

# Tysons Corner Comprehensive Plan Stormwater Conformance Checklist

Project: \_\_\_\_\_

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

An amendment to the Comprehensive Plan for Fairfax County envisions a new Tysons Corner Urban Center. The Board of Supervisors adopted the new Plan for Tysons Corner on June 22, 2010. Included within the Environmental Stewardship section of the Area wide Recommendations is stormwater management guidance intended to protect receiving waters downstream of Tysons Corner by reducing runoff from impervious surfaces using a progressive approach to stormwater management. Achieving a goal of retaining on-site and/or reusing the first inch of rainfall will ensure that runoff characteristics associated with the site will mimic those of a good forest condition for a significant majority of rainfall events. (The adopted Comprehensive Plan Amendment can be downloaded at this link: <http://www.fairfaxcounty.gov/tysons/comprehensiveplan/>)

This checklist provides a tool for county staff, submitting engineers, and development teams to assist in the preparation and review of stormwater plans in Tysons Corner. Using this checklist at the conceptual and final design phases is encouraged to ensure that the adopted stormwater management goals are integrated into each plan's stormwater management strategies early in the design process and implemented at final design.

| YES                      | NO                       | Comprehensive Plan Stormwater Management Goals   | Sheet No. if applicable |
|--------------------------|--------------------------|--|-------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | A <b>stormwater management narrative*</b> is provided and explains how the proposed stormwater management strategy will comply with the goals of the Tysons Corner Comprehensive Plan Amendment, Environmental Stewardship Guidelines for Stormwater including, as a minimum, the following stormwater goals:  | _____                   |
| <input type="checkbox"/> | <input type="checkbox"/> | The narrative describes how infiltration BMPs and/or rainwater harvesting will be used and if not used, demonstrates why they are not practicable. This is in support of the goal that states: " <i>Stormwater management and water quality controls for redevelopment should be designed to <b>return water into the ground where soils are suitable or reuse it, where allowed, to the extent practicable</b> . Reduction of stormwater runoff volume is the single most important stormwater design objective for Tysons.</i> "   | _____                   |
| <input type="checkbox"/> | <input type="checkbox"/> | The narrative describes how the first 1 inch of rainfall will be retained onsite and if not fully achievable, demonstrates why it is not practicable. This supports the goal that states: " <i><b>At a minimum, the first inch of rainfall should be retained on-site through infiltration, evapotranspiration and/or reuse. If, on a given site, the retention on-site of the first inch of rainfall is demonstrated not to be fully achievable, all available measures should be implemented to the extent possible in order to support this goal and achieve partial retention of the first inch of rainfall.</b></i> " | _____                   |

\*FOOTNOTE: Strategies described in the narrative are to be shown, in appropriate detail, on the CDP, FDP, and site plans.

YES NO

The narrative describes how runoff reduction practices will be used, or if not, then demonstrated to not be practicable as a strategy toward meeting the stormwater goal: *“Redevelopment projects in Tysons should incorporate innovative stormwater management measures in a manner that will, **first and foremost, optimize reduction of stormwater runoff volume** and control of peak flows for the remaining stormwater that cannot be completely captured on-site.”* \_\_\_\_\_

The narrative describes how the project will meet **eligibility for LEED Stormwater Credit** in support of the goal: *“At a minimum, stormwater management measures that are sufficient to attain both the stormwater design-quantity control and stormwater design-quality control credits of the most current version of the LEED-NC or LEED-CS rating system (or the equivalent of these credits) should be provided. If, on a given site, the attainment of the stormwater design LEED credits (or equivalent) is demonstrated not to be fully achievable, all available measures should be implemented to the extent possible in support of this goal.”* \_\_\_\_\_

If stormwater goals are not fully achievable onsite, the narrative describes how **offsite or shared stormwater alternatives** will be used to meet all, or a part of the stormwater goals. This supports the goal that states: *“Equivalent approaches may incorporate coordinated stormwater management on multiple development sites and/or off-site controls. Additional stormwater management efforts should be encouraged.”* \_\_\_\_\_

