



Stantec Consulting Services Inc.
482 Payne Road – Scarborough, ME 04074

November 9, 2018

Mr. Jonathan Cohen
Rawhide LLC
24 Carroll Street
Falmouth, ME 04105

Subject: Falmouth Plaza Master Plan – Stormwater Management

Dear Jonathan:

This letter is intended to support the proposal for development activity at the Falmouth Shopping Plaza. This is specifically related to the stormwater management provisions that will be required as part of the expansion of the center for mixed use development. As we understand the development planning currently consists of indoor and outdoor athletic facilities, residential, office, and retail land use to be expanded onto the existing 65-acre Falmouth Plaza site. We are aware that the Falmouth Town Council is interested in better understanding the potential for stormwater impact resulting from the proposed development as they consider zoning changes across the site. Our initial opinion is that the regulations set forth both locally and by the State's Maine Department of Environmental Protection will result in what is typically considered a robust stormwater management design for the proposed development area and will likely result in significant improvement to the overall stormwater management regime for the Plaza in general. This is due, in part, to the existing plaza age and conditions, which consist of a very rudimentary drainage collection system, with no measures for addressing water quality treatment prior to discharge of stormwater runoff into multiple drainage tributaries that leave the site and discharge to Webe's Creek and Mill Brook.

To better understand the Stormwater management standards that apply we have reviewed both the local ordinance and State regulations. The following regulatory standards apply:

Town of Falmouth

The Town regulates stormwater both thru the Site plan review standards, Subdivision Ordinance and the Chapter II-20 Stormwater and Non-stormwater Discharge Ordinance. The Town's subdivision stormwater performance standards generally speak to the peak discharge standard whereby an analysis of the traditional 2, 10- and 100-year peak discharge must be evaluated and possibly mitigated by the implementation of onsite measures. The Non-Stormwater Discharge Ordinance also outlines the Town's objectives for non-stormwater discharges thus provide some degree of oversight as to the broader water quality discussion, although the local standards seem somewhat less tied to strict numerical compliance as is outlined below for the Maine DEP Chapter 500 standards.



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State of Maine

The Control of Stormwater is covered within Chapter 500: Stormwater Management Regulations. The proposed development will likely trigger Site Law review by the Maine Department of Environmental Protection as the proposed activity will involve greater than 3 acres of structure area (includes buildings, paved or impervious areas and athletic fields¹). With the Site Law application stormwater management is covered under sections 12, 13 and 14 of the submission.

The Chapter 500 standards break down a development activity into three basic parameters consisting of the following:

- **Basic Standards** – pertaining to erosion and Sedimentation control, inspection and maintenance and housekeeping standards for long term operations of a development site. Evidence of the developer's ability to properly install, monitor and maintain the developments stormwater management systems is required as part of this submission. Further the Maine DEP now requires an applicant follow thru under a 5 year re-certification program for compliance under the stormwater management standards.
- **General Standards** – pertain to water quality treatment for 95% of all new impervious area and no less than 80% of the overall proposed developed area of the site. In the case of the Falmouth Plaza, there is likely to be requirements to upgrade areas of the existing developed site if there are development activities including, but not limited to, outparcels to be proposed along Route 1 or within the core existing plaza area.
- **Flooding standards** – pertains to the control of stormwater runoff discharging from the development site so that the peak rates of runoffs leaving the site do not exceed the peak flows under current conditions. In the case of the Falmouth Plaza the control of peak discharge may be subject to a waiver since the site is proximate to tidal conditions within Mill Creek. The basic premise is that any increase in runoff resulting from a development is mitigated by the fact that the discharge is direct to tidal conditions, wherein there is no potential for flooding impacts to downstream properties.

Overview of Existing Conditions

The Falmouth Plaza site consists of multiple parcel including the existing Plaza site within a 32 acre +/- area and additional undeveloped land consisting of approximately 33

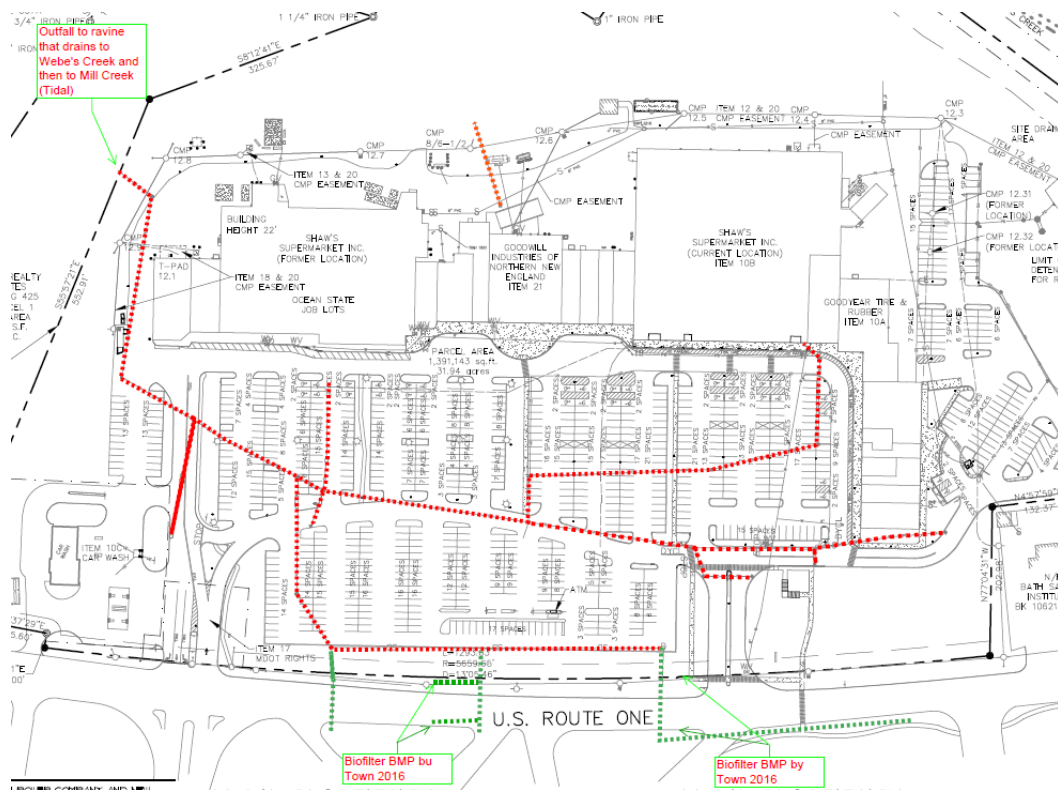
¹ See Chapter 500 Section 3 Part L for definition of Impervious Area, which includes underdrained artificial turf fields.



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acres. The total land area is approximately 65 acres. The existing plaza contains approximately 18 acres of impervious area associated with building rooftop, paved parking areas and ancillary hard surfaces around the site. The plaza was constructed prior to 1970 hence the site is a grandfathered use that was not subject to the Site Law when it was enacted in 1975. However, changes to the site, including any additional impervious areas greater than 3 acres, trigger Site Law applicability and so this is the case for the proposed development being considered.

The Site's existing drainage systems consist of a rudimentary, yet traditional closed system consisting of catch basin inlets and connecting storm drainage pipes. The catch basins may or may not contain sumps in the structures to provide the most basic collection for sediment and debris. Per the Route 1 Falmouth Commercial District study² the plaza site may contain a dry detention basin, although the specific location and condition of this system has not been specifically reviewed for this letter. This will be reviewed and considered as the project moves thru design in the future. The primary outfall for the existing parking lot discharges to the north side of the plaza in a natural drainage ravine that runs easterly towards Webe's Creek which then discharges into the tidal conditions of Mill Creek.



² See Woodard and Curran January 2013 prepared for Town of Falmouth; the Falmouth Shopping plaza is in the Webe's Creek watershed.



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We note that the US Route 1 drainage system is partially connected to the site's drainage system along a portion of the Route 1 frontage. As part of the Route 1 improvements completed in 2016, the Town installed several Bio-filter Best Management Practices along the road. These aid with providing some degree of stormwater runoff treatment prior to conveyance and discharge to Mill Creek.

