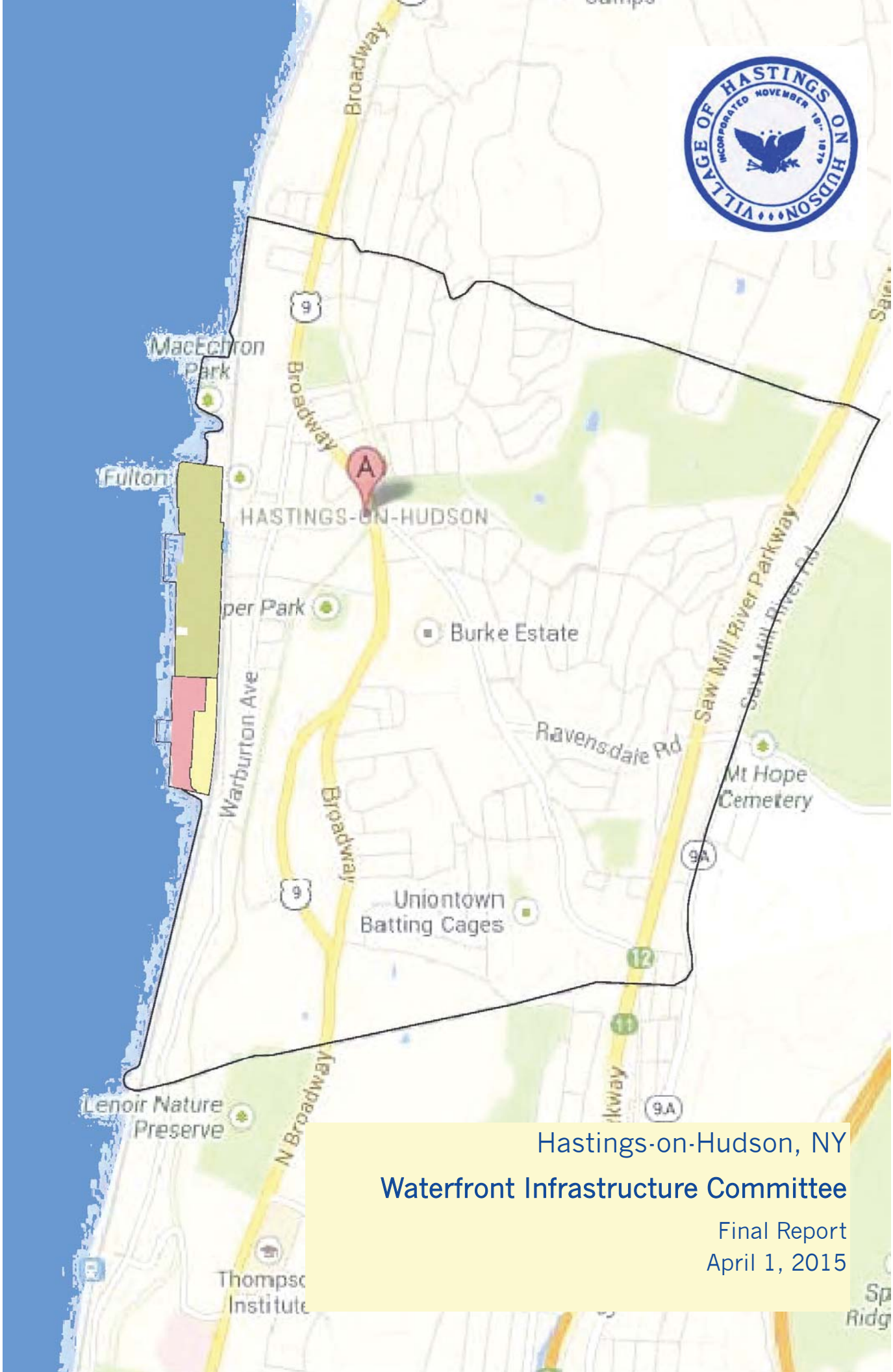
