



TODAY

- Bioretention Building Blocks
- Other Types of Green Infrastructure
- Preparation for Maintenance
- Debris Removal
- Bioretention Soil
- Plants and Irrigation

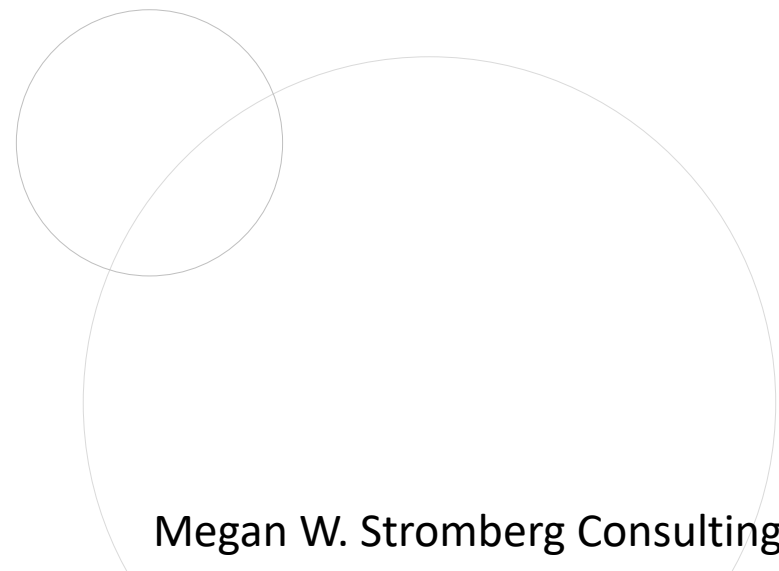


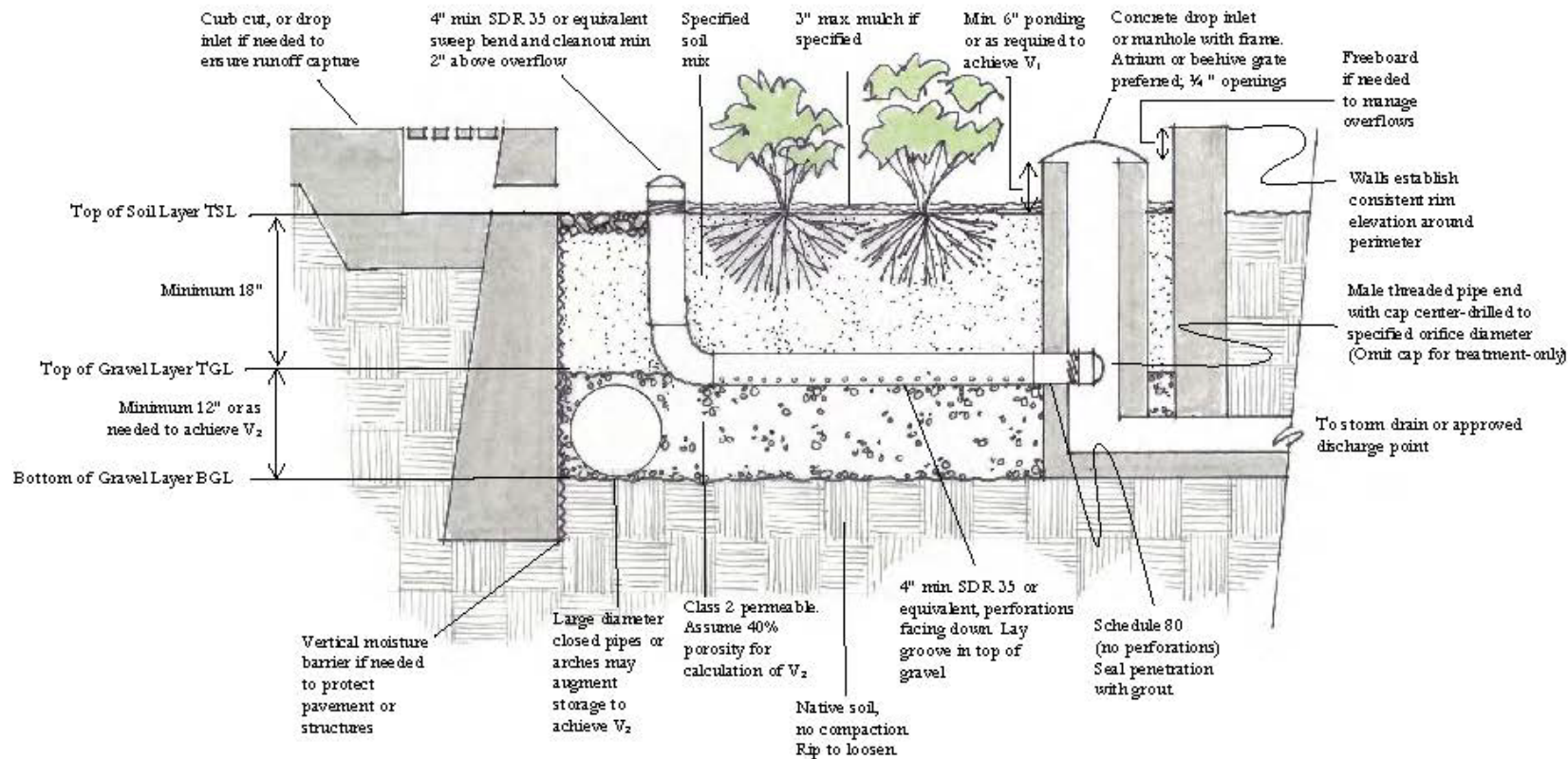
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GREEN INFRASTRUCTURE BUILDING BLOCKS