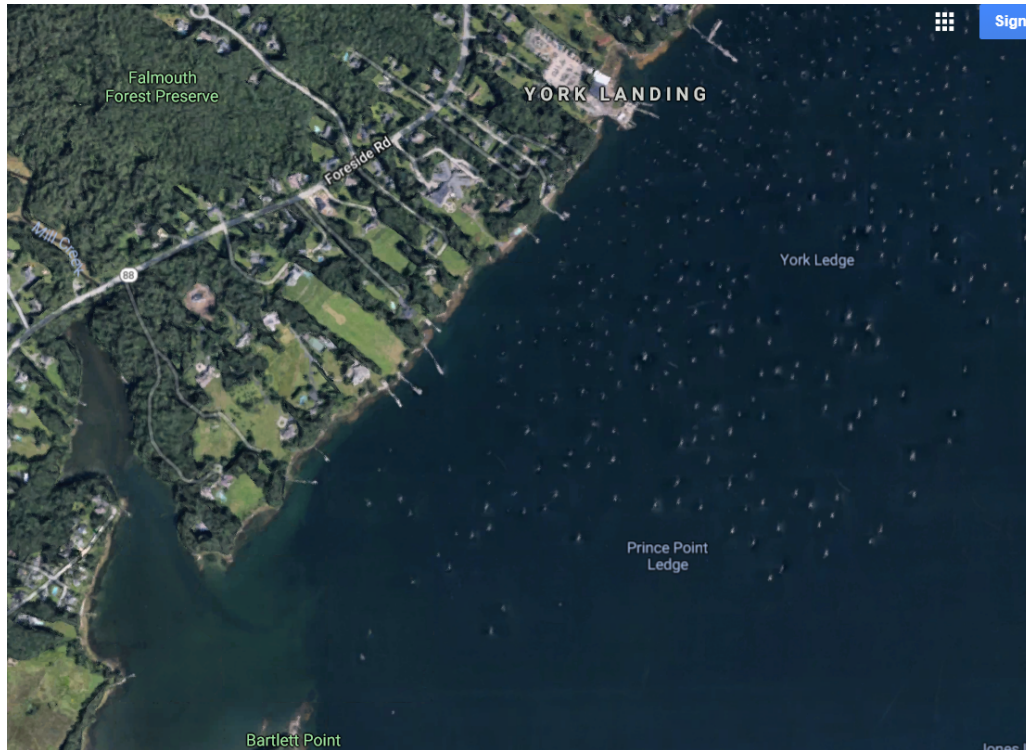


We also note that Mussel Cove is identified as an impaired Marine Waters on the MDEP Nonpoint Source Priority Watersheds list. The priority list reasoning includes the following:

- CBEP Priority water – Casco Bay Estuary Bay Partnership
- DMR/NPS Threat – Department of Marine Resources – Non-Point Source threat



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Contributing factors to the water quality issues in Mussel Cove likely include the preponderance of moored recreational vessels along the Foreside as well as the commercial development along Route 1 that contributes to Mill Creek. This listing supports the Department's ability to garner funding for improving water quality and is not specifically linked to the Chapter 500 regulations. A positive outcome related to the proposed Falmouth Plaza development will be the overall improvement to the current stormwater management systems and treatment within this watershed. The Route 1 Stormwater Management Plan also contains substantial background information and priorities for introducing retro-fit opportunities, some specifically for the Shopping Plaza property.

Initial Considerations

We offer the following initial considerations on stormwater management for the Falmouth Plaza site:

- The Chapter 500 regulations include specific treatment measures that can be considered as part of the development program. These are as follows:
 - A traditional wet pond that meets various sizing requirements whereby stormwater runoff enters the pond and is treated thru a soil media filtering



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bench around the pond perimeter. An advantage of a pond is that it can treat a larger contributing area.

- Vegetated Soil Filters – are becoming very common for commercial development given their versatility for positioning and incorporating into a comprehensive landscape approach. We expect that some form of filter system(s) will be looked at closely for implementation into the proposed project. This may include underground soil filter systems also.
- Infiltration – is not typically achieved more coastal areas simply due to soils conditions that consist of clay soils and shallow groundwater.
- Buffers – consists of undisturbed wooded areas that contain shallow slopes and sufficient soils conditions. These too, are not often used in southern Maine development sites as buffers require substantial land area and cannot typically be designed in urban settings to achieve the necessary design criteria outlined in the DEP Best Management Practice Manual.
- Innovative Treatment measures – these may involve a site-specific method and design that must go thru a rigorous examination by DEP for acceptance. One approach we've successfully used has been a gravel wetland design. This design involves the construction of a wetland area to achieve stormwater management water quality treatment. Porous pavement has also become a possible option given proper site conditions. Our most recent porous pavement application can be viewed at the Department of Human Services Parking lot in South Portland, near the Portland Jetport.
- Proprietary Systems – there are numerous product lines currently accepted by the Department that provide primary water quality treatment of stormwater runoff and these systems have received written verification from the Department on their use. These include among others:
 - Stormtec
 - Filterra
 - Jellyfish
 - FocalPoint

Conclusions:

The Falmouth Plaza site will be required to meet the Maine Department of Environmental Protection Chapter 500 Stormwater Management regulations and local Town standards. This will involve drainage system designs that will capture and treat at least 95% of the



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proposed impervious area and 80% of the overall developed area. We expect that certain measures will also be required for implementation into the existing drainage systems serving the existing parking lots and roofs, that may achieve even greater water quality treatment of this long-developed site. This will serve to work towards the goals of the Route 1 Stormwater Management Plan. The options for making these drainage improvements are relatively broad and decision making on the selection and approach to these designs will be refined as the project development moves into the full design phase.

We look forward to assisting you and discussing the development's technical needs with Town officials as the need demands. Feel free to pass this information along to Town staff so they and the Town Council may review and consider in their deliberations on the requested zoning action for the site.

Sincerely,

STANTEC CONSULTING SERVICES INC.

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Associate
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Fax: (207) 883-3376
stephen.bushey@stantec.com