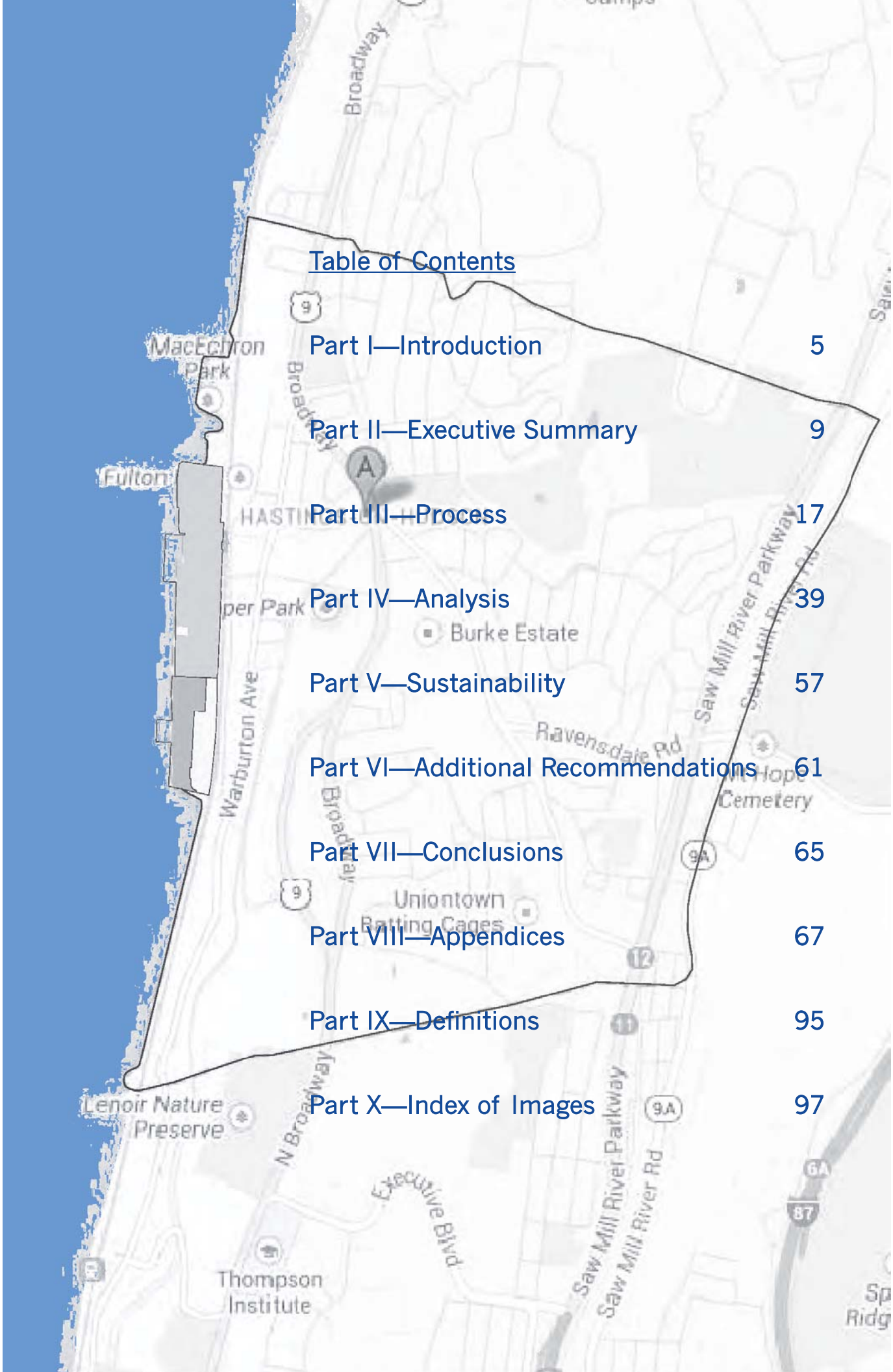


