SvR DESIGN COMPANY

Aurora Corridor
Stormwater Management Options

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Presentation Overview

- What Has Happened Since Last Meeting
- Existing Conditions
- Stormwater Management Goals
- Why Combine Low Impact Development (LID) Methods with Conventional Methods
- Stormwater Management Strategies
- Presentation of Stormwater Management Elements and Facilities
- Alternative Comparison
- Next Steps

What has happened since last meeting?

- Continued Data Gathering
- Project Team Meetings
- Existing Conditions Assessments
- Stormwater Design Charrette
  - Stormwater Professionals and City Officials
- Stormwater Regulatory Issues
  - City of Shoreline Current Stormwater Code: 1998 KCSWDM
  - Goal is to move toward 2005 KCSWDM

Existing Conditions

- Soils
  - Glacial Till or Fill
  - Low infiltration rates
- Right-Of-Way
  - Width Varies
  - Business Access
- Existing Stormwater System
- Basin Information
  - Boeing and McAleer Creeks

Stormwater Management Goals

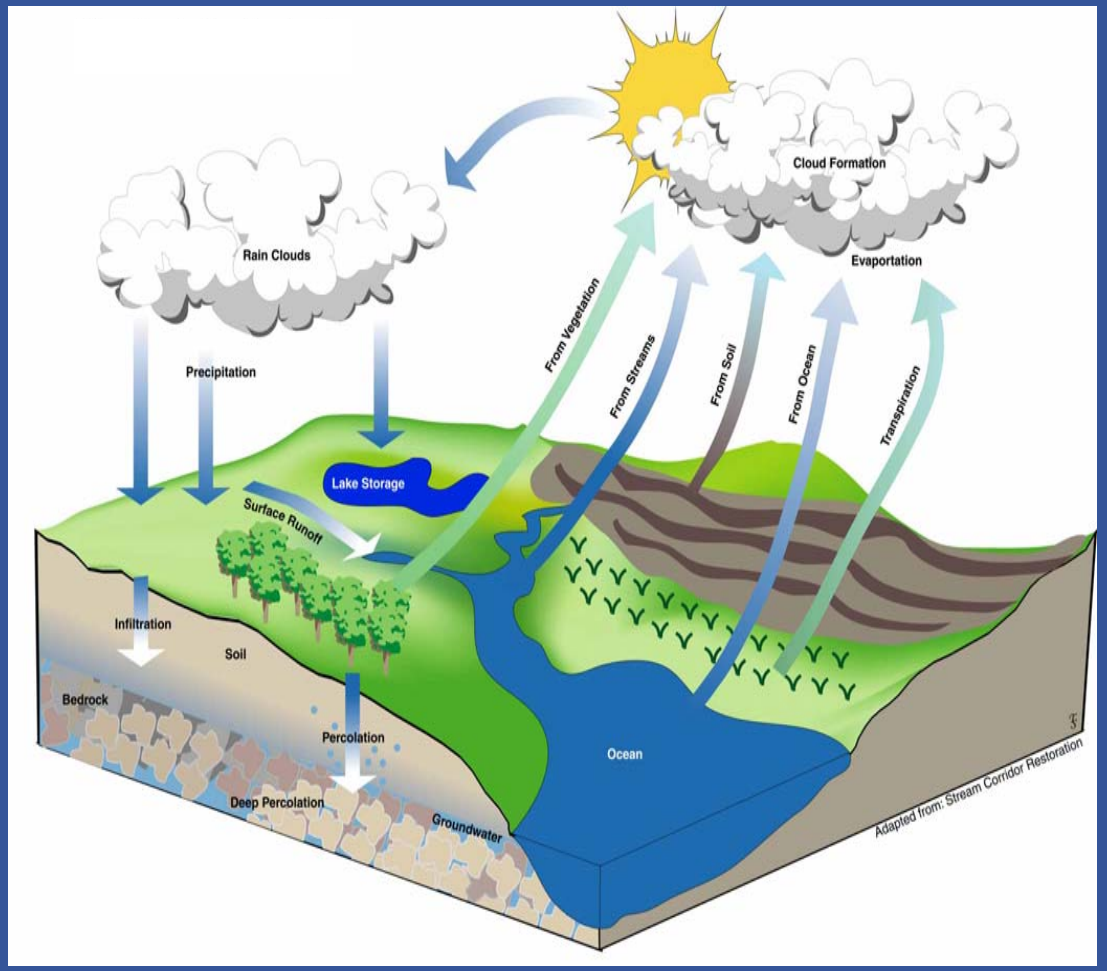
- Restore natural stormwater management and function
- Manage stormwater within right-of-way
- Create Feasible, Cost Effective, Maintainable Facilities
- Meet Current Stormwater Code
- Where Possible Exceed Current Regulations
- Look for Opportunities to Inform/Demonstrate

Why LID and Conventional?

