Game On –

Creative Consent Order Solutions Using Green Technology

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Background

- City of Columbus Consent Order
  - Effective August 2002
  - Reduce SSOs and CSOs
- Identified Berliner Park Area
  - Susceptible to surface flooding & sewer overflows
  - 126-in Olentangy-Scioto Interceptor Sewer (OSIS)
  - 48-in “Old Dry Flow” (ODF) Combined Sewer
    - History of overflows in park

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Flooding / Sewer Overflow

Jan 2005

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Flooding/Sewer Overflow

Jan 2005

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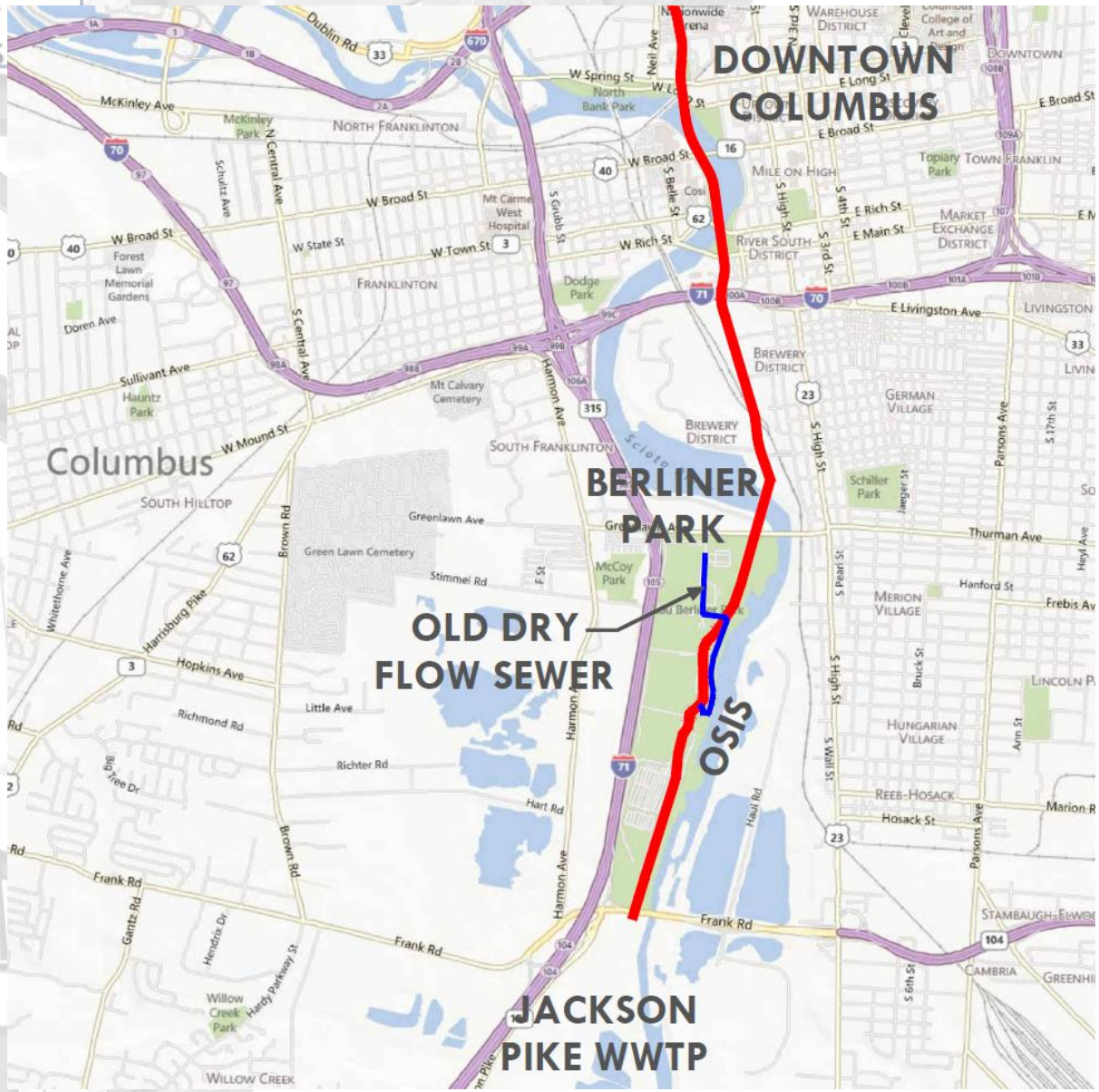
Site Location



