

WATERFRONT DEVELOPMENT IN A CHANGING CLIMATE

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June 20, 2017



PARTNERS FOR WHAT'S POSSIBLE

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Outline



- ◆ The Navy Yard
- ◆ PNY Development Conditions
- ◆ Design Considerations
- ◆ Green Stormwater Infrastructure



Firm Profile



- ◆ Established in 1966 by chairman Chuck Pennoni, PE
- ◆ Multidisciplinary engineering & design firm
- ◆ More than 1,200 professionals & support staff
- ◆ Offices throughout the United States
- ◆ Clients are local, state, and federal governments, private, commercial, industrial, and construction clients, as well as other professional firms

As an ESOP-owned firm, every Pennoni employee has a vested interest in the success of each project.

- ❖ Civil/Site
- ❖ Construction Services
- ❖ Energy & Sustainability
- ❖ Environmental
- ❖ Geotechnical
- ❖ Landscape Architecture & Planning
- ❖ Materials Inspection & Testing
- ❖ MEP
- ❖ Structural
- ❖ Survey & Geospatial
- ❖ Transportation
- ❖ Water Resources
- ❖ Water/Wastewater

The Navy Yard

- ◆ **Navy Ownership**
 - ❖ 1868



The Navy Yard

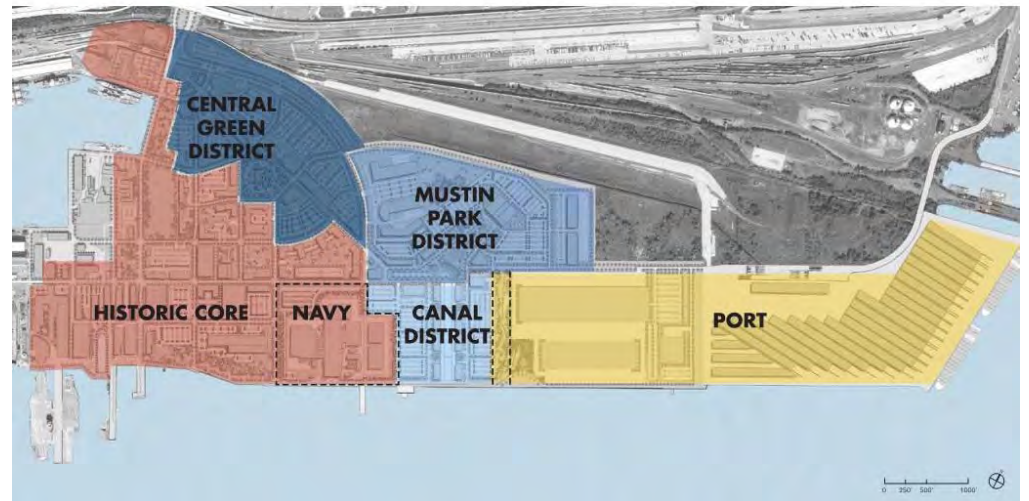
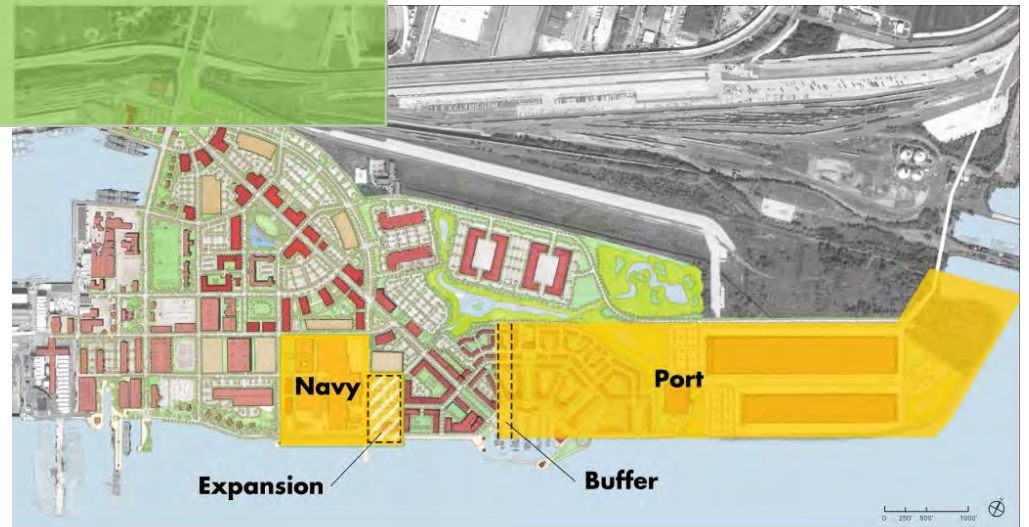
- ◆ **Navy Ownership**
 - ❖ 1868
- ◆ **BRAC Closure**
 - ❖ 1996
- ◆ **PIDC Control**
 - ❖ 2000