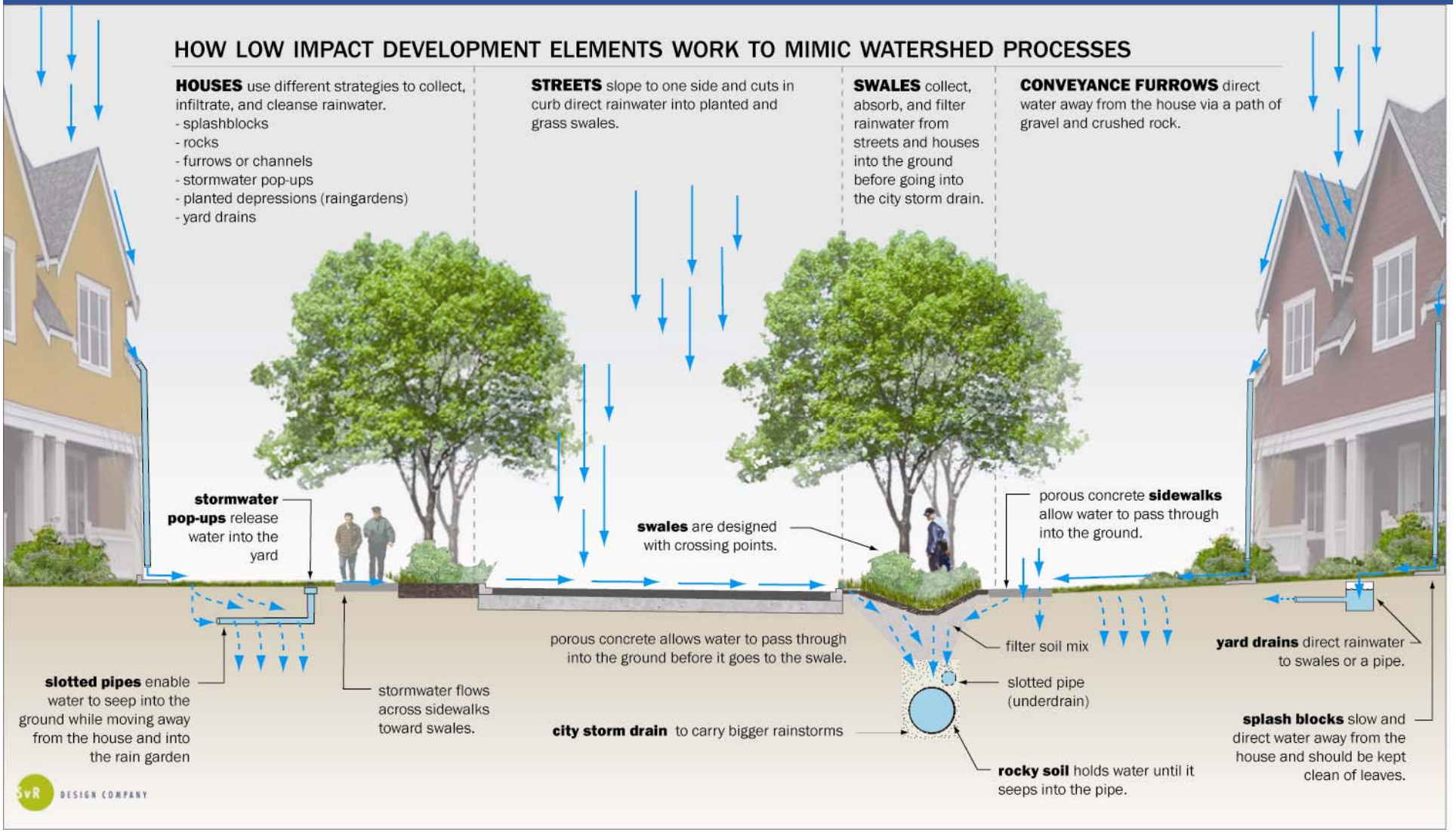
- Mimic Historic Basin Hydrology
  - Overland and subsurface flow on vegetated surfaces
- Minimize Impacts of Stormwater
  - Reduce Volume and Peak Flow
    - Evapotranspiration
    - Flow Control (Attenuation)
    - Horizontal Subsurface Flow
  - Water Quality
- Manage Large Storm Events (100-yr) in pipes