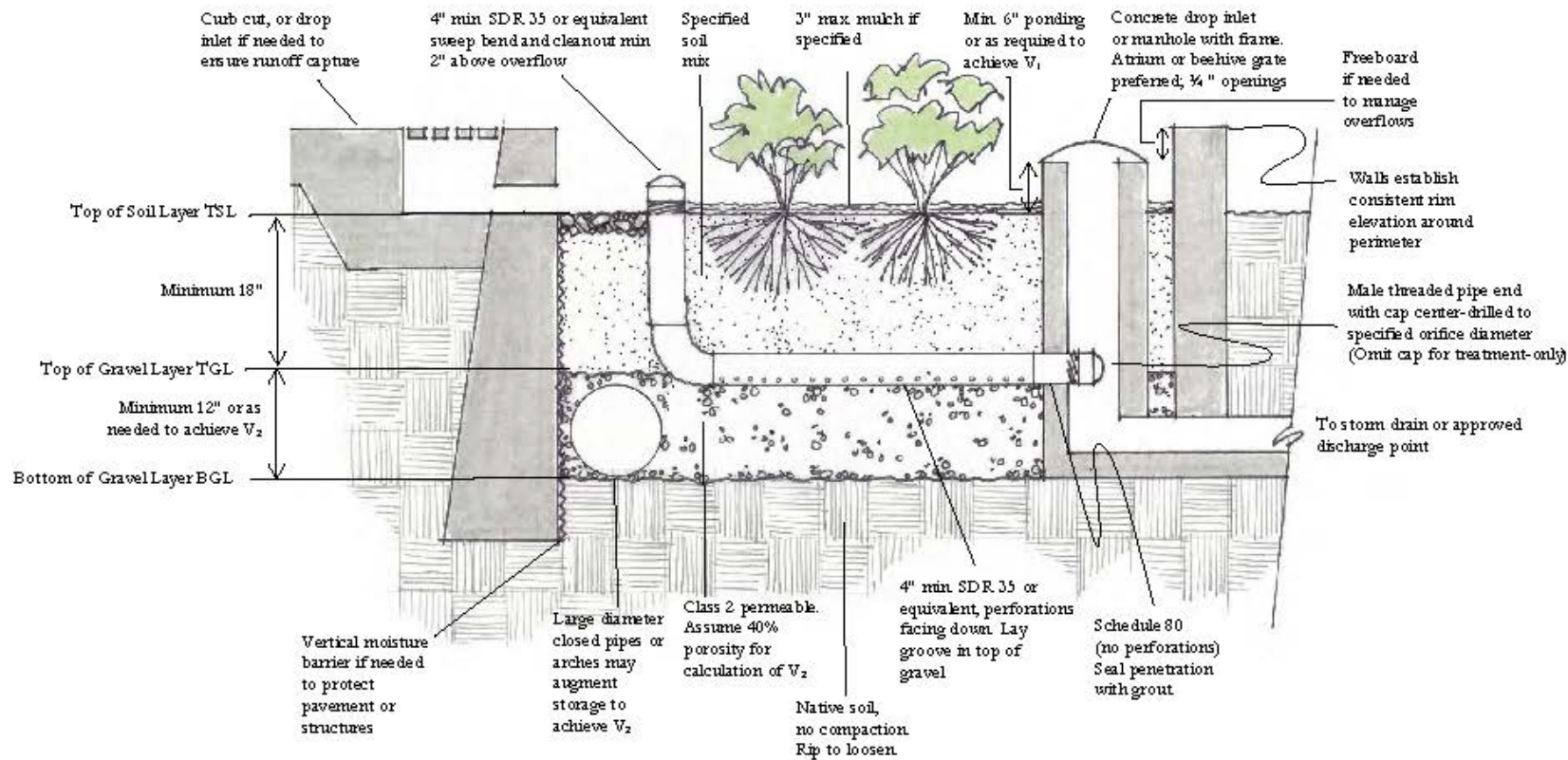
GRAVEL, SOIL, MULCH, PIPES, INLETS, CURBS, PLANTS