Hastings-on-Hudson, NY

Waterfront Infrastructure Committee

Final Report

April 1, 2015



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PART I

INTRODUCTION

The Waterfront Infrastructure Committee hereby reports its findings and recommendations relating to the infrastructure plan for the Waterfront.

1. INTRODUCTION

1.1 Committee Appointment and Mission Statement

The Waterfront Infrastructure Committee (the "Committee") was appointed by the Board of Trustees (the "Board") in March of 2012 and was charged with, among other tasks:

a. to assist the Board in providing the Village's recommendations to British Petroleum ("BP") as BP begins its remedial design for the waterfront. The charge of the Committee is to create a memorandum that includes a basic infrastructure plan describing the Village's preferences for the location and key features of parks, an esplanade, roads, and utility infrastructure that can be constructed during the remediation of the BP property.

b. In addressing the remedial design for the waterfront, the Committee reviewed not only the 28-acre Anaconda site owned by BP, but also the adjacent industrial property to the south, the "Tappan Terminal site". The Tappan Terminal site consists of an additional 14 acres on which Uhlich Color Company manufactured pigments and Chevron and Mobil had oil storage facilities.

1.2 Mayor Peter Swiderski's Comments

a. In 2011, the Committee was charged by the Board to create a draft schematic plan for the location of infrastructure on the 42 acres of property that constitute our undeveloped former industrial waterfront. This document reflects the outcome of that effort.

b. The idea for a Waterfront Infrastructure Committee emerged from discussions with Arco/BP over the years regarding the rehabilitation and revitalization of the waterfront. BP is responsible for the clean-up of the northern 28 acres of this waterfront, a Class 2 waste site deeply polluted with a range of PCB-derived substances and various other metals and industrial poisons. The clean-up work will include the removal of several feet of contaminated soil, followed by a replacement of the contaminated soil with clean fill, and then followed by another approximately five feet of fill on top of the original soil as set forth in the consent decree. During the course of these discussions, BP indicated that, were the Village to provide an indication of where

parks, roads and infrastructure (such as sewers and electrical conduit) were likely to lie, they would seek to incorporate those plans into its remediation design. This incorporation of the Village's plans could mean a choice of where to lay down certain grades of fill, the actual laying of conduit while the ground was open for remediation, and the laying of road foundation where there would be ultimately roads. The idea was that these engineering-phase accommodations would be far, far less expensive to carry out during the remediation phase and would leave a site much better prepared for future development.

c. The Committee was appointed by the Board to take advantage of this opportunity to provide guidance to BP during its design phase. The Committee was charged with the creation of a high-level schematic plan that would indicate where roads and parks are likely to be, where the heaviest development was likely to go, and as a result, where conduits and piping was likely required, and, finally, likely recreational uses on the waterfront so that BP could plan to accommodate those into its engineering design for the ultimate remediation of the waterfront. The Committee was also requested to incorporate the southern 14 acres (owned by Exxon and Uhlich) into its plans, so that a coherent vision for the waterfront could be created. Finally, the Committee was asked to plan for the presence and absence of the remaining structure on the waterfront, Building 52, since its ultimate fate has yet to be determined.

d. One thing the Committee was not asked to do was to determine what was going to actually be built on the waterfront. The site is currently zoned Marine Industrial ("MI"), a designation left from the days when this was an area dense with factories. While the Committee had to make assumptions about where structures would likely be placed and where the highest density of development was likely to be, the Committee was not asked to determine whether development would be commercial, industrial or residential in nature. Its only charge was to plan for the densest reasonable development given the restrictive covenants of the new Consent Order and the 2003 Consent Decree that govern the site, as well as guidance from the Comprehensive Plan and other relevant documents that govern view sheds. There are no current plans to rezone the waterfront: it remains the property of BP, Exxon/Mobil and Uhlich.

e. The Committee addressed its charge with great enthusiasm and rigor. Its efforts here reflect the substantial work put in by the Committee. This report will be forwarded to the Board for review and then onto BP and the DEC,

which have requested the document as well, for integration into their engineering process.

f. This document represents a very big step in the process of redevelopment of the waterfront. It is the first such document produced by a group of residents that will actually be reflected in the reality of a completed waterfront: we are now officially past the point of dreaming. This is the first broad brushstroke on the actual canvas of the future. Read it and begin to see the future waterfront coming into focus.

1.3 Organization and Membership

- Wm. Lee Kinnally, Jr. - Chair
- Douglass Alligood
- Richard Bass
- Jeffrey Gaspar
- Kerry Gould-Schmidt
- Guy Sliker
- Brian Steinwurtzel
- Edward Weinstein

1.4 Staff

- Susan Maggiotto
- Ex Officio Members
    - Trustee Meg Walker
    - Trustee Jeremiah Quinlan

PART II

EXECUTIVE SUMMARY

2 EXECUTIVE SUMMARY

2.1 Executive Summary

a. Shoreline Access: Maximizing public access to the shoreline is the highest priority. The Committee utilized four different form based planning concepts to assess the various uses contemplated on the site: linear (continuous ribbon) *[Part III – Drawing 3.2]*; nodes (major open spaces) *[Part III – drawing 3.3]*; a hybrid of linear and nodes *[Part III – drawing 3.4]*; and concentrated open spaces *[Part III – drawing 3.5]*.

b. It was determined that a linear or concentrated scheme is preferable to a node scheme for shoreline access because a linear scheme provides continuous public access to the water's edge. Exceptions should be considered for eating establishments with outdoor seating where direct access to a boardwalk might also serve as a public amenity.

c. Recreational uses: The top three preferred activities identified by participants in a Village-wide survey of "quiet" or "reflective" activities include walking/strolling; picnicking and nature trails. Active recreation uses scored closer to the bottom of the survey.

d. Community Activities: All of the community or group activities scored high in the survey. The node, hybrid or concentrated scheme are preferred because they can provide enough contiguous open space for community activities. The linear scheme is not ideally suited for community activities.

