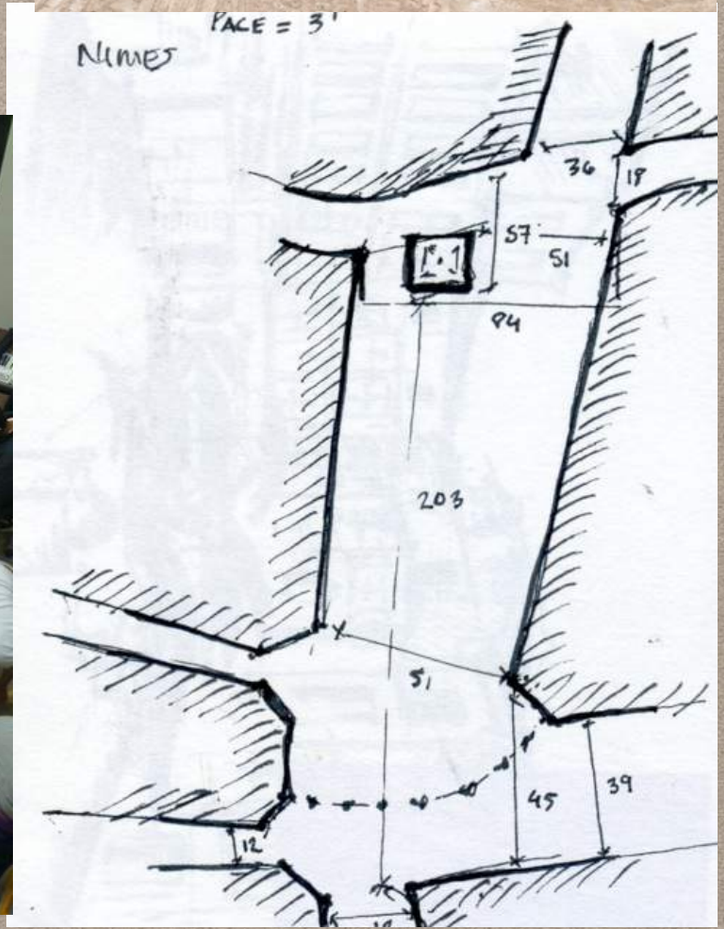
COASTAL COMMUNITY DESIGN COLLABORATIVE

ADAPTATION STRATEGIES AT THE DISTRICT SCALE

HAMPTON UNIVERSITY
ARCHITECTURE



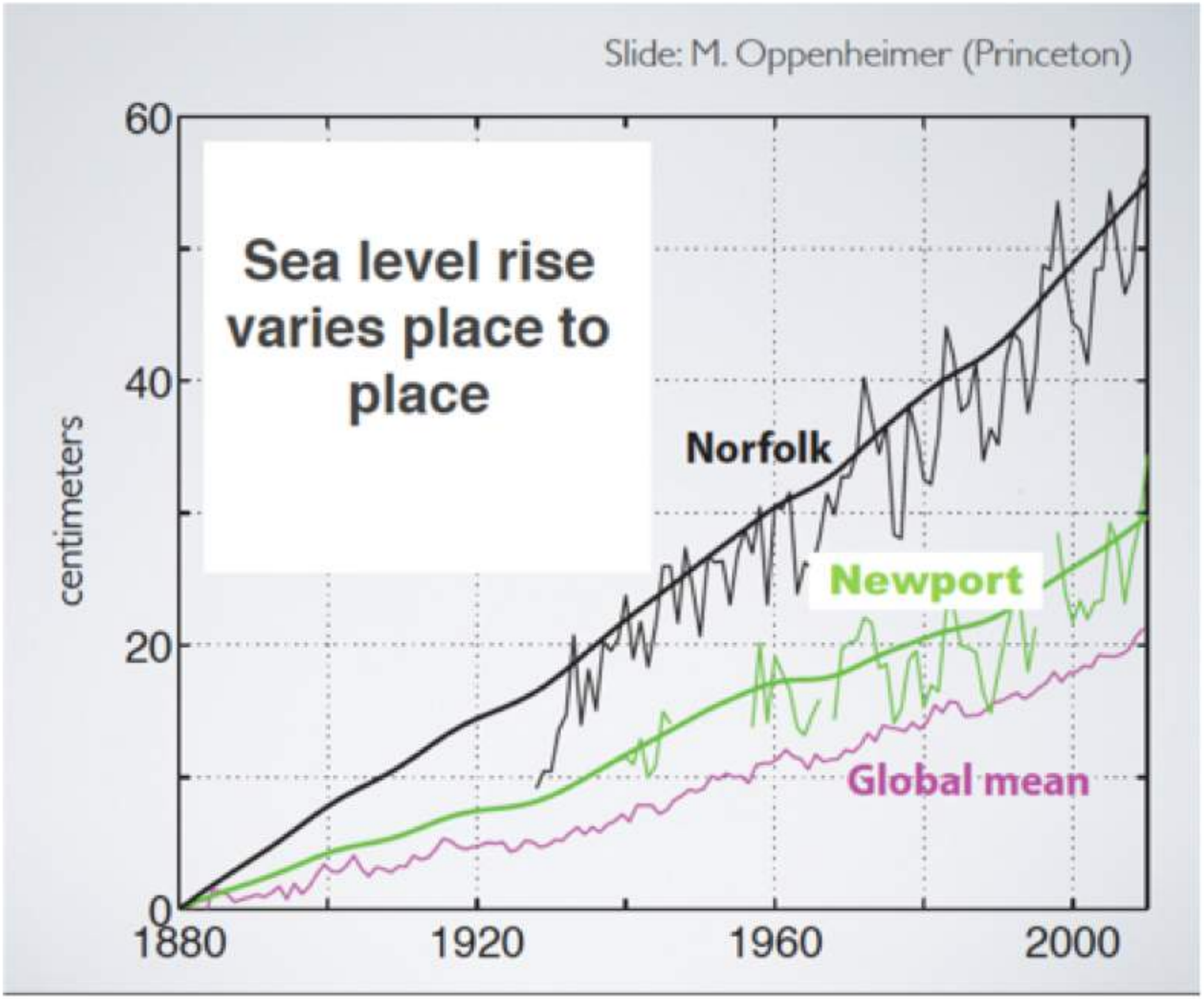
Hampton University Departments of Architecture and Marine and Environmental Science
Old Dominion University Departments of Civil and Environmental Engineering and Engineering Technology
Community groups
“Cloud” of Academic and Professional Advisors
Itinerant Participation: James Madison Engineering, 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

