A Collaborative Approach to Facility Floodplain Mitigation

October 29, 2014

Joseph Canas, PE, LEED AP, CFM, Project Manager
The Facility

Metro North Commuter Railroad
Norwalk River
West Pond
Driveway Bridge
Pedestrian Bridge
Flooding Issues

- Norwalk River had flooded the site in the past
- River came close to flooding facility on number of occasions
- Basement pump had failed, flooding basement
- Only a matter of time before it happens again!
Formula for Success

- Insurers
- Consulting
- Regulatory Agencies
- Neighbors
- ASML
Identify Potential Flooding Sources

- **Groundwater**
  - Pump failure

- **Norwalk River**
  - Overtops banks

- **West Pond**
  - Culvert plugging
  - Embankment breach

- **On-Site Storm Drains**
  - Pipe blockages
  - Inlet blockages
Selecting the Level of Protection

■ **1% Annual Chance Protection Not Enough**
  – Sensitive Equipment
  – Loss of Productivity
  – Financial Exposure of Flooding
  – Disruption to Supply Chain

■ **Insurers Requested**
  – 2 Feet of Freeboard Along River
  – Regrading Parking Lot to Increase Pitch Away From Building
  – Draining the West Pond
Selected Mitigation Strategy

- Demolish Portion Of Building
- Remove Exist. Pedestrian Bridge
- Widen Channel
- Cantilever New Walkway
1% Chance WSEL Reduction

- 2.68 feet
- 1.23 feet

Upstream neighborhood
Approval Agencies

- Town of Wilton DPW
- Town of Wilton Inland Wetlands
- CTDEEP Fisheries
- US Fish & Wildlife Service
- CTDEEP Inland Water Resources Division
- US Army Corps of Engineers
Approval Agencies

- Meet early in process
- Identify concerns upfront
- Partnership for success
- Collaboration takes time!
<table>
<thead>
<tr>
<th>Date</th>
<th>Approval Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 05</td>
<td>Applications Submitted to Regulatory Agencies</td>
</tr>
<tr>
<td>May 15</td>
<td>CTDEEP 401 Water Quality Certification</td>
</tr>
<tr>
<td>June 04</td>
<td>USACOE CT PGP Approval</td>
</tr>
<tr>
<td>Aug. 08</td>
<td>Town of Wilton Inland Wetlands Permit</td>
</tr>
</tbody>
</table>
West Pond

- Walked site, found two outlets

- Risk assessment assuming pond and spillway plugged
  - 8 different scenarios

- Consideration of other risks
  - Embankment failure
  - Power transmission company modifications
West Pond

- Mitigation strategies limited
- Primary concern was railroad’s maintenance
- Met onsite with Metro North and CTDOT
- ASML wanted easement to maintain pond culvert
- Force account for additional maintenance
Key Takeaways

■ Involve stakeholders
■ Identify synergies and trade-offs
■ Meet early with approval agencies
■ Set appropriate level of risk
■ Look beyond the FIRM to identify risks
■ Collaboration takes time!