Attachment: Stormwater Management Plan Strategy Plan Preliminary Sketch Book

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Falmouth Plaza

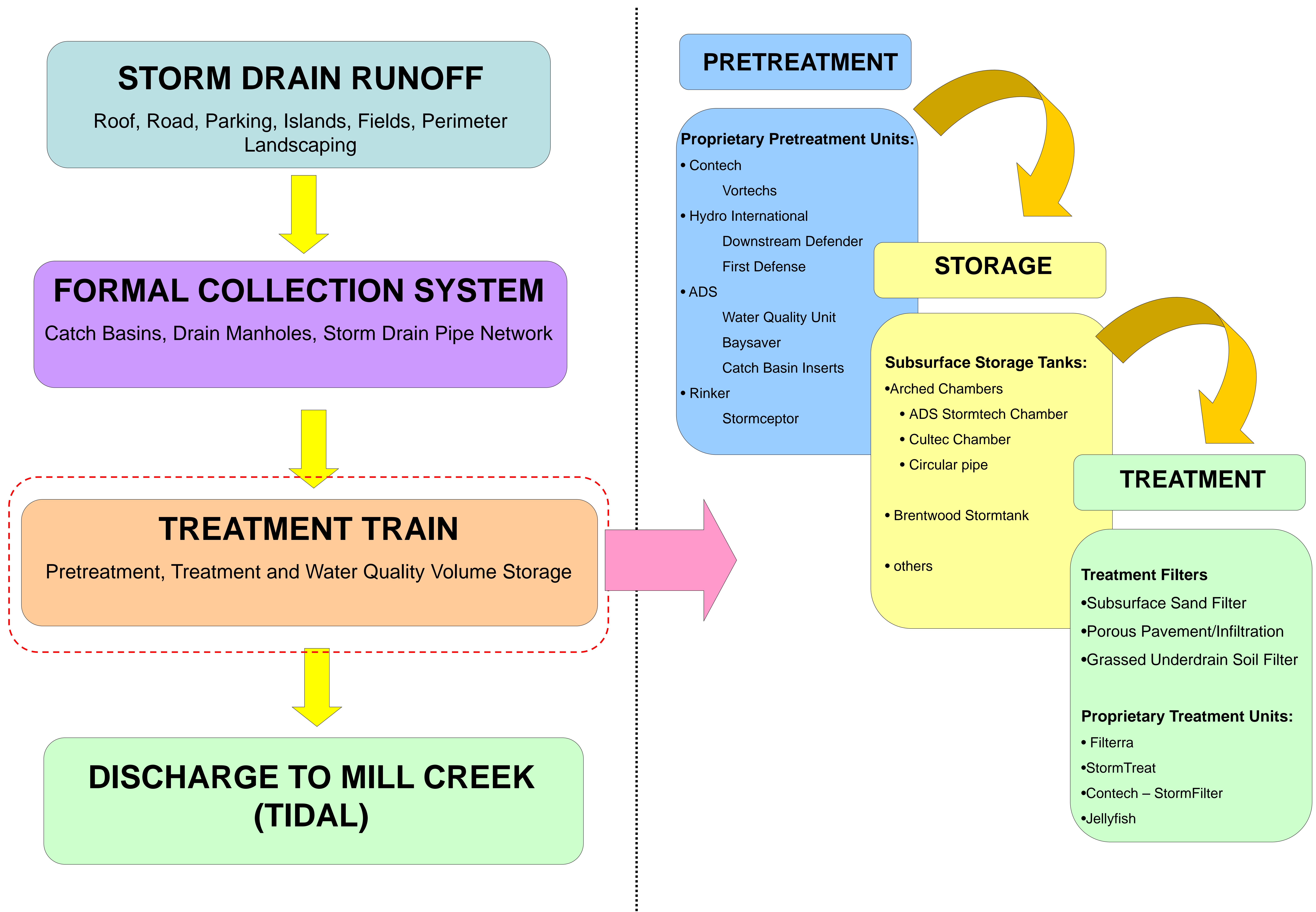
Stormwater Management Strategy Plan

Preliminary Sketch Book

**Prepared by
Stantec
482 Payne Road
Scarborough, ME 04074**

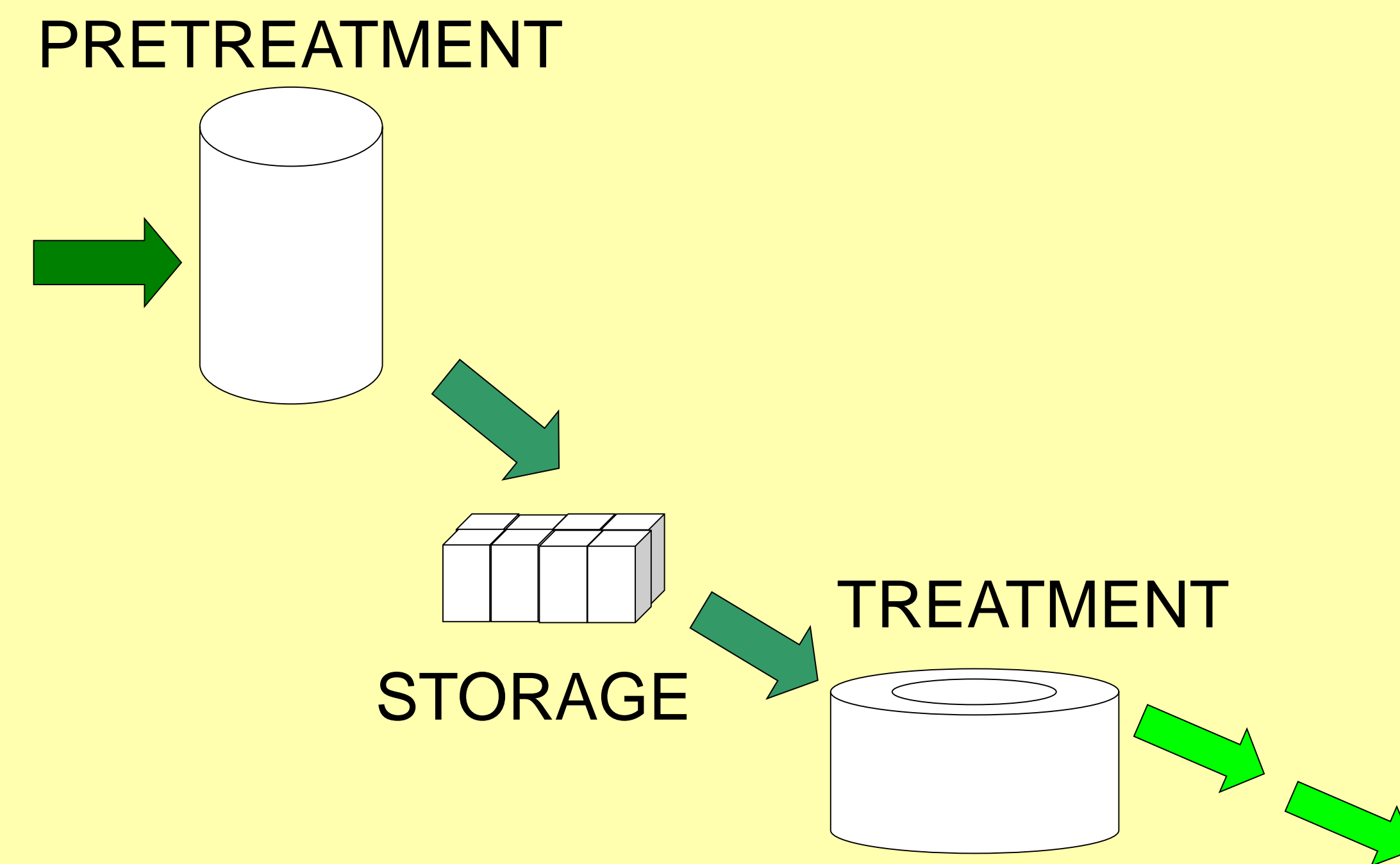
November 2018

Stormwater Management Strategy Plan



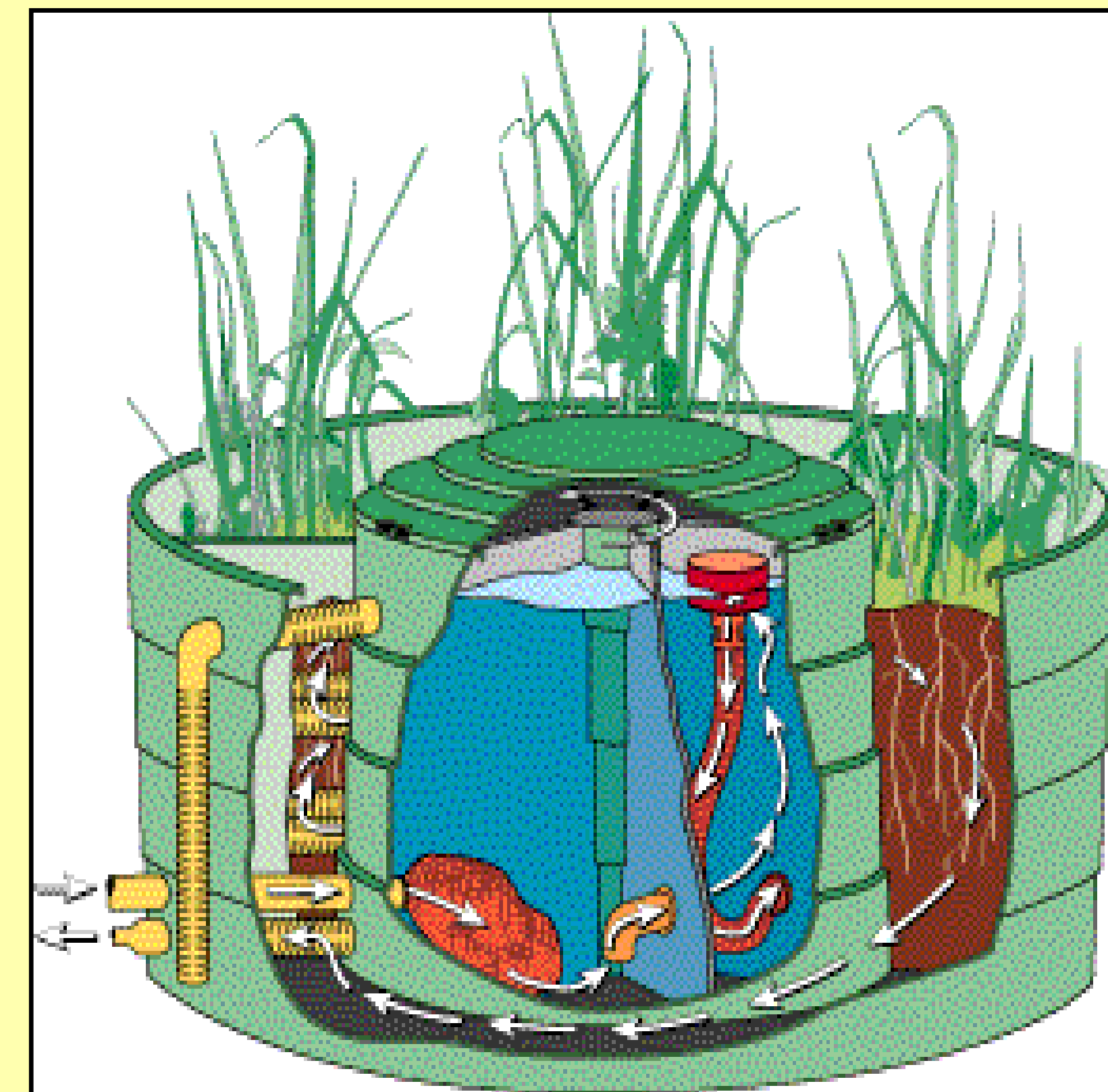
Primary Treatment Options

THE STORMTREAT UNIT



RUNOFF ENTERS UNDERGROUND STORAGE TANKS WHICH RELEASE RUNOFF TO THE STORMTREAT UNITS FOR TREATMENT. MAJOR STORM EVENTS BY-PASS THE UNITS