Stormwater Management Strategies

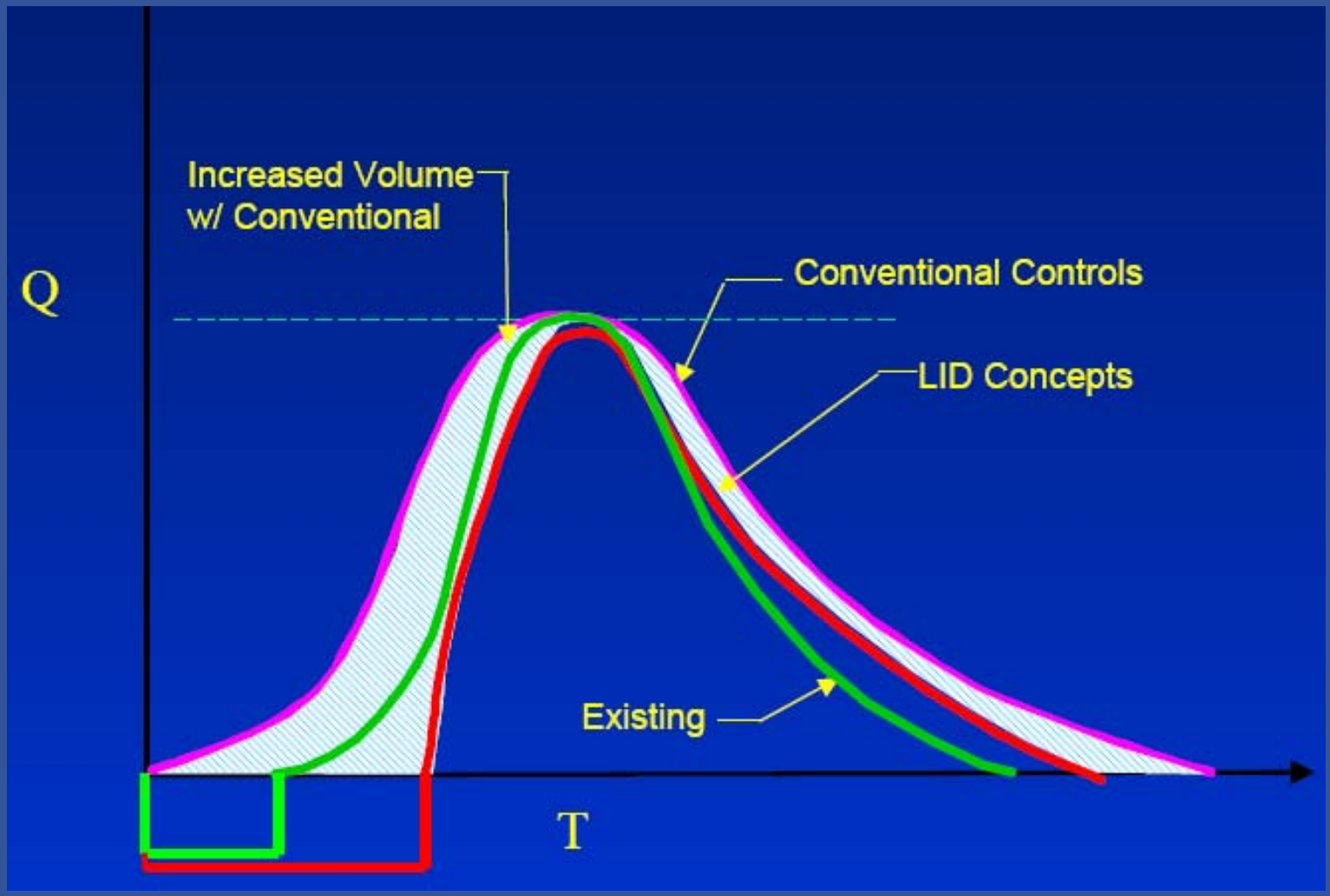
- Reducing Volume and Peak Flows
  - Evapotranspiration (ET)
  - Flow Attenuation and Control
  - Shallow Infiltration
- Conveyance and Detention
- Water Quality
  - Downstream water bodies



