STORMWATER AS-BUILT REQUIREMENTS

The following is required per the City of Lebanon's Title 22, Stormwater:

(1). As-Built Plans, which states:

All applicants are required to submit actual as-built plans for any structures located on-site after final construction is completed. The plan must show the final design specifications for all stormwater management facilities and must be sealed by a registered professional engineer licensed to practice in Tennessee. A final inspection by the City of Lebanon is required before any performance security will be released. The City of Lebanon shall have the discretion to adopt provisions for a partial pro-rata release of the performance security on the completion of various stages of development. In addition, occupation permits shall not be granted until corrections to all BMP's have been made and accepted by the City of Lebanon.

INSTRUCTIONS

Prior to the last ten percent (10%) of building permits or the last two (2) building permits, whichever is greater, being granted, the ***attached form must be filled out and returned to the City of Lebanon Engineering Department office along with the items listed below.*** An engineer must also stamp and sign the as-built documents. Failure to return this information to this office will delay approval; therefore, it is recommended that as soon as you anticipate a completion date for your project, you should notify your engineer immediately. (*** Required for Preliminary As-built Review – must be submitted prior to first building permit issuance)

1. An electronic As-Built (pdf & dwg) with the below layers and specifications should be submitted on GeoCivix. under the "2.6 Engineering As-built" application. ***
   - Link to GeoCivix: https://lebanon.geocivix.com/
   - Coordinate data shall be presented in the State of Tennessee Plane system with the North American Datum 1983 (NAD83) and North American Vertical Datum (NAVD) of 1988.
2. The City requires As-Builts to be submitted for all development in the City concerning stormwater management facilities infrastructure including quality and conveyance information. The As-Builts should show plainly the **approved and constructed layout**, elevations, design, etc. of the entire site. The following as-built layers and documents must be included for the site (show as-designed vs as-built information):
   - Catch Basins ***
   - Conduits (swales, ditches, etc.) ***
   - Streams & stream buffers ***
   - Green Infrastructure Practices (GIP) (Bioretention, Pavers, Extended Detentions, etc.)
   - Permanent Treatment Practices (PTP) (Wet/Dry Ponds, Sand Filters, etc.)
   - Water Quality Units ***
   - Permanent Outlet Protection (riprap, level spreader, etc.)
   - Stormwater Calculations (inlets ***, pipes ***, swale ***, pond, water quality, etc.)
   - Cut / Fill balance certification for floodplain and sinkhole alterations ***
   - All impervious surfaces: parking, roads, driveways, etc.
3. **For residential developments, the last two (2) building permits shall not be issued until corrections to all stormwater infrastructure listed in item #2 above have been made and accepted by the City of Lebanon. For all other developments, a Final Certificate of Occupancy will not be issued until corrections to all stormwater infrastructure listed in item #2 above have been made and accepted by the City of Lebanon**

For questions, contact:

- Brad Bork, bradley.bork@lebanontn.org, phone (615) 444-3647 ext. 2351
- Mattie Neely, mattie.neely@lebanontn.org , phone (615) 444-3647 ext. 2339.

CITY OF LEBANON
Engineering Department
200 North Castle Heights Avenue, Suite 300
Lebanon, Tennessee 37087

STORMWATER INFRASTRUCTURE CERTIFICATION

☐ Check box if submittal is for Preliminary As-built Review (*** Required for Preliminary As-built Review)

General Information:

Date:

Project Name:_____

Developer / Owner Name:

Professional Land Surveyor:
Company Name:
Address:
City, State, Zip Code:
Contact Name:
Phone:
Email:
License No.:

Professional Engineer:
Company Name:
Address:
City, State, Zip Code:
Contact Name:
Phone:
Email:
License No.:

Stormwater infrastructure (check items):

See the as-built requirements checklist for each infrastructure type

☐ Catch Basins ***	☐ Pipes/Culverts ***	☐ Outlet structure ***
☐ Outlet Protection (riprap)	☐ Bio-retention	☐ Permeable Pavement
☐ Infiltration Trench	☐ Water Quality Swale	☐ Extended Detention
☐ Permanent Pool (Wet) Detention	☐ Sand Filter	☐ Dry Detention
☐ Grass Channel / Swale ***	☐ Water Quality Unit ***	☐ Stream Buffers

☐ Other(s): _____

Stormwater requirements (check YES/NO):

