aesthetic Standards”) reflect the desire of the City of Spring Hill (“City”) to maintain the aesthetics within the city, while allowing for an increase in the availability and quality of wireless services.

These Aesthetic Standards apply to all small cell antenna applications for placement of new small cell antennas on city-owned and non-city-owned poles in the public right-of-way, whether collocated streetlight poles, monopoles or utility poles. Applications that do not conform to these Aesthetic Standards will be denied by the City.

For small cell antenna structures installed on any pole within the public right-of-way, the intent of these Aesthetic Standards is:

1. To establish a clear, defined aesthetic standard for use throughout the City.
2. To minimize unnecessary quantities of new poles by encouraging collocation of small cell facilities.
3. To require, in situations where new poles will be placed, that equipment be placed on new, pre-designed and approved poles such that as much equipment as reasonably possible, including any wiring, can be concealed inside the pole.
4. To require, in situations where attachments will be made to existing poles, that equipment, cabling, and conduit be concealed internally or through the use of approved shrouding or camouflaging equipment.
5. To require that all electrical or control cabinets be located in a manner as to not detract from the aesthetic appeal of adjacent houses, buildings, etc. or to be located as to cause an obstruction to visibility and be landscaped to provide necessary screening.

### Section 1. Application Requirements

The City may develop new or additional permit application forms, checklists, updated or amended Aesthetic Standards, and other related materials as required to optimally meet the goals of the City, its citizens, and its leadership.

- 1.1 **Site Plans and Structural Calculations:** The applicant must submit fully-dimensioned site plans, elevation drawings and structural calculations prepared, sealed, stamped and signed by a Professional Engineer licensed and registered by the State of Kansas. Drawings must depict improvements and the proposed facility, with all proposed transmission equipment, power source, electrical service pedestal and other associated access or utility easements and setbacks.

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<sup>1</sup> Intended to include DAS antennas and other similar wireless communications facilities.

All equipment depicted on the plans shall include:

1. Manufacturer's name and model number
2. Physical dimensions including, without limitation, height, width, depth, volume and weight with mounts and other necessary hardware, and effective projected area (EPA)
3. Technical rendering of all external components, including enclosures and all attachment hardware, including a depiction of how much external wiring will exist.

## **Section 2. General Design and Construction Standards**

The City desires to promote safe, cleanly organized and aesthetically acceptable facilities using the smallest and least obtrusive means available to provide wireless services to the community. All wireless facilities in the public right-of-way must comply with all applicable provisions in these Aesthetic Standards. If any other law, regulation or code requires any more restrictive structural design and/or construction requirements, the most restrictive requirement will control.

**Document Superscript Key:** The following superscript key shall be used to indicate which various type(s) of small cell installations are governed by the specific design and construction standard listed below:

**C** - applies to equipment collocated on City streetlight poles

**M** - applies to monopoles

**U** - applies to wood or steel utility poles

### **2.1. RF Cutoff Switch**<sup>C,M,U</sup>

All facilities shall be designed, constructed, operated and maintained in compliance with all generally applicable health and safety standards, regulations, and laws, including without limitation all applicable federal regulations for human exposure to RF emissions. The small cell provider shall provide an RF cutoff switch a maximum of 10' from the finished ground surface at the pole location that is easily reached by maintenance personnel. An RF warning sign shall also be placed on the pole below the cutoff switch.

### **2.2. Small Cell Antenna**<sup>C,M,U</sup>

The small cell antenna shall either be mounted internal to the pole, or top-mounted and concealed within a radome that also conceals the cable connections, antenna mount and other hardware. Any radome, shield or shroud shall meet the following requirements for concealing exposed cable and finish.

#### **2.2.1. Antenna Shroud Requirements:**

A screening shroud shall be provided on the underside of the small cell antenna, mounted external to the pole, to conceal cable connections from public view. The shroud shall be firmly attached and sealed to prevent birds



from entering and nesting.

2.2.2. Finish Requirements:

The equipment shroud must be non-reflective and painted or color impregnated to match the color of the existing pole as close as possible.