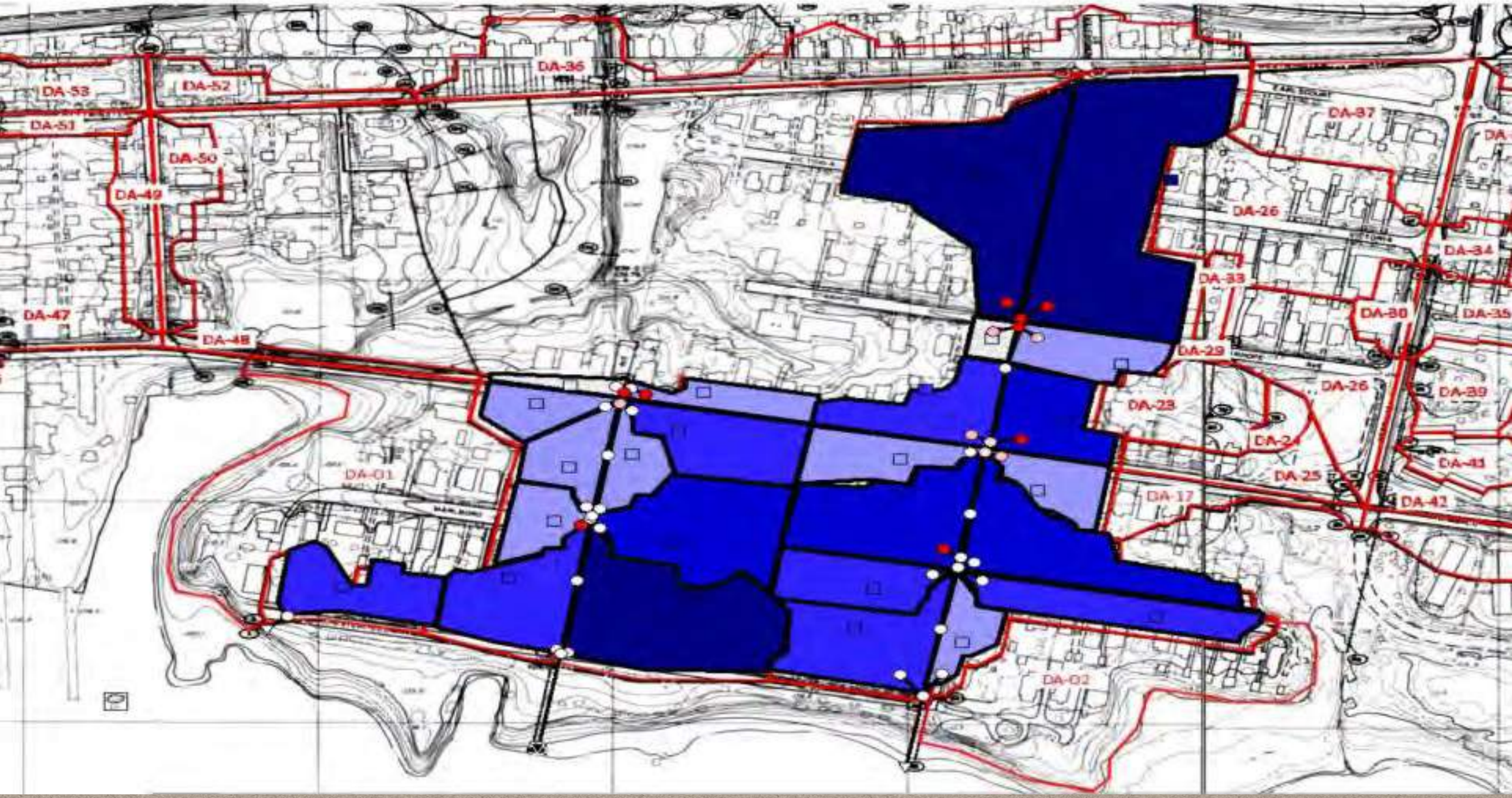
HAMPTON UNIVERSITY
ARCHITECTURE

OLD DOMINION UNIVERSITY
1930

Coastal Community Design Collaborative


Slide: M. Oppenheimer (Princeton)
Sea level rise varies place to place
Norfolk
Newport
Global mean
centimeters
60
40
20
0
1880
1920
1960
2000

