Coastal Community Design Collaborative Adaptation Strategies at the District Scale

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COASTAL COMMUNITY DESIGN COLLABORATIVE
ADAPTATION STRATEGIES AT THE DISTRICT SCALE
Hampton University Departments of Architecture and Marine and Environmental Science
Old Dominion University Departments of Civil and Environmental Engineering and Engineering Technology
Community groups
“Cloud” of Academic and Professional Advisors
Itinerant Participation: James Madison Engineering, William & Mary Coastal Policy Center, Norfolk State Engineering

Now offering Concentration in Adaptation to Sea Level Rise
By 2019 Certificate in Adaptation to Sea Level Rise
Sea level rise varies place to place

- Norfolk
- Newport
- Global mean
**BARRIERS**

- TIDAL CHECK VALVES ON STORMWATER OUTFALLS (2)
- LIVING SHORELINE
- RAISED ROAD WITH TIDE GATE AT WETLAND AREA

**SPONGES**

- PERMEABLE PAVEMENT AT SIDEWALKS AND PARKING ZONE OF ROADWAY OVER CISTERNS
- BIO-RETENTION IN VERGES
- ROOFTOP DISCONNECTION PROGRAM
- TIDE GATE AT WETLAND AREA
GUIDING PRINCIPLES

- Leave people, buildings, & utilities in place
- Manage water as a district network
- Preference for low impact devices over pipe & pump
- Initiate community network in which all scales have part to play street by street, block by block, parcel by parcel
National Disaster Resilience Competition
GHENT: THE HAGUE

- National Register of Historic Places listed district
- Developed in 1890s to 1920s
- Public waterfront park and other open garden areas
- Between riverine estuary, medical center, arts district, and downtown.
- Failing bulkhead
- Significant flooding
PROPOSAL 1: OUTFALL BARRIER
TIDAL CHECK VALVES

SWMM MODEL
NODES
PROPOSAL 2: PERIMETER BASIN WALL

11. 100 year rain event
5' sight line from porch
Mean lower
low water
SPONGES: LARGER BASINS
STOCKLEY GARDENS AND OLNEY
DRY SWALES

4,421,000 gallons
SPONGES: LARGER BASINS
EVMS/LEIGH HOSPITAL
WALLED RAIN GARDEN
COMBINES DRY SWALE WITH ABOVE GROUND STORAGE

2,845,242 gallons
L.I.D. STREET-SCAPE STRATEGY

- PERVIOUS PAVING FOR SIDEWALKS AND 6’ PARKING WITHIN CARTWAY
- BIO-RETENTION VERGE
- EXISTING TREES PRESERVED FOR USEFUL LIFETIME; TREEWELLS WITHIN PARKING ZONE PLANTED UNTIL SERVICE FOR REPLACEMENT TREES.
- PERVIOUS PLANTING AREAS WILL REDUCE SIDEWALK HEAVE FROM ROOT SYSTEMS.
- GRANITE CURBING CUT FOR INFLOWS

As shown c. 42,000 gallons
Wetlands restoration at MoCA
Retention basin at foot of 264 Streetscape interventions
Dry swale performance space
HUNTERSVILLE

NEIGHBORHOOD OF THE FUTURE
EXISTING CONDITIONS

• sand/silt; groundwater 6-8’
• legacy creek bed
• retrofit/undersized/absent storm water lines
• flooding @ low points
• disjunctions in connectivity
• high social capital
Studio Based Learning