City of Chattanooga

Runoff Reduction

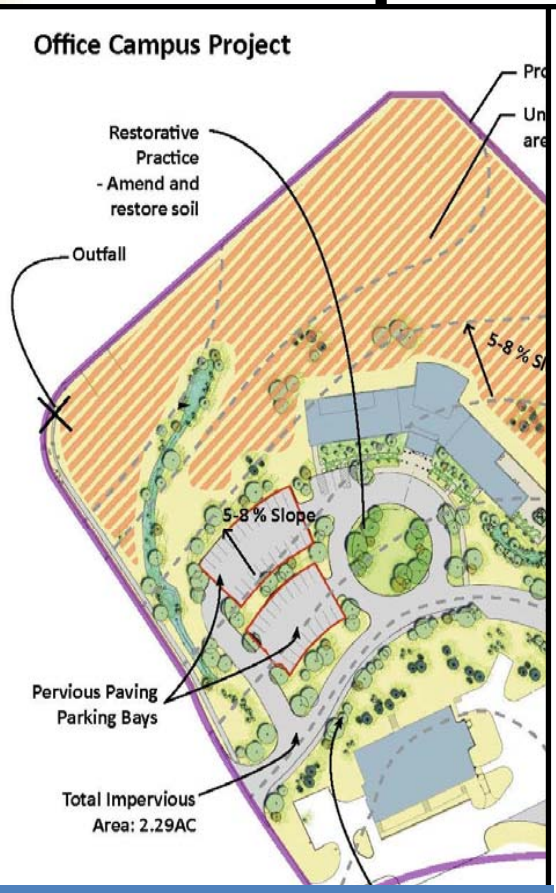
Permits, Construction, and As-Built Drawings

Plan Submittal Process

- **Concept Phase Submittal**
- **Preliminary Phase Submittal**
- **Final Submittal**

Plan Submittal Process

- **Concept Phase Submittal**



Blob Drawing

CONCEPT STORMWATER MANAGEMENT PLAN

ITEM DESCRIPTION
Existing Site Conditions Assessment Plan – 1"=100' scale maximum, showing the following

a. Property owners
b. Easements
c. Existing zoning of adjoining parcels (ref: Hamilton County GIS Zoning Layer)
d. Contours, 2' intervals (http://www.chattanooga.gov/searchresults?q=gis+maps)
e. Site Drainage
   1. Water bodies (perennial and intermittent creeks, streams, springs, lakes, a ponds)
   2. Riparian corridors
   3. Mapped floodplains
   4. Wetlands (including vegetation condition – wet meadow, shrub/scrub, and swamp)
f. Vegetation and its Condition (annotate drawing)
   1. Tree canopy lines
   2. Individual trees (above 6" in caliper, identify specimens)
g. Soil Types (http://websoilsurvey.nrcs.usda.gov)
   1. List all soil types with descriptions
   2. Indicate alluvial soils
   3. Description table to include, at a minimum:
      i. Permeable soils based on hydrologic soil groups
      ii. Soil structure based on soil maps (% sand, silt, and clay)
h. Geologic Features
   1. Karst areas/sinkholes
   2. Rock outcrops
i. Manmade features including, but not limited to, buildings, parking areas, utilities, of-way, cemeteries, and burial grounds
j. Other (describe below)

Proposed Site Layout Plan – 1"=100' scale maximum, showing the following items overlai the project parcel map and site inventory map:

a. Layouts and width of the right-of-way and paving of proposed streets, alleys, and easements
b. Layout of lots showing approximate dimensions, lot numbers, and approximate ar each lot
c. Parcels of land intended to be dedicated or reserved for schools, parks, playgroun parking areas, common open space, or other public, semi-public or community pur
d. Any identified floodplain area or district, including limits of the 100-year flood defi FEMA
e. Propos
f. All pr
g. Propos
h. Propos
i. Constr
j. Buffer

Checklist

Project Name:	PROJECT	**WORKSHEET 1: SOV and BMP AREA**
Date Prepared:	DATE	
Prepared by:	NAME	

=> Denotes input by user

SOV DESIGN RAINFALL = 0.5 in.