e. Density: For density, the concentrated scheme minimizes the development footprint; however, it has the drawback of resulting in a corresponding increase development height. Another disadvantage to this scheme is that traffic and parking would be concentrated at development areas. A decision needs to be made early on by the Board and the Village Planning Board to determine where best to concentrate development. Development densities can be modulated in either a node or hybrid schemes.

f. Bridge Access - in anticipation of the raising of the Dock Street Bridge the Committee recommends increasing the grades on both sides of the bridge, increasing the turning radii of the lanes going to the site and connecting bike and pedestrian lanes from the bridge to similar amenities on the site *[Part IV – Drawing 4.1]*.

g. Road placement: The consensus of the committee was that the site would be best serviced by two primary roads *[Part IV – Drawing 4.2]*. One, a meandering road that would have a somewhat rural flavor, running north to south through the middle of the two properties. It would intersect with or be adjacent to various walking and biking paths dispersed throughout the site.

h. The second road, also running north south would be a limited access, more urban type of road situated on the eastern perimeter of the site parallel to and close to the railroad tracks. It would be designed to carry the bulk of the traffic servicing the site. More importantly, it would also be in the general ar-

ea of the major utility infrastructure such as sewer and water lines and pumping stations, and should be constructed with the requisite manholes and other entryways to enable ready access to the utilities. The Committee recommends that all utilities be installed below grade, situated in such a way to avoid penetration of the cap for future development *[Part IV – Drawings 4.3 and 4.4].*

i. Shoreline treatments are somewhat limited by the existing conditions on the site. A substantial portion of the current treatment is comprised of sheet metal piling but alternative treatments were studied for functional, aesthetic and performance impacts *[Part IV – Drawings 4.6 and 4.7].*

j. The Committee recommends that the site be raised a variety of levels to assure that the areas designated for development are above the 100-year flood plain *[Part IV – Drawing 4.11].*

k. View Corridors - the Committee recommends that views from the Library Park, Warburton Bridge, Washington Avenue, the train station platforms and Maple Avenue be preserved and that unobstructed views onsite to the north and south be preserved along the shoreline.

l. Our recommendations are that the infrastructure is planned with flexibility to allow for future technologies, sustainability and increasing need for resiliency, as such, we recommend that two new sewer lines be installed; extensive recapture and reuse of "grey water"; that alternative and renewable energy sources be explored; and that various ecology-friendly building materials and plantings be used.

m. There were also a variety of other initiatives for the site that were explored such as daylighting a portion of the stream that flows into the Hudson, adding a pedestrian bridge at Washington Avenue; widening the two coves; and providing access to the in-river dolphins.

2.2 Meetings and Public Workshops

a. The Committee held over 24 meetings, all of which were open to the public and at which the public participated, including two public workshops which reviewed the work of the Committee and solicited input and reactions from the public.

b. In addition, various Committee members visited the Anaconda site with BP personnel on several occasions.

c. The Committee held its initial public workshop on Wednesday, November 28, 2012 at the James Harmon Community Center for the purpose of:
   - sharing the Committee's thoughts on the layout of the property's open spaces; and
   - brainstorming with the public a program for activities in the public spaces.

d. The focus at this first workshop was to provide guidance and public input to the Committee in the following areas:

- The likely activities for the parks, open spaces and water-related uses;
- The location and key features of the desired park(s) and esplanade;
- Other open spaces;
- Key waterfront amenities such as boat access points, piers, floating docks, marinas, etc.;
- The location and size of the road(s); and
- The physical infrastructure to support future development, including sewers, electrical conduits, telecom and other utilities, and BP's long-term financial commitment to maintain the site's bulkhead and cap for a period of 100 years.

e. The second public workshop held on May 1, 2014, also at the James Harmon Community Center, reviewed the revisions to the report since the initial public hearing and discussed the broad outlines of the report.

2.3 Site Description

a. The 42-acres that comprise the Hastings waterfront are divided into two separate components: the Anaconda site of approximately 28 acres and the 14 acres of the Tappan Terminal site just to the south of the Anaconda site on which Uhlich and Mobil had operations.

b. The Anaconda site is located on the east shore of the Hudson River. The New York Department of Environmental Conservation ("NYDEC" or "DEC") has divided this site into two operable units, OU-1 and OU-2. OU-1 is the land portion of the Anaconda site bordered on the west by the Hudson River and on the east by the railroad tracks. OU-2 is immediately to the west of OU-1, out into the Hudson River.