CHESTERFIELD HEIGHTS

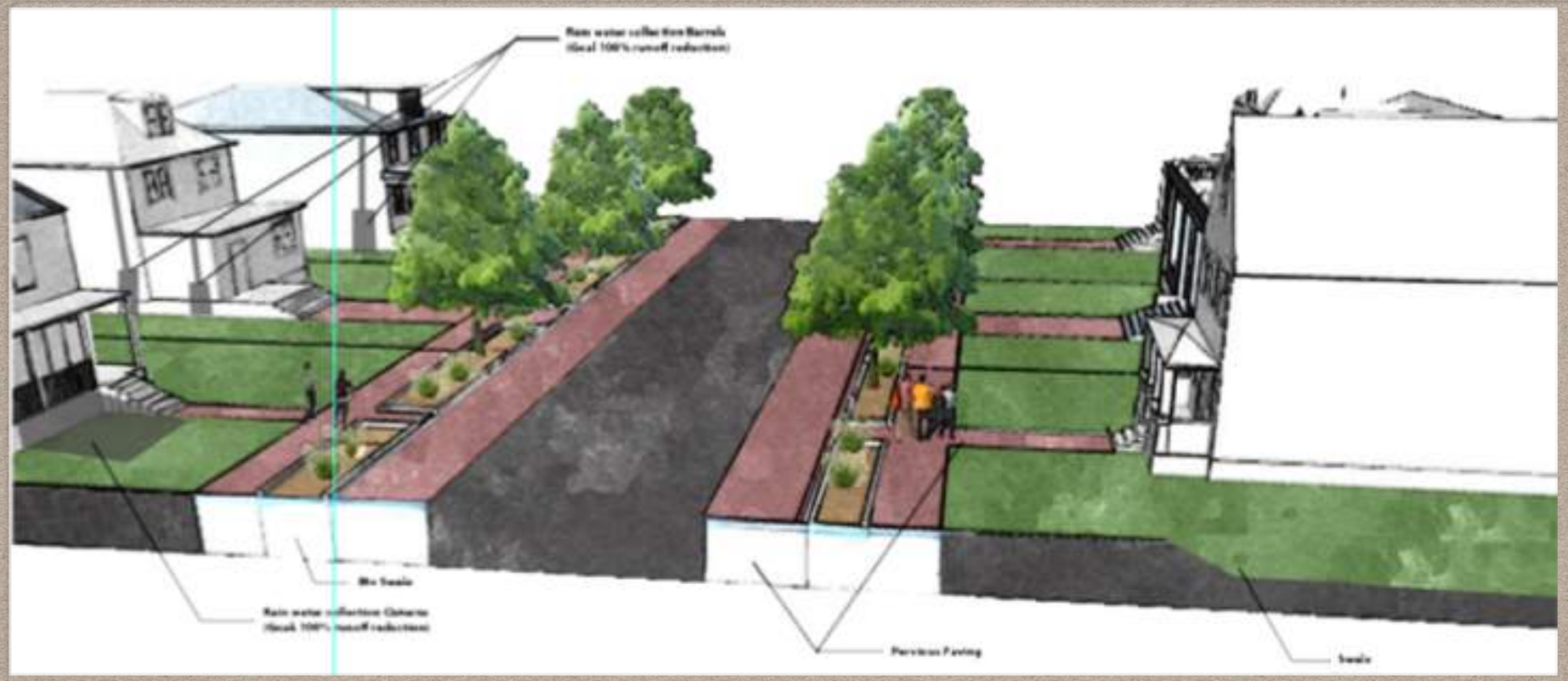


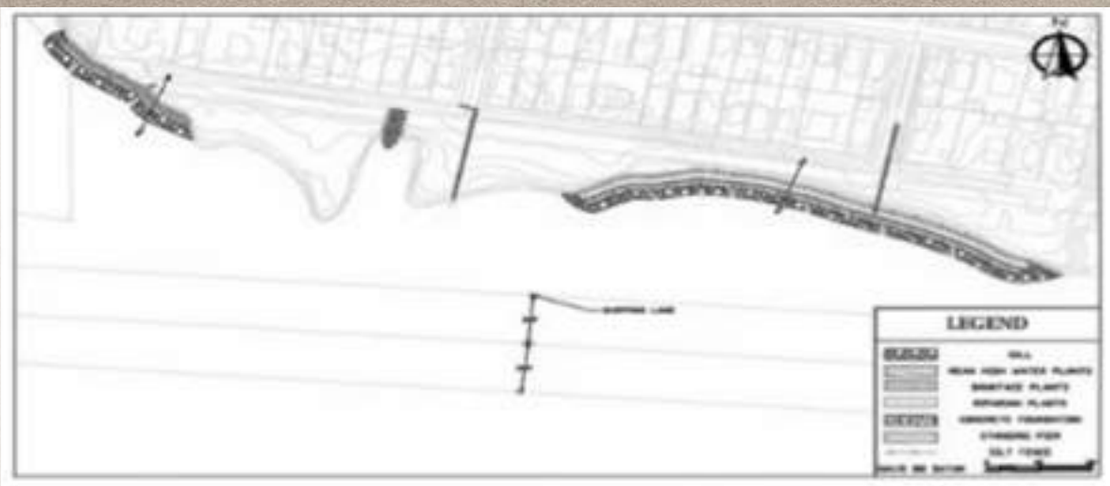
BARRIERS

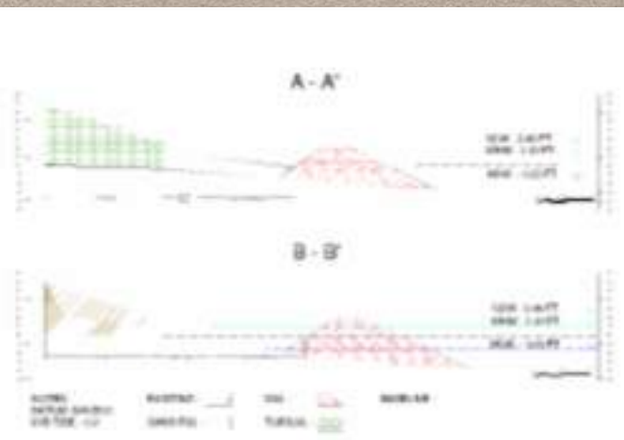
- TIDAL CHECK VALVES ON STORMWATER OUTFALLS (2)
- LIVING SHORELINE
- RAISED ROAD WITH TIDE GATE AT WETLAND AREA

