2016 MAFSM Fall Conference
"Gray Within Green"
Bioretention Retrofit / Stormwater Management Case Study
Anne Arundel County, MD
2016

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20 October 2016

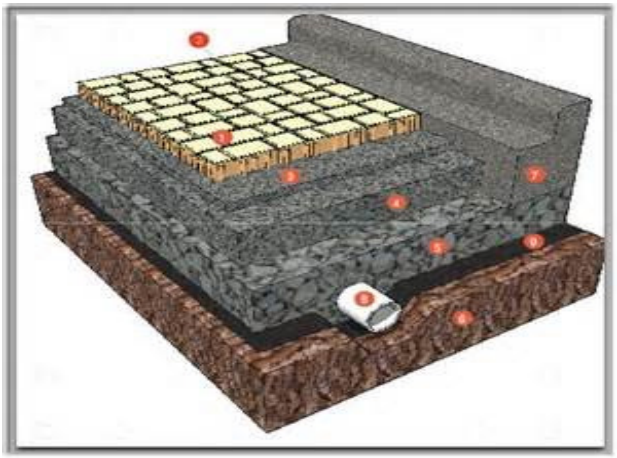
PREVENTATIVE STORMWATER MANAGEMENT

CONTECH ENGINEERED SOLUTIONS

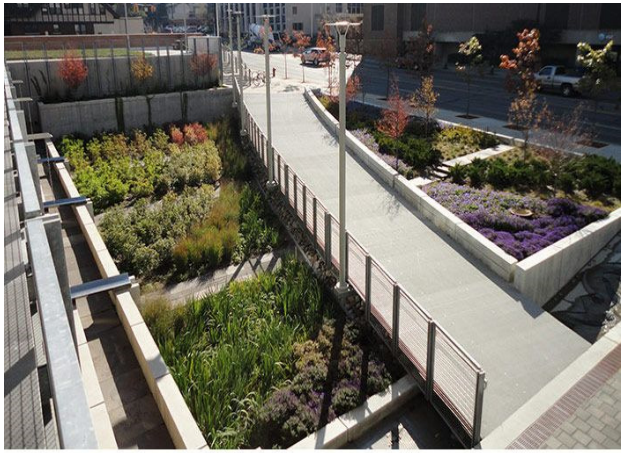
Bay Engineering Inc. Engineers, Planners and Surveyors

Natural Soil Bioretention

Permeable Pavement



Rain Garden



Green Roof

Planter Boxes

Rainwater Harvesting

Reduce Stormwater Runoff & Offsite Discharge

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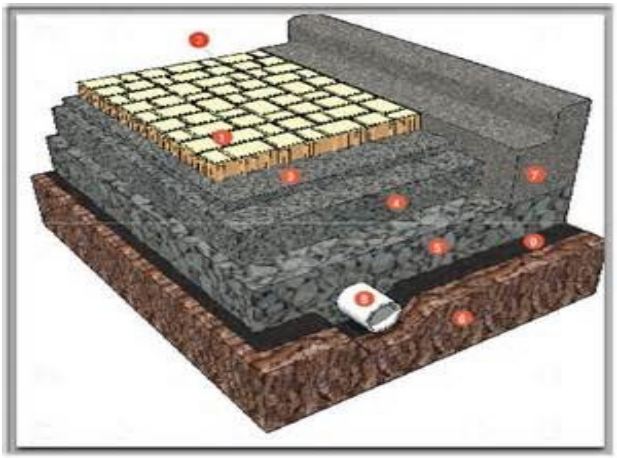

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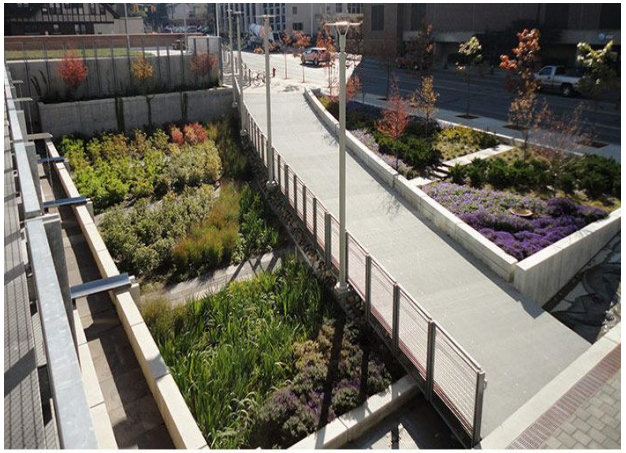