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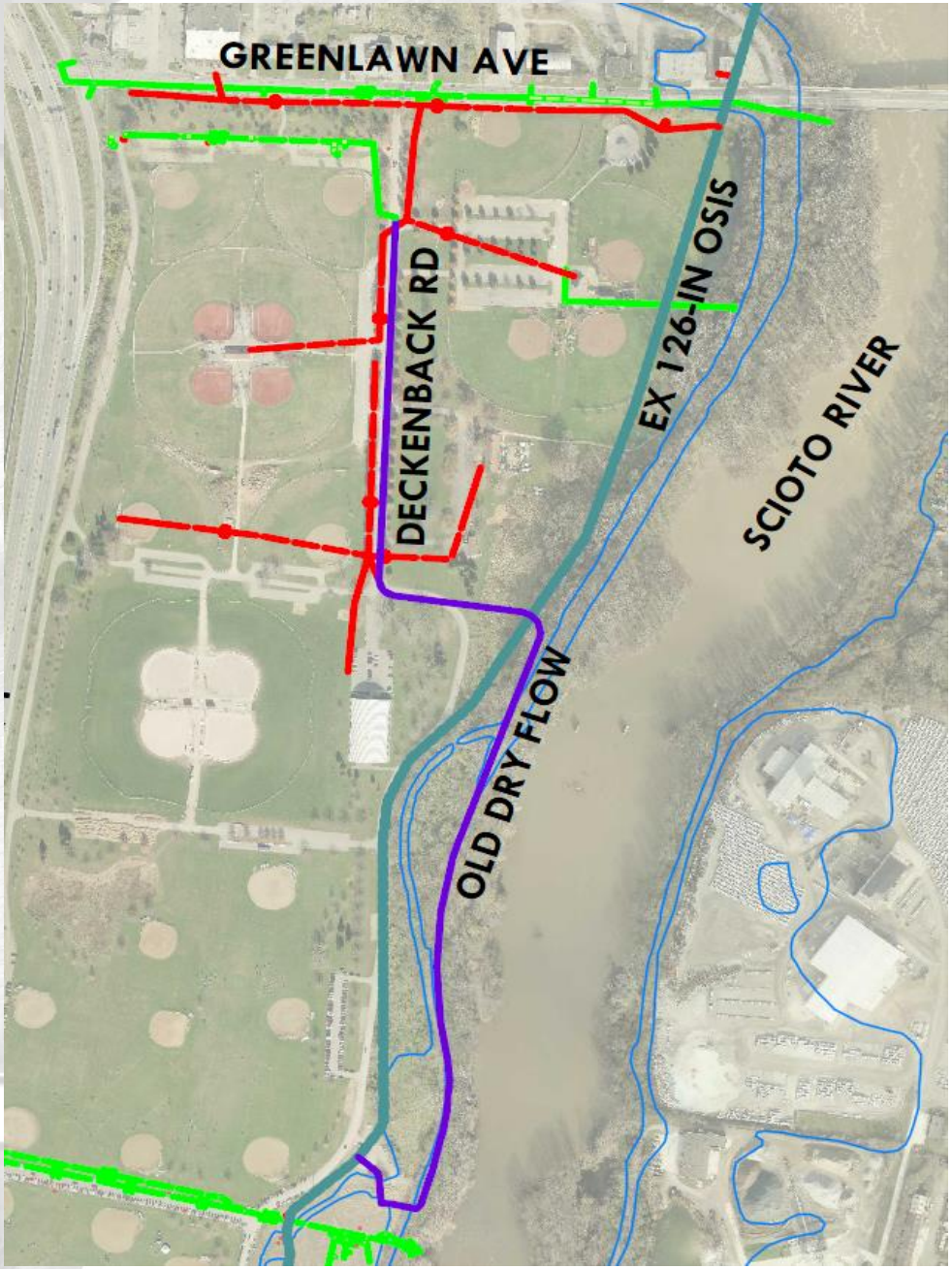
Existing Conditions



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Planned Improvements

- System Wide Capacity Enhancement
  - OSIS Augmentation Relief Sewer (OARS) Deep Tunnel
- Local/Berliner Park Improvements
  - Sewer separation and abandonment of ODF
  - Reduce SSOs/CSOs
  - Comply with OEPA Consent Order