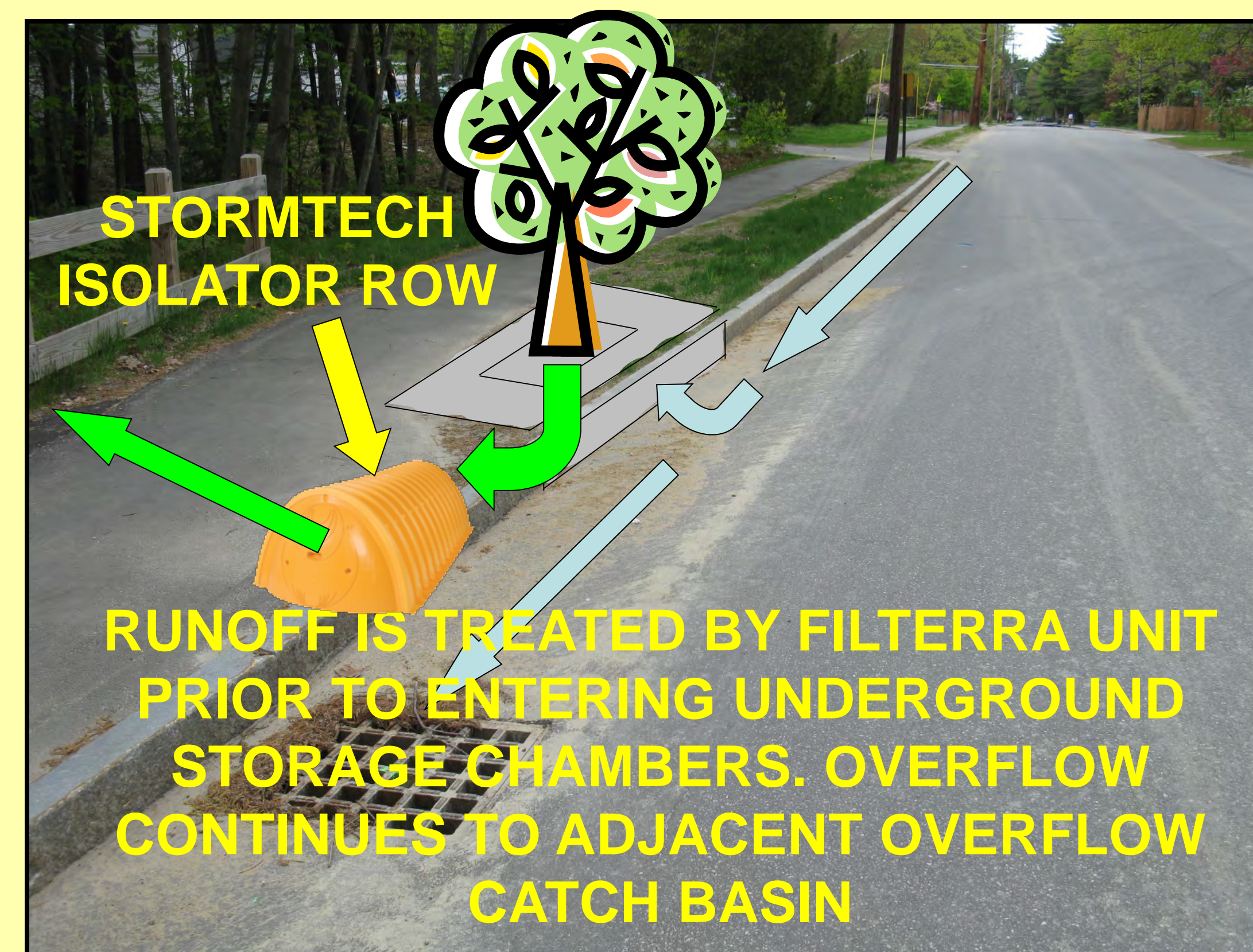
Flow Diagram



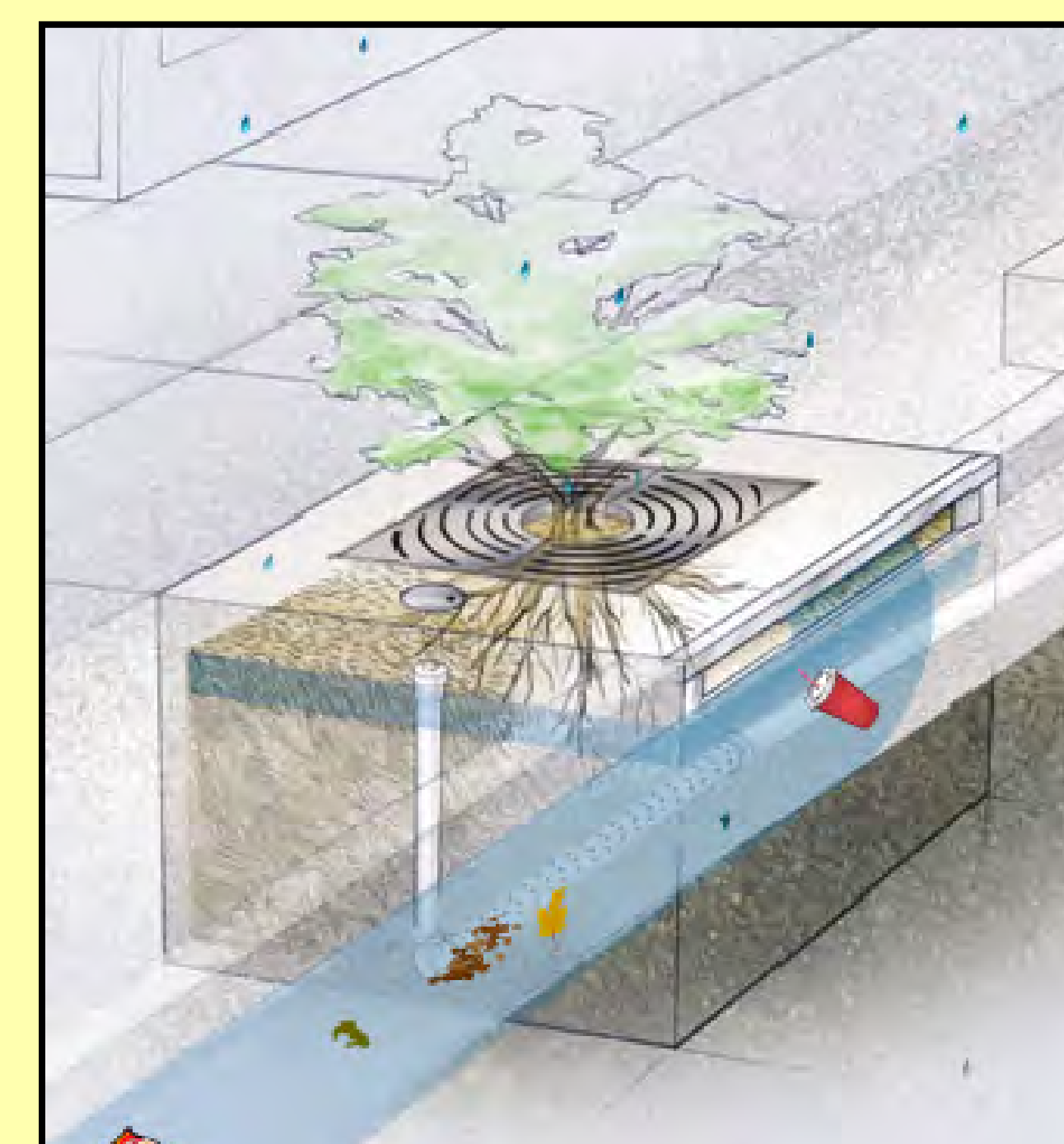
Schematic and Photo of StormTreat

(note: plantings utilize a combination of Soft Rush and Bul Rush)

