Disaster Planning in the City of Philadelphia

Keeping History Above Water
October 30, 2017
WHY CONNECT HISTORIC RESOURCES WITH DISASTER PLANNING? HOW?

Most historic resources were built along waterways and before modern flood regulations and building codes, so they tend to be located in flood-prone areas.

BUT….

A recent report* found that 60% of all states lack specific preservation strategies in their hazard mitigation plans and only 13 include specific goals and strategies that mention protecting historic resources.

**SCOPE**

Gather up-to-date and consistent information for the SHPO on 568 registered historic properties in identified flood hazard areas, with focus on:

- Building construction characteristics
- Character-defining features
- Elevation data

<table>
<thead>
<tr>
<th>Flood Inundation Area</th>
<th>Designated Historic Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>- An area within the 100-year (1% annual chance) or 500-year (0.2% annual chance) flood according to FEMA’s Digital Flood Insurance Rate Maps (DFIRMs); or</td>
<td>- Is individually listed in the National Register of Historic Places (NRHP) by the National Park Service (NPS), including National Historic Landmarks (NHLs); or</td>
</tr>
<tr>
<td>- An area identified as vulnerable to high tide storm surge inundation during a category-1 hurricane event (the SLOSH model); or</td>
<td>- Is individually listed in the Philadelphia Register of Historic Places (PRHP); or</td>
</tr>
<tr>
<td>- An area identified as being vulnerable to up to 6 feet of projected sea level rise by the National Oceanic and Atmospheric Administration’s Sea Level Rise Impacts model.</td>
<td>- Contributes to a listed National Register Historic District; or</td>
</tr>
<tr>
<td></td>
<td>- Contributes to a listed Philadelphia Register Historic District.</td>
</tr>
</tbody>
</table>
QUICK STATS:

- **568** total resources ranging in date from 1697 to 1974
- **495** resources contributing to a historic district
- **34** NHL’s
- **296** in the 100-year flood (1% annual chance)
- **273** in the 500-year flood (0.2% annual chance)
- **164** vulnerable to up to 6 feet of projected sea level rise
- **52** in a high-tide, category 1 hurricane inundation area
HIGH CONCENTRATION AREAS

1
CENTRAL SCHUYLKILL
Central & University Southwest
(left)

2
NAVAL SHIPYARD
Lower South
(top right)

3
NORTHERN SCHUYLKILL RIVER
Lower Northwest
(bottom right)
DATA GATHERING

GIS and Google Earth Analysis
EMBEDDED REAL-TIME MONITORING
## Pennsylvania State Historic Preservation Office

### Disaster Planning for Historic Properties Initiative (2015-17)

#### Historic Resource Flood Hazard Vulnerability Survey Form

<table>
<thead>
<tr>
<th>PASHPO Key #</th>
<th>001472</th>
<th>Inventory ID #</th>
<th>448</th>
<th>Current Historic Register Status</th>
<th>NRHP, PRHP</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>County</th>
<th>Philadelphia</th>
<th>Municipality</th>
<th>Philadelphia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning District</td>
<td>Central</td>
<td>Neighborhood</td>
<td>Queen Village</td>
</tr>
<tr>
<td>Address</td>
<td>904-38 S Swanson St</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latitude</td>
<td>39.934491</td>
<td>Longitude</td>
<td>-75.143453</td>
</tr>
<tr>
<td>Resource Type</td>
<td>District</td>
<td>Building Type</td>
<td>2 STORY MASON</td>
</tr>
<tr>
<td>Building Name</td>
<td>Gloria DelOld Swedes’ Church</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Function(s)</td>
<td>Religious structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax Parcel ID</td>
<td>771170000</td>
<td>Owner Type</td>
<td>Private</td>
</tr>
<tr>
<td>Assessed Value</td>
<td>$464,900</td>
<td>Valuation Year</td>
<td>2006</td>
</tr>
<tr>
<td>Valuation Source</td>
<td>Philadelphia Office of Property Assessment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Site Location

- **Architectural Style:** Vernacular
- **Rowhouse Type:** N/A
- **Retention of Character-Defining Features:** High
- **Physical Condition:** Good
- **Primary Exterior Material:** Brick
- **Structural System:** Masonry
- **Est. First Floor Sq. Ft.:** 636.186
- **Number of Stories:** 2
- **Basement Present:** Yes

### Flood Risk Details

- **FIRM #:** 4205750192H
- **FIRM Date:** 11/18/2015
- **Flood Zone:** X
- **Category-1 Storm Surge:** No
- **100-Year Floodplain:** No
- **Sea Level Rise:** N/A
- **500-Year Floodplain:** Yes
- **Base Flood Elevation (ft):** 16.121
- **First Floor Elevation (ft):** 17.244
- **Lowest Adjacent Grade (ft):** 10.283
- **Highest Adjacent Grade (ft):** 17.244

**Elevation data courtesy of:**

**US Army Corps of Engineers, Philadelphia District**

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**Recorded by:** AECOM

**Date Prepared:** June 2016
COMMON DISASTER-PRONE CDFs

- Original painted metal cornice and finials
- Prismatic glass
- Early wooden storefront
- Door surround
- Basement windows
- Original marble stoop, cheek wall, and threshold
- Projection
- PA blue marble
- Cast iron boot scraper + window grills