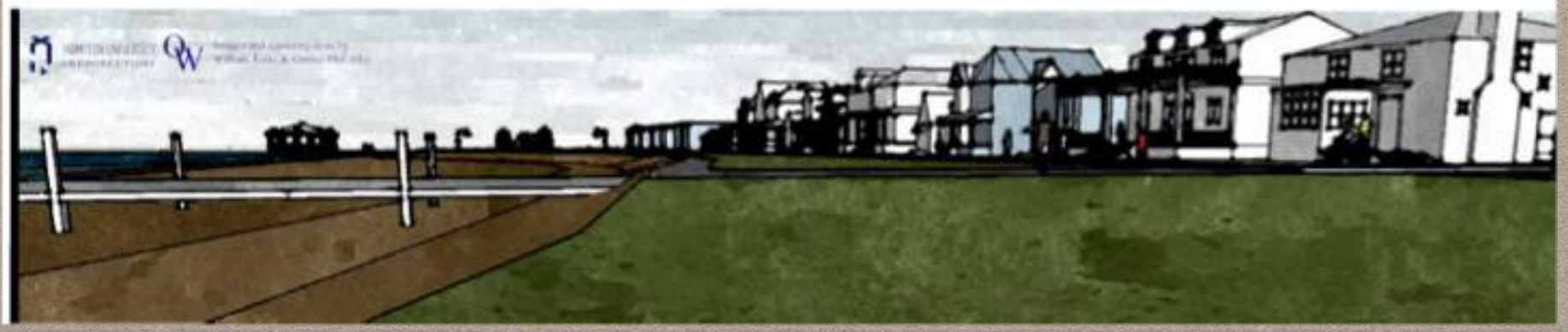
SPONGES

- 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

DUTCH DIALOGUES VIRGINIA:LIFE AT SEA LEVEL JUNE 2015

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

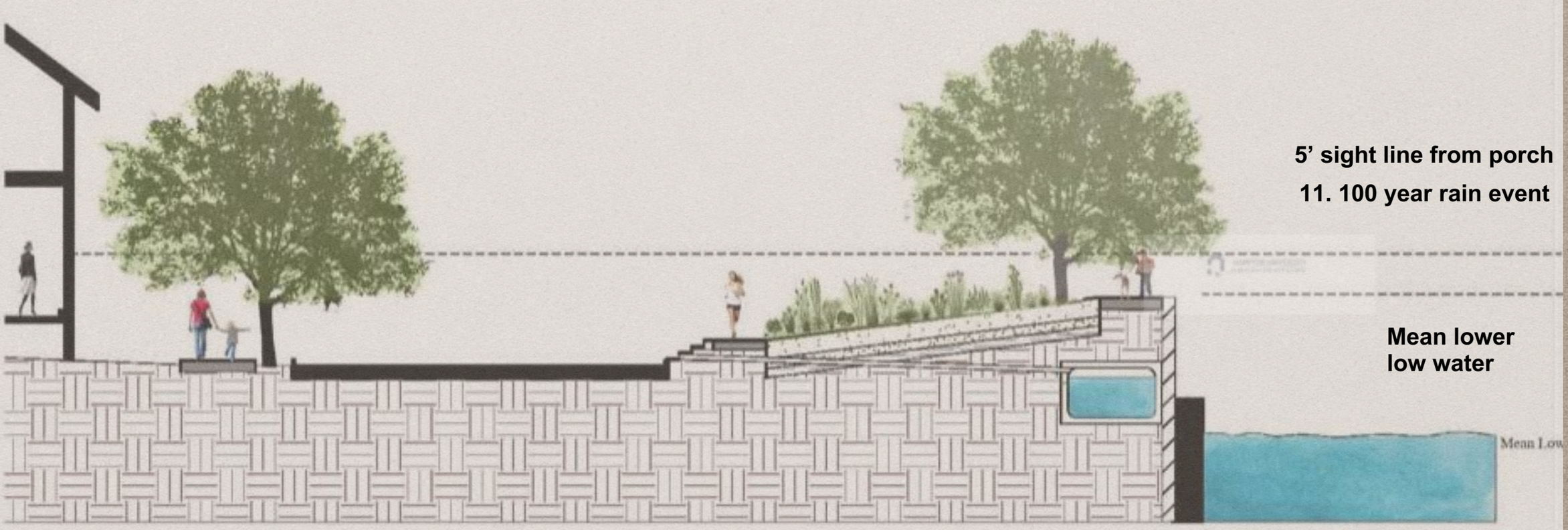
PROPOSAL 1: OUTFALL BARRIER

TIDAL CHECK VALVES

SWMM MODEL

NODES

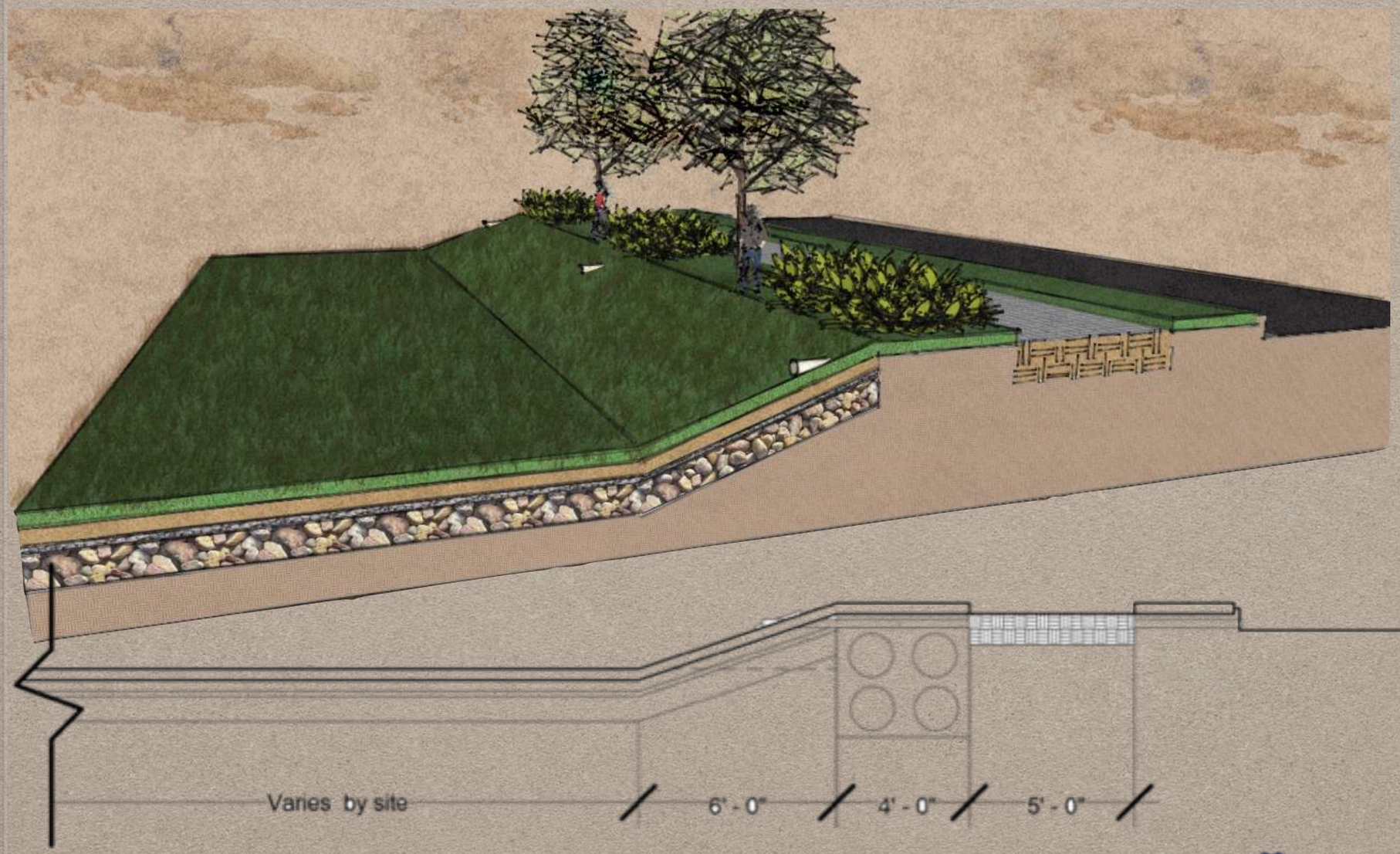
PROPOSAL 2: PERIMETER BASIN WALL