Provide a summary table of pipes/culverts/swales/ponds/peak flows/BMPs/etc.
If answered NO, note any stormwater infrastructure that does not meet requirements in submitted documents

Are all pipes slopes exceed 0.5%? ***	☐ YES	☐ NO
Are all pipe velocities exceed 2.0 ft/sec? ***	☐ YES	☐ NO
Are all flows below pipe/culvert/swale capacity? ***	☐ YES	☐ NO
Are gutter spreads less than ½ of drive aisles? ***	☐ YES	☐ NO
Are as-built total pond volume(s) meeting or exceeding the design volume(s)?	☐ YES	☐ NO
Are as-built water quality volume(s) meeting or exceeding the design volume(s)?	☐ YES	☐ NO
Are post-dev. flows below pre-dev.? (1, 2, 5, 10, 25, 50, & 100-yr storms)	☐ YES	☐ NO

Engineer's acknowledgement: ***

I hereby acknowledge that the above information is accurate and that the plans and supporting data have been submitted as required. I further acknowledge that this as-built information complies with the City of Lebanon's Title 22, Stormwater.

_____ _____
Professional Engineer Signature Date

AS-BUILT REQUIREMENTS CHECKLIST

(*** Required for Preliminary As-built Review)

The City of Lebanon Engineering has requirements and a checklist for stormwater as-builts. Please ensure this document is reviewed prior to performing the survey and all items are addressed. See below to find each SCM with details of components that need to be documented.

NOTE: Building permits shall not be issued until corrections to all BMP's have been made and accepted by the City of Lebanon.

Documents to provide:

- Brief description of the type of SCM and basic design characteristics
- The Engineer's Post-Construction Inspection Report (based on the Long Term Maintenance Plan) with checklists and photos of SCMs.
- Summary table of as-designed vs as-built pipes*** / culverts*** / swales*** / ponds / peak flows / BMPs / etc., highlighting any items that do not meet requirements
- Variations summary to approved design plans and specifications ***
- As-built survey (sealed by a professional land surveyor) ***
- As-designed vs as-built Structures/Pipes Tables ***
- As-designed vs as-built Stormwater Calculations (sealed by a professional engineer):
    - calculations for water quality & quantity, pipe/swale ***, gutter spread ***, etc.
- Cut / Fill balance certification for floodplain and sinkhole alterations ***
- Tickets (Outlet structures, water quality units, bio-retention materials, outlet protection, other GIP materials, etc.)
- As-designed vs as-built details (Outfalls, spillway, bio-retention/swale sections, etc.)
- Provide Record Drawing Certification on as-built plans (below): ***

Record Drawing Certification:

I hereby certify that all components of this stormwater management system have been built substantially in accordance with the approved plans and specifications. Any substantial deviations (noted in the attached documents) from the approved plans and specifications will not prevent the system from functioning in compliance with the City of Lebanon's Title 22, Stormwater, when properly maintained and operated. These determinations have been based upon on-site observation of the system conducted by me or by my designee under my direct supervision and/or my review of as-built plans certified by a registered professional engineer and land surveyor licensed in the State of Tennessee.

_____ Date: _____

(Professional Engineer Signature)

As-built Infrastructure Requirements:

(*** Required for Preliminary As-built Review)

Stormwater Drainage System(catch basins, pipes/culverts, outlets structures, etc.)***

- Culverts (inlets and outfalls): details, slopes, sizes, material, etc.
- Catch Basins: top of castings, inverts, etc.
- Storm sewer size of 15 inches and larger shall be video-inspected to verify proper installation with the video recording and any associated inspection report submitted as a part of a drainage as-built record. The professional preparing the video shall be certified by the Pipeline Assessment and Certification Program (PACP®). Video documentation shall be prepared in conjunction with the preparation of drainage as-builts, shall be no more than 90 calendar days prior to a submittal. A summary of video findings shall be provided by a professional engineer.

Permanent Outlet Protection* (riprap, level spreader, etc.):

- Material type and size (rip rap, median rock size, matting, etc.)
- Limits/dimensions of the outlet protection
- Top of level spreader elevation with shots at each end and every 7 feet along the level lip.