GOALS FOR BIORETENTION

- Capture runoff in a shallow reservoir on the surface
- Filter runoff through plant roots and biologically active soil mix
- Store treated runoff in gravel layer below, slowly soak in
 - Underdrain when gravel layer is full
 - Overflow for large storms



PARTS OF BIORETENTION



- Inlets
 - Area for ponding
 - Scour protection
- Biotreatment Soil + Mulch
 - Underdrain & Cleanout
- Gravel layer
 - Moisture barrier (if needed)
 - Undisturbed subsoil
- Overflow
 - Plants



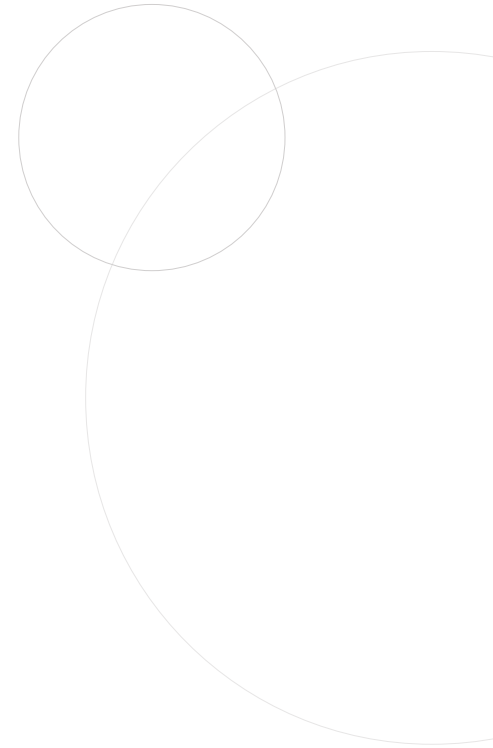
Nature is dirty

WHAT IS BIORETENTION SOIL?

- ASTM C33 aggregate (concrete sand)
- Compost
- Commonly available from local soil suppliers, some variation



SOIL MIX



60-70% ASTM C33 Sand + 30-40% Compost



ROLE OF PLANTS

- Uptake nutrients & metals
- Maintain flow paths
- Feed soil organisms
- Create soil aggregates
- Replace organic matter
- Long-term soil function