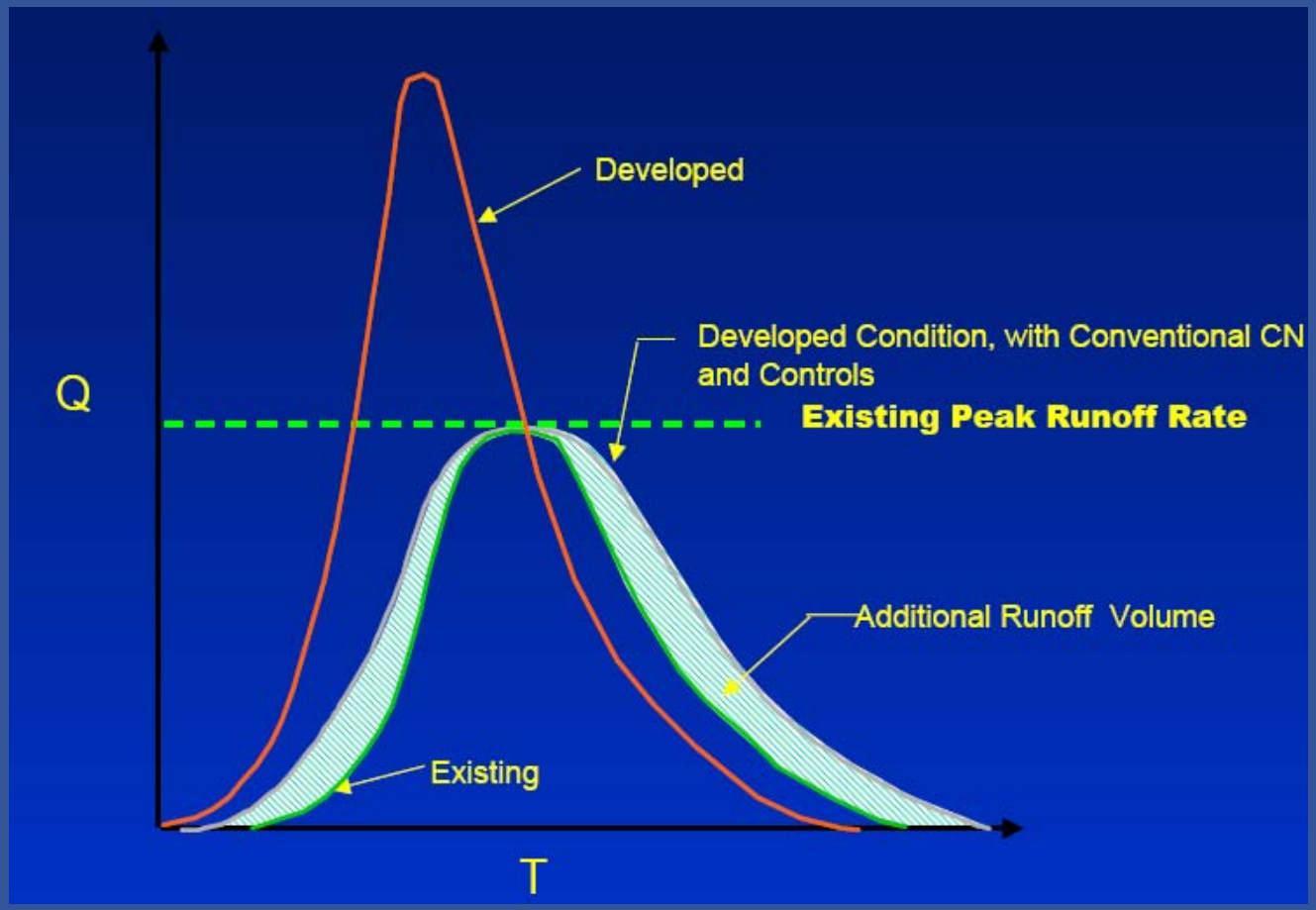
Reducing Volume and Peak Flows



Reducing Volume and Peak Flows



Conveyance and Detention



Water Quality

- Sediment
- Debris/Garbage
- Source Control-Required By Regulations
  - ADT Source Control
  - Oils and associated pollutants

Stormwater Management Approaches

- LID Approaches
  - Stormwater Planter Boxes
  - Tree Box Filter/Tree Pits
  - Center Medium Swales/Rain Gardens
  - Porous Curb and Gutter
  - Porous Sidewalk/Drive Lanes