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Project Challenges

- Floodplain / facility elevations
- Lack of a convenient storm outlet
- Planned operational changes to OSIS
  - Increase in HGL to approx. 705-ft
  - Ground elevations in park: 697-ft to 702-ft

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Storm Water Separation

- Evaluated several options
  - Storm sewer
  - Stormwater Pump Station
  - Green Alternatives
    - Infiltration trenches
    - Dry Wells
    - Exfiltration Structures

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Geotechnical Data

- Soil borings taken at various locations to 15-ft
  - 0 to 0.5-ft – Topsoil
  - 0.5 to 6-ft – Clay
  - 6-ft to 15-ft – Sand and Gravel
  - Water at 6 to 9-ft
- Natural sand and gravel strata at approx. 6-ft

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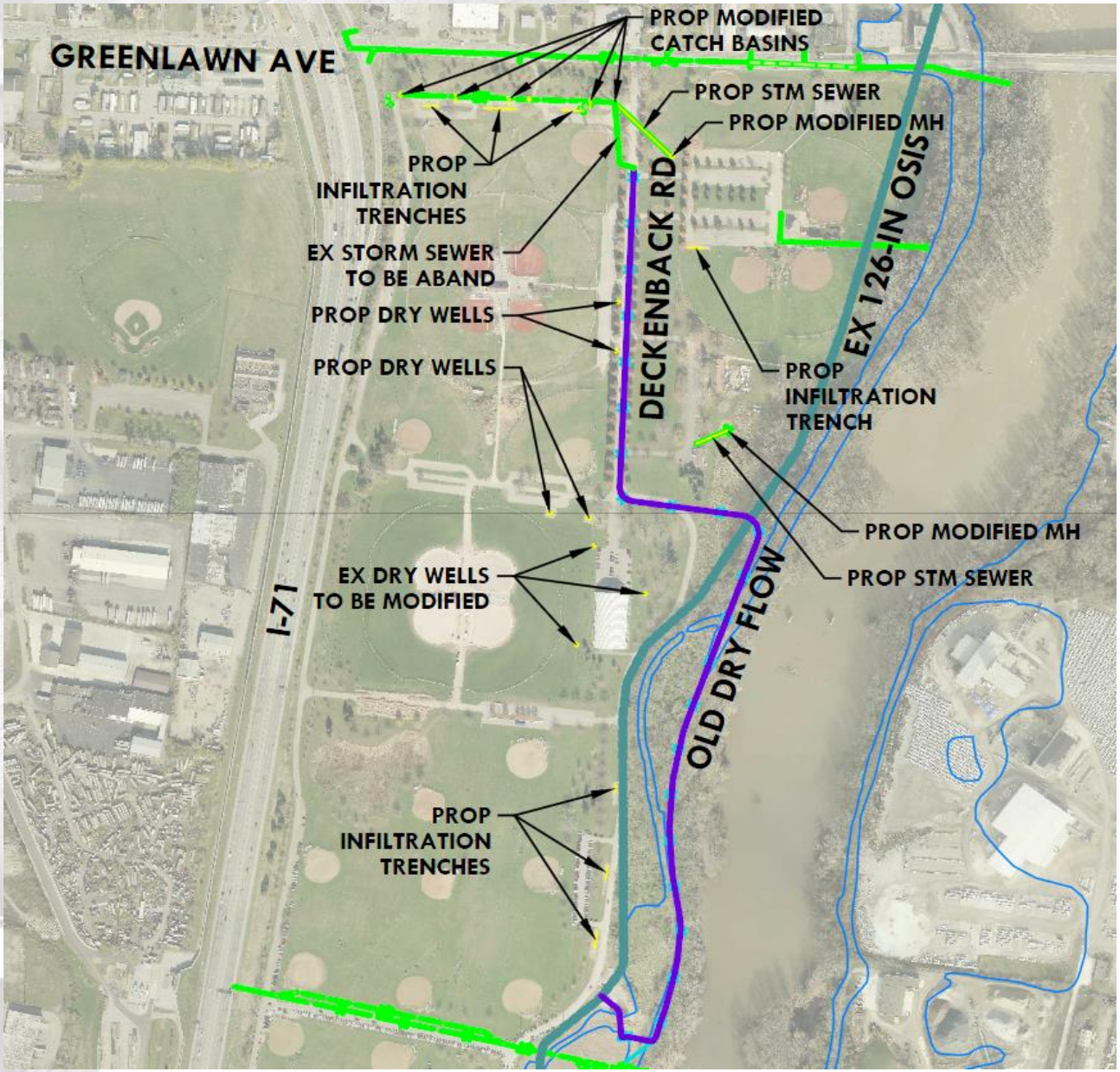
Storm Grading Plan