The Navy Yard

◆ Master Planning Overviews

- ❖ Original Master Plan (2004)
 - ❖ Main Diagonal (Rouse Blvd) from Broad St. to Marina District
 - ❖ Subsequent expansion of Port Facilities
- ❖ Master Plan Update (2013)
 - ❖ 5 Districts



PNY Development Conditions



- ◆ FEMA Flood Insurance Rate Maps (FIRMs)

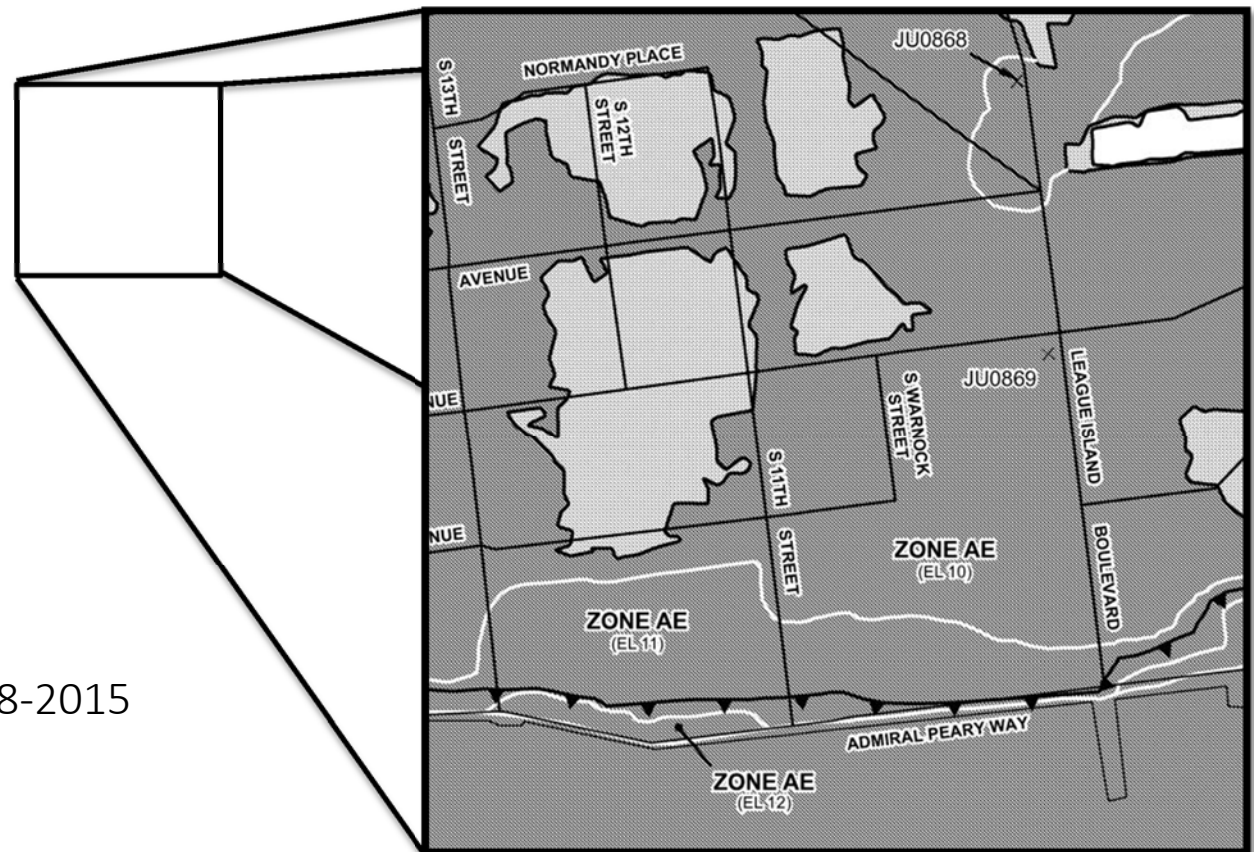


Panel "G" Valid 1-17-2007

PNY Development Conditions



- ◆ FEMA Flood Insurance Rate Maps (FIRMs)