c. The Tappan Terminal site is located along the southern boundary of OU-1 and adjacent to OU-2. The site comprises two properties: what is today referred to as the Exxon/Mobil property, which is located adjacent to the Hudson River, and the Uhlich Color Company property, which is located along the railroad tracks at the eastern boundary of the site and adjacent to the Exxon/Mobil property.

d. The Uhlich property contained a former pigment manufacturing facility; the Exxon/Mobil property was most recently used by Exxon/Mobil as a petroleum distribution terminal, and before that by Chevron. All former operations at the site have been discontinued and the buildings have been demolished. A small portion of the southern end of the Exxon/Mobil property was used by the Pioneer Boat Club as a marina and clubhouse, but that use has also been discontinued. There had been limited vehicular and pedestrian access to the site from Railroad Avenue at the southeast corner of the property via the Zinsser Bridge. Because of its poor condition, the bridge is no longer open to vehicular traffic.

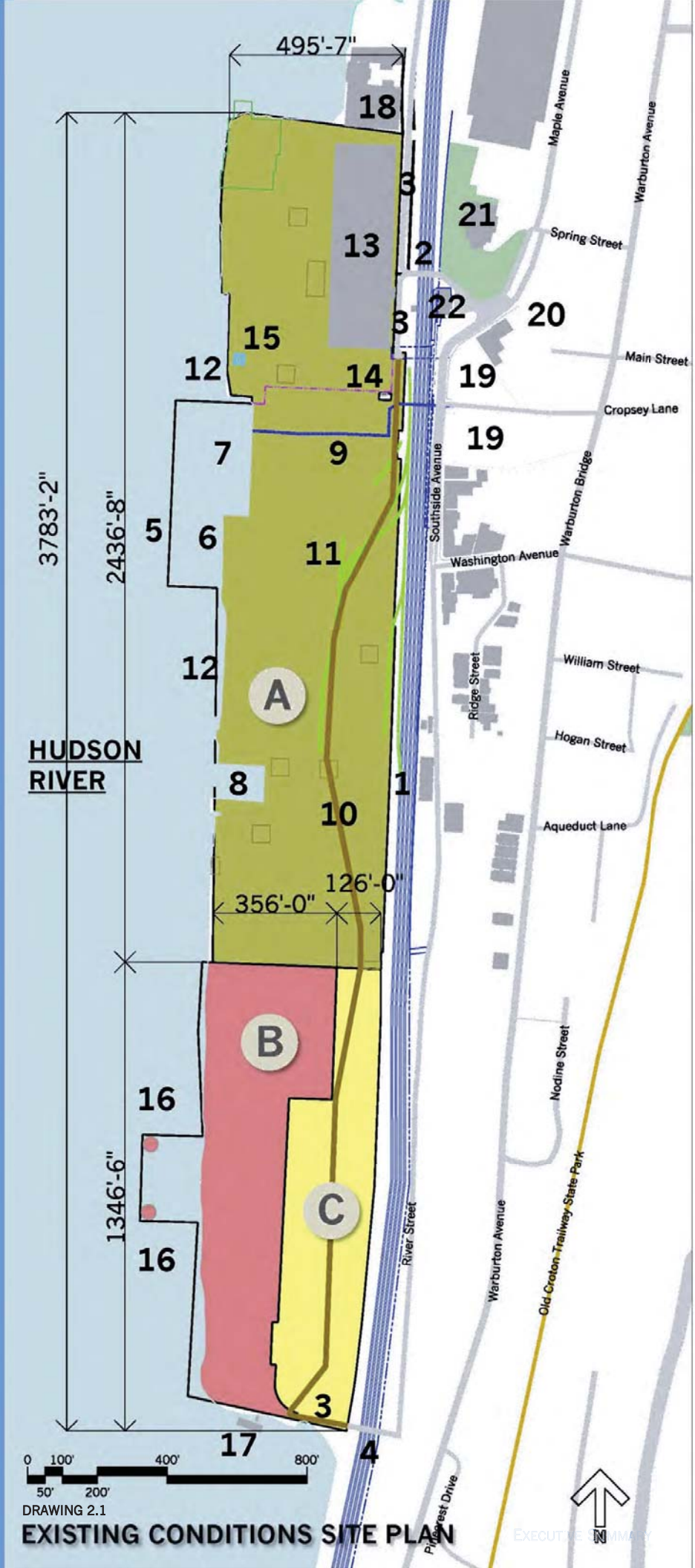
A BP Arco

B Exxon / Mobil

C Uhlich

LEGEND

1. Metro North Railroad Tracks
2. North Bridge
3. Ramp
4. Zinsser Bridge
5. Property Line
6. Shoreline
7. Shallow Water Port
8. Deep Water Port
9. Underground Stream
10. Easement
11. Abandoned Train Tracks
12. Abandoned Piers
13. Building 52
14. Pumping Station
15. Water Tower
16. Mooring Dolphins
17. Abandoned Boat Club
18. Tennis Club
19. Ravine Parking Lot
20. Con Ed Parking Lot
21. Library
22. Station Café