THE FILTERRA UNIT



Flow Diagram

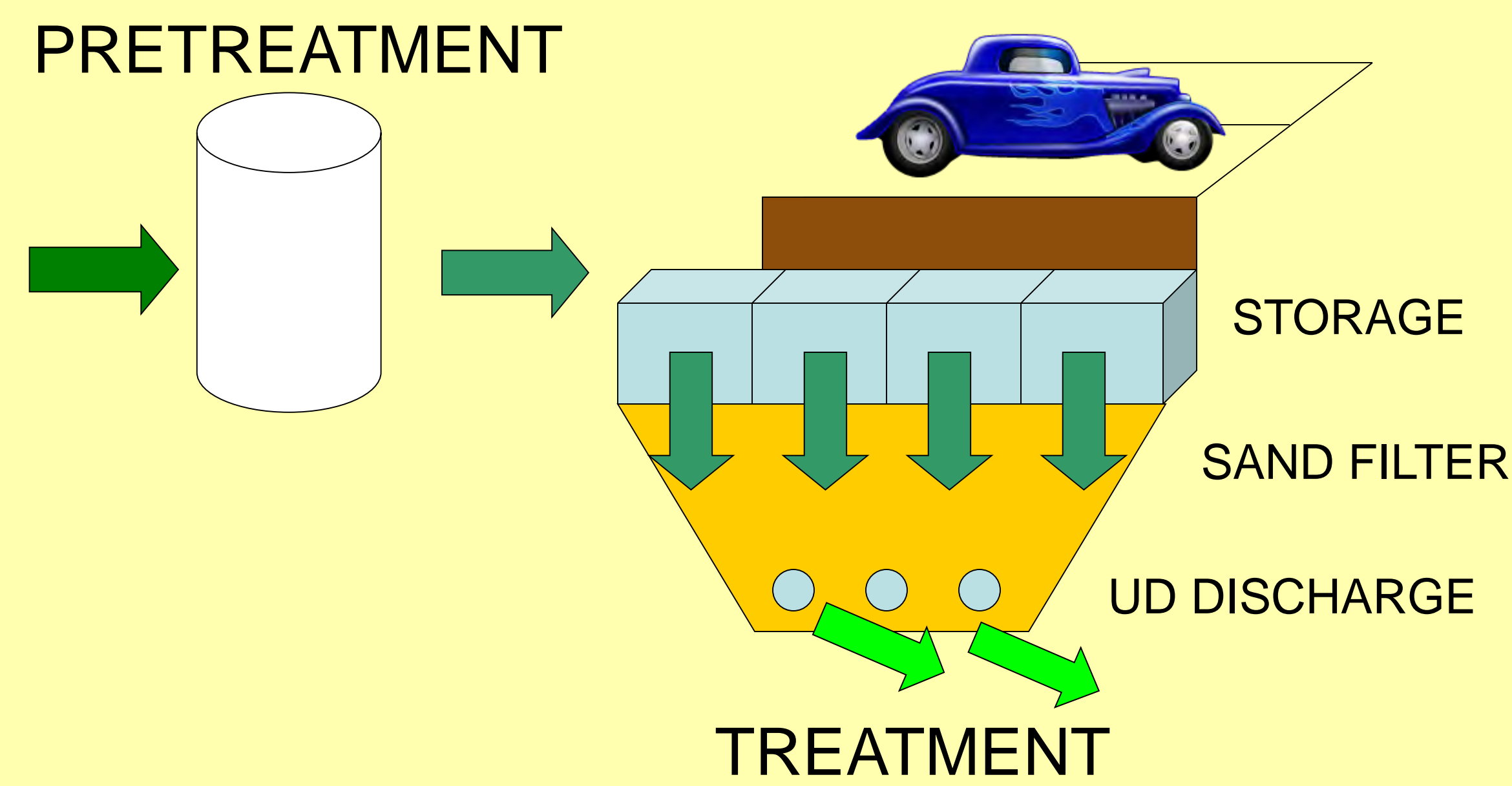


Schematic and Example of Filterra

(note: Tree species will not match this example)

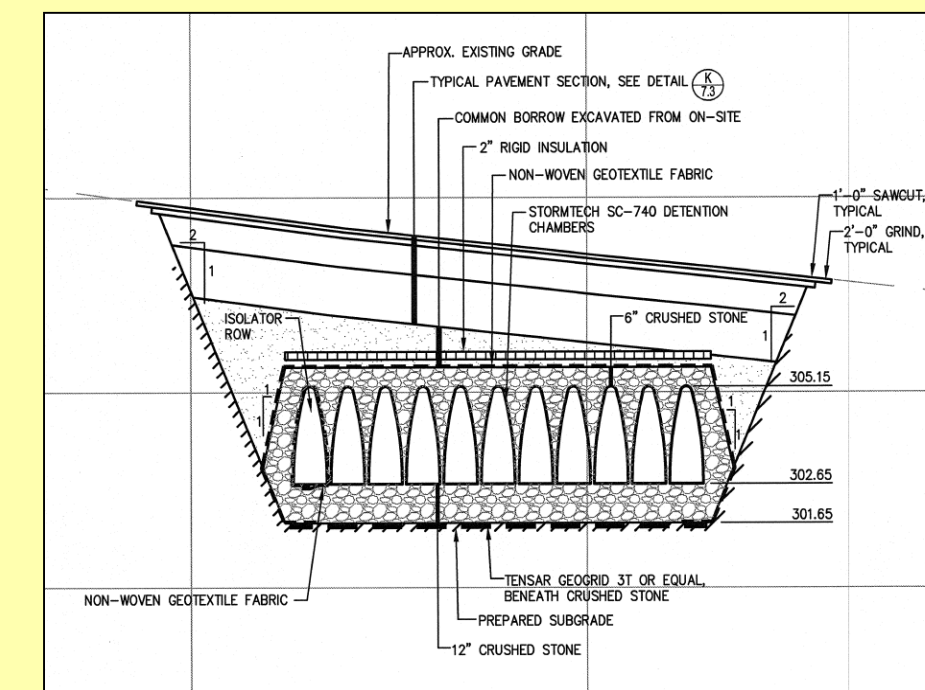
Primary Treatment Options

THE SUBSURFACE SAND FILTER APPROACH



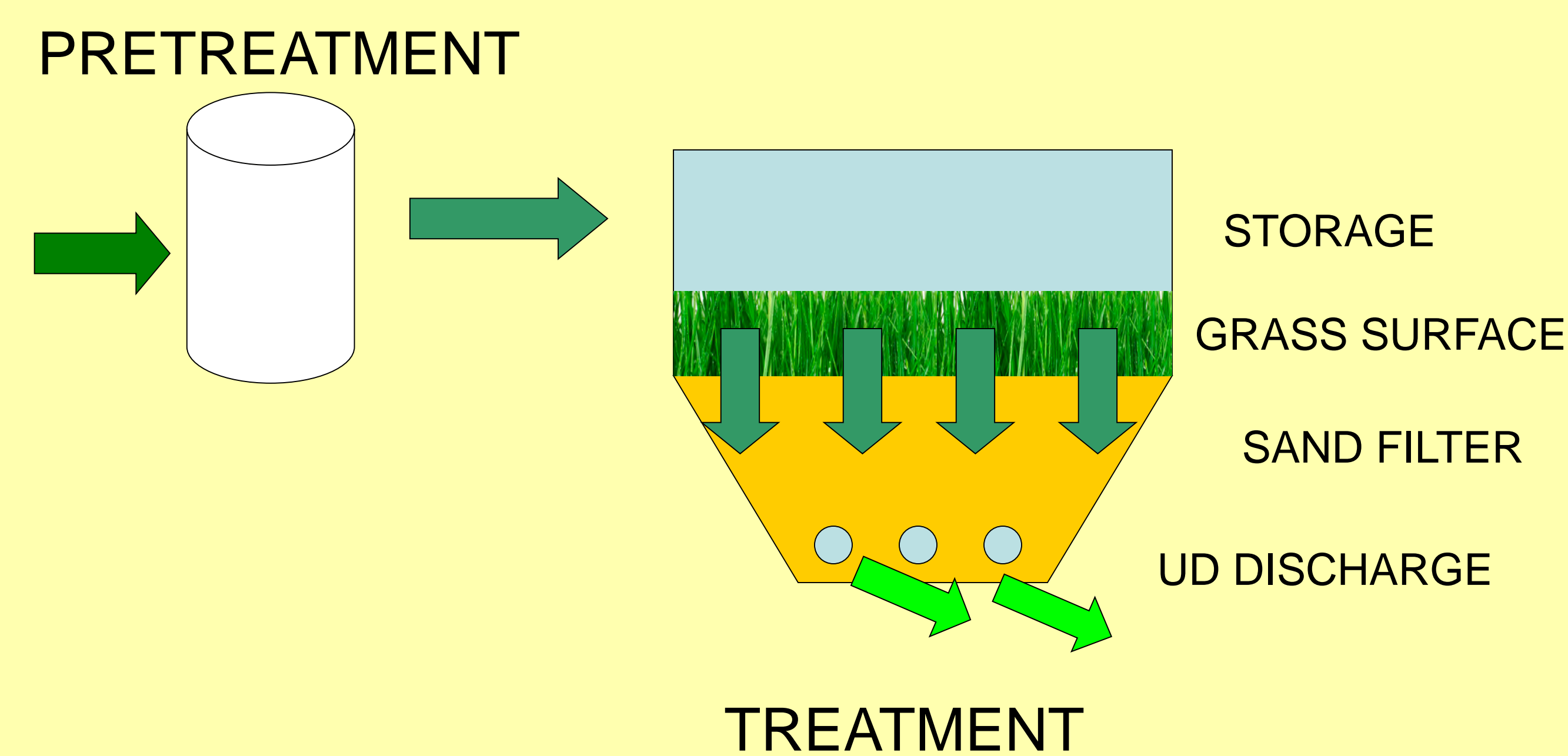
RUNOFF ENTERS UNDERGROUND TANKS AND IS TREATED BY MOVING THROUGH THE SAND FILTER BELOW. THE TREATED RUNOFF IS COLLECTED AND DISCHARGED THROUGH AN UNDERDRAIN SYSTEM