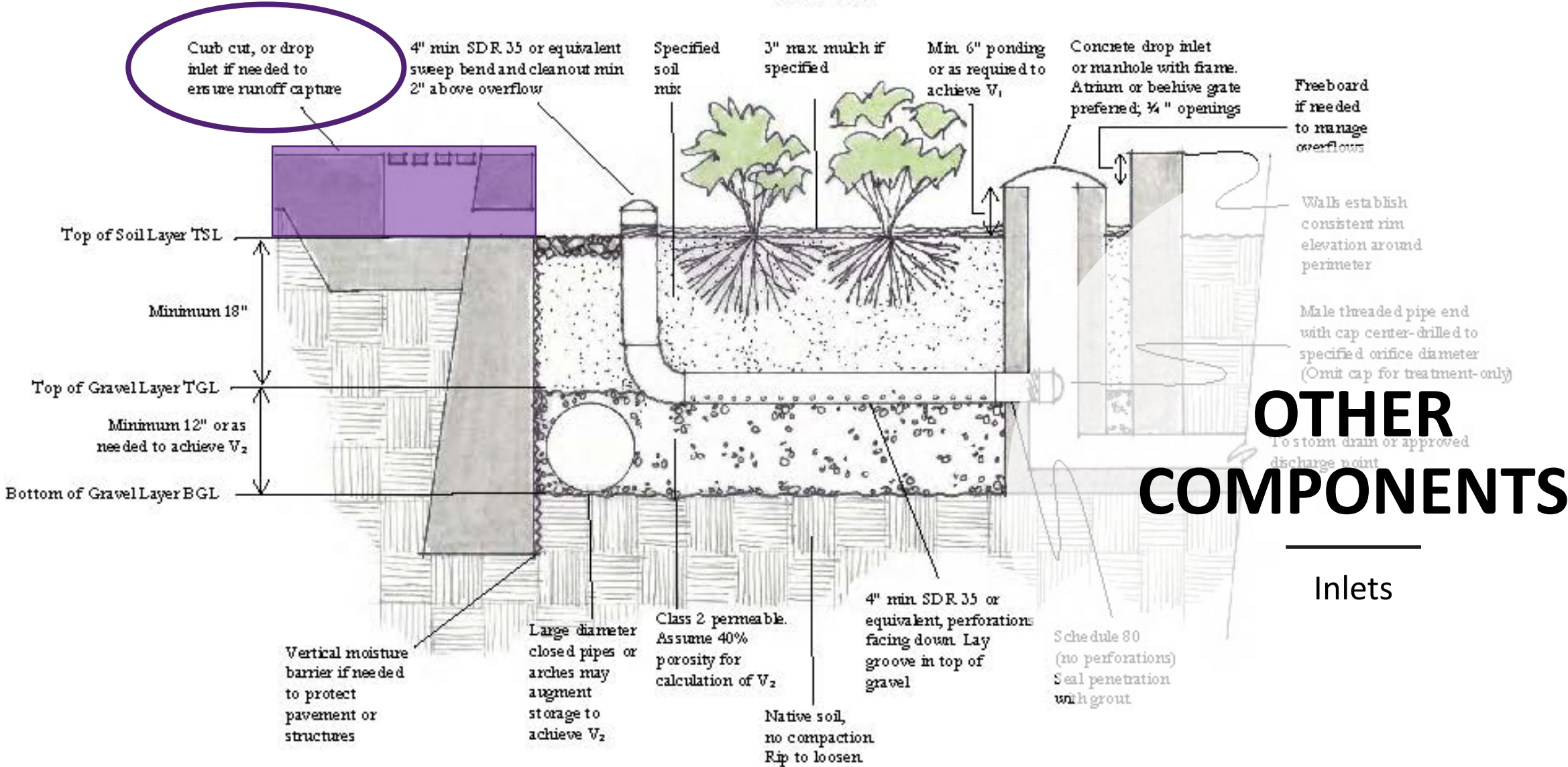
MULCH

- 3” Max depth if specified
- Rock or cobble mulch below the flow line
- Organic mulch: wood chips, compost, “aged” mulch
- Wood chips are prone to floating and can clog the overflow, compost floats somewhat less