DRAWING 2.1

EXISTING CONDITIONS SITE PLAN

PHOTO 2.1

SOUTHWEST VIEW OF SITE
FROM SOUTHSIDE AVENUE

PHOTO 2.2

WEST VIEW OF SITE FROM SOUTHSIDE AVENUE

PHOTO 2.3

WEST VIEW OF SITE FROM SOUTHSIDE AVENUE

PHOTO 2.4

NORTHWEST VIEW OF SITE
FROM SOUTHSIDE AVENUE

PART III

WIC PROCESS

3 PROCESS

3.1 The Committee's Process

In developing its recommendations as set forth in this report, the Committee investigated many components and explored a number of options.

The first thing the Committee did was to agree upon a definition for "Infrastructure." It then reviewed the recommendations and findings of prior committees which had looked at the waterfront. To assess existing grades and site features the Committee next utilized CAD to stitch together surveys of the entire 42-acre site with surveys of the east side of the railroad tracks.

The Consent Decree was reviewed to determine the locations and dimensions of "no-build" zones and height restrictions. The Committee also identified and analyzed view corridors both onsite looking to the site to help in defining and preserving preferred open space areas on the site.

The Committee studied the possible implementation of the strategies and objectives described for the Waterfront in The Village of Hastings-on-Hudson Comprehensive Plan of 2011.

In summary the strategies were defined in the Comprehensive Plan as follows:

Objective 1. Ensure fiscally responsible development.

Objective 2. Design a plan for the Waterfront that promotes appropriately scaled development that will provide economic support for the Village.

Objective 3. Maximize public enjoyment of the Waterfront.

Objective 4. Ensure environmentally smart development.

Objective 5. Preserve public views of the Hudson River, Palisades and New York City Skyline.

Objective 6. Preserve the historical architectural features in the area.

Objective 7. Investigate improvements to circulation to and through the Waterfront.

Objective 8. Proactively seek out opportunities for the Waterfront that are consistent with the goals and vision of the Comprehensive Plan and the (future) Form-Based

Code for the Waterfront.

Objective 9. Ensure that built areas do not create self-contained enclaves and impede public access to the Waterfront.

Members of the Committee visited the site and its periphery on several occasions.

Potential destinations and uses were identified and sited with the help of a public survey that was drafted and circulated in June of 2013 to measure the community's interests related to eventual uses of the waterfront. The survey had a very good response rate - - 703 participants, 98% of whom were Hastings residents. In summary, respondents indicated their preferences for how they want to use the waterfront and what activities they would like to see occur there.

The top five scored land based uses/facilities, chosen from a list of 11 provided in the survey were:

a. walking/strolling;
b. picnicking;
c. nature trails;
d. playgrounds; and
e. biking.

The lowest scoring land based use was a physical fitness course.

The top five water-based uses/facilities, chosen from a list of seven provided in the survey were:

a. kayaking and canoeing;
b. beaches;
c. fishing pier;
d. swimming; and
e. pier or dock for tour or ferry boats.

The lowest scoring water based use was a Marina for transient boaters.

The Committee then analyzed the existing flood plain and grade and assessed possible changes to the flood plains and the impact it would have on the locations and the type of any developments. Consistent with the above, the Committee identified certain existing and potential visitor destinations on the sites:

a. Public open space;
b. Kayak/canoe launch;
c. Cove areas;
d. Access to shore;
e. Daylit Stream;
f. Southbound Metro North platform drop-off; and
g. The two dolphins adjacent to the Exxon/Mobil property in the Hudson.

Preferred recreational uses according to survey responses:

1. Walking / Strolling
2. Picnicking
3. Nature Trails

Preferred amenities according to survey responses:

1. Restrooms
2. Benches for enjoying views
3. Restaurant / outdoor cafe

Preferred events according to survey responses:

1. Outdoor concerts / movies / performances
2. Farmer's market
3. Arts & Crafts fairs

Preferred water related activities according to survey responses:

1. Kayak / canoe launch
2. Beach
3. Fishing pier

DRAWING 3.1
DESTINATIONS

3.2 Form-Based Planning Studies:

a. Because the site has not yet been rezoned, the Committee was careful to avoid land use planning as directed in its mission statement. However, because this report may help inform any eventual rezoning considerations by the Board, we used the concept of form-based planning in its simplest format - comparing solids (potential building form) to voids (non-built space, such as open space, walkways, roadways, etc.). We "backed into" various massing schemes by a process of elimination: removing lot area for waterfront setback, required walkways, no-build contaminated locations and view corridors, etc. Additionally, we factored in the restricted height limits prescribed by the Consent Decree. In this manner, we were able to develop different build scenarios that dealt with massing, not use.