Flow Diagram



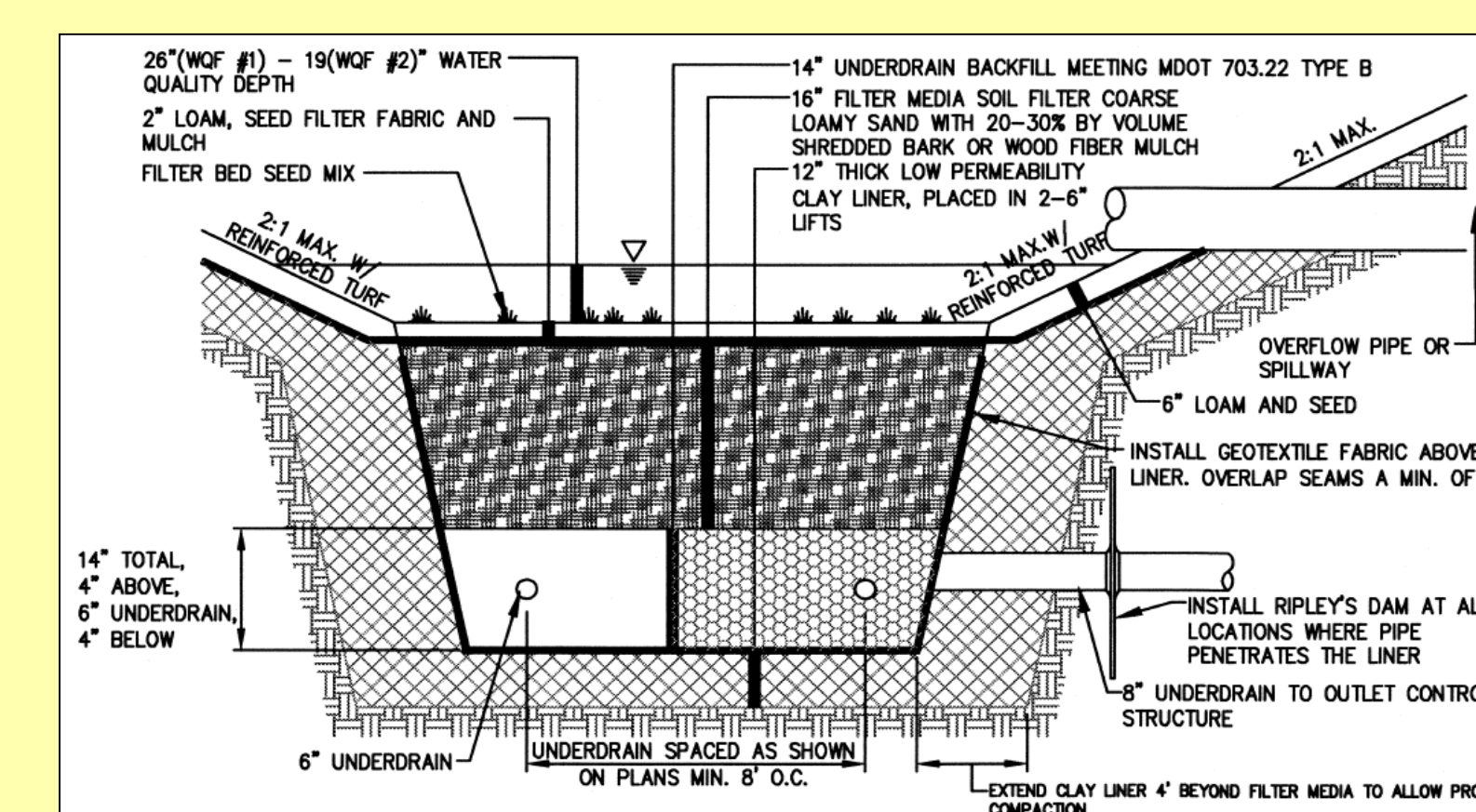
Schematic and Photo of a Subsurface Sand Filter

THE UNDERDRAINED SOIL FILTER APPROACH



RUNOFF ENTERS FILTER BASIN AREA AND IS TREATED BY MOVING THROUGH THE GRASSED SOIL FILTER BELOW. THE TREATED RUNOFF IS COLLECTED AND DISCHARGED THROUGH AN UNDERDRAIN SYSTEM

