Flood Protecting Critical Assets at The Ohio State University

One Water Conference
August 29, 2018
University Framework Plan

- Better access to the University’s Medical Campus and other core areas
- Potential for the Olentangy River to be part of an open space amenity
Fifth Avenue Dam Removal and River Restoration
Historical Flood Protection
Historical Flood Protection
Medical Campus and Research Center in the 500-Year Floodplain
Phase I

Phase II

Relocated Cannon Drive/
Line of Flood Protection

King Avenue

Woody Hayes Drive
Project Goals

- Create an eventual north-south connection between Lane Ave and King Ave
- Provide a 500-year level of flood protection
- Levee recognized by NFIP
- Create 12 acres of developable land
- Enhancing green space along the Olentangy River corridor
Project Considerations

- Transportation Needs
- Park Development
- Landscaping
- Utility Coordination
- Engineered Levee
- NFIP Acceptance (CLOMR/LOMR)
- ODNR Approval
- Columbus Approval

- Environmental Covenant Modification
- Section 404 Permit (USACE)
- NPDES Stormwater NOI (OEPA)
- Columbus Stormwater Drainage Manual Compliance
Roadway Section
Levee Section

Land Side of Levee
Riverine H&H

- 543 sq. mi. watershed
- FEMA model revised after 5th Ave Dam Removal
- Hydrology influenced by Delaware Dam
- Peak discharge rates based on USGS Gaging Station in Worthington
- SWMM model prepared to validate FEMA flows
- Levee final design based on FEMA 500 year streamflow plus two foot freeboard to address uncertainty concerns
Interior Drainage System - JPA

- Likelihood of local rain event and Olentangy River flood occurring simultaneously
- Review of historical rainfall data and stream gage records
- Analysis determined weak correlation

<table>
<thead>
<tr>
<th>River Flooding Return Frequency</th>
<th>Annual Probability</th>
<th>Design Storm Event¹</th>
<th>24-hour Rainfall Depth</th>
<th>HGL Elevation at 12th Ave.</th>
<th>Joint Probability of Occurrence</th>
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<tr>
<td>1-yr (100%)</td>
<td>100%</td>
<td>500-yr</td>
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<td>723.35</td>
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</table>
• SWMM analysis
• Routing to detention basin under river low flow condition
• Under river high flow condition, weir opens at pump station to divert flow
• Box culvert (8’x5’) in Cannon Drive provides conveyance and storage
Interior Drainage System – Phase 1 Pump Station

- Maximum capacity = 120 cfs
  - 3 duty pumps; 2 submersible pumps
- Primary electrical feed with natural gas backup generator
ODNR Levee Construction Permit

- Preliminary Design Report: Phase 1 & 2
- Final Design Report: Phase 1 only in 2017
- Permit issued for Phase 1 construction: September 2017
Permitting – Federal

Conditional Letter of Map Revision
• Phase 1: Issued Feb. 2017
• Phase 2: Revised CLOMR
• LOMR to be filed upon completion of Phase 2
• NFIP 65.10 compliance
  • Freeboard (7 to 8 feet provided for 100 year flood)
  • Closures (Checkmate backflow valves)
  • Scour protection
  • Embankment Stability, Seepage, & Settlement
  • Interior drainage analysis
  • Operation and Maintenance Plan
Project Schedule

• Phase 1 under construction; completion 12/2019
• Phase 2 schematic design; construction TBD
Project Partners
Phase 2 – Existing Conditions
Phase 2 – Proposed Conditions
Phase 2 – Proposed Conditions
Phase 2 – Proposed Conditions