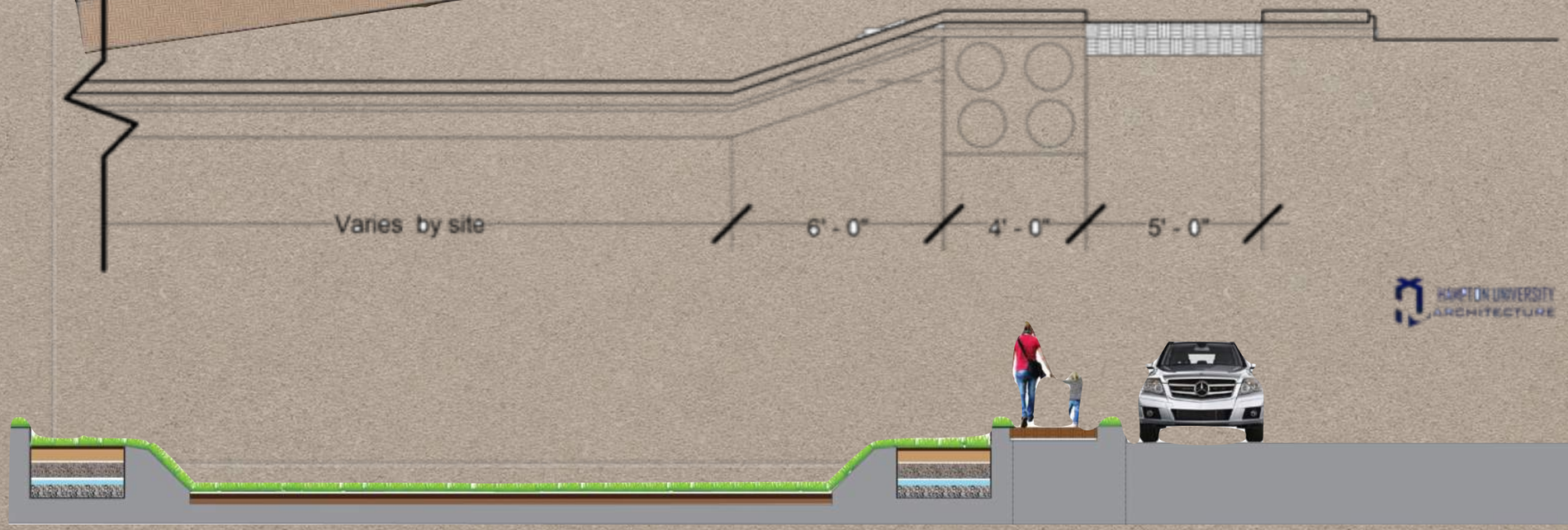


SPONGES: LARGER BASINS

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

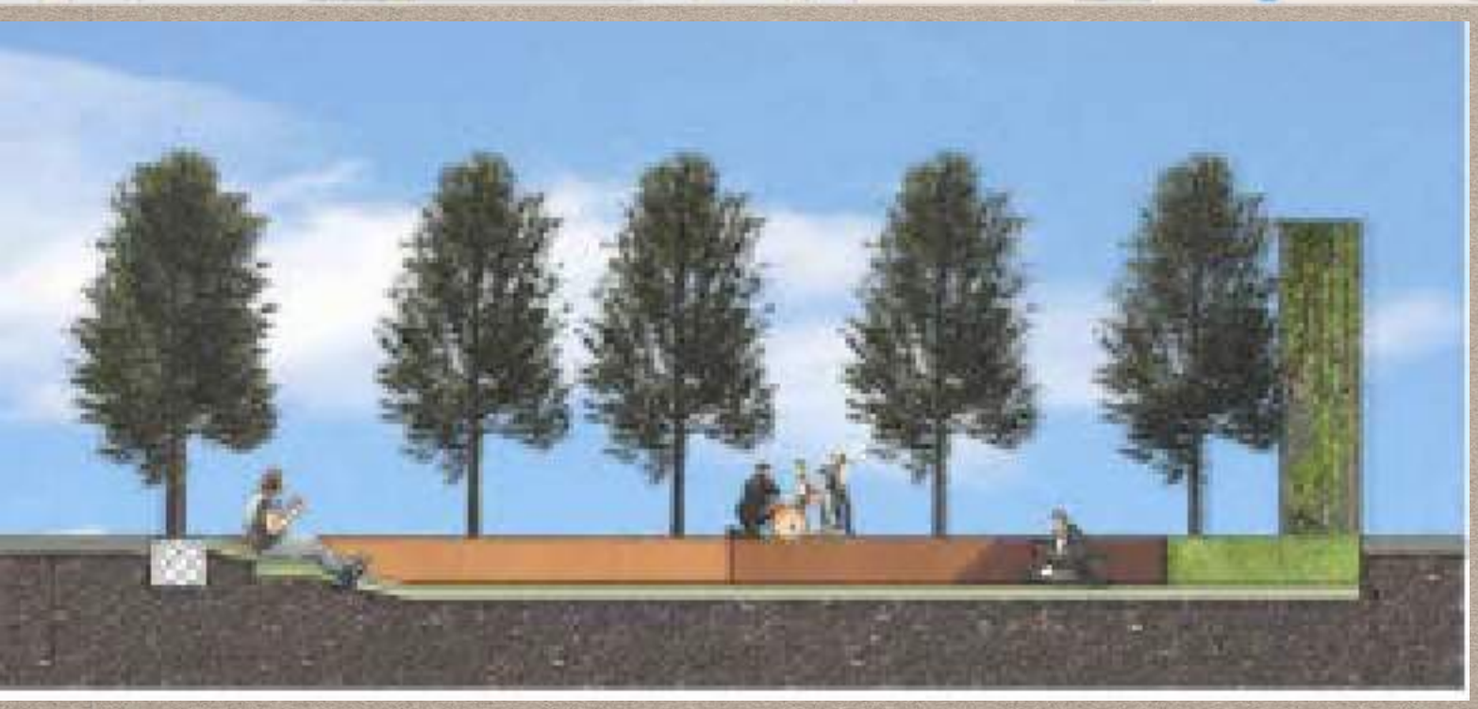
L.I.D. STREET-SCAPE STRATEGY

- 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

CREATIVE DISTRICT

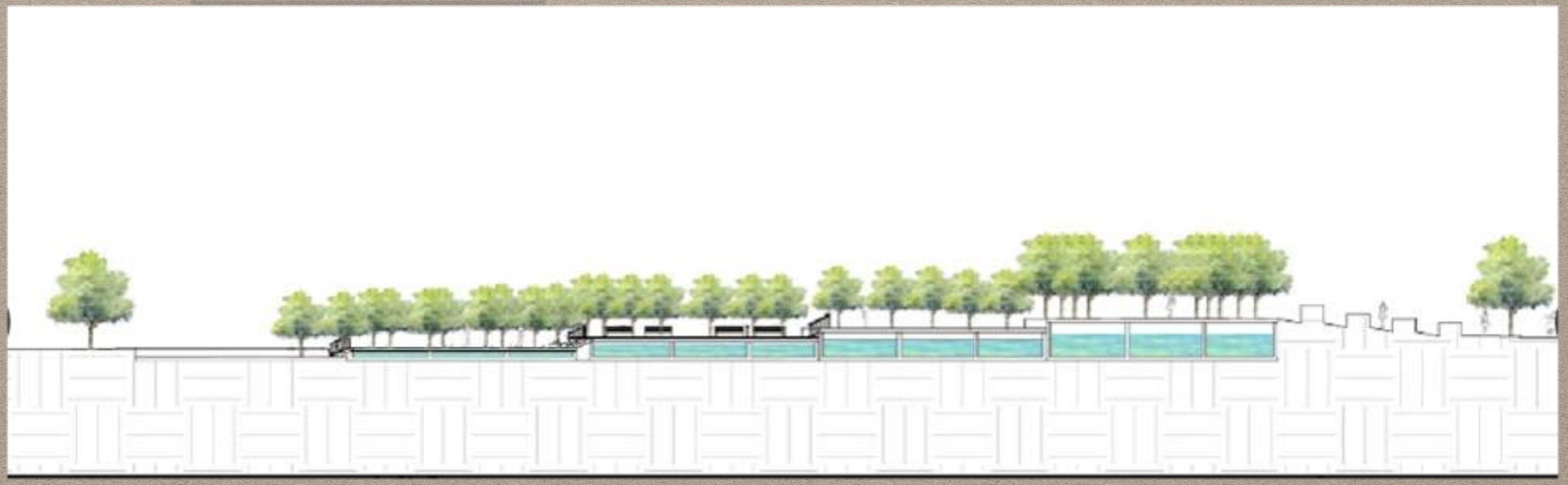
Written by the Hampton University
Coastal Community Design Collaborative Team