YES NO N/A

Sheet No. if applicable

The narrative describes how **low impact development (LID) techniques are incorporated into the street design** in order to satisfy the goal: *“LID techniques of stormwater management should also be incorporated into new and redesigned streets where allowed and practicable.”* \_\_\_\_\_

The narrative describes **opportunities for stream restoration** in accordance with the goal: *“Restoration and/or stabilization of degraded streams on development sites should be pursued where feasible; restoration and stabilization techniques that incorporate ecologically and aesthetically beneficial, vegetated approaches are preferred. Off-site efforts to restore and/or stabilize streams in Tysons Corner should also be encouraged. The above guidelines are intended to improve stormwater management controls sufficiently to allow for improvements to the habitat and recreational values of streams in Tysons Corner through natural restorative processes and/or through restoration projects.”* \_\_\_\_\_

| YES | NO | <i>Comprehensive Plan Implementation</i> | Sheet No. if applicable |
|-----|----|--|-------------------------|
|-----|----|--|-------------------------|

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|--------------------------|--------------------------|---|-------|
| <input type="checkbox"/> | <input type="checkbox"/> | The target stormwater treatment volume is calculated as 1 inch of rainfall over the entirety of the property that is subject to the zoning application, including areas planned for dedication as public rights-of-way.                           | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Will the design include new and innovative stormwater practices? <b>If yes</b> , describe:  | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Will the design provide safe and adequate access to the inlet structure, outlet structure and around the perimeter of the stormwater BMP facilities as needed for inspection, maintenance, and repair?  | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Will the plan include a commitment for private maintenance of stormwater BMPs?  | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Will the proposed design create a safe environment for the public?  | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Is the project to be designed and constructed in phases? <b>If yes</b> , does the narrative and plan address how phasing will impact stormwater management and how stormwater goals will be met in the interim and ultimate build-out conditions? | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Is a PFM modification or waiver request anticipated? <b>If yes</b> , describe:  | _____ |

| YES | NO | N/A | Sheet No. if applicable |
|-----|----|-----|-------------------------|
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|--------------------------|--------------------------|--------------------------|---|-------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If used, will stormwater vaults be located where they do not adversely impact the landscape amenity panel and sidewalk zone?              | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If used, will stormwater vaults be located where they can be readily accessed by equipment (e.g. vacuum truck) and maintenance personnel? | _____ |

***Design of Best Management Practices †***

| YES | NO | <i>Infiltration BMPs</i> | Sheet No. if applicable |
|-----|----|--------------------------|-------------------------|
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|--------------------------|--------------------------|---|-------|
| <input type="checkbox"/> | <input type="checkbox"/> | Are one or more <b>infiltration BMPs</b> being proposed (i.e. infiltration practice, bioretention with infiltration, permeable pavement with infiltration, etc.)?   | _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | <p><b>If yes</b>, has a soil analysis been completed or sufficient documentation provided to demonstrate that site conditions are suitable for infiltration? Prior to final design the PFM requires a soils analysis be prepared and infiltration tests conducted by a licensed professional engineer with experience in geotechnical engineering and soil evaluation, a certified professional soil scientist, or a certified professional geologist. A minimum field measured infiltration rate of 0.52 inches per hour is required for infiltration. The design infiltration rate shall be half of the field measured rate (PFM 6-1304.4I and PFM 6-1307.4O).</p> <ul style="list-style-type: none"> <li>&gt; Pervious pavement systems with infiltration may not be constructed on fill material (PFM 6-1304.2C).</li> <li>&gt; Bottom of facility shall be &gt; 4 ft. above groundwater table and bedrock (PFM 6-1304.4G).</li> <li>&gt; Soils with CBR (&gt;96 hrs. soaked) &lt; 5 or highly expansive are not suitable for infiltration (PFM 6-1304.4I).</li> <li>&gt; Bioretention facilities that utilize infiltration may not be constructed on fill material (PFM 6-1307.2C).</li> <li>&gt; Infiltration shall not be used where there is evidence of soil contamination.</li> </ul> | _____ |