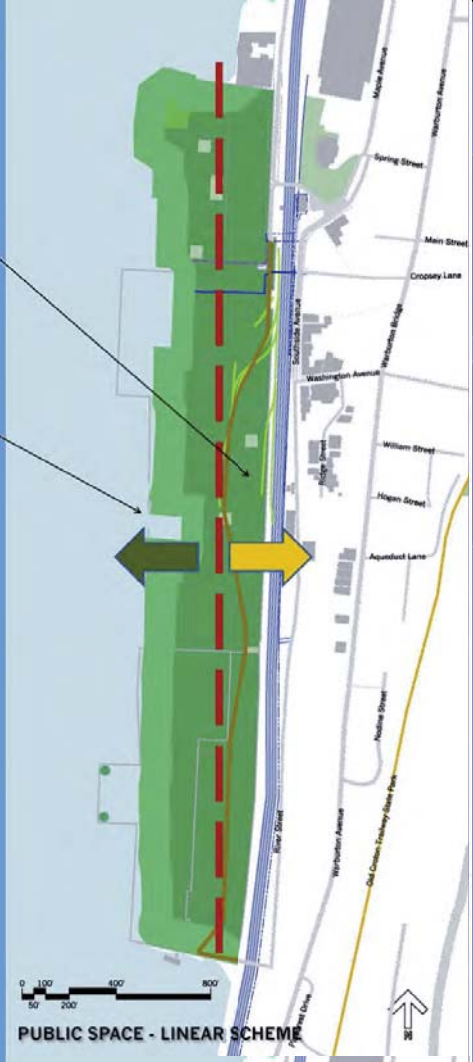
b. Using the foregoing information and process, we looked at different ways of providing public access to the shoreline.
   - Continuous ribbon – linear
   - Major open spaces – nodes
   - A hybrid of 1 and 2
   - Concentrated open space.

c. Each of the form-based planning studies was evaluated in terms of the pathways, constructability and expandability of an infrastructure system.

d. In addition, each scheme was evaluated for its potential to provide a pleasant spatial quality (including view corridors), easy access to public spaces and distribution of potential development parcels.

PRIVATIZED AND/OR DEVELOPABLE SPACE – at east side of site, adjacent to train tracks

UNDEVELOPED PUBLIC OPEN SPACE – at west side of site, adjacent to shore



DRAWING 3.2

PUBLIC SPACE - LINEAR SCHEME

PRIVATIZED AND/OR DEVELOPABLE SPACE – maximizes access to shoreline for developed areas

UNDEVELOPED PUBLIC OPEN SPACE – concentrated open space allows for larger park uses

DRAWING 3.3

PUBLIC SPACE – NODE SCHEME

PRIVATIZED AND/OR DEVELOPABLE SPACE – allows minimal access to shoreline for developed areas

UNDEVELOPED PUBLIC OPEN SPACE – concentrated open space allows for larger park uses

DRAWING 3.4

PUBLIC SPACE – HYBRID SCHEME

PRIVATIZED AND/OR DEVELOPABLE SPACE – minimized development footprint

UNDEVELOPED PUBLIC OPEN SPACE – concentrated open space allows for larger park uses

DRAWING 3.5

PUBLIC SPACE – CONCENTRATED SCHEME

3.3 View Corridors:

The Committee looked at the site from various vantage points to determine what, if any, view corridors should be considered when developing an infrastructure layout. The primary source for the information came from the Village's Comprehensive Plan and onsite observations and visits.

Given that all but one of the factory buildings have been demolished and the site is clear, every direction, except from the east, was considered a potential view corridor.

The Committee identified a number of view corridors that it concluded had to be preserved and enhanced. Those include:

a. looking onto site from
   - Library Park
   - Warburton Bridge
   - Washington Avenue
   - The train station platforms
   - Maple Avenue

b. looking from within the site to the Palisades and the north and south river views: It is recommended that unobstructed views north and south be preserved at the shoreline along the length of waterfront.