Water Quality Units***

- Provide top of castings, inverts
- As-built details and photos

Conduits* (swales, ditches, revised streams, etc.):

- Cross sections
- Lengths, depths, slopes of each side of the channel, bottom widths, and channel slopes,
- As-built contours and grading spots (25' max. spacing)

Stream Buffers***

- As-built buffer limits
- As-built buffer sign locations

Green Infrastructure Practices (GIP) Requirements:

GIP-01 Bioretention

- Invert elevations of the underdrain and outlet control structure, top of castings, and overflow elevations & width.
- Elevations shall be provided for top of soil and top of surrounding berm.
- Pretreatment information (forebay surface area, depth, etc.)
- Bioretention surface area and layer depths & details.
- Curb cut location and width, if applicable.

GIP-02 Urban Bioretention

- Invert elevations of the underdrain and outlet control structure, top of castings, and overflow elevations & width.
- Top of soil and top of surrounding berm elevations.
- Pretreatment information (forebay surface area, depth, etc.)
- Bioretention surface area and layer depths & details.
- Curb cut location and width, if applicable.

GIP-03 Permeable Pavement

- Underdrain inverts, if utilized, and layer depths.
- Surface area of the permeable pavement with layer depths & details
- Curb cut location and width, if applicable.

GIP-04 Infiltration Trench

- Invert elevations of the underdrain and outlet control structure, top of castings, and overflow elevations & width.
- Top of soil and top of surrounding berm elevations.
- Pretreatment information (forebay surface area, depth, etc.)
- Surface area of the feature with layer depths & details
- Curb cut location and width, if applicable.

GIP-05 Water Quality Swale

- Invert elevations of the underdrain and outlet control structure, top of castings, and overflow elevations & width.
- Top of soil and top of surrounding berm elevations.
- Pretreatment information (forebay surface area, depth, etc.)
- Surface area of the feature with layer depths & details
- Curb cut location and width, if applicable.

GIP-06 Extended Detention

- As-design vs as-built elevations with details shall be provided for inverts of the outlet control structure, low flow orifice, top of casting (overflow), and all applicable features: forebay, micro pool, deep pool, wetland, dewatering device, etc.
- Top of surrounding berm and emergency spillway elevations.***
- Pretreatment information (forebay surface area, depth, etc.)
- Provide as-built contours and grading spots (25' max. spacing)

GIP-07 Grass Channel***

- Cross sections of the channel
- Lengths, depths, slopes of each side of the channel, widths of the bottom of the channel, and slopes throughout the channel.
- As-built contours and grading spots (25' max. spacing)

GIP-08 Sheet Flow

- Top of level spreader elevation with shots at each end and every 7 feet along the level lip.
- Confirm the level spreader is properly installed to create sheet flow.
- Slope of the vegetated filter strip or open space that receives sheet flow.
- Slope, flow path, and area of paved area draining toward a level spreader and pervious area.
- Photos of proper vegetation has been established or protected.
- If using amended soils, ensure proper installation by digging a test pit to verify the depth of mulch, amended soil and scarification.

GIP-09 Reforestation

- Certification from a Landscape Architect registered in the State of Tennessee to certify that the plantings have been installed per the approved plan and, if applicable, that the soil has been properly amended.
- Location, size, and species of the plantings.
- Confirm ground cover; organic mulch or establishment/germination native seed mix.

GIP-11 Green Roof

- Profile view of facility including typical cross-sections with dimensions;
- Growing medium elevations.
- Stormwater piping associated with the site, including pipe materials, sizes, slopes, invert elevations at bends and connections.
- Elevations of all overflow devices.
- Planting and irrigation plan.

Permanent Treatment Practices (PTP) Requirements:

PTP-01 Stormwater Wet Pond

- As-design vs as-built elevations with details shall be provided for permanent pool, inverts of the outlet control structure, low flow orifice, top of casting (overflow), and all applicable features: forebay, micro pool, deep pool, wetland, dewatering device, etc.
- Top of surrounding berm and emergency spillway elevations.***
- Pretreatment information (forebay surface area, depth, etc.)
- Provide as-built contours and grading spots (25' max. spacing)
- Provide as-built water balance calculations

PTP-02 Constructed Wetland

- Note the differences between the measure in the field and the design approved by the City
- Demonstrate that the design meets the requirements of the City's stormwater program and, if applicable, the City's floodplain management program
- If needed, propose additional measures to be included on the site to mitigate any differences.
- Elevations of the different areas of the wetland (i.e. deep water, low marsh, high marsh, etc.), permanent pool, inverts of the outlet control structure, low flow orifice, top of casting (overflow), and all applicable features: forebay, micro pool, deep pool, wetland, dewatering device, etc.
- Top of surrounding berm and emergency spillway elevations.***
- Pretreatment information (forebay surface area, depth, etc.)
- Provide as-built contours and grading spots (25' max. spacing)

PTP-03 Bioretention

- Invert elevations of the underdrain and outlet control structure, top of castings, and overflow elevations & width.
- Elevations shall be provided for top of soil and top of surrounding berm.
- Pretreatment information (forebay surface area, depth, etc.)
- Bioretention surface area and layer depths & details.
- Curb cut location and width, if applicable.