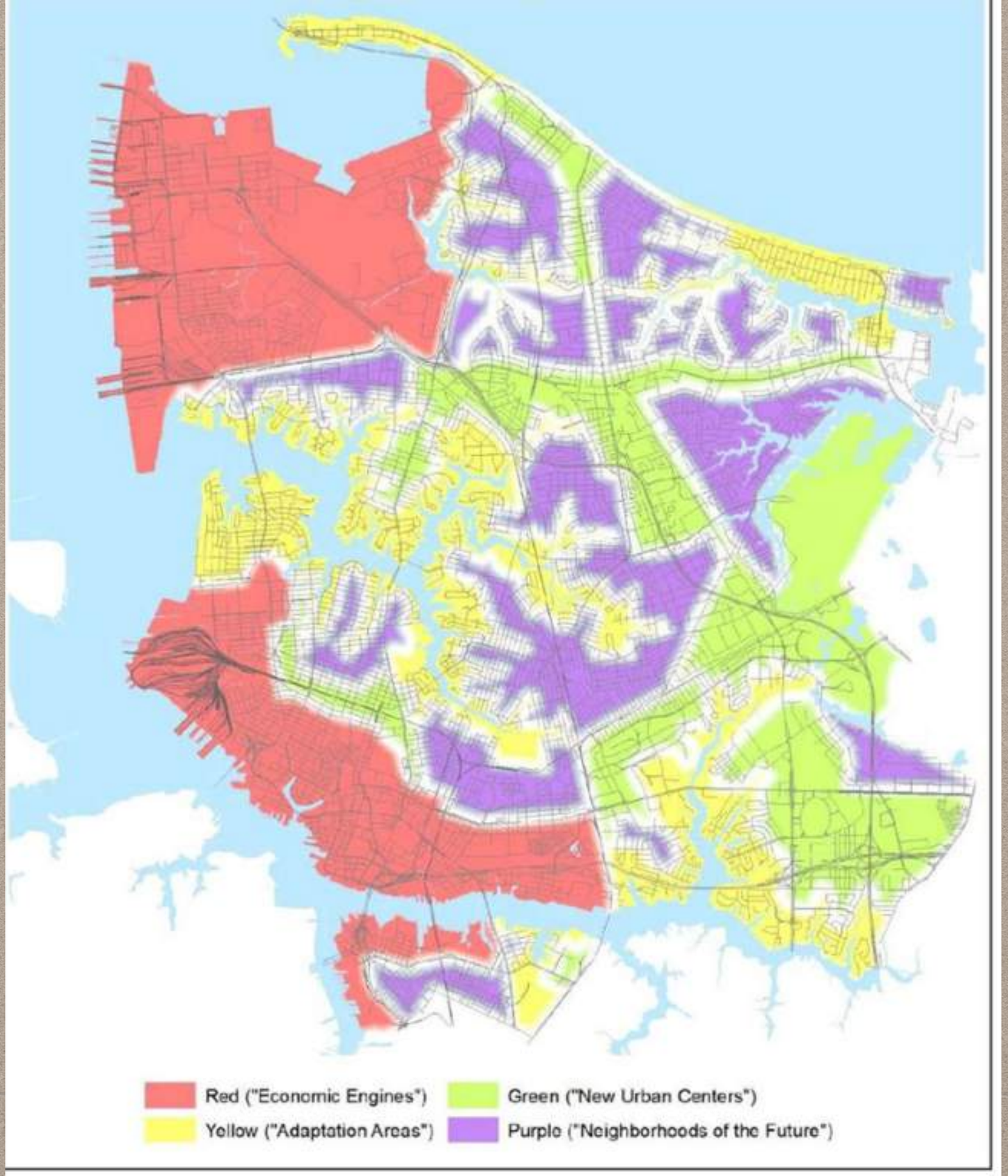


VIBE

Wetlands restoration at MoCA
Retention basin at foot of 264
Streetscape interventions
Dry swale performance space


PRINCESS ANNE ROAD
VIRGINIA BEACH BOULEVARD
BRAMBLETON AVENUE
WESTOVER
LLEWELLYN
NORTH BOTETOURT
SOUTH BOTETOURT
COLONIAL
RALEIGH
FERGUSON
OLNEY
MONTICELLO
ADDISON
MOWBRAY
SOUTH MOWBRAY
GRACE
YORK
BUTE
WILSON
OLNEY
POSEY
TULIP
SALTER
WHITAKER
PEMBROKE
DUMBARTON
MEMORIAL
MAGAZINE
FORTUNE
11TH
9TH




Red ("Economic Engines")
Yellow ("Adaptation Areas")
Green ("New Urban Centers")
Purple ("Neighborhoods of the Future")