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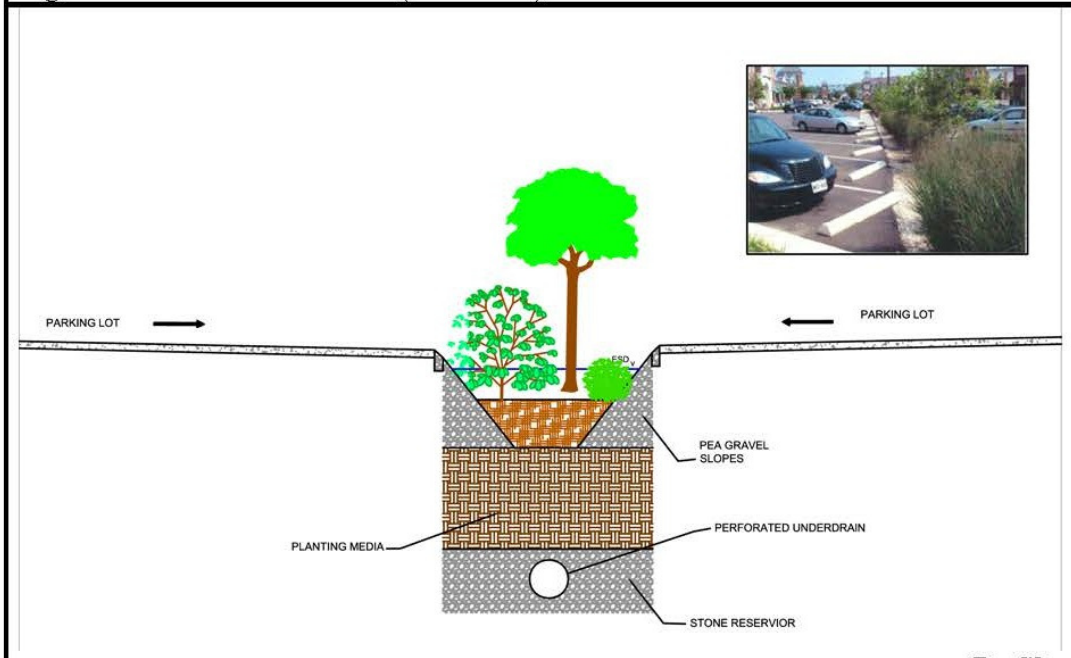
SITE OVERVIEW

- Location: Annapolis, MD
- Site Use: Flex Office Space
- Built: Phased Beginning in 2003
  SWM in Service 2006

BIORETENTION CELL

Chapter 5. Environmental Site Design.....Nonstructural and Micro-Scale Practices

Figure 5.16 Micro-Bioretention (Variation 3)



- Native Soil
- Drain Rock Layer
- Perforated Underdrain Pipe (Each Cell) With Cleanouts
- 24”-48” Thick Soil Layer
- Selected Plantings
- River Rock Surface Cover
- Riser Overflow Outlet
- Direct Pavement Drain Along Perimeter

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OWNER CONCERNS

- ✓ Aesthetics; Impact on Curb Appeal to New and Existing Tenants
- ✓ Surface Ponding After Rainstorms and During Snowmelt
- ✓ Cost of Regular Maintenance of Bioretention Facility
- ✓ Deterioration of Concrete and Adjacent Asphalt Pavement
- ✓ Anticipated Cost to Renovate Facility and Pavement Back to Original Condition

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INNOVATIVE WQ CONTROL PRACTICES

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Engineered Bioretention

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Engineered Bioretention

- High Flow (140” per hour) Functionality
- Minimal Surface Footprint
- Prefabricated “Plug-N-Play” Package System Technology
- 175+ Approved Plant Species
- Approved by MDE for Stand Alone WQv Control
- Remove and Replace Mulch Layer Every 6-9 Months