PTP-04 Surface Sand Filter

- Elevations of the underdrain inverts, bottom of forebay, top of sand bed, standpipe in forebay or berm separating forebay/sand bed, and overflow
- Pretreatment information (forebay surface area, depth, etc.)
- Surface area of the sand bed and layer depths

PTP-05 Water Quality Swale

- Invert elevations of the underdrain and outlet control structure, top of castings, and overflow elevations & width.
- Top of soil and top of surrounding berm elevations.
- Pretreatment information (forebay surface area, depth, etc.)
- Surface area of the feature with layer depths & details
- Curb cut location and width, if applicable.

PTP-06 Dry Pond

- As-design vs as-built elevations with details shall be provided for bottom of pond, inverts of the outlet control structure, low flow orifice, top of casting (overflow), forebay, and all applicable features
- Top of surrounding berm and emergency spillway elevations.***
- Pretreatment information (forebay surface area, depth, etc.)
- Provide as-built contours and grading spots (25' max. spacing)

PTP-07 Filter Strip

- Confirm stormwater spreads evenly across the filter strip.
- Confirm and show slopes are between 2% and 6%.
- Dimensions of filter strip.
- Top of level spreader elevation with shots at each end and every 7 feet along the level lip.

PTP-08 Grass Channel***

- Cross sections of the channel
- Lengths, depths, slopes of each side of the channel, widths of the bottom of the channel, and slopes throughout the channel.
- As-built contours and grading spots (25' max. spacing)

PTP-09 Green Roof

- Profile view of facility including typical cross-sections with dimensions;
- Growing medium elevations.
- Stormwater piping associated with the site, including pipe materials, sizes, slopes, invert elevations at bends and connections.
- Elevations of all overflow devices.
- Planting and irrigation plan.

PTP-10 Underground Sand Filter

- Confirm manufacturer & model information of the vault, if manufactured (provide tickets & photos).
- Location, top of castings & inverts of cleanouts / manholes.
- Elevations of inlet/outlet/underdrain inverts, top of filter sand bed, and overflow weir.
- Confirm the vault is free of sediment and construction trash/debris.

PTP-11 Perimeter Sand Filter

- Elevations of grates (inlet) with top of castings and inverts, bottom of forebay, weir, top of filter sand bed, underdrain invert, and any overflow/spillway.
- Forebay surface area and depth shall be provided.
- Surface area of sand bed with layer depths & details

PTP-12 Organic Filter

- Elevations of underdrain inverts, bottom of forebay, top of filter bed, standpipe in forebay or berm separating forebay/filter bed, and overflow
- Pretreatment information (forebay surface area, depth, etc.)
- Surface area of the filter bed with layer depths & details

PTP-13 Gravity Oil Grit Separator ***

- Confirm manufacturer and model information (provide tickets & photos).
- Location, top of castings & inverts of cleanouts / manholes.
- Confirm the separator is free of sediment and construction trash/debris

PTP-14 Infiltration Trench

- Invert elevations of the underdrain and outlet control structure, top of castings, and overflow elevations & width.
- Top of soil and top of surrounding berm elevations.
- Pretreatment information (forebay surface area, depth, etc.)
- Surface area of the feature with layer depths & details
- Curb cut location and width, if applicable.

PTP-15 Permeable Pavement

- Underdrain inverts, if utilized, and layer depths.
- Surface area of the permeable pavement with layer depths & details
- Curb cut location and width, if applicable.

This list is provided for reference and should not be considered comprehensive. The Lebanon Engineering Department may request additional information if required.

For questions, contact:

- *Brad Bork, bradley.bork@lebanontn.org, phone (615) 444-3647 ext. 2351*
- *Mattie Neely, mattie.neely@lebanontn.org , phone (615) 444-3647 ext. 2339.*