**2.3. Electrical Meter and Cabinet Requirements<sup>C,M</sup>**

The electrical meter shall not be installed on the pole. Any necessary meter or other accessory cabinet shall be installed on the outside edges of the street, behind the sidewalk, bicycle or multi-use trail, and said cabinet shall meet all location and landscaping requirements of the National Electrical Code. (Requires screening for cabinets with an actual or projected footprint greater than 2 square feet.) The provider shall be required to maintain any required vegetative landscaping to ensure a neat appearance and to mitigate sight distance obstructions. When the installation occurs in an area where the adjacent poles are painted, the City may require that the electrical meter cabinet be painted to match the color of the poles.

**2.4. Strand Mounted Small Cell Facilities<sup>U</sup>**

Aerial fiber and power strand installations are allowed. However, coiling of excess fiber or other cables is not allowed. All lines shall be neatly trained and secured.

2.4.1. Size Requirements:

Any strand mounted cell facility shall not be larger in dimension than 24” in length, 15” in width, and 12” in height, and any exterior antenna is no longer than 11”, that are strung on cables between existing utility poles, in compliance with the National Electrical Safety Code and shall be subject to the structural limitations of the utility company

2.4.2. Finish Requirements:

The equipment shroud must be non-reflective and painted or color impregnated to match the color of the existing pole, or surrounding infrastructure as close as possible.

**2.5. Pole Requirements When Located Within the Clear Zone or Center Median<sup>C,M</sup>**

Poles located within the clear zone or center median of any street shall meet the following requirements for design, material, shape, height, diameter and finish. Any collocated poles shall also meet the City standard streetlight details in regard to handhole size and location, standard bolt patterns for luminaire arm attachments, cable hooks, grounding lugs, cabling access, etc. as required to accommodate and maintain the City infrastructure.

2.5.1. Breakaway Requirements:

The following breakaway requirements shall be maintained.

2.5.1.1. Pole Requirements:

All poles within the center median of any public street or those poles located on the outside of curb lines within the established clear zone requirements, in accordance with the latest edition of the

City of Spring Hill Design Criteria and Technical Specifications Standards, shall be breakaway according to National Cooperative Highway Research Program (NCHRP) 350 or Manual for Assessing Safety Hardware (MASH), latest edition, using approved breakaway couplings or frangible bases. The weight of a small cell pole, including all attached equipment, shall not exceed the total weight as recommended by either the pole manufacturer or manufacturer of the breakaway device. The breakaway pole device shall not exceed 12” in height.

2.5.1.2. Cable Requirements:

When poles are required to meet breakaway requirements, all cabling within the pole shall also be required to meet breakaway requirements with appropriate “pull apart” electrical connectors so the cables do not “snag” upon impact by an errant vehicle.

2.5.2. Pole Foundation Requirements

The foundation shall remain essentially flush with the ground so that the breakaway device leaves no more than a 4” stub height above the ground, consistent with AASHTO requirements. The foundation shall be either a cast-in-place reinforced concrete foundation or screw-in foundation meeting the structural requirements of the loaded pole. All foundations shall be accompanied with a detail or shop drawing that is sealed by a Professional Engineer approving of the design.

2.5.3. Pole Design Requirements:

The pole shall be designed in accordance with the 2013 American Association of State Highway Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, or latest version adopted by the City.

2.5.4. Pole Material:

The poles shall be manufactured from 6063 extruded aluminum with a T6 temper.

2.5.5. Pole Shape:

The cross section of the pole shall be round and shall be fabricated in a continuous true taper from 2’ from the base to the top of the shaft.

2.5.6. Pole Height:

The pole height shall be consistent with the adjacent poles. The maximum height from the finished ground surface to the top of the antenna shall not exceed the values indicated in the table below:

| <b>Maximum Pole Height Requirements Based on Existing Adjacent Poles</b> |                                        |
|--------------------------------------------------------------------------|----------------------------------------|
| Existing Pole Shaft Length                                               | Proposed Pole Height to Top of Antenna |
| 14'-0"                                                                   | 20'-0"                                 |
| 27'-6"                                                                   | 40'-0"                                 |
| 37'-6"                                                                   | 50'-0"                                 |

2.5.7. Pole Diameter:

The pole diameter measured at the base of the pole shall not exceed the values indicated in the table below:

| <b>Maximum Pole Diameter Requirements Based on Proposed Pole Height to Top of Antenna</b> |                                       |
|-------------------------------------------------------------------------------------------|---------------------------------------|
| Proposed Pole Height to Top of Antenna                                                    | Maximum Outside Diameter at Pole Base |
| 20'-0"                                                                                    | 6"                                    |
| 40'-0"                                                                                    | 8"                                    |
| 50'-0"                                                                                    | 10"                                   |