HUNTERSVILLE

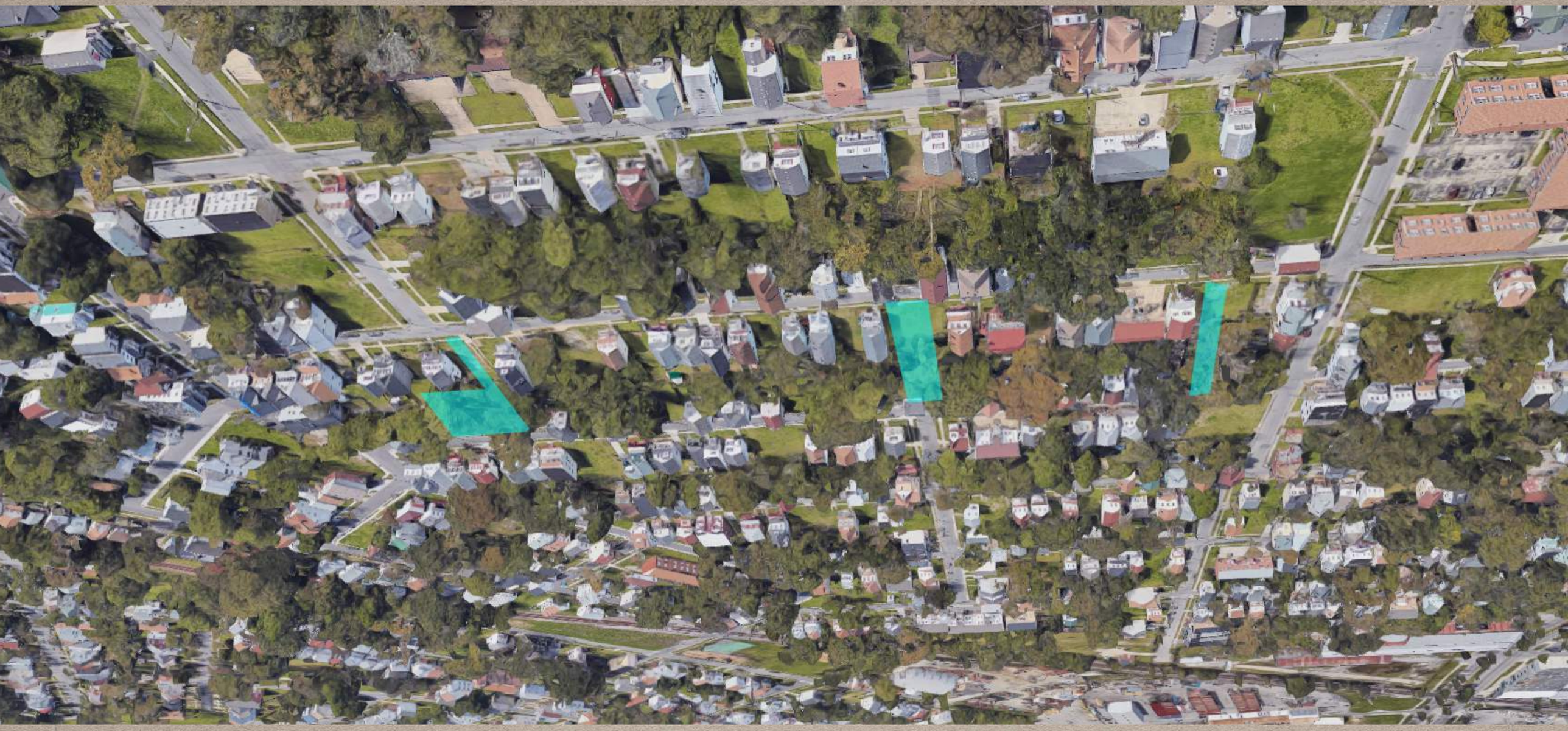
NEIGHBORHOOD OF THE FUTURE

EXISTING CONDITIONS

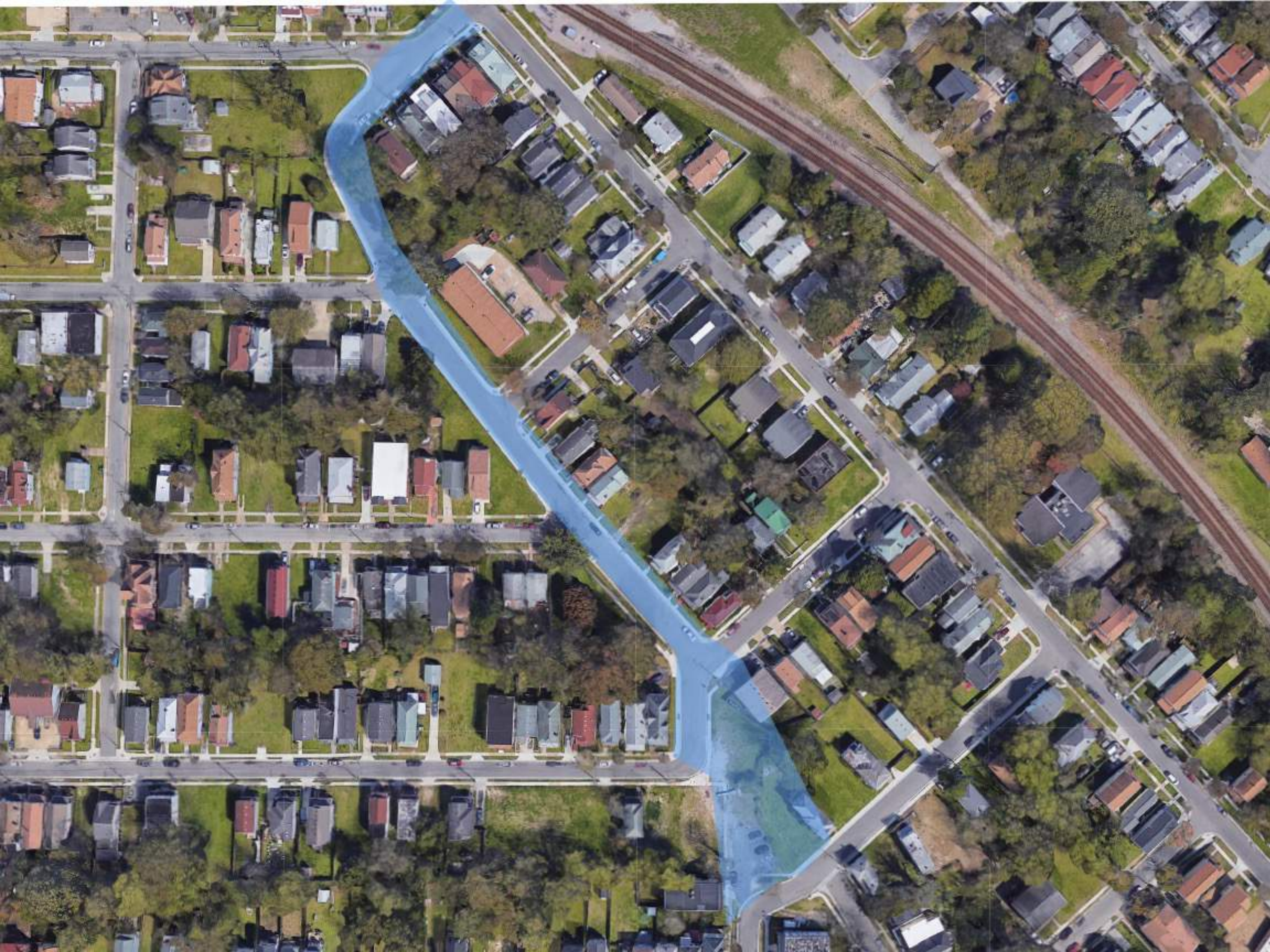
- sand/silt;groundwater 6-8′
- legacy creek bed
- retrofit/undersized/absent storm water lines
- flooding @ low points
- disjunctions in connectivity
- high social capital

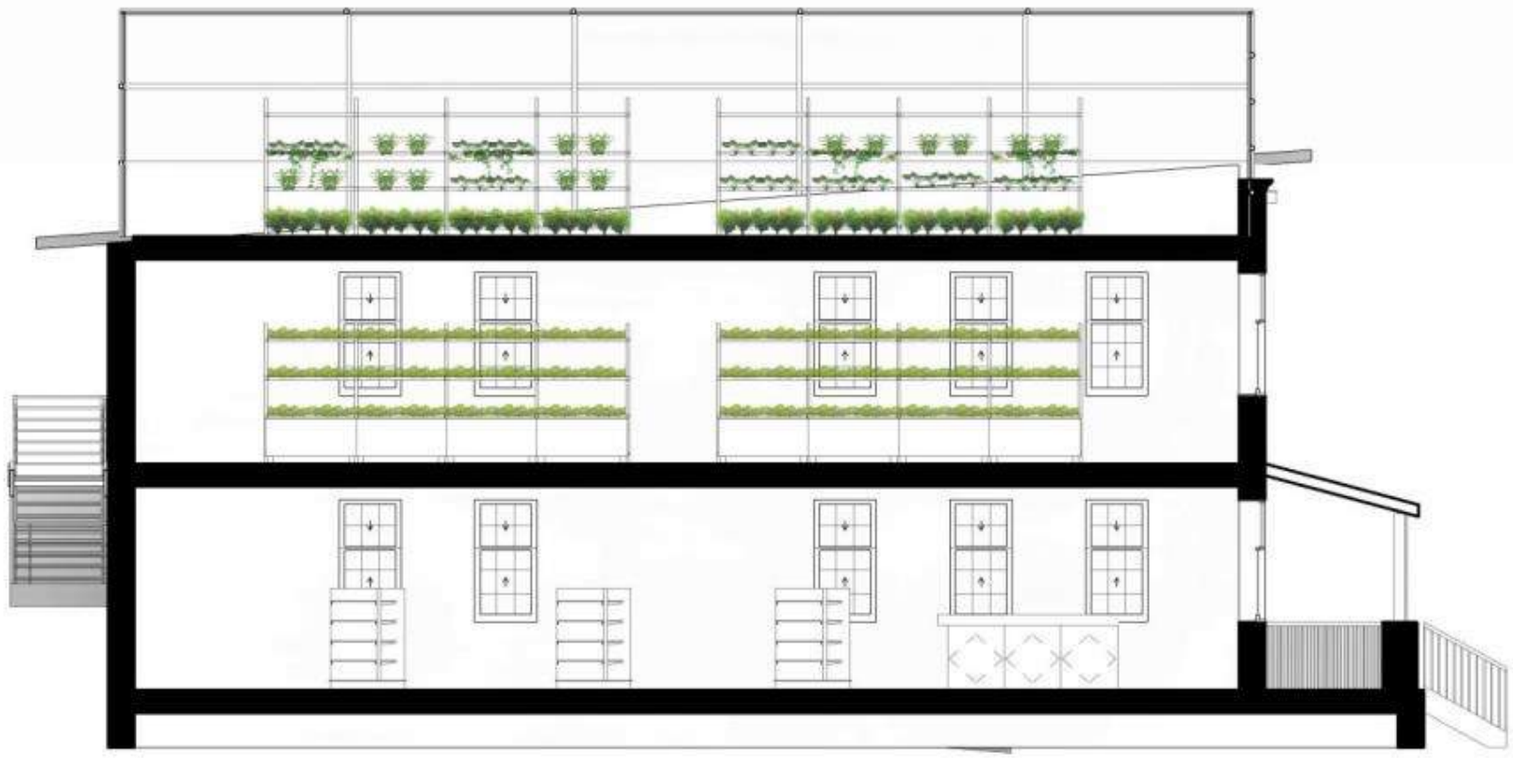
Explanation
Brick or Stone buildings
Frame buildings
Stables or sheds
Green houses
Scale 300 feet to the Inch
TANNER'S CREEK
LINDENWOOD
HUNTERSVILLE
OUTENSVILLE
JOHNSON'S PLAN
HARRISONVILLE
THE BARRAUD FARMS
ELMWOOD CEMETERY
CEDAR GROVE CEMETERY
CALVARY CEMETERY
CITY ALMS HOUSE
Old Burying Ground
OLD FAIR GROUNDS
Ward Est.
Miss Ella Wood
H. Pressekar
Turner Estate
P. M. Hunt
11
8
7
9