TARGET LOADING RATIO = 10 (See Ch. 5 for details)

Concept Design

	Total Parcel Area =	348,480	ft.²	or	8.00 ac
	Total Proposed Impervious Area =	99,844	ft.²	or	2.29 ac
Protected Areas					0.00 ac
5.2.1	Area of Protected Undisturbed and Healthy Soils	178,596	ft.²	or	4.10 ac
5.2.1.1	Area of Minimized Land Disturbance	0	ft.²	or	0.00 ac
5.2.1.2	Area of Protected Soils/Steep Slopes	0	ft.²	or	0.00 ac
5.2.2	Area of Protected Natural Flow Paths	0	ft.²	or	0.00 ac
5.2.3	Area of Protected/Enhanced Riparian Corridors	0	ft.²	or	0.00 ac
5.2.4	Area of Protected/Preserved Vegetation	0	ft.²	or	0.00 ac
	Total Protected Area	178,596	ft.²	or	4.10 ac
	Total Disturbed Area	169,884	ft.²	or	3.90 ac
					0.00 ac
	Total Impervious Area	99,844	ft.²	or	2.29 ac
	Total Pervious Area	70040	ft.²	or	1.61 ac
	Concept Level BMP Area (Based on Proposed Impervious Area)	9,984	ft.²	or	0.23 ac

Disturbed Area Requiring Stormwater Management =	169,884	ft²	(A)
=	3.90	ac	

Runoff Coefficients, Rv for Design Rainfall

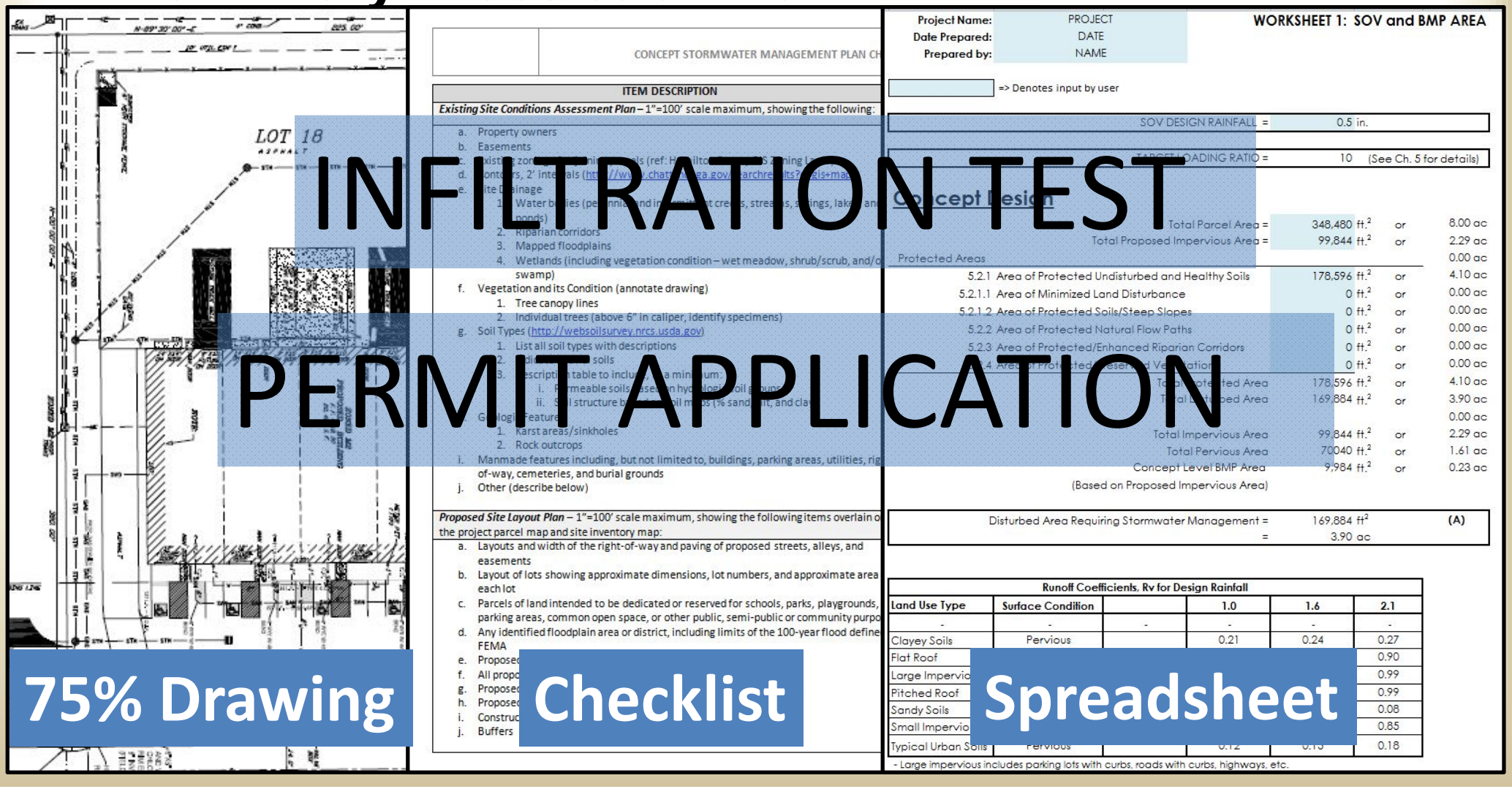
Land Use Type	Surface Condition		1.0	1.6	2.1
-	-	-	-	-	-
Clayey Soils	Pervious		0.21	0.24	0.27
Flat Roof					0.90
Large Impervio					0.99
Pitched Roof					0.99
Sandy Soils					0.08
Small Impervio					0.85
Typical Urban Soils	Pervious		0.12	0.15	0.18