2.5.8. Pole Finish:

Aluminum poles shall have a satin ground finish unless otherwise specified. If adjacent poles are painted, the proposed pole shall be finished meeting the same color chip as the adjacent poles. Aluminum poles that are painted to match adjacent poles shall be painted with a polyester powder coat. (Refer to Section 3.3)

2.6. **Pole Requirements When Located Outside the Clear Zone or Center Median<sup>M</sup>**

It is presumed that this section will only pertain to monopoles. The poles shall meet the following requirements for design, material, shape, height, diameter and finish.

2.6.1. Pole Design Requirements:

The pole shall be designed in accordance with the 2013 American Association of State Highway Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, or latest version adopted by the City.

2.6.2. Breakaway Requirements:

Poles that are located on the outside curb lines beyond the clear zone boundary, are not required to be breakaway.

2.6.3. Pole Material:

The poles shall be manufactured from 6063 extruded aluminum with a T6 temper.

2.6.4. Pole Shape:

The cross section of the pole shall be round and may be fabricated in a continuous true taper from at least 2' from the base to the top of the shaft or straight without a taper.

2.6.5. Pole Height:

The pole height shall be consistent with the adjacent poles. The maximum height from the finished ground surface to the top of the antenna shall not exceed the values indicated in the table below:

| <b>Maximum Pole Height Requirements Based on Existing Adjacent Poles</b> |                                        |
|--------------------------------------------------------------------------|----------------------------------------|
| Existing Pole Shaft Length                                               | Proposed Pole Height to Top of Antenna |
| 14'-0"                                                                   | 20'-0"                                 |
| 27'-6"                                                                   | 40'-0"                                 |
| 37'-6"                                                                   | 50'-0"                                 |

2.6.6. Pole Diameter:

The pole diameter measured at the base of the pole shall not exceed the values indicated in the table below:

| <b>Maximum Pole Diameter Requirements Based on Proposed Pole Height to Top of Antenna</b> |                                       |
|-------------------------------------------------------------------------------------------|---------------------------------------|
| Proposed Pole Height to Top of Antenna                                                    | Maximum Outside Diameter at Pole Base |
| 20'-0"                                                                                    | 8"                                    |
| 40'-0"                                                                                    | 10"                                   |
| 50'-0"                                                                                    | 12"                                   |

2.6.7. Pole Finish:

Aluminum poles shall have a satin ground finish unless otherwise specified. If adjacent poles are painted, the proposed pole shall be finished meeting the same color chip as the adjacent poles. Aluminum poles that are painted to match adjacent poles shall be painted with a polyester powder coat.

**2.7. Utility Pole Requirements<sup>U</sup>**

At the approval of the local utility company, small cell equipment may be installed on wood or steel utility poles as long as they meet the clearance requirements to power lines or other requirements or regulations of the local utility.

2.7.1. Antenna and Utility Pole Height:

The maximum height from the finished ground surface to the top of the antenna mounted on a utility pole may be 10' greater than the height of the existing pole but shall not exceed 50' in any circumstance. (This is intended to be a one-time height increase allowance. If multiple height increases are made, they should not cumulatively exceed 10' higher than the original pole height.)

**2.8. Luminaire Arm Requirements<sup>C</sup>**

The luminaire arm(s) shall meet the following requirements for design, material, shape, length, location and finish according to the City's standard streetlighting details.

2.8.1. Design Requirements:

The luminaire arm(s) shall be designed in accordance with the 2013 American Association of State Highway Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, or latest version adopted by the City.

2.8.2. Luminaire Arm Material:

The luminaire arm(s) for 30' and 40' luminaire mounting heights shall be tubing/piping manufactured from 6063 aluminum tubing with a T6 temper. The luminaire arm material shall be the same as the pole material. The luminaire arm for 14' luminaire mounting heights shall be an aluminum casting as detailed by the City, that is compatible with the residential fixture mounting.