Flow Diagram

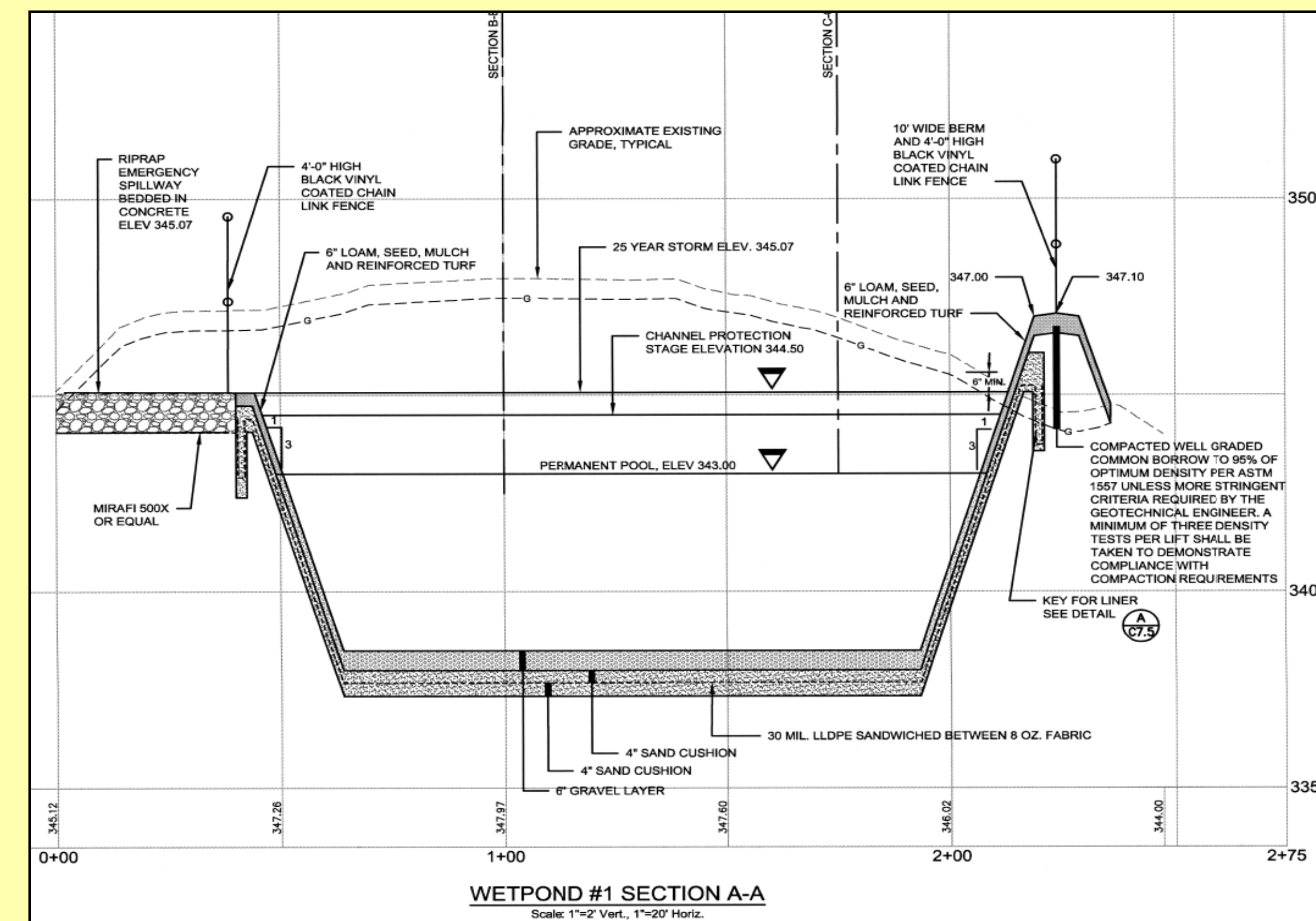


Schematic and Example of Soil Filter

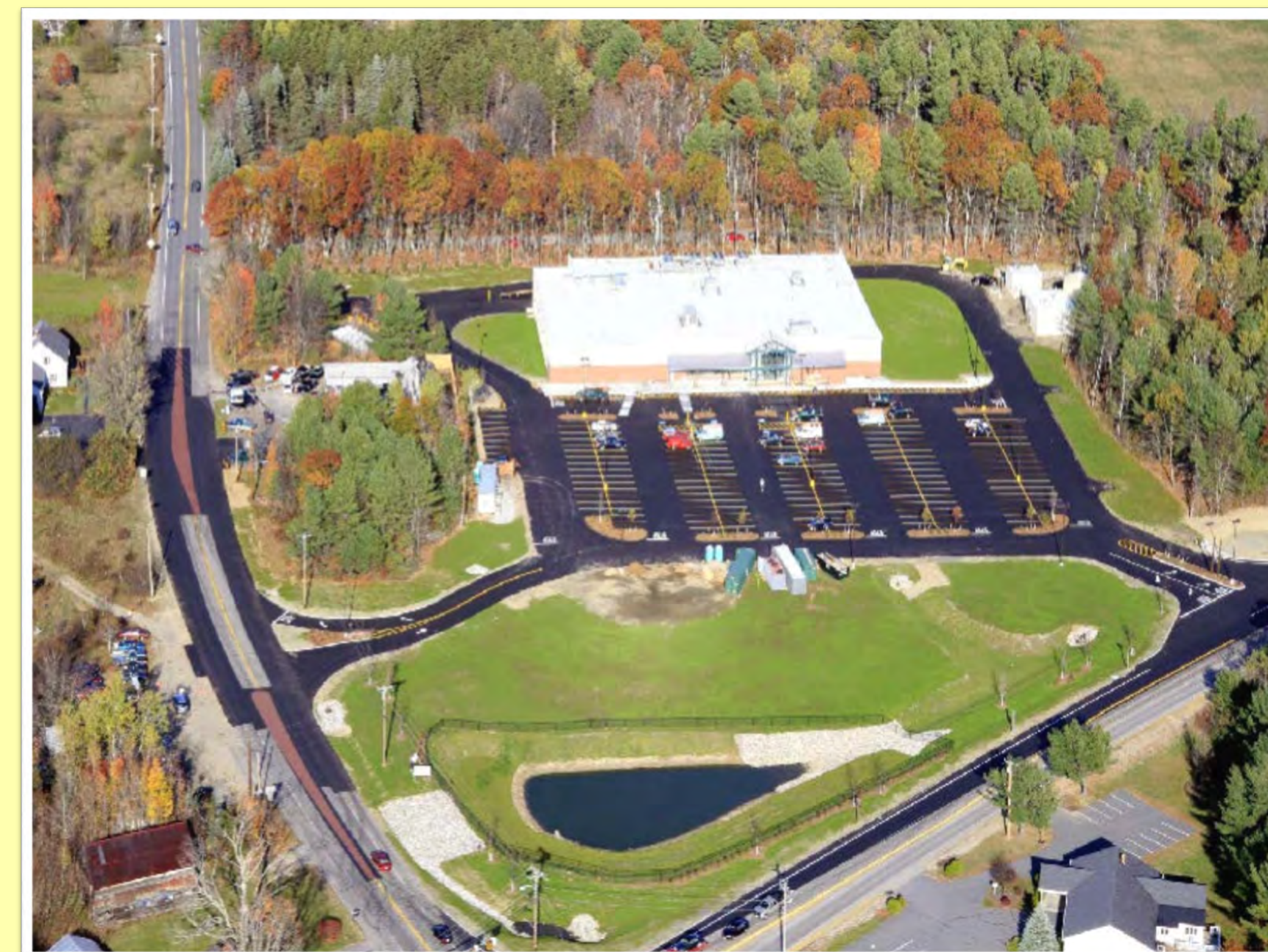
Primary Treatment Options

THE WET POND APPROACH

RUNOFF IS COLLECTED VIA FORMAL DRAINAGE SYSTEM INCLUDING CATCH BASINS, MANHOLES AND PIPE AND IS DIRECTED TO THE WETPOND. WETPONDS CAN BE UTILIZED FOR BOTH WATER QUALITY TREATMENT AND WATER QUANTITY CONTROL



Typical Section for Wet Ponds



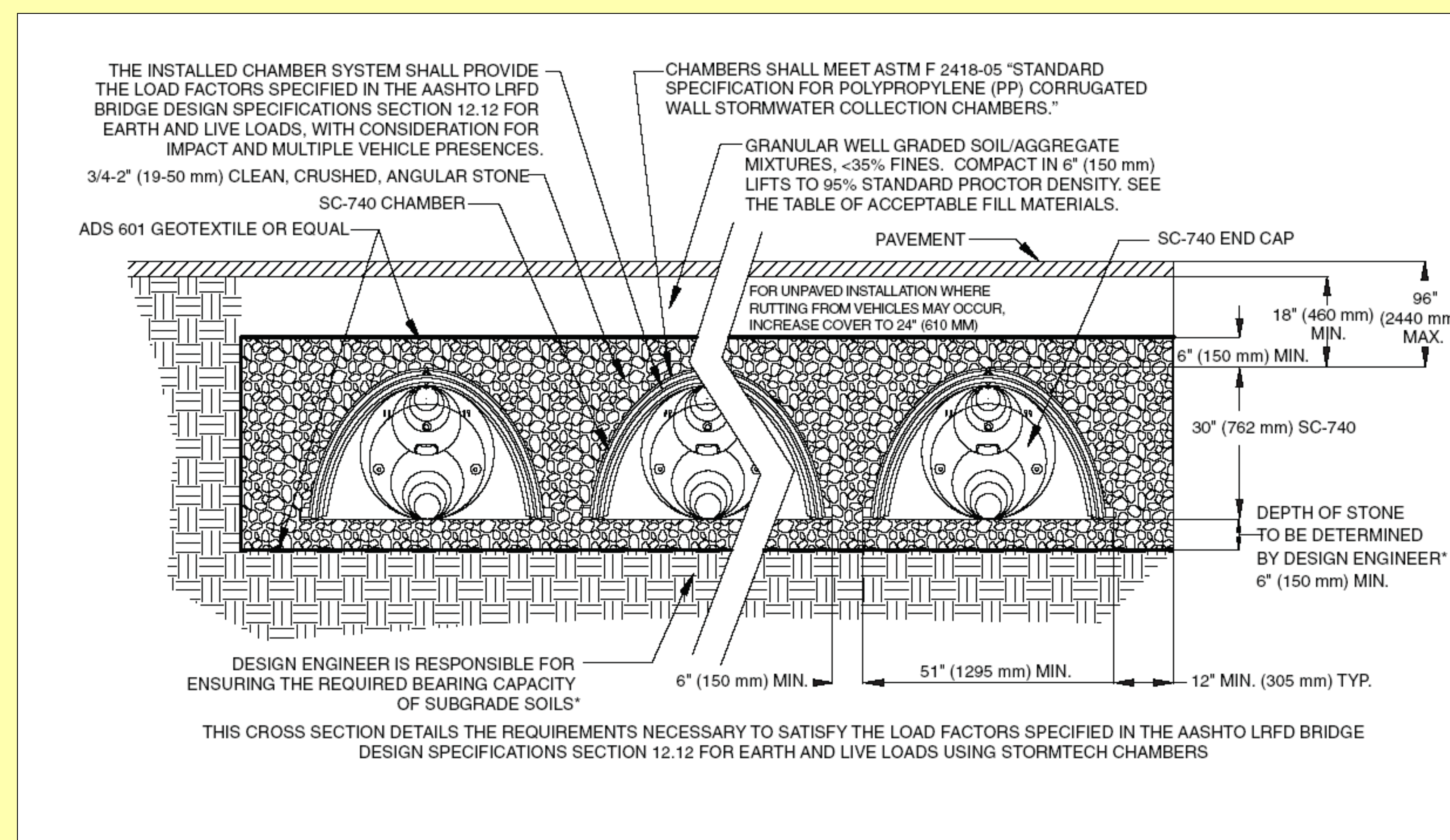
Photographs of Wet Ponds

Subsurface Storage Options

UNDERGROUND CHAMBER FOR STORAGE OF WATER QUALITY VOLUME



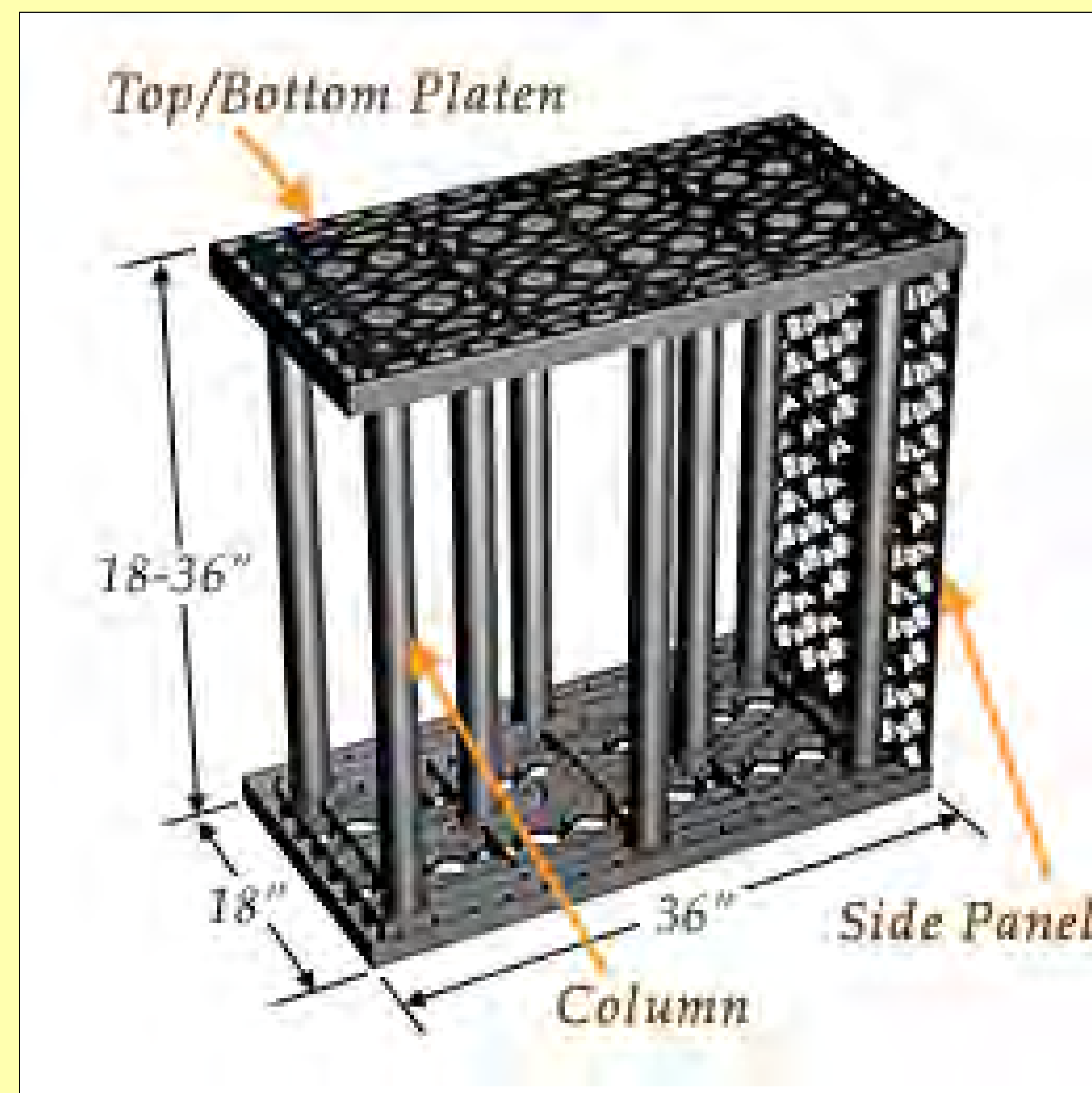
- 60-70% Void Space
- 3 sizes available
- No assembly required
- Small Inspection ports
- Isolator row for easy maintenance and flushing of solids and silt
- 2' cover min
- Surrounded in stone – below, above and in between