Panel "H" Valid 11-18-2015

Design Considerations



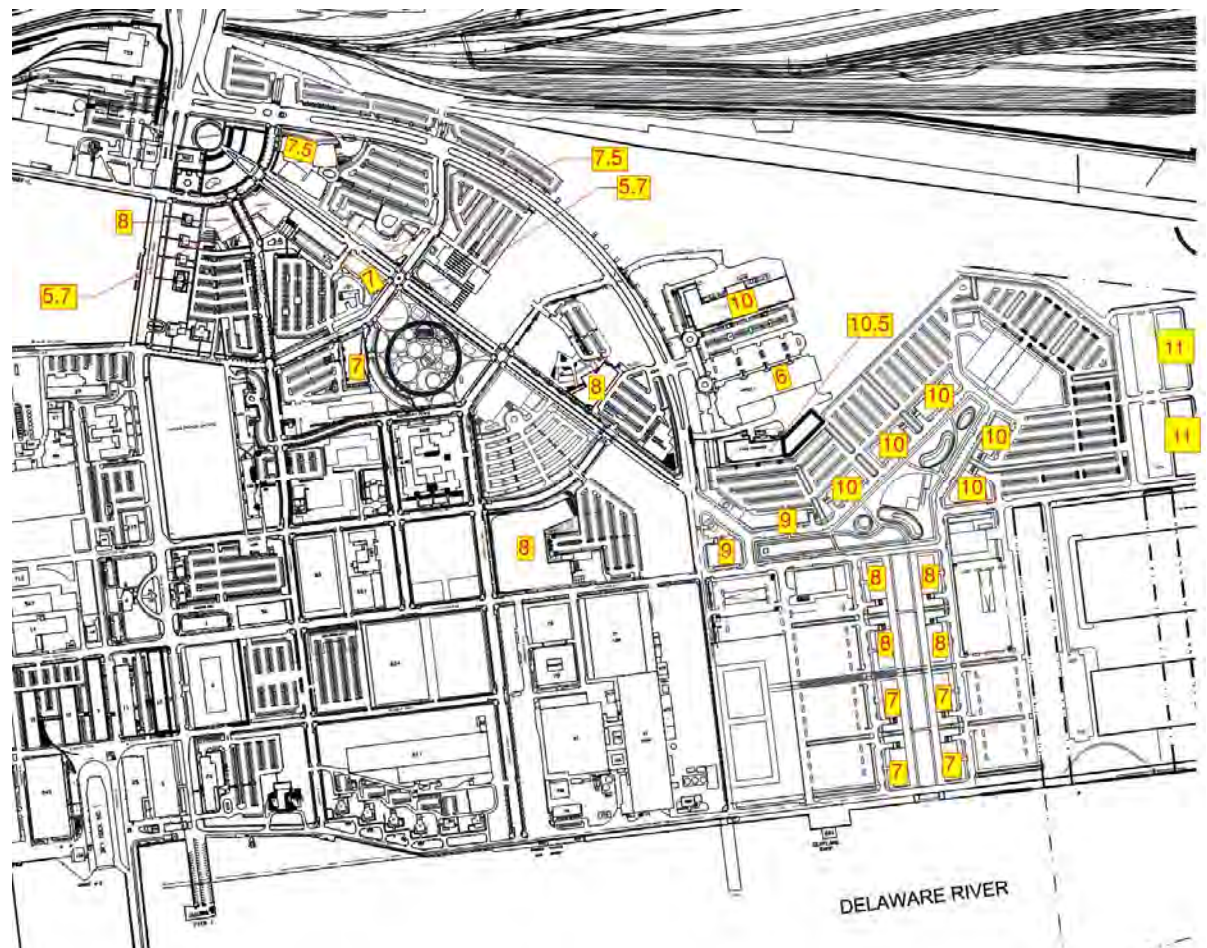
- ◆ **Original Master Plan**

- ◆ **Corporate Center**

- ❖ Road Grades Vary 4' to 9'
- ❖ Building Floor Elevations Vary 5.7 to 8.0
- ❖ Limited SWM