Bioretention Facility

Cross-section
Not to Scale





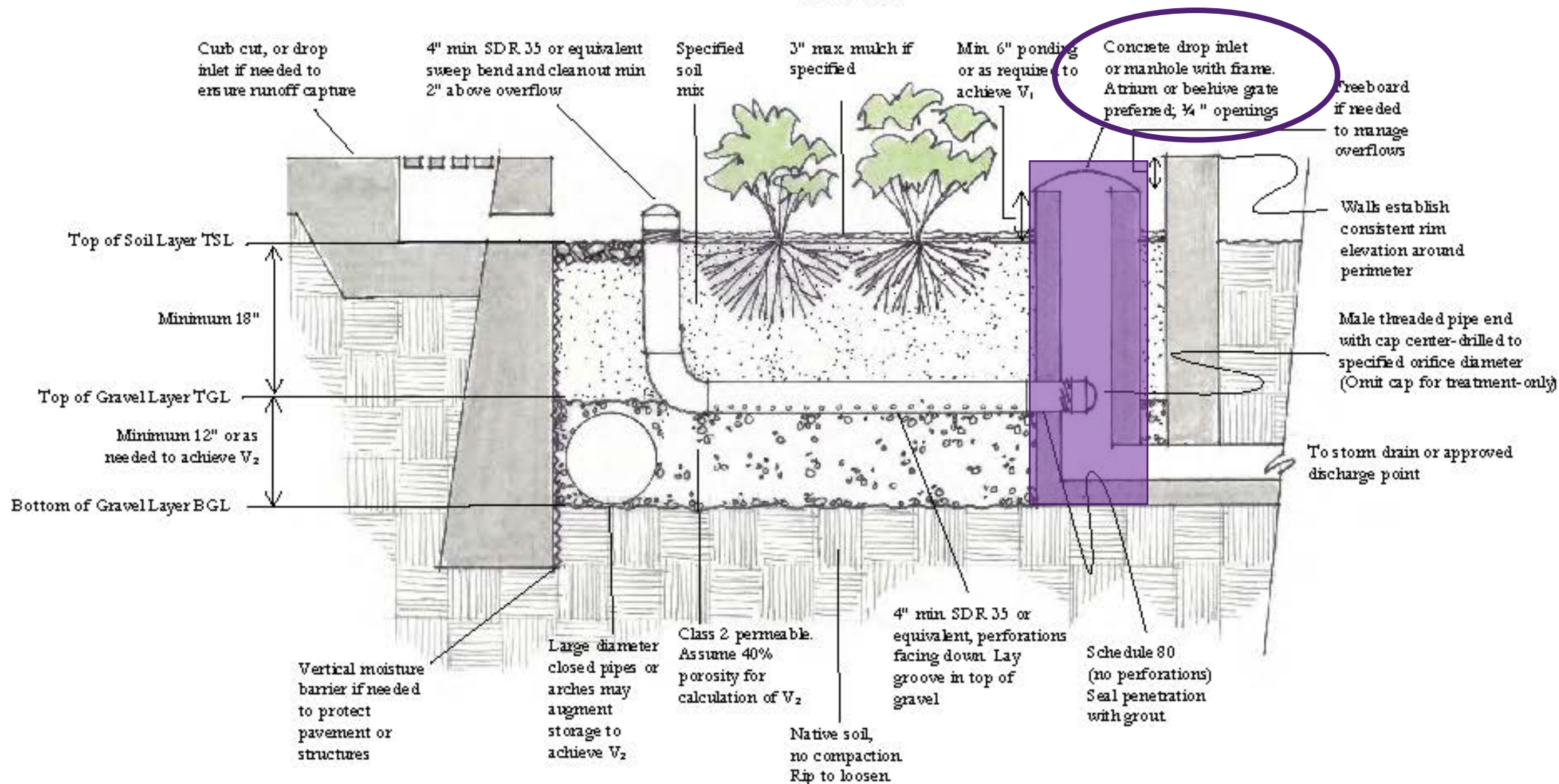
OTHER COMPONENTS

Inlets

Bioretention Facility

Cross-section

Not to Scale





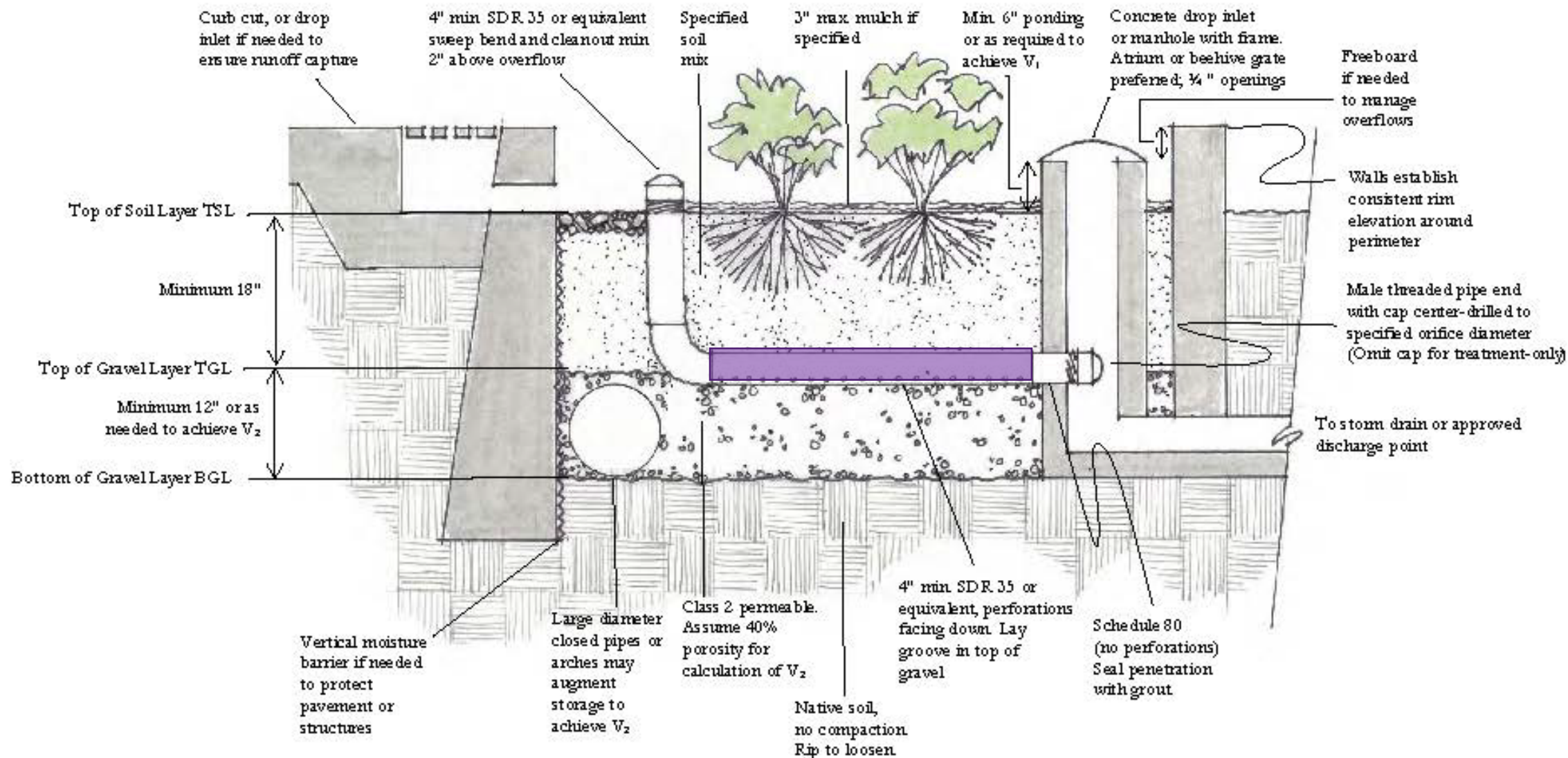
OTHER COMPONENTS

Overflow

Bioretention Facility

Cross-section

Not to Scale



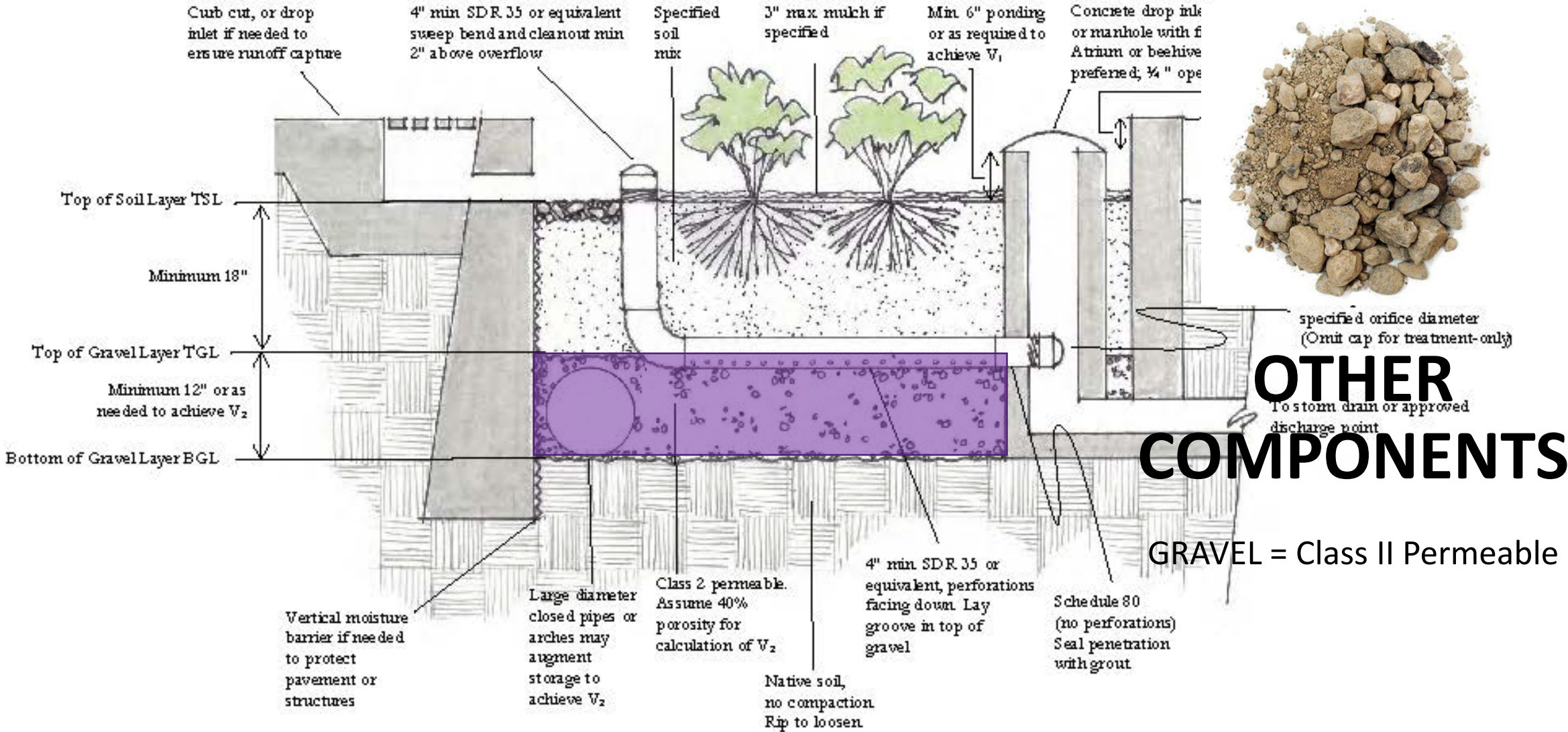


OTHER COMPONENTS

PERFORATED PIPE

Bioretention Facility

Cross-section
Not to Scale