*Don’t forget streetscape elements!
ROWHOUSE TYPOLOGY

TRINITY / BANDBOX

DOUBLE TRINITY / LONDON HOUSE

FEDERAL / GEORGIAN TOWNHOUSE
ROWHOUSE TYPOLOGY

WORKINGMAN’S HOUSE

URBAN MANSION

PORCHFRONT
ROWHOUSE TYPOLOGY

248 rowhouses
OTHER SOURCES
HABS/HAER/HALS
## ANALYZING THE DATA

### Period of Development

<table>
<thead>
<tr>
<th>Key Period of Development</th>
<th>Total Number</th>
<th>100-Year Flood</th>
<th>500-Year Flood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colonial Period: 1640 – 1800</td>
<td>7</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Early Republic Period: 1780 – 1830</td>
<td>18</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Mid-19th Century Period: 1830 – 1860</td>
<td>79</td>
<td>15</td>
<td>64</td>
</tr>
<tr>
<td>Late Victorian Period: 1850 – 1910</td>
<td>221</td>
<td>50</td>
<td>171</td>
</tr>
<tr>
<td>Late 19th and Early 20th Century Period: 1890 – 1930</td>
<td>154</td>
<td>42</td>
<td>112</td>
</tr>
<tr>
<td>Modern Movement: 1925 – 1950</td>
<td>70</td>
<td>31</td>
<td>39</td>
</tr>
<tr>
<td>N/A</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Totals:</td>
<td>561</td>
<td>150</td>
<td>411</td>
</tr>
</tbody>
</table>
ANALYZING THE DATA

Period of Development

- Pre-1800: 9 Resources
- 1800-1849: 35 Resources
- 1850-1899: 288 Resources
- 1900-1949: 225 Resources
- Post-1950: 11 Resources

Emergent Historic Properties in Flood Inundation Area
All Historic Properties in Flood Inundation Area
ANALYZING THE DATA

NHL’s
LESSONS LEARNED

Property Owner Interaction
LESSONS LEARNED

Property Owner Interaction

2012

2016

Source: Joseph Petraglia
LESSONS LEARNED

Property Owner Interaction
# LESSONS LEARNED

## Property Owner Interaction

<table>
<thead>
<tr>
<th>RESOURCE</th>
<th>FID NO.</th>
<th>VISIT DATE</th>
<th>OWNERSHIP</th>
<th>FLOOD EVENT OVERVIEW</th>
<th>ENACTED MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fairmount Water Works</td>
<td>172, 173 499, 500 501, 502 503, 504 505</td>
<td>02/01/2016</td>
<td>Municipal</td>
<td>Schuylkill RiverFlooding occurs approximately once per year at the below-grade water works facility. The sprawling below-ground complex – comprised of both the New and Old Mill Houses – is inundated frequently with water, as well as a substantial amount of debris carried in with the flood water. The last flood was registered in May 2014.</td>
<td>In 2002, the Fairmount Water Works Interpretive Center floor (located in the Old Mill House portion of the facility) was elevated approximately two feet to protect the exhibits from water infiltration.</td>
</tr>
<tr>
<td>Water Department Filtering Station</td>
<td>377</td>
<td>02/04/2016</td>
<td>Municipal</td>
<td>Schuylkill RiverFlooding occurs frequently at the filtering facility for the Queen Lane Treatment plant due to its location directly atop the Schuylkill River. At the time of the visit, Water Department employees were working to contain rising water level before flooding would occur.</td>
<td>Wooden boards used to barricade doors from surging flood water.</td>
</tr>
<tr>
<td>G. J. Littlewood &amp; Son, Inc. (Littlewood Dyers)</td>
<td>182</td>
<td>02/04/2016</td>
<td>Private</td>
<td>Schuylkill RiverIndustrial property has survived decades of flooding events due to its location on the narrow flood plain of southern Main Street in Manayunk – a stretch of Main Street that is generally more vulnerable to flooding events that properties located further west. Water regularly infiltrates ground level.</td>
<td>Offices were elevated to the second floor to protect the company’s operations from flood damage. Exterior ground level stone walls parged with stucco to prevent water infiltration. Dry-floodproofing measures (watertight barriers/flood gates) employed during flood events.</td>
</tr>
<tr>
<td>Philadelphia Canoe Club</td>
<td>280</td>
<td>02/04/2016</td>
<td>Private</td>
<td>Schuylkill River and Wissahickon CreekFlooding is common at the basement-level; however high water marks have been known to reach past the first floor.</td>
<td>Members of the canoe club move furniture away from flood-prone areas of the property on an as-needed basis. Valuable canoes are hung from the first floor ceiling. Some furniture placed on wheels for easy portability during flooding events.</td>
</tr>
</tbody>
</table>
Disaster Planning for Historic Properties Initiative

CITY OF PHILADELPHIA, PENNSYLVANIA

PHASE 1: Historic Building Flood Vulnerability Assessment Data Recording

Prepared for:

Pennsylvania Historical and Museum Commission
State Historic Preservation Office
400 North Street, 2nd Floor
Harrisburg, PA 17120-0093

Prepared by:

AECOM
437 High Street
Burlington, NJ 08016-4514

FINAL DECEMBER 2016
THANK YOU

Emily Paulus Everett, AICP
emily.everett@aecom.com