- ◆ **Update**

- ❖ Fill Operation
- ❖ Anticipated Floor Elevations
- ❖ Expanded SWM



PNY Development Conditions

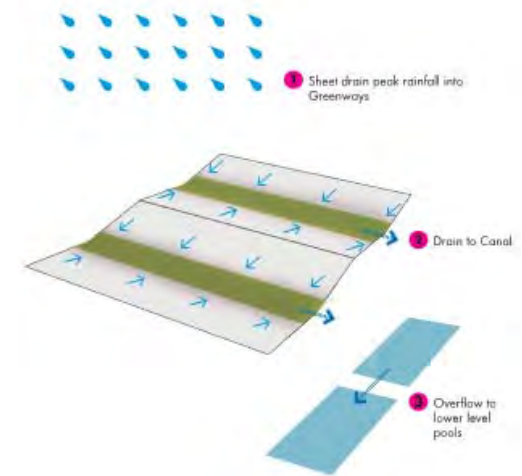


◆ Master Plan Update

- ❖ Raised Grade Sloping Up From River
- ❖ Maximize Surface Runoff- Less Pipe, Water Quality
- ❖ Detention in Bio-Basin and Stepped Canals

◆ Groundwater

- ❖ Elevation 0 to -3 Typical...Varies with Tide



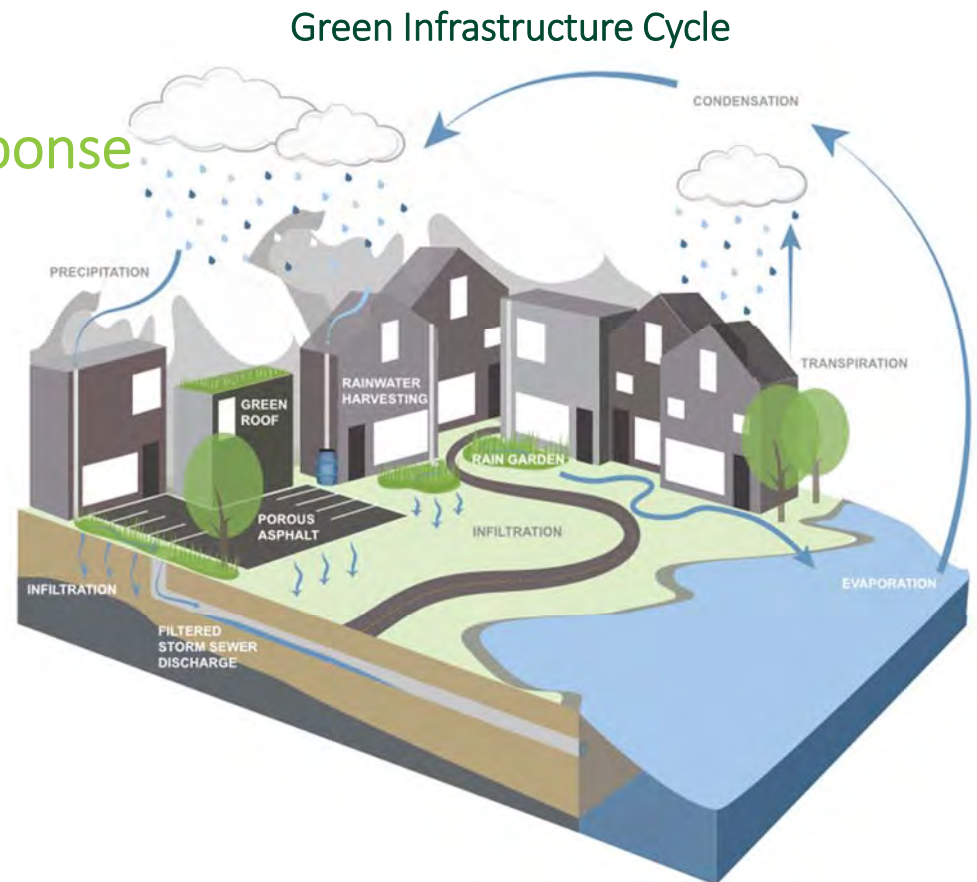
Source: The Navy Yard 2013 Master Plan Update

Green Stormwater Infrastructure



◆ Green City, Clean Water

- ❖ 1. EPA Mandate
- ❖ 2. Philadelphia Unique Response
- ❖ 3. PNY Design Response
 - ❖ *Green Streets*
 - ❖ *Central Green*



Central Green District - Green Street Design



Green Street
(Rouse Boulevard)



Rain Gardens

Central Green District

Source: The Navy Yard 2013 Master Plan Update

Central Green District - Central Green



Source: Halkin Mason Photography



**THANK YOU
QUESTIONS?**