- Conventional Approaches
  - Conveyance Pipes
  - Catch Basins
  - Water Quality Filters
  - Tank/Vault

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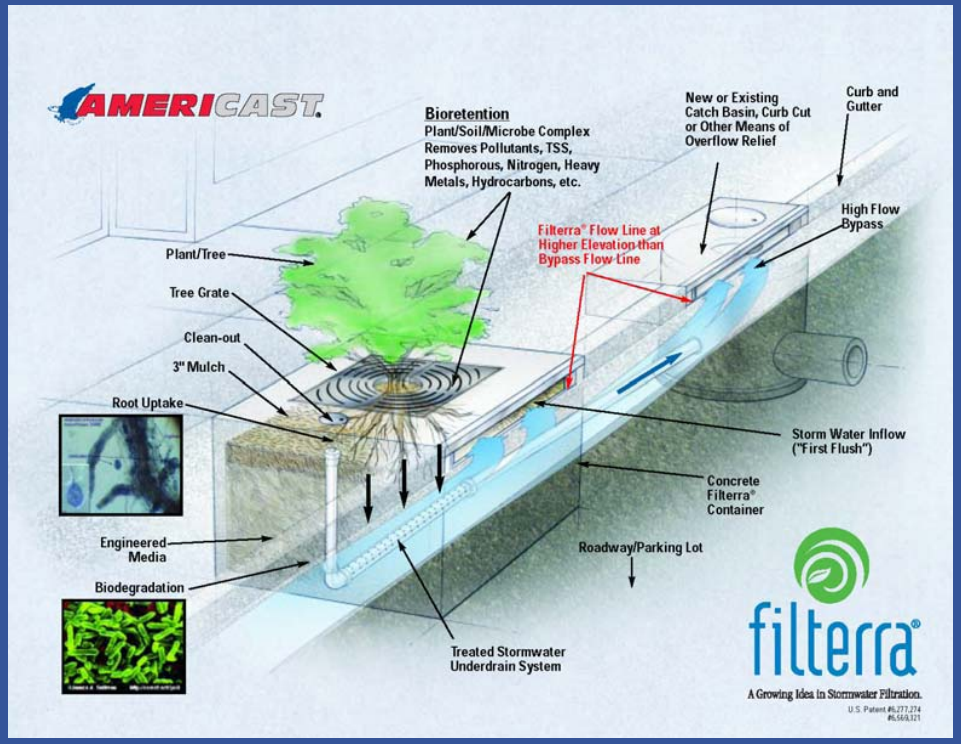
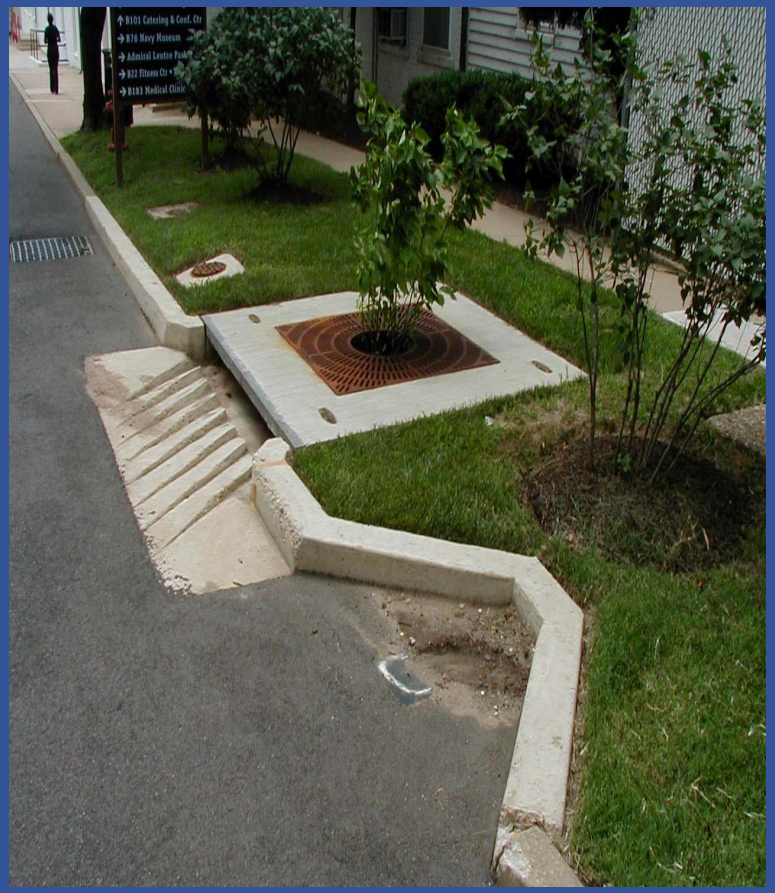
Stormwater Planter Boxes

- Collect water from right-of-way to treat and infiltrate run off from the adjacent streets and sidewalks.