THE ADS STORMTECH CHAMBER

Subsurface Storage Options

UNDERGROUND CHAMBER FOR STORAGE OF WATER QUALITY VOLUME



- 97% Void Space
- Several Heights available (12"-36")
- Can be stacked
- Contractor Assembled
- Small Inspection Ports
- Pretreatment required
- 2' cover min
- Stone base and geogrid



THE BRENTWOOD STORMTANK

Porous Pavement



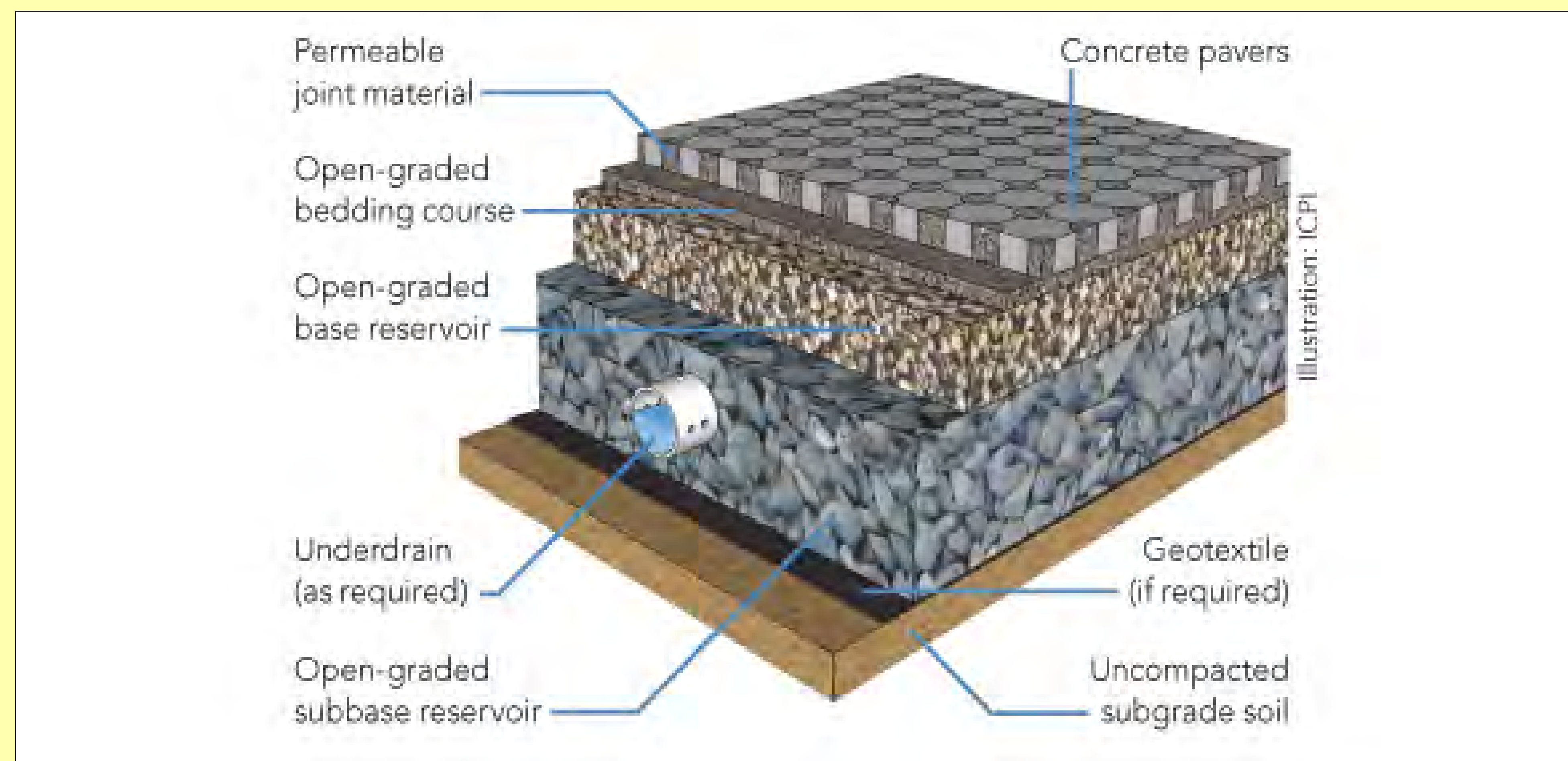
POROUS PAVERS



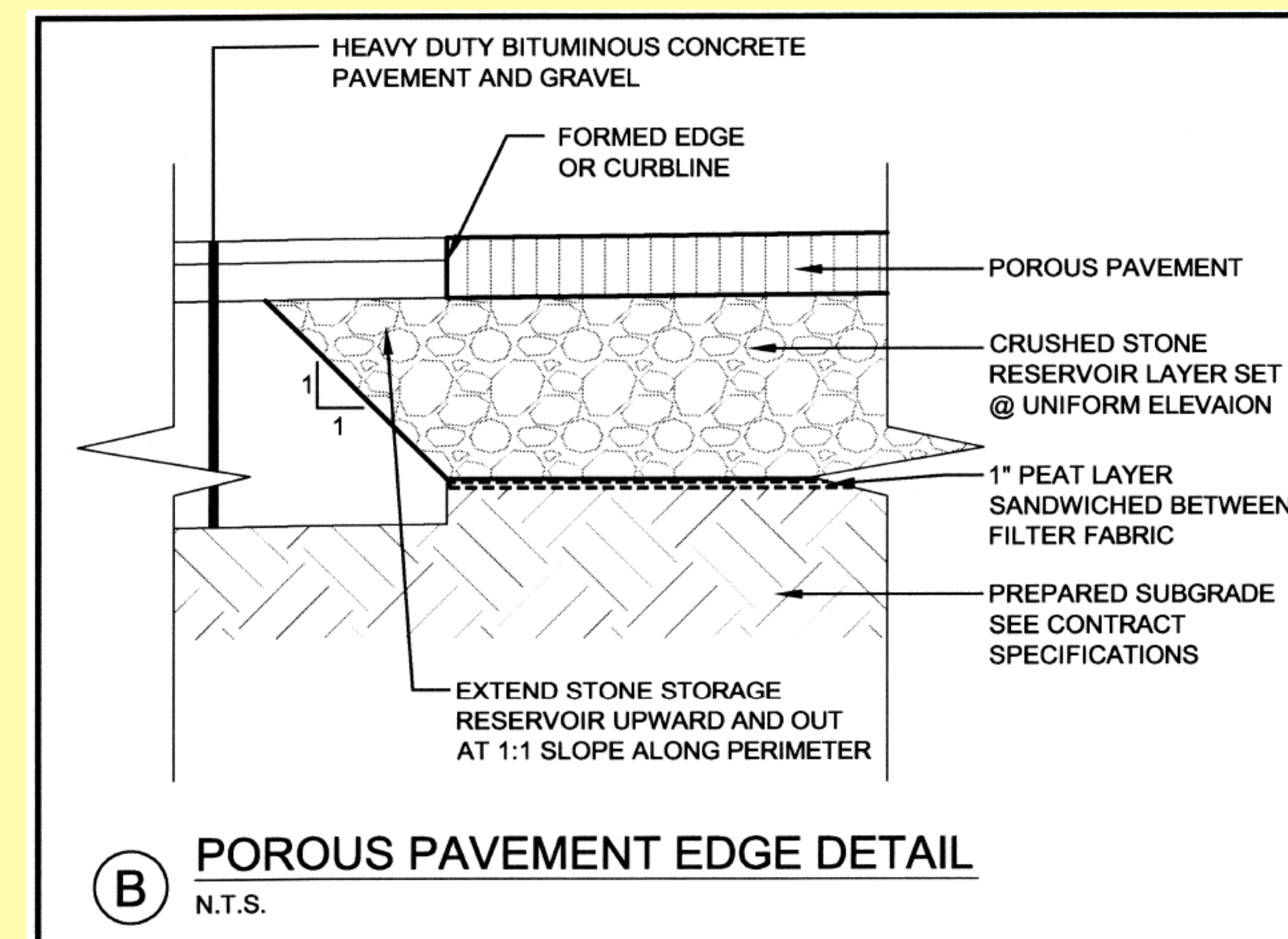
STONE BASE/RESERVOIR



POROUS ASPHALT



SAMPLE SECTION



SAMPLE DETAIL