Disaster Planning in the City of Philadelphia

Pennsylvania Statewide Conference on Heritage
June 14, 2017
Goals

How We Approached the Data Collection

How We Analyzed the Data

Lessons Learned
GOAL

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

### Flood Inundation Area

- 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
- An area identified as vulnerable to high tide storm surge inundation during a category-1 hurricane event (the SLOSH model); or
- 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.

### Designated Historic Properties

- Is individually listed in the National Register of Historic Places (NRHP) by the National Park Service (NPS), including National Historic Landmarks (NHLs); or
- Is individually listed in the Philadelphia Register of Historic Places (PRHP); or
- Contributes to a listed National Register Historic District; or
- Contributes to a listed Philadelphia Register Historic District.

6/7/2017
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
## EXISTING REGISTER DISTRICTS

<table>
<thead>
<tr>
<th>PRHP</th>
<th>Properties</th>
<th>Date Listed</th>
<th>Plan District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manayunk Main Street Historic District**</td>
<td>93</td>
<td>03/18/1983</td>
<td>Lower Northwest</td>
</tr>
<tr>
<td>Rittenhouse-Fitler Residential Historic District**</td>
<td>31</td>
<td>02/08/1995</td>
<td>Central</td>
</tr>
<tr>
<td>Historic Street Paving Thematic District</td>
<td>24</td>
<td>12/09/1998</td>
<td>University South, South, Central, Lower Northwest, River Wards</td>
</tr>
<tr>
<td>Old City Historic District</td>
<td>8</td>
<td>12/21/2003</td>
<td>Central</td>
</tr>
<tr>
<td>League Island (AKA FDR) Park Historic District</td>
<td>3</td>
<td>08/08/2000</td>
<td>Lower South</td>
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<tr>
<td>Ramcat/Schuylkill Historic District</td>
<td>193</td>
<td>01/08/1986</td>
<td>Central</td>
</tr>
<tr>
<td>Philadelphia Naval Shipyard Historic District</td>
<td>124</td>
<td>12/22/1999</td>
<td>Lower South</td>
</tr>
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<td>Manayunk Main Street Historic District</td>
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<td>03/18/1983</td>
<td>Lower Northwest</td>
</tr>
<tr>
<td>Boat House Row Historic District*</td>
<td>12</td>
<td>02/27/1977</td>
<td>Central (NR and NHL)</td>
</tr>
<tr>
<td>Frankford Arsenal Historic District</td>
<td>9</td>
<td>03/16/1972</td>
<td>North Delaware</td>
</tr>
<tr>
<td>Upper Roxborough Historic District</td>
<td>4</td>
<td>05/02/2001</td>
<td>Lower Northwest</td>
</tr>
<tr>
<td>Chestnut Hill Historic District</td>
<td>3</td>
<td>06/20/1985</td>
<td>Upper Northwest, Lower Northwest</td>
</tr>
<tr>
<td>Fairmount Park Historic District</td>
<td>3</td>
<td>02/07/1972</td>
<td>Central, West Park, Lower North, North, Lower Northwest, Upper Northwest</td>
</tr>
<tr>
<td>Laurel Hill Cemetery Historic District</td>
<td>2</td>
<td>10/28/1977; 8/05/1998</td>
<td>North, Lower North (NHL)</td>
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<tr>
<td>Fairmount Waterworks Historic District*</td>
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<td>05/11/1976</td>
<td>Central</td>
</tr>
<tr>
<td>Fort Mifflin Historic District</td>
<td>8</td>
<td>08/29/1970</td>
<td>Lower Southwest (NR and NHL)</td>
</tr>
<tr>
<td>Southwark Historic District</td>
<td>1</td>
<td>05/19/1972</td>
<td>Central, South</td>
</tr>
<tr>
<td>Philadelphia Historic District</td>
<td></td>
<td></td>
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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)
DOCUMENTING CHARACTER-DEFINING FEATURES

1 Roof features
   Roof shape, slope, cupolas, chimneys, dormers

2 Openings
   Distinctive openings

3 Projections
   Porches, front stoops, cornices, bay windows

4 Decorative Trim and Secondary Features
   Window and door surrounds, original shutters and hardware, ornamental ironwork, decorative brickwork

5 Craft details
   Hand-tooled/patterned stonework, patterned brickwork, narrow mortar “butter” joints
COMMON DISASTER-PRONE CDFs

Original marble stoop, cheek wall, and threshold
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 TYPOMETRY

248 rowhouses
OTHER SOURCES

HABS/HAER/HALS
OTHER SOURCES

Historic Photos
Pennsylvania State Historic Preservation Office

Disaster Planning for Historic Properties Initiative (2015-17)
Historic Resource Flood Hazard Survey Form

PASHPO Key #: 079900  Inventory ID #: 436  Current Historic Register Status: NRHP

Photograph of Main Façade

Year Built: 1890  Year Built Est.: Yes  Architectural Style: Late Victorian

Tax Parcel ID: 302160700  Owner Type: Private

Assessed Value: $334,900  Valuation Year: 2013

Valuation Source: Philadelphia Office of Property Assessment

Flood Risk Details (All elevations measured in feet NAVD88)

FIRM #: 42075/1630  FIRM Date: 9/17/2007  Flood Zone: X

Category 1 Storm Surge: Yes  100-Year Floodplain: Yes

Sea Level Rise: N/A  500-Year Floodplain: Yes

Base Flood Elevation (ft.): 12.090  First Floor Elevation (ft.): 23.001

Lowest Adjacent Grade (ft.): 20.012  Highest Adjacent Grade (ft.): 20.012

Description of Character-Defining Features

Roof Features: Yes  Wood cornice with applied decorative motif and brick dentil courses. Corbelled brick end brackets.

Openings: Yes  Painted stone basket handle sashes and tall stone units with segmental arch openings. Original wood window trim at first floor. Pre-1953 Colonial Revival wood door surround obscuring original transom and lintel above door.

Projections: Yes  Painted stone stoop with sheared cheek wall. High polished stone walkable.

Decorative Trim: Yes  Corbelled brick colonettes.

Craft Details: No  Additional: No  Ancillary: No

Resource Notes

Additional character-defining features include the side walkway/entry access. Colonial Revival door surround visible in 1953 photo on file with the Department of Records.
## 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 River. Flooding 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 River. Flooding 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 River. Industrial 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 Creek. Flooding 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>
LESSONS LEARNED

Surveyor Observations

Exterior Flood Safety Measures / Retrofits Observed During Field Survey

- Basement window openings infilled with glass block
- Basement window lintels and/or sills replaced with precast stone
- Raised planter beds in front of basement windows and window wells to protect openings
- Ground floor window openings infilled with recessed brick to seal opening and preserve the location and shape of character-defining openings
- Applied parging / stucco of masonry walls at foundation and first floor level where no water table exists
- Operable shutters at first floor openings to protect windows and withstand wind-borne debris
- Exterior storm windows and doors to protect windows and withstand wind-borne debris
THANK YOU

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