Google




Google





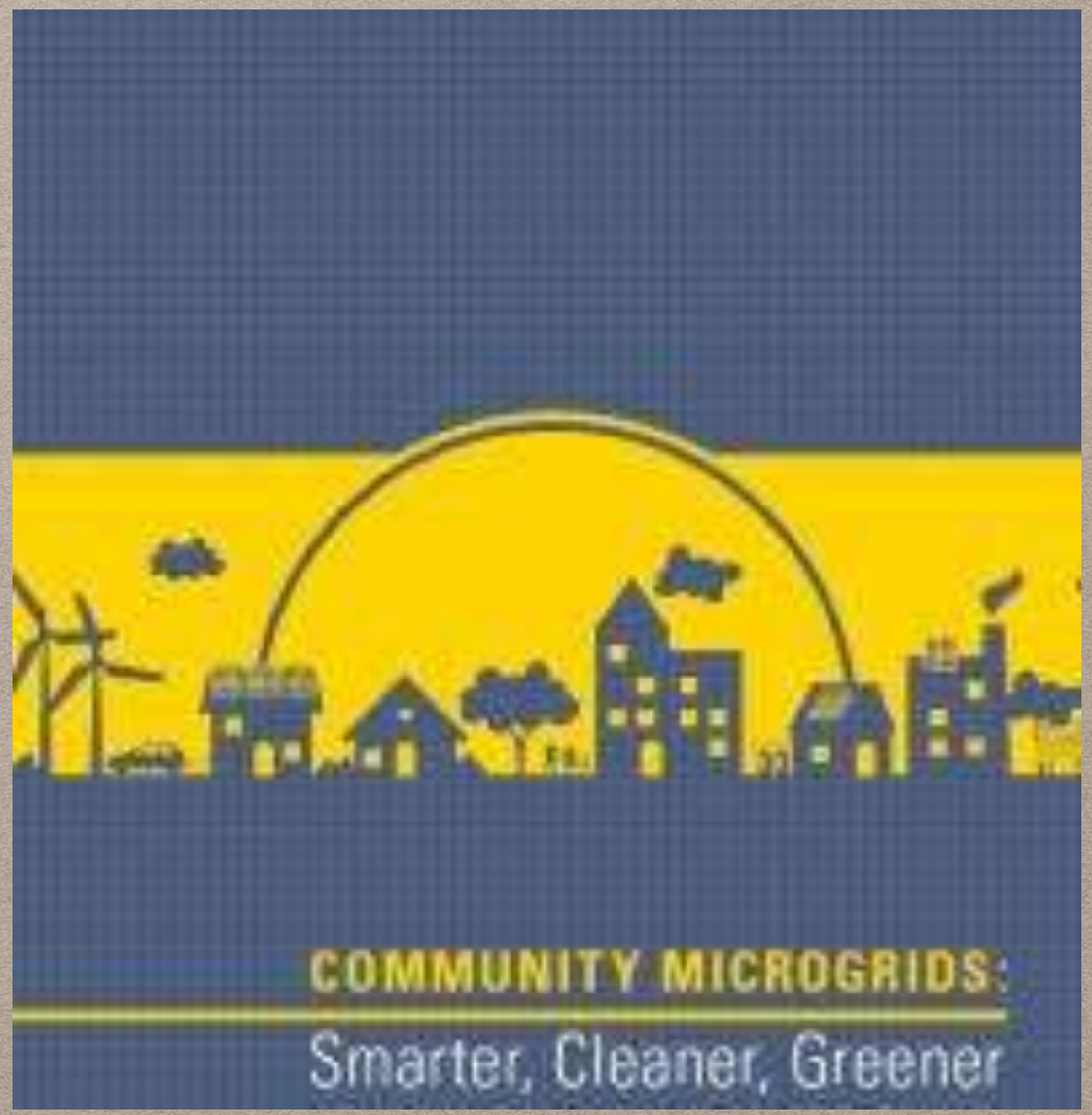

COMMUNITY MICROGRIDS:
Smarter, Cleaner, Greener

PLATE. 2.

Scale 100 feet to the Inch.

COVE ST.

PLUME ST.

TALBOT ST.

ADMISSIONS OFFICE

POLICE

OLD POINT COMFORT HOTEL

NEW MARKET AND COURT HOUSE

CITY CHAMBERS

EAST MAIN ST.

WEST MAIN ST.

CHURCH ST.

FRENCH ST.

ALLYN'S COURT

CHAPEL

VIRGINIA

RILEY

HOLT ST.

GRANBY ASYLUM

WALKE

CONWICK

CANAL

WAVERLEY ST.

BERMUDA

Mr. Brannon & Co. COAL AND WOOD YARD

UNION ST.

CALVARY

M.E. CHURCH

NEBRASKA ST.

WESTERN UNION TELEGRAPH CO.

MADISON ST.

BUTTERMILK

WATER ST.

NORFOLK AND WESTERN RAIL ROAD

TAYLOR ST.

Old Dominion Steamship Company

Clyde Company

Chas. Reid & Son

SMITHS WHARF

Richard Jackson

Chas. Reid & Son

ELIZABETH RIVER


NSF
National Science Foundation
WHERE DISCOVERIES BEGIN

Studio Based Learning