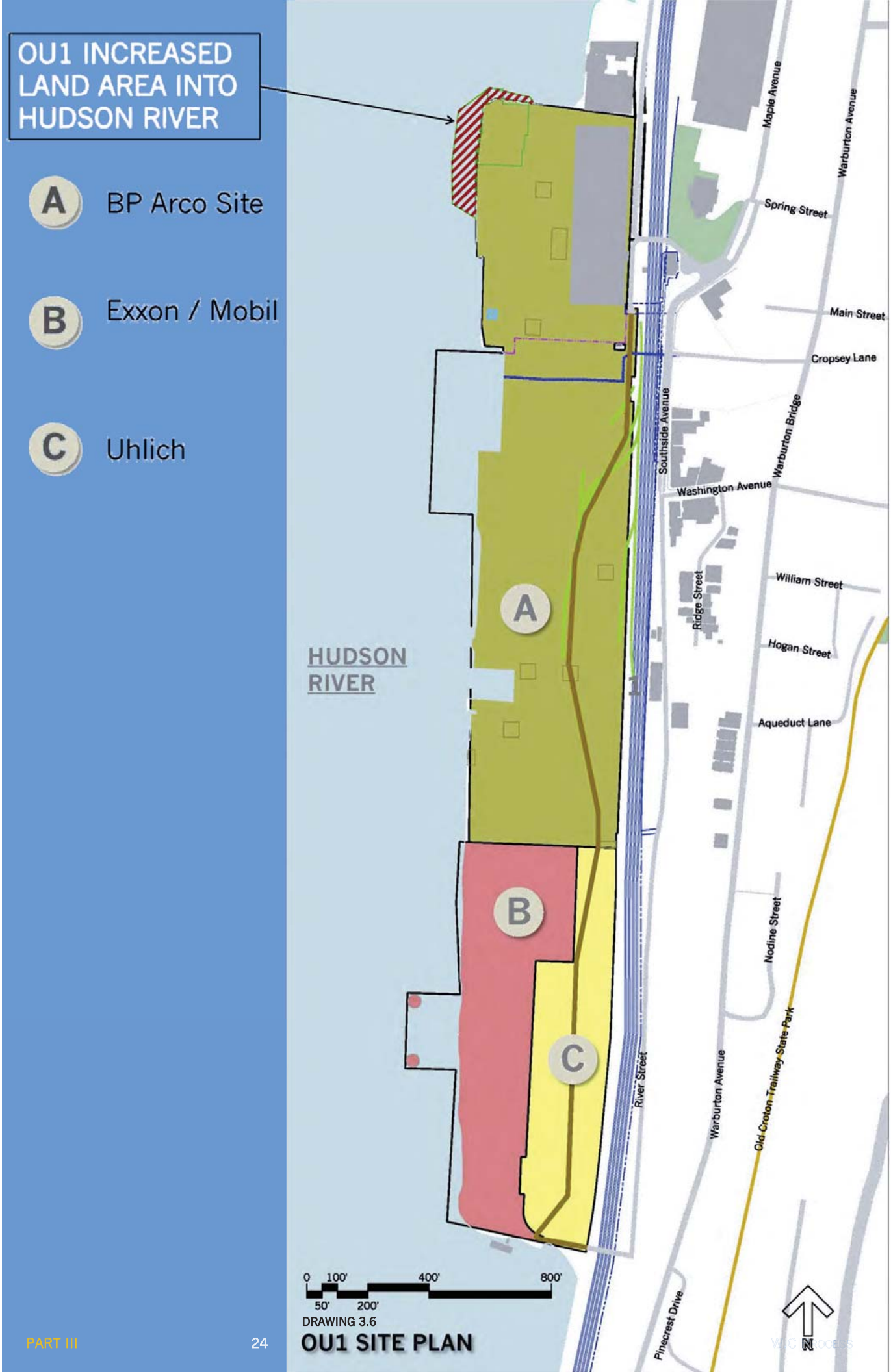
3.4 Constraints

There are several constraints to the waterfront that affect any future uses and/or development.

The Consent Decree contains a series of "no-build" restrictions and setbacks.

- No buildings may be placed at the northwest corner of the Anaconda site.
- There is a 30-foot minimum continuous setback at river's edge, which was defined as Mean Low Tide.
- There is a minimum 100-foot continuous setback from river's edge, except at the two coves where a 60 foot minimum setback applies.
- There is a high contaminant concentration at the Northwest corner of the site which leads to no build restriction there.
- Several lead hot spots and contamination outliers exist throughout the site.
- Buildings are limited to a maximum height of 65 feet.
- 100-foot set back from Hudson River (60-feet from the coves) for any buildings.

	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**



DRAWING 3.6

OU1 SITE PLAN

	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**
OU1	0.76			
Sub-total	27.41	7.89	6.33	**41.63**

A BP Arco Site
25.06 acres

B Exxon / Mobil Site
6.86 acres

C Uhlich Site
6.27 acres