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Retrofit Plan

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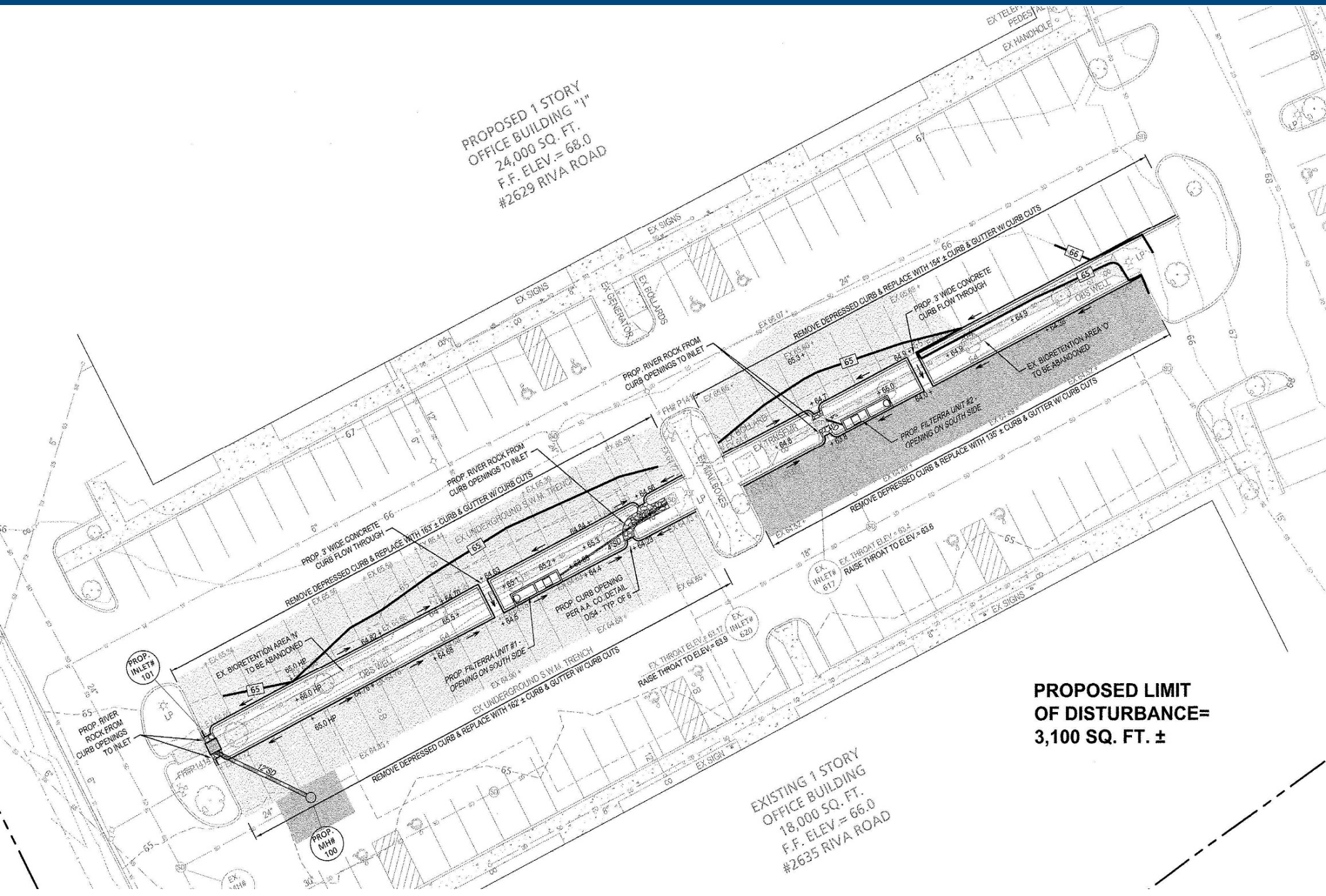