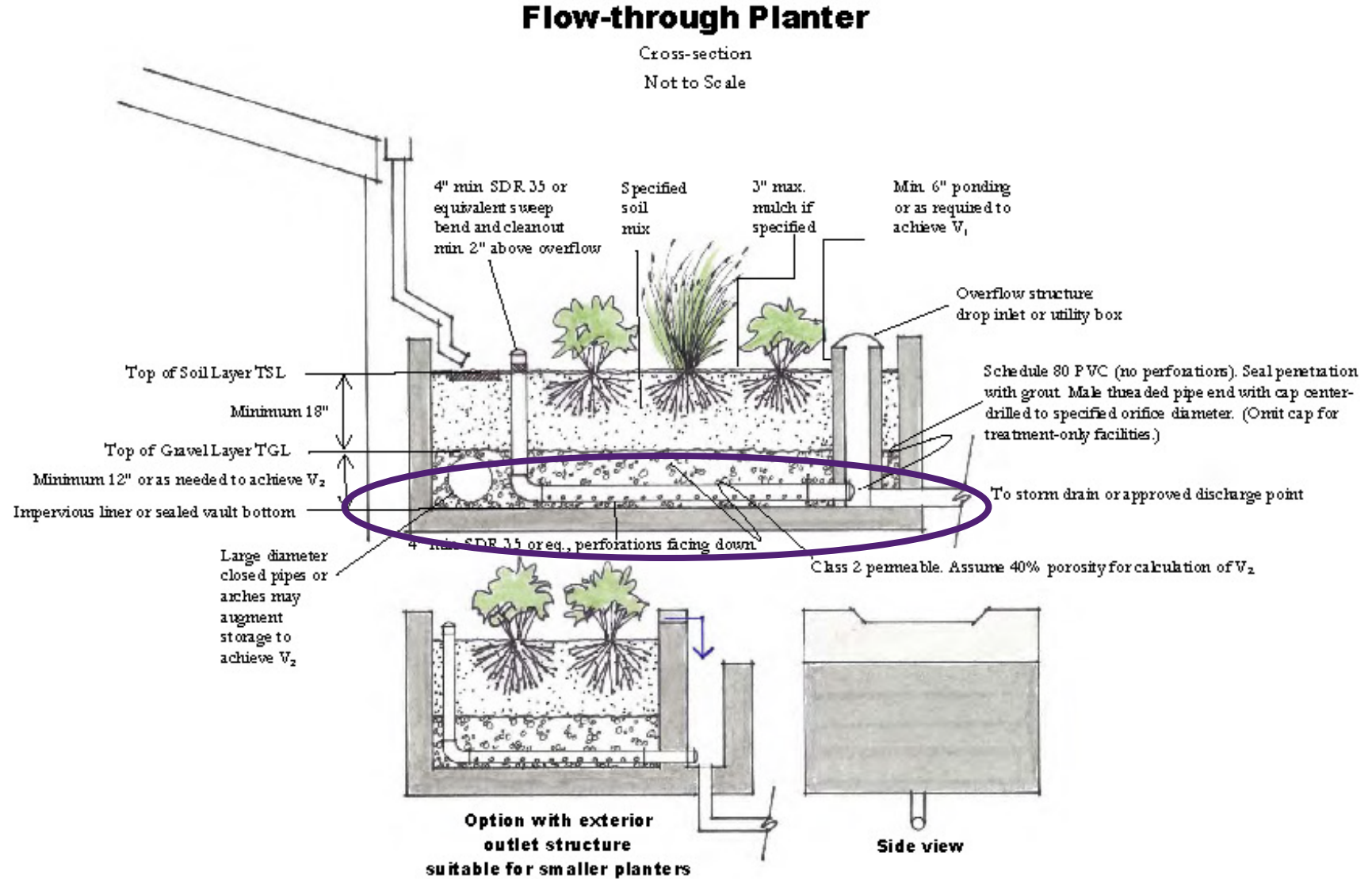




FLOW-THROUGH PLANTERS

Similar to bioretention

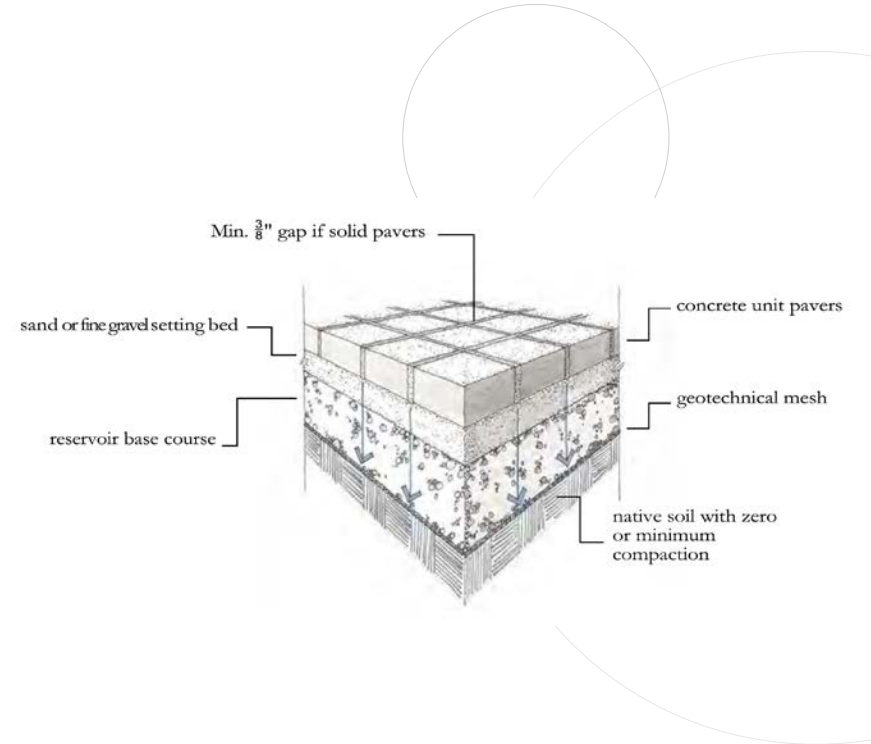
- Designed to discharge all runoff (no infiltration)
- Contained with concrete or plastic liner
- Underdrain at bottom so there is no anaerobic or “dead” storage
- Maintenance essentially the same



FLOW-THROUGH PLANTERS

- Designed to discharge all runoff (no infiltration)
- Contained with concrete or plastic liner
- Underdrain at bottom of gravel so there is no anaerobic or “dead” storage
- Maintenance essentially the same as bioretention





PERMEABLE PAVERS & PAVEMENT

Permeable Pavers and Permeable Pavement

PERMEABLE PAVERS & PAVEMENT



Maintaining Permeable Pavers and Permeable Pavement

- Key to maintenance is preventing clogging
- Vacuum twice/year – before winter (leaves) and after winter (sediment)
- Regenerative vacuum sweeper for regular maintenance
- True vacuum sweeper for neglected or clogged permeable pavements
- Replacement aggregate (washed sand or fine aggregate) between pavers after true vacuum sweeper used



TREE WELLS

Filterra Tree Box



Silvacells



Maintaining Tree Wells

- Similar to regular street tree – pruning and irrigation
- Check inlets on Filterra Tree box and remove sediment
- Filterra Drains to Creek/Bay - No Fertilizer, herbicides, pesticides



GREEN ROOFS