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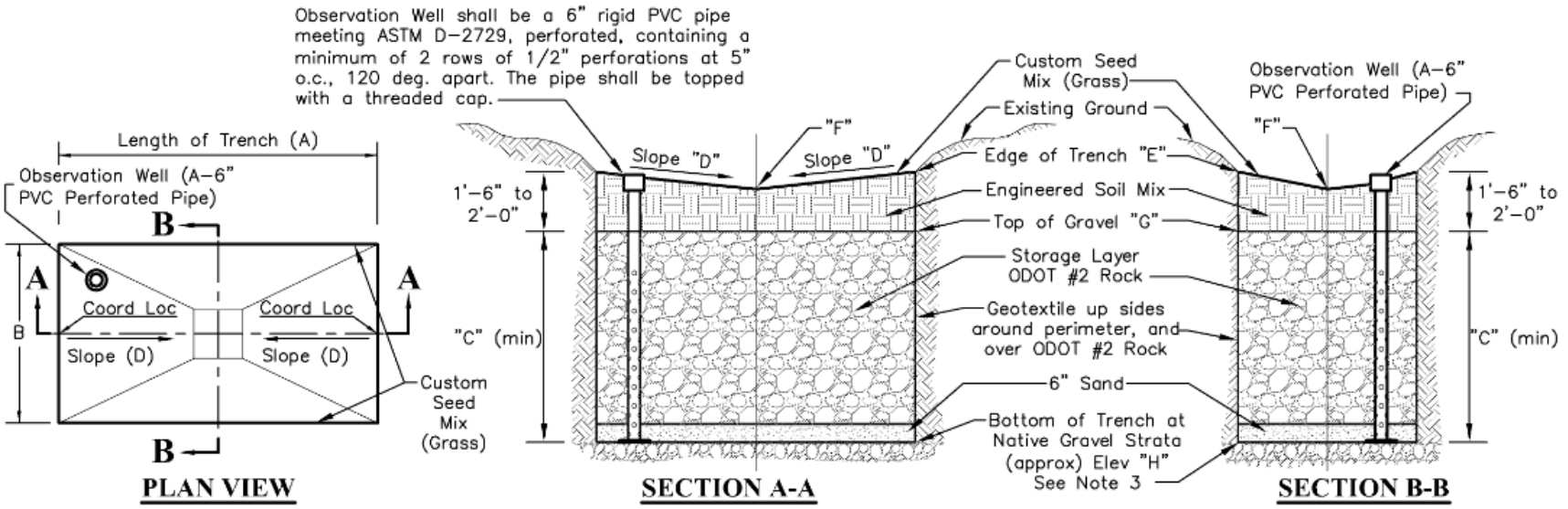
Infiltration Trenches



+ Drain larger areas (parking, roadway, ball fields)
+ Permeable engineered soil mix
+ No. 2 stone to the depth of the native sand/gravel
+ Slope surface to the center of trench
+ Geotextile fabric
+ Observation well
+ Maintenance Plan