- Large impervious includes parking lots with curbs, roads with curbs, highways, etc.

Spreadsheet

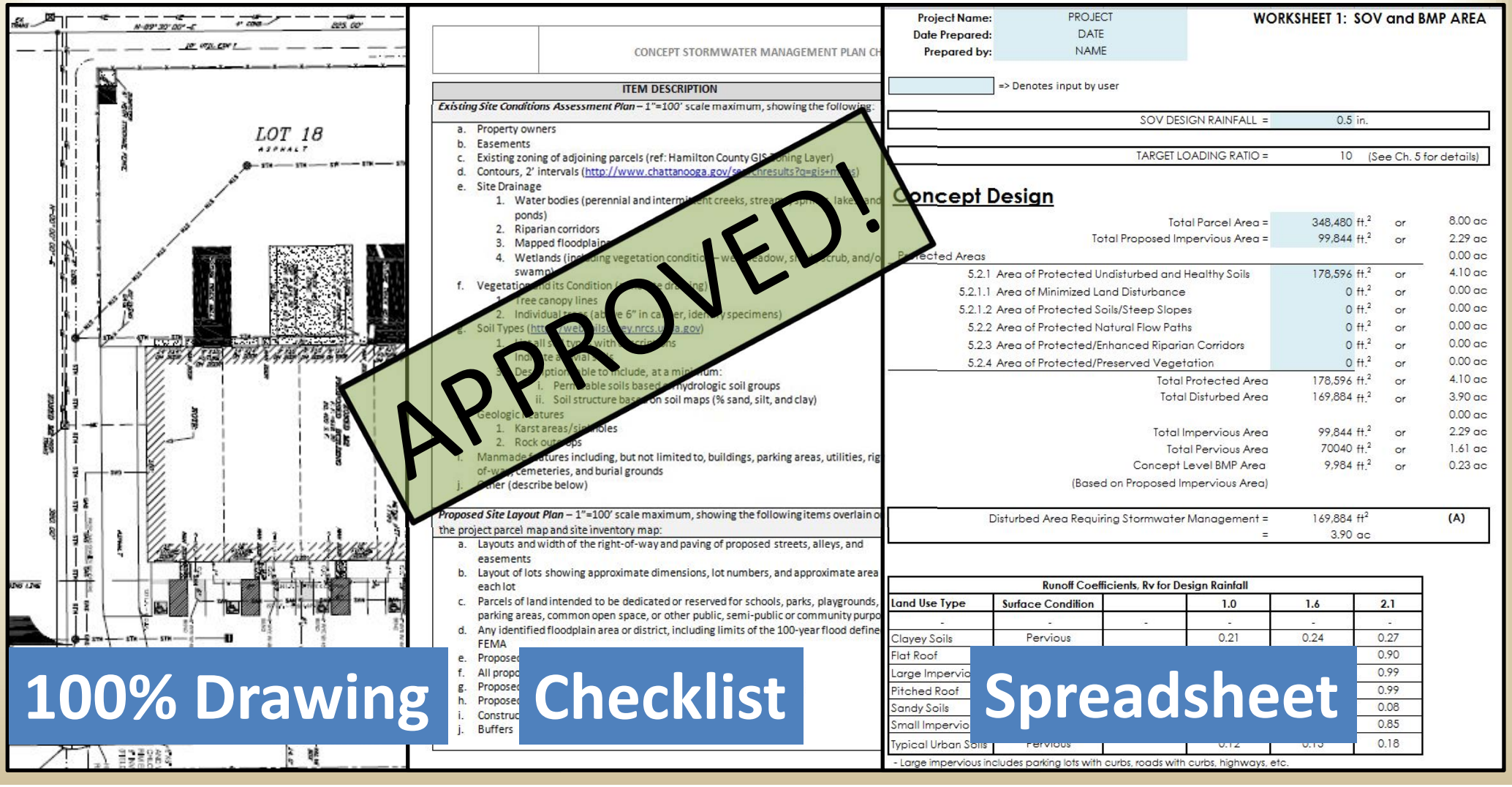
Plan Submittal Process

- **Preliminary Phase Submittal**



Plan Submittal Process

- **Final Submittal**



Plan Submittal Process

- **Concept Submittal**
  - **Desktop review and Concept Drawing**
  - **Face to Face meeting w/ LDO**
  - **Developer/Engineer leaves with review comments**
- **Preliminary Phase Submittal**
  - **Preliminary Engineering Drawings and meeting w/ LDO**
  - **Preliminary SW Calculations/soil tests**
  - **Developer/Engineer leaves with review comments**
- **Final Submittal**
  - **Final Engineering drawings**
  - **Review & Approval by LDO**

Construction Phasing & Installation

- **Do**- keep heavy equipment OUT of BMP's.
- **Don't**- Compact soil inside BMP area using heavy equipment.

Controlling sediment during construction

***Infiltration beds, rain gardens, bio-swales, bio-ponds, certain underground detention systems and some other Low Impact Development (LID) or Green Infrastructure BMP's must be protected from sediment laden runoff during construction.

***Sedimentation of these types of BMP's may result in delays, re-installation or even total loss of suitable BMP conditions.

Construction Phasing and Installation

- **BMP's must be protected from construction site runoff;**
- **Phasing of BMP construction is critical to its success;**
- **Sedimentation of a BMP may cause it to malfunction and may lead to delays or even re-installation of the BMP.**

Construction Phasing and Installation

- **Q- Must I complete other areas of construction before installing the BMP?**
- **A- YES. Begin BMP construction only once rest of site is complete and/ or stable;**
- **Q- Does this mean I may have to provide stabilization before installing the BMP?**
- **A- YES. Sedimentation of a BMP may cause it to malfunction and may lead to delays and even re-installation of the BMP;**

IF phased & protected properly during construction Green Infrastructure can be completed in a timely, cost-effective way.

As-built drawings & Engineer's Certifications

- **Survey shots must be taken during construction;**