2.8.3. Luminaire Arm Shape:

The luminaire arm(s) for 30' and 40' luminaire mounting heights shall match the style and shape as the luminaire arm(s) on the existing pole that is being replaced. The style shall either be a single member arm type or truss type arm. The luminaire arm for a 14' luminaire mounting height shall be rectangular in shape with decorative enhancements as depicted in the special details.

2.8.3.1. Single Member Arm:

The single member arm shall be tapered tubing. After tapering, the member shall be flattened to produce an elliptical cross-section

with the major diameter in the vertical plane, perpendicular to the wind. The outboard end of the arm shall remain round with a 2" slip-fitter for mounting the luminaire.

2.8.3.2. Truss Type Arm:

The truss type member arm assembly shall be a one-piece welded assembly consisting of an upper arm and lower arm (brace) securely joined by a vertical strut and a connector or weld at the outboard end of the arm assembly. The upper arm shall be tapered. After tapering, the upper arm shall then be flattened to produce an elliptical cross-section with the major diameter in the horizontal plane, parallel to the wind. The outboard end of the upper arm shall remain round with a 2" slip-fitter for mounting the luminaire. The outboard end of the lower arm (brace) shall be covered by an end cap.

2.8.3.3. Residential Pole Arm:

The luminaire arm for 14' residential poles shall be a special fabricated mounting bracket to mount the luminaire on the side of the pole instead of at the top of the pole. The design of the arm shall be based on drawing number 19-119-PR101 with bracket arm number SAL-WSB-PB which is on record at the City.

2.8.4. Luminaire Arm Length:

The length of the luminaire arm(s) for 30' and 40' luminaire mounting heights shall be the same as those on the existing pole that is being replaced. The luminaire arm length for 14' luminaire mounting heights shall be approximately 17" from the side of pole to the center of the luminaire.

2.8.5. Luminaire Arm Location:

The luminaire arm mounting location for 30' and 40' luminaire mounting heights shall match the location of the existing poles, such that the mounting height of the proposed luminaire housing matches the mounting height of the adjacent poles and luminaires.

The luminaire arm for 14' luminaire mounting heights shall require special rivnut mounting hardware to accommodate the decorative arm.

2.8.6. Luminaire Arm Finish:

The arm(s) for 30' and 40' luminaire mounting heights shall be finished the same color of the poles. See section 2.5.6. The arm for the 14' luminaire mounting height shall be painted black to match the luminaire housing.

**2.9. Luminaire Requirements<sup>C</sup>**

The luminaire(s) shall meet the following requirements for style and finish:

2.9.1. Luminaire Style:

The luminaire(s) for 30' and 40' mounting heights shall be LED cobrahead style and be from the City Approved Materials List which can be found and conform to the City of Spring Hill Technical Specifications Section 9000.

The class of luminaire to be used shall be approved by the City. Existing LED cobrahead luminaire(s) shall be replaced with the same class of LED luminaire(s) that already exists on the pole that is being removed. Existing HPS cobrahead luminaire(s) shall be replaced with LED cobrahead luminaire(s) according to the table below:

| <b>Luminaire Requirements Based on Existing HPS Luminaire</b> |                                        |
|---------------------------------------------------------------|----------------------------------------|
| Existing HPS Cobrahead Luminaire Wattage                      | Required LED Cobrahead Class Luminaire |
| 400 Watt                                                      | Class A                                |
| 310 Watt                                                      | Class B                                |
| 250 Watt                                                      | Class C                                |
| 150 Watt                                                      | Class D                                |
| 100 Watt                                                      | Class E                                |

The luminaire for the residential poles shall be the standard post top fixture as indicated in the Approved Materials list. It shall be equipped with an LED lamp. All existing luminaires shall be returned to the City of Spring Hill Public Works Department.

2.9.2. Luminaire Finish:

The luminaire(s) shall have a factory applied finish that matches the same color chip as the luminaires on adjacent poles.

**2.10. Cabling Requirements<sup>C,M</sup>**

All cabling shall primarily be internal to the pole. Any exposed cabling, external to the pole, shall be minimized. No cable shall be visible at the top of the pole near the antenna. External cables powering the pole mounted radios, cutoff switches or other devices shall be limited to a total length of 24”, including drip loops, slack, etc. Any cable access point on the pole shall be sealed with a manufactured product to keep birds from entering and nesting. Duct seal or putty is not an approved product.