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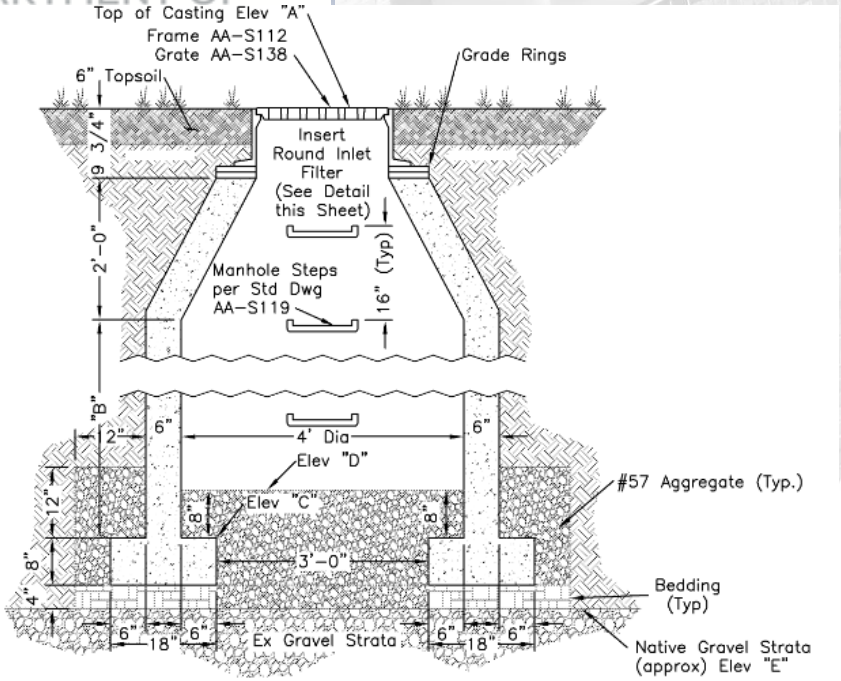
Dry Wells



- Drain isolated low spots in the park
- Standard manhole with open grate cover
- Open bottom extending to natural sand and gravel
- Inlet filter installed for maintenance

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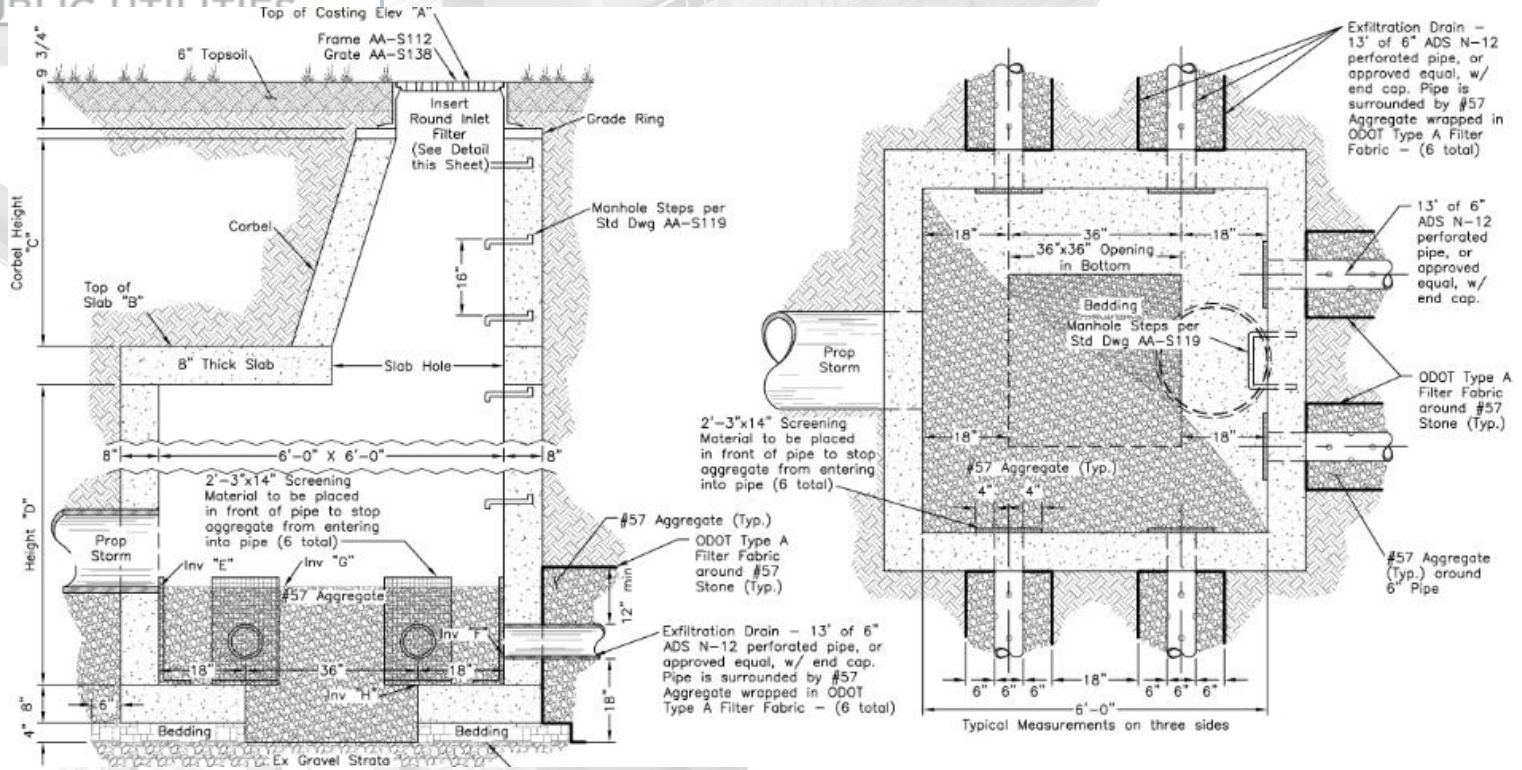
Exfiltration Structure