ET - HIGH
Flow Control - HIGH
WQ-Debris and Sediment Control - HIGH

Tree Box Filter/Tree Pit





- Collects and filters runoff through a sandy media, removing pollutants and trapping sediments

ET - HIGH
Flow Control - MED
WQ-Sediment and Debris - HIGH

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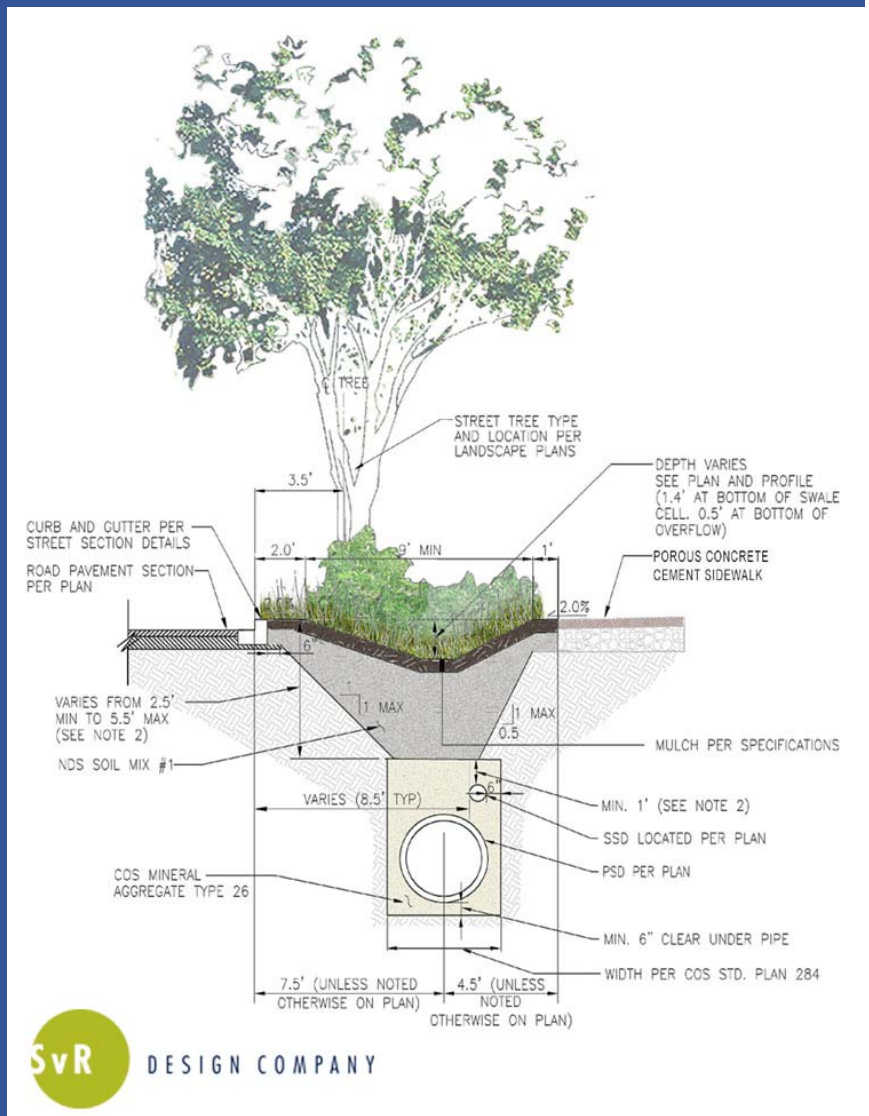
Center Medium Swales/Rain Gardens

- Collects and filtrates water removing pollutants and attenuates flows

ET - HIGH
Flow Control - HIGH
WQ-Debris and Sediment Control - HIGH



Porous Gutter/Median

- Placed along gutter or curbed median to collect and attenuate flows
- Sub-base removes TSS