- ****If you cannot survey *after* installation, then you must survey *during* installation;**
- **Survey data must be provided on the as-built drawings;**
- ****Engineer must certify that the BMP has been installed properly.**

As-Built Drawings

- **What information is required?**
- **When & Why is it required?**
- **Who is responsible for providing the information?**
- **Why is this different than in the past?**

As-Built Drawings

- **What information is required?**

"As Built Plans" means drawings depicting structures, facilities, systems, landscaping, and site conditions as they were actually installed and constructed.

- Drainage Structure Number;
- Drainage Structure Label (ex: oil skimmer, water quality unit type/model, etc.);
- Northing, Easting, and Rim Elevation;
- Invert Elevations;
- Size, Material, and Direction of flow for each pipe entering and leaving the drainage feature;
- Detail drawings of water quality features including but not limited to profiles, contours, and elevations (ex: bio-retention areas, swales, grass filter strips, etc.).

As-Built Drawings

- **Why is it required?**
  - **The City is required by TDEC to maintain an inventory of all stormwater infrastructure within the MS4 boundaries, and to inspect WQ BMP's on a regular basis.**
- **When is it required?**
- **In a nutshell – PRIOR TO A CERTIFICATE OF OCCUPANCY BEING ISSUED.**

As-Built Drawings

- **Who is responsible for providing the information?**
- As Built Plans must show the final design specifications, meet the criteria in the RMG and per City requirements, and be sealed by a registered **professional engineer**, **registered land survey**, or **registered landscape architect** licensed in Tennessee.
- Typically, there is a note on the construction drawings that makes the **contractor** responsible for retaining the services of a licensed professional to perform this task.

As-Built Drawings

- **Why is this different than in the past?**

- Actually, it isn't that different, except that some of the BMP's we will be using will be different and may require different data collection techniques.

Landscape Performance BMPs

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Questions?

Thank You!