- Replace existing storm sewer
- Larger discharge structure allows storm water to ex-filtrate to gravel strata

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Green Infrastructure – Design Procedure

- Design procedure is not straight forward
- Calculate water quality volume
- Establish model using design storm that produces WQv
- Model infiltration trenches as ponds to determine required size

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Sanitary Sewer Modifications

- 4 facilities in the park discharging to ODF
- OSIS HGL issues
  - Facility ground elev. = 697 – 702-ft
  - Proposed OSIS HGL elev. = 705-ft
- Hydraulically disconnect the local collection system from the OSIS
  - Eliminate WIBs / surcharging at facilities

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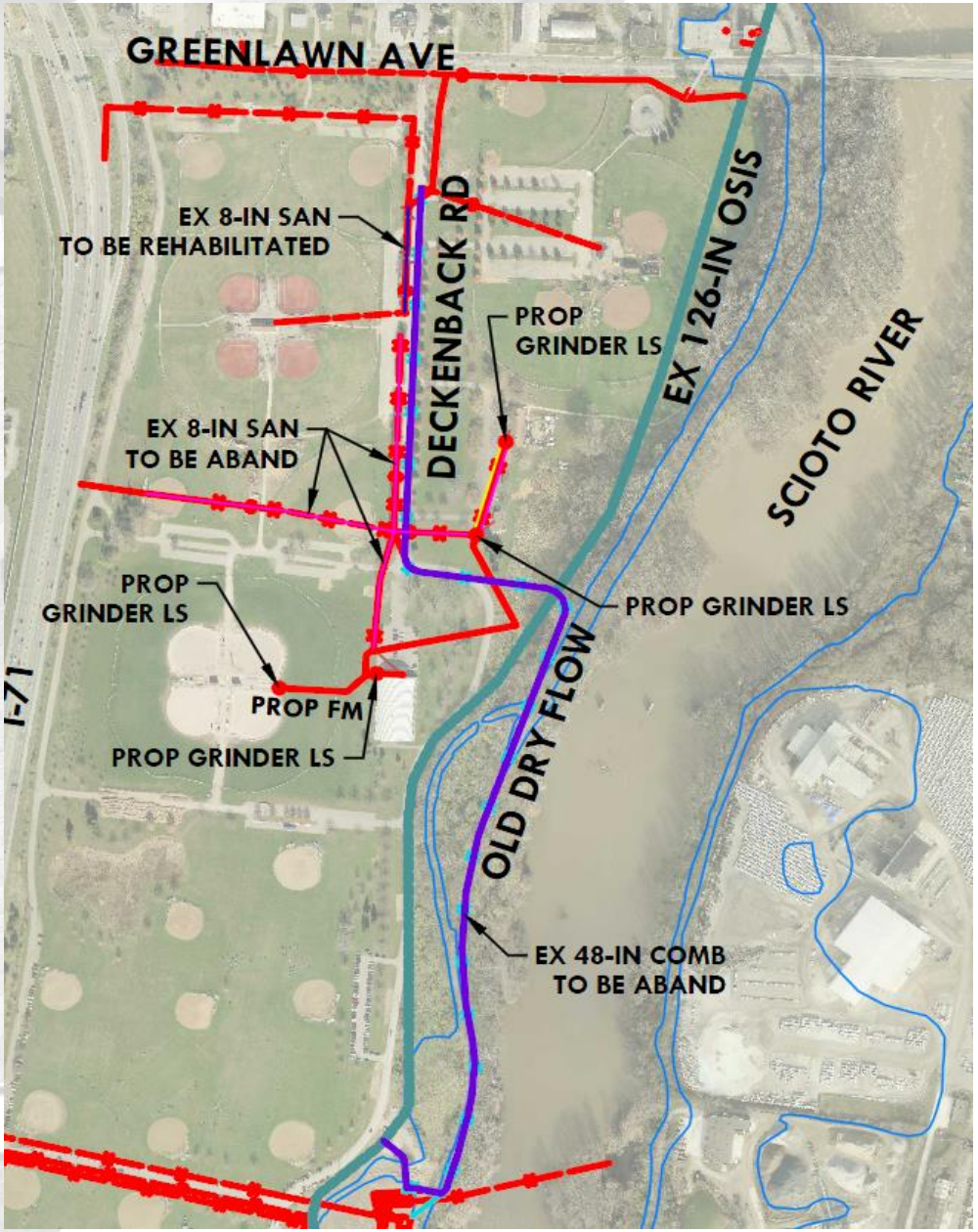
Sanitary Plan