Paver Median Route 87, Chandler, AZ (Cahill Associates)

Porous Concrete Portland OR (BES)

Flow Control - HIGH

WQ-Sediment and Debris - MEDIUM

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Porous Sidewalk/Drive Lanes

Public Sidewalk (High Point)

Flow Control - HIGH
WQ-Sediment and Debris - MEDIUM

- Allows water to pass though concrete
- Attenuates flow and gravel sub-base removes Total Suspend Solids (TSS) from stormwater

32nd Avenue SW

Conveyance Pipe

- Facilities to convey water to a receiving water body

Flow Control - HIGH

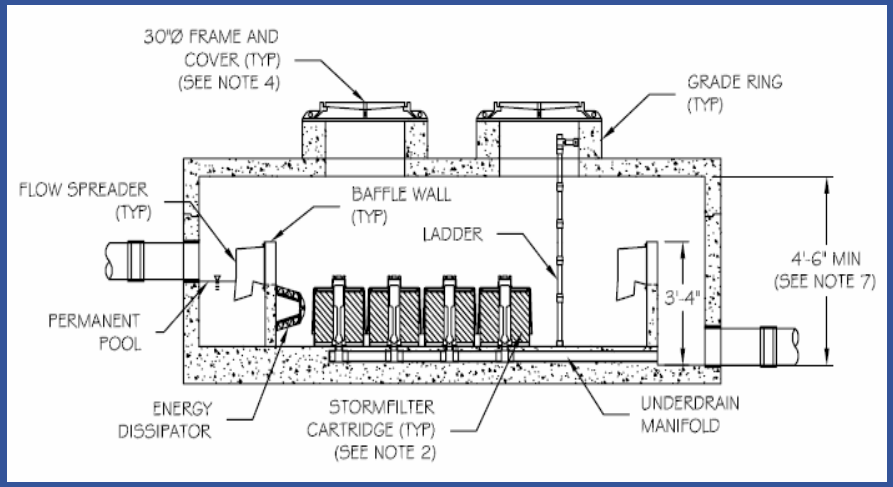
Catch Basins

- Large catch basins and maintenance holes collect surface water flows
- Collects Debris and Sediment in Sump

Flow Control - MEDIUM
WQ-Sediment and Debris - HIGH

Water Quality Filter

- Collection structures
- Filter media selected for treatment of metal, TSS, and oil.
- Number of filters depends on the size of the area being collected.
  - Catch basin inserts can be used for small areas
  - Vaults can contain multiple cartridges for larger areas.



