Stormwater Management Practices
Design Standard

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New Standard!

334100 STORMWATER MANAGEMENT PRACTICES

Cornell's Design and Construction Standards provide mandatory design constraints and acceptable or required products for all construction at Cornell University. These standards are provided to aid the design professional in the development of contract documents and are not intended to be used verbatim as a contract specification nor replace the work and best judgement of the design professional. Any deviation from the Design and Construction standards shall only be permitted with approval of the University Engineer.

PART 1: GENERAL

1.01 INTENT AND BACKGROUND

A. Cornell is committed to reducing the quantity of, and improving the quality of, stormwater that flows from its land. The University strives to construct the most efficient stormwater management practices (SMPs) that are deemed cost effective and provide ease of maintenance for the subject building or project use type.

B. SMPs manage rain where it falls. They reduce or delay the volume of stormwater that enters the stormwater system or local waterways, reduce the maximum flow rate, and improve water quality.

C. This design standard should be referenced by all members of the planning and design team. All parties involved in project conception, design, construction, and operation are responsible for executing project stormwater capture goals and requirements. Stormwater management should be considered at the design concept stage.

D. This design standard pertains to green infrastructure and infiltration/detention/retention/water quality installations on campus, as opposed to the University's "gray infrastructure" such as storm inlets/catch basins and storm pipes.

Stormwater Management Practices – Examples

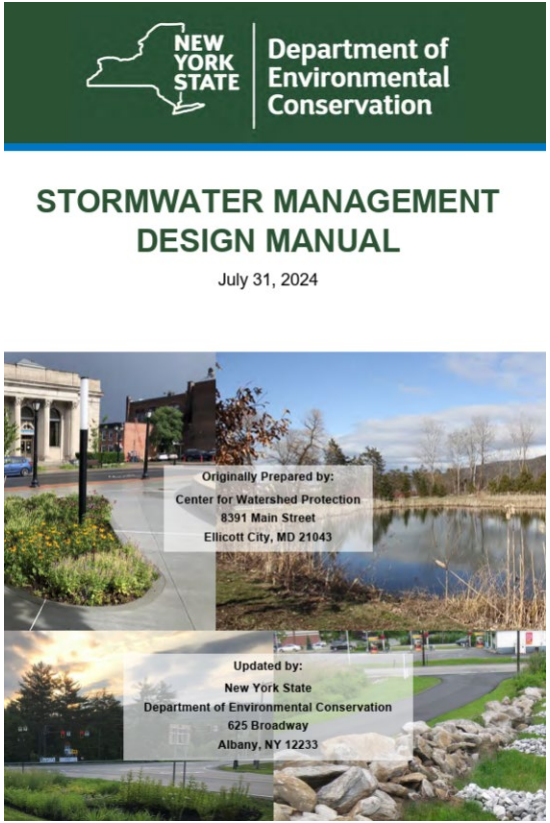
Cornell University – Bioretention, NCRE

https://www.conteches.com/stormwater-management/filtration/jellyfish-filter/

Stormwater Park in Milwaukee, WI. Image courtesy: Aaron Volkening, CC BY 2.0 https://creativecommons.org/licenses/by/2.0, via Wikimedia Commons

Stormwater Management Practices (SMP) – Design Standard

- SMPs manage rain where it falls
- Pertains to permanent green infrastructure and infiltration/retention/filtration practices
  - Not for designing “gray infrastructure” like pipes and inlets
- Requires designers to follow NYSDEC Stormwater Design Manual



Stormwater Management Practices (SMP) – Design Standard

- For projects with 1 acre+ soil disturbance during construction, requires permanent “enhanced stormwater capture” to qualify for phosphorus offsets
- For projects with less than 1 acre of soil disturbance, Cornell may request additional stormwater capture if project is pre-identified as a “stormwater focus project”

Cornell University CIS building under construction in 2023, https://cis.cornell.edu/new-building/building-updates

Stormwater Management Practices (SMP) – Design Standard

- Standard requires soil permeability testing if infiltration is proposed
- Requires use of NYSDOT bioretention soil (with modifications) and associated testing
- Includes lists of shrubs and plants that work well on Cornell campus

Bioretention soil, from https://dirtexchange.us/products/rain-garden-bio-retention

Photos, left to right: Buttonbush, Swamp Rose (attributed to Ethan M. Dropkin), and Groundseltree, from the Cornell University Woody Plants Database, https://woodyplants.cals.cornell.edu/home

Stormwater Management Practices (SMP) – Design Standard

- Thinking about stormwater management at design concept stage
- Keeping as much existing landscaping as possible
- Creating as little impervious surface as possible
- Designers must provide analysis of cost and frequency of operations & maintenance
- Designing to allow easy construction of SMP, also to allow easy maintenance of SMP in the future

Cornell Botanic Gardens, bioretention adjacent to parking lot

Stormwater Management Practices (SMP) – Design Standard

Preferred SMPs

- Planted SMPs (bioretention, swale, stormwater tree, wetland, wet pond, etc.)
- Non-planted SMPs (sand filter, membrane filter, detention chambers, etc.)
- NYSDEC-approved proprietary practices in their stormwater management design manual

Non-preferred SMPs (require additional discussion and approval from stakeholders)

- Porous/permeable pavements (gravel/grass filled concrete block pavement, poured in place porous asphalt, precast porous concrete, permeable pavers)
- Green roofs
- New or proprietary designs not included in NYSDEC stormwater management design manual

Prohibited SMPs

- Poured-in-place porous concrete
- Gravel/grass filled systems containing plastic cells as the structural element

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Thank you!

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334100

Division 32: Exterior Improvements

Expand all

Division 33: Utility Distribution

Section #	Section Name	Date Reviewed	Date Revised
330100	Utility Interruptions and Connections	09-08-23	08-09-16
330526	Utility Identification: Direct Buried Non-conductive	10-01-24	12-06-19
331000	Water Distribution	10-23-23	10-23-23
333000	Sanitary Sewer	03-15-23	08-09-16
334000	Storm Water	12-08-22	12-08-22
334600	Subdrainage	12-21-22	12-21-22
336113	District Heating Hot Water Distribution	02-06-24	02-06-24
337500	Medium Voltage Distribution	06-24-22	06-24-22
337800	Pole Mounted Exterior Lighting	11-05-18	11-05-18

Expand all

Division 43: Gas and Liquid Storage