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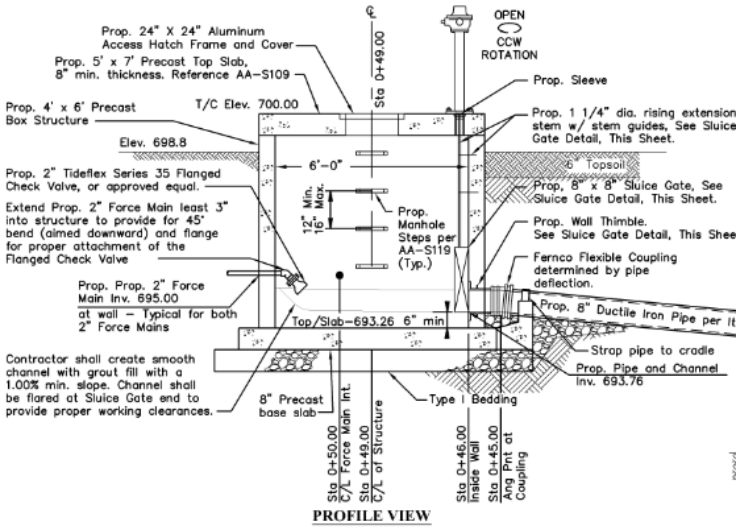
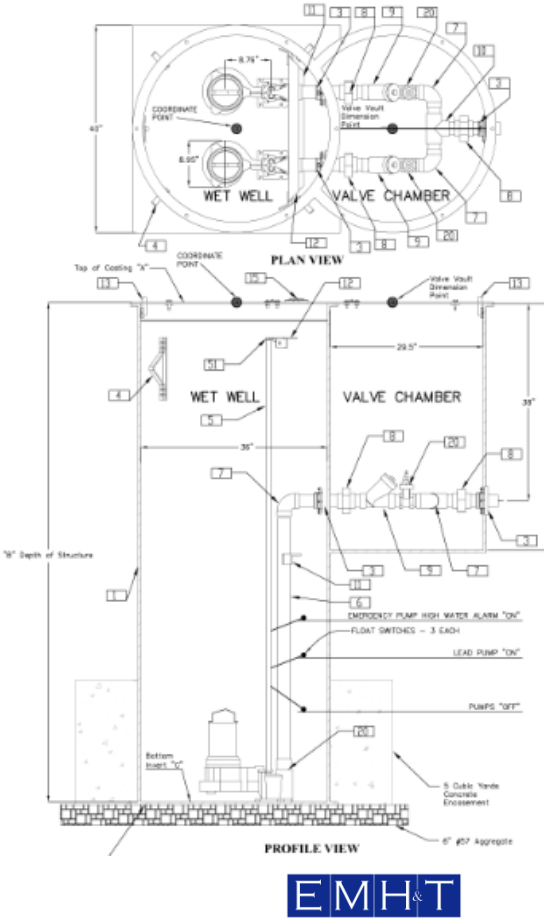
Pressure Sewer Design

- Four prepackaged grinder lift stations
- Common force main(s)
- Discharge structure with gate
- Check valve structures at junctions





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Old Dry Flow Abandonment

- Clean / remove settled debris
- Plug upstream of OSIS
- Abandon / fill with flowable fill
- Cut down manholes

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Construction

- Coordination with Columbus Recreation and Parks
- Costs
- Lessons learned
  - Design
  - O&M Considerations

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Construction / Photos

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Questions

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