WQ-Sediment and Debris - HIGH
WQ-Source - HIGH

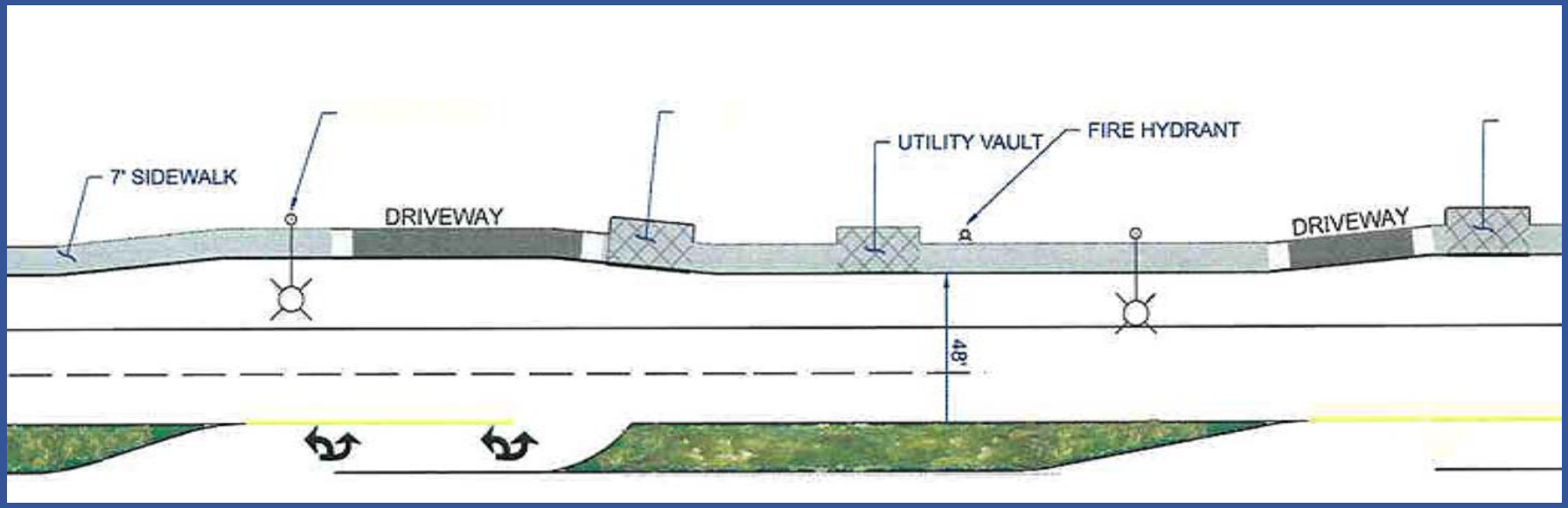
Tank/Vault

- Stores stormwater to detain and treat before releasing at a rate calculated to minimize downstream impacts.
  - Oil/Water Separators
  - Detention Tanks
  - Filter Vaults
- Often very large and requires periodic specialized maintenance.

Flow Control - High
WQ-Sediment and Debris - HIGH
WQ-Source - HIGH

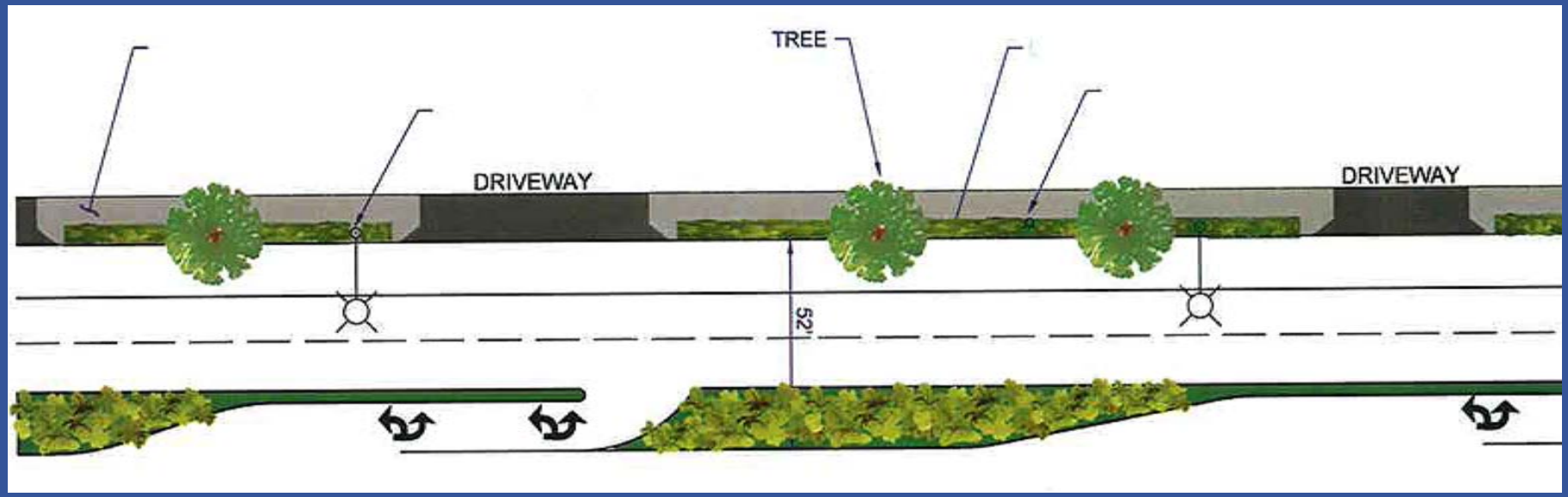
Alternative A

- No Amenity Zone – Limited area available for stormwater facilities adjacent to roadway
- Narrower Medians - Less opportunity for stormwater treatment



Alternative B/C

- Amenity Zone Adjacent to Roadway – Possible location for tree filter and stormwater planters
- Wider Medians – Opportunity for more stormwater treatment



Next Steps

- Continued Stormwater Management Discussions with SvR Design, Tom Holtz and City of Shoreline Staff
- Incorporate Findings and Results into the Discipline Report
- Community Meeting – Anticipated for June
- Council Selection of preferred alternative – including stormwater management approach – Anticipated for July