- Will all of the runoff from the site's first inch of rainfall be captured by infiltration BMPs? **If yes**, the plan meets the Comprehensive Plan goal to retain the first 1 inch onsite. **If no**, continue to the next checklist item. Additional BMPs are needed to help meet the Comprehensive Plan goal. \_\_\_\_\_

| YES | NO | <i>Rainwater Harvesting</i> | Sheet No. if applicable |
|-----|----|-----------------------------|-------------------------|
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- Does the plan propose **rainwater harvesting** that captures some, or all of the roof runoff? Using rainwater harvesting as a stormwater strategy requires reliable, year-round demand that will draw down the storage cistern to make capacity available for the next storm. Which of the following reuses are proposed? \_\_\_\_\_

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><input type="checkbox"/> Water closet flushing (permanent year-round)</li> <li><input type="checkbox"/> Cooling tower makeup water (seasonal)</li> <li><input type="checkbox"/> Laundry (permanent year-round)</li> <li><input type="checkbox"/> Irrigation (seasonal)</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Equipment washing (year-round)</li> <li><input type="checkbox"/> Exterior washing (seasonal)</li> <li><input type="checkbox"/> Landscape water feature (seasonal)</li> <li><input type="checkbox"/> Other _____</li> </ul> |
|--|--|

- For final design of the rainwater harvesting (RWH) system, sufficient documentation will be provided to support demand assumptions and cistern sizing including the following: \_\_\_\_\_

- A continuous simulation model for sizing the storage cistern (Virginia DCR spreadsheet or equal) using local historic daily rainfall data for the inflow and demand assumptions for the drawdown assuming seasonal and other demand variations. \_\_\_\_\_
- The RWH system design will include a first flush (first 0.05 inches of rainwater) bypass to protect water quality; an overflow and/or bypass system for larger storms, and additional storage capacity as a factor of safety. \_\_\_\_\_
- In times of reduced demand or overflow, the RWH system will discharge to a BMP or adequate channel. \_\_\_\_\_
- If the RWH system will be oversized to provide stormwater detention (in addition to reuse), then adequate volume for the design storms will be provided with supporting calculations including routing of the 2 and 10-yr storm, outfall to an adequate channel, and provision for overland relief. \_\_\_\_\_

- Instead of reuse will the design collect roof runoff and discharge it directly to a BMP (i.e. infiltration, bioretention, stormwater planter, landscape feature, simple rooftop disconnection, etc.)? \_\_\_\_\_

- Does the RWH system alone, or in combination with infiltration practices, manage the volume of runoff from the first 1 inch of rainfall over the entire site? **If yes**, the plan meets the Comprehensive Plan goal to retain the first 1 inch onsite. **If no**, continue to the next checklist item. Additional BMPs are needed to help meet the Comprehensive Plan goal. \_\_\_\_\_

| YES | NO | Runoff Reduction Practices | Sheet No. if applicable |
|-----|----|----------------------------|-------------------------|
|-----|----|----------------------------|-------------------------|

- Will **Runoff Reduction BMPs** with underdrains and a subsurface stone storage layer be used to capture and treat some, or all, of the runoff from the first 1 inch of rainfall for the entire site? \_\_\_\_\_
- Will the design of runoff reduction practices conform to the PFM and/or Virginia DCR Stormwater Design Specifications found at the Virginia BMP Clearinghouse Website? \_\_\_\_\_
- Does the total volume treated by infiltration, RWH system, and runoff reduction BMPs - either alone or in combination - meet or exceed the volume of runoff from the first 1 inch of rainfall over the entire site? **If yes**, the plan meets the Comprehensive Plan goal to retain the first 1 inch onsite. **If no**, continue to the next checklist item. Additional BMPs are needed to help meet the Comprehensive Plan goal. \_\_\_\_\_

| YES | NO | Tier 2 Innovative BMPs | Sheet No. if applicable |
|-----|----|------------------------|-------------------------|
|-----|----|------------------------|-------------------------|