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Retrofit Plan Detail

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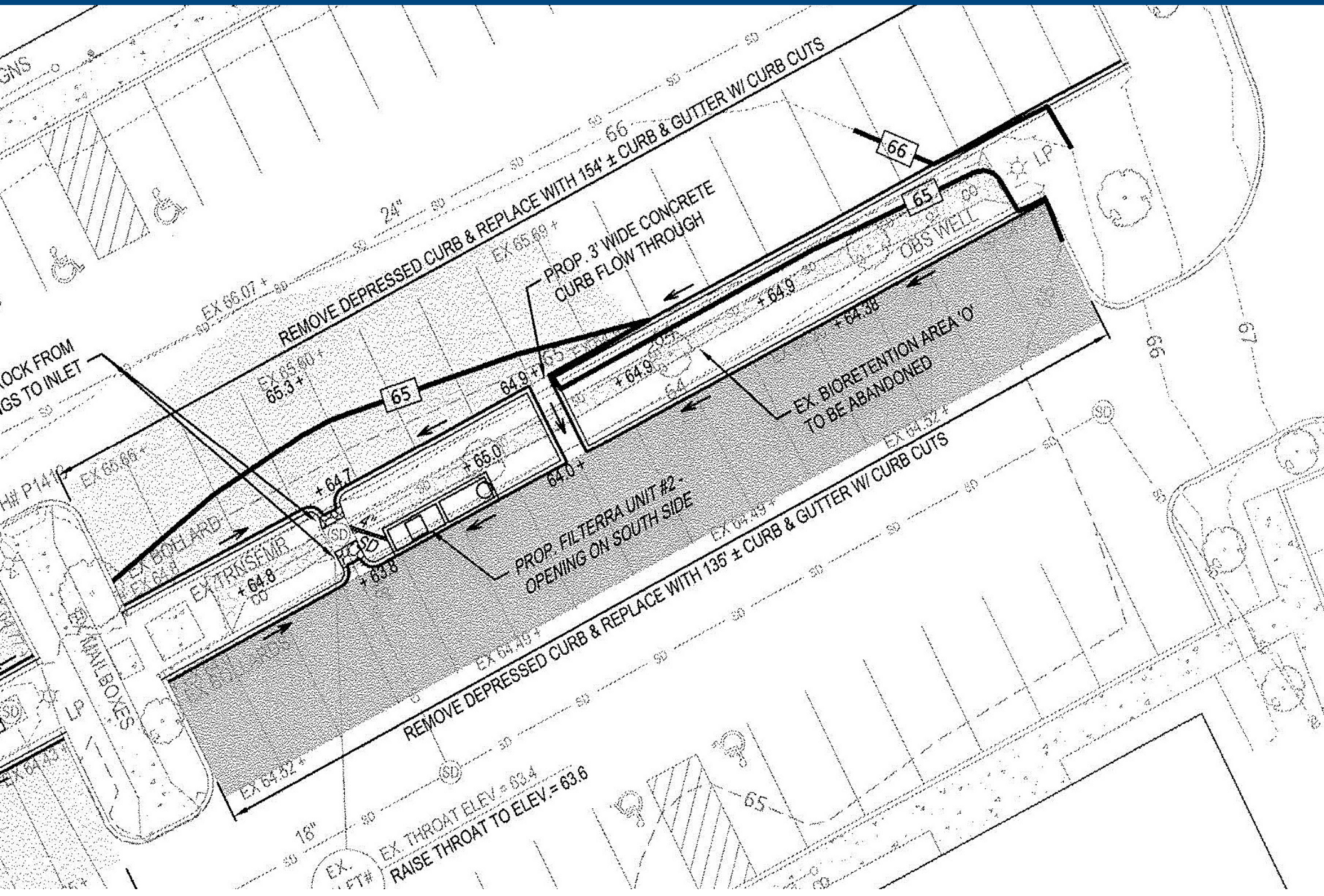

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CONCLUSIONS

- Bioretention Replaced with Filterra for WQ Control
- Bioretention Cell Replaced with Grass and Trees Behind New Curbing; Filterras as Curb-and-Gutter Inlets
- Standard Pavement Edge to Curb Now in Place
- Predictable Maintenance for Two Filterra WQ Control Facilities – Remove and Replace Mulch in October and May; Care for Grass and Trees
- Improved Aethestics and Curb Appeal; Well Maintained Look
- Worry Free Pavement and Curbing Aging

DISCUSSION

- Bioretention Facilities Susceptible to Surface Clogging & Regressive Failure; As Such,

- Vegetation Density Matters
- Vegetation Selection Matters
- Storage Capacity Above Surface Matters
- Type of Ground Cover Matters
- Drainage Area Ratio Matters
- Subsoils Matter
- Regular Maintenance Matters
- In Highly Urbanized Environments – All of These Elements Difficult to Line Up

- Combination of Technology and Natural Processes Can Work

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Thank You

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