**Section 3. General Location Criteria**

Any new pole and/or equipment and other improvements associated with a new pole or an existing pole must meet the following criteria:

### **3.1 Pole Location:**

#### **3.1.1 Collocation:**

The City desires and encourages collocations between limited numbers of multiple, separate wireless service providers on the same support structure whenever feasible.

#### **3.1.2 General:**

These general principles shall apply:

##### **3.1.2.1 Monopoles Located in a Raised Street Median:**

Monopoles, located in a raised street median, shall be placed equidistant between two existing streetlight poles and roughly centered in the median. (See Section 2.5.1 for applicable breakaway requirements.)

##### **3.1.2.2 Monopoles Located on the Outside of Curb Line:**

Monopoles, located on the outside of the curb line, shall be placed, to the extent possible, approximately equidistant between two existing streetlight poles with preference to being located on the property line between lots and no closer than 3' from the back of curb to the center of the pole. (See Section 2.5.1 for applicable breakaway requirements.)

### **3.2 Not on Traffic Signal Poles:**

Small cell equipment shall not be allowed on existing or proposed traffic signal poles or existing or proposed streetlight poles that have existing or proposed traffic signal equipment mounted to them.

### **3.3 Not on Decorative Poles:**

Small cell equipment shall not be allowed to collocate on decorative streetlight poles or poles that have decorative luminaires. The term “decorative” shall be applied to anything that does not conform to the City of Spring Hill Technical Specifications Section 9000 – Street Lights.

### **3.4 Not to Cause Obstructions:**

Any new pole and/or equipment and other improvements associated with a new pole, electrical meter cabinet or an existing pole must not obstruct:

1. Any intersection sight distances as required by the American Association of State and Highway Transportation Officials (AASHTO), latest edition adopted by the City.
2. Any above-ground or underground infrastructure for traffic control, streetlight or public transportation, including without limitation any curb control sign, vehicular traffic sign or signal, pedestrian traffic sign or signal, barricade or traffic control equipment.



3. Access to any public transportation vehicles, shelters, street furniture or other improvements at any public transportation stop (including, without limitation, bus stops, bike share stations, etc).
4. Any access to sidewalks, pedestrian facilities, etc. as outlined in the United States Access Board Public Rights of Way Access Guidelines (PROWAG).
5. Access to above ground or underground infrastructure owned or operated by any public or private utility agency, including fire hydrants, etc.
6. Access to any doors, gates, sidewalk doors, passage doors, stoops or other ingress and egress points to any building appurtenant to the right-of-way, or access to any fire escape.

#### **Section 4. City Pre-Approved Pole Designs.**

The Director of Public Works may require providers to design their pole(s) utilizing pole designs pre-approved by the City.

#### **Section 5. Amendment.**

The requirements set forth in these Aesthetic Standards may be amended from time to time at discretion of the Director of Public Works. Any amendment of these Aesthetic Standards shall be published once in the official City newspaper and shall become effective upon publication.

#### **Section 6. Exceptions.**

The Director of Public Works, in the Director of Public Works sole discretion, may grant exceptions to these Aesthetic Standards if the Director of Public Works finds the following conditions exist:

1. The Aesthetic Standards as applied to a specific set of circumstances are: (a) technically infeasible and (b) unreasonable when balanced against the interest of avoiding or remedying the intangible public harm of unsightly or out-of-character facility deployments; and
2. The applicant's proposed design and aesthetic appearance for the proposed facilities meets the spirit of these Aesthetic Standards.

#### **Section 7. Design and Construction Standards Manual**

The Aesthetic Standards set forth herein regarding streetlight poles are meant to be read in conjunction with the City's Technical Specifications criteria for streetlight poles. These Aesthetic Standards will be amended as necessary so as to not conflict with the current version of the City's Technical Specifications requirements regarding streetlight poles.

#### **Section 8. Severability.**

The provisions of any part of these Aesthetic Standards are severable. If any provision or subsection, or the application of any provision or subsection to any person, entity or

circumstance is held invalid, the remaining provisions, subsections and applications of such Aesthetic Standards to other persons, entities or circumstances shall not be made invalid as well. It is declared to be the intent of this section that the remaining provisions would have been adopted had such invalid provisions not been included in these Aesthetic Standards when originally adopted.