- If the stormwater goals are not fully achievable using the stormwater practices listed above, then innovative BMPs that have been approved for use in other jurisdictions may be used to meet the stormwater goals. Are any other **new and innovative BMP practices** proposed that will reduce runoff volume and/or control peak flows for the first 1" of rainfall? \_\_\_\_\_
- If yes**, have the proposed new and innovative practices been accepted for use in another jurisdiction? If so, what is the name of the jurisdiction(s) where the practice has been \_\_\_\_\_  
\_\_\_\_\_
- Will the plan and calculations include a runoff reduction and/or total phosphorus removal rate that has been assigned by another jurisdiction? (Fairfax County will verify runoff reduction rates, efficiencies, and/or removal rates with the named jurisdiction) \_\_\_\_\_
- Will the innovative practice(s) proposed be appropriate for use in Fairfax County considering local soils, climatic patterns, availability of materials, cost of maintenance, and other factors? \_\_\_\_\_
- Will the plans and documentation include recommended maintenance procedures and frequency of inspection for the innovative practice(s)? \_\_\_\_\_
- Does the total volume treated by infiltration, RWH, runoff reduction BMPs, and Tier 2 practices - either alone or in combination - meet or exceed the volume of runoff from the first 1 inch of rainfall over the entire site? **If yes**, the plan meets the Comprehensive Plan goal to retain the first 1 inch onsite. **If no**, continue to the next checklist item. Additional BMPs are needed to help meet the Comprehensive Plan goal. \_\_\_\_\_

| YES | NO | Tier 3 Innovative BMPs | Sheet No. if applicable |
|-----|----|------------------------|-------------------------|
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- Will the plan propose any other **new and innovative practices** that are not within the PFM, previously approved for use by Fairfax County, Virginia BMP Clearinghouse, or approved for use in another jurisdiction? (If yes, then adequate documentation should be included for the county to evaluate the innovative practice). \_\_\_\_\_

- If yes**, will the innovative practice(s) proposed be appropriate for use in Fairfax County considering local soils, climatic patterns, availability of materials, cost of maintenance, and other factors? \_\_\_\_\_
- Will the plans and documentation include recommended maintenance procedures and frequency of inspection for the innovative practice(s)? \_\_\_\_\_
- Does the total volume treated by infiltration, RWH , runoff reduction BMPs, and Tier 2 and 3 practices - either alone or in combination - meet or exceed the volume of runoff from the first 1 inch of rainfall over the entire site? **If yes**, the plan meets the Comprehensive Plan goal to retain the first 1 inch onsite. **If no**, continue to the next checklist item. Additional BMPs are needed to help meet the Comprehensive Plan goal. \_\_\_\_\_

**YES NO Offsite or Shared Facilities Sheet No. if applicable**

- Will **shared, or offsite stormwater management facilities** be used to manage some, or all, of the runoff from the first 1 inch of rainfall for the entire site? If so, where will the offsite facilities be located? \_\_\_\_\_
- If yes**, proposed offsite / shared practices include:
  - Infiltration  Runoff reduction practices
  - Rainwater harvesting  Other \_\_\_\_\_

**YES NO N/A Conformance with Comprehensive Plan Stormwater Goals Sheet No. if applicable**

- Will the proposed design manage the first 1 inch of rainfall in a way that infiltrates, reuses, or evaporates rainfall before it leaves the site? If yes, the plan meets the Comprehensive Plan goal to retain the first 1 inch onsite. \_\_\_\_\_
- Will the proposed design optimize runoff reduction by employing runoff reduction stormwater practices (i.e. rainwater harvesting, infiltration, bioretention, permeable pavement, green roof, etc.) to the extent possible? \_\_\_\_\_
- If the "1-inch" goal cannot be fully achieved, has it been demonstrated that all available measures were considered for implementation 'to the extent possible' to achieve total or at least partial retention of the first inch of rainfall? \_\_\_\_\_
- If retaining the runoff from the first 1 inch of rainfall is not fully achieved, does the proposed design control peak flow for that which cannot be retained onsite? \_\_\_\_\_
- Has runoff from streets been addressed, either through innovative BMPs and low impact development techniques that would be integrated into the street design or through other measures? \_\_\_\_\_
- If street runoff has not been addressed, does the stormwater narrative justify why this is not feasible, allowed, and/or practicable? \_\_\_\_\_
- If applicable, is restoration and/or stabilization of degraded streams proposed using restoration and stabilization techniques that incorporate ecologically and aesthetically beneficial, vegetated approaches (including off-site efforts to restore and/or stabilize streams in Tysons Corner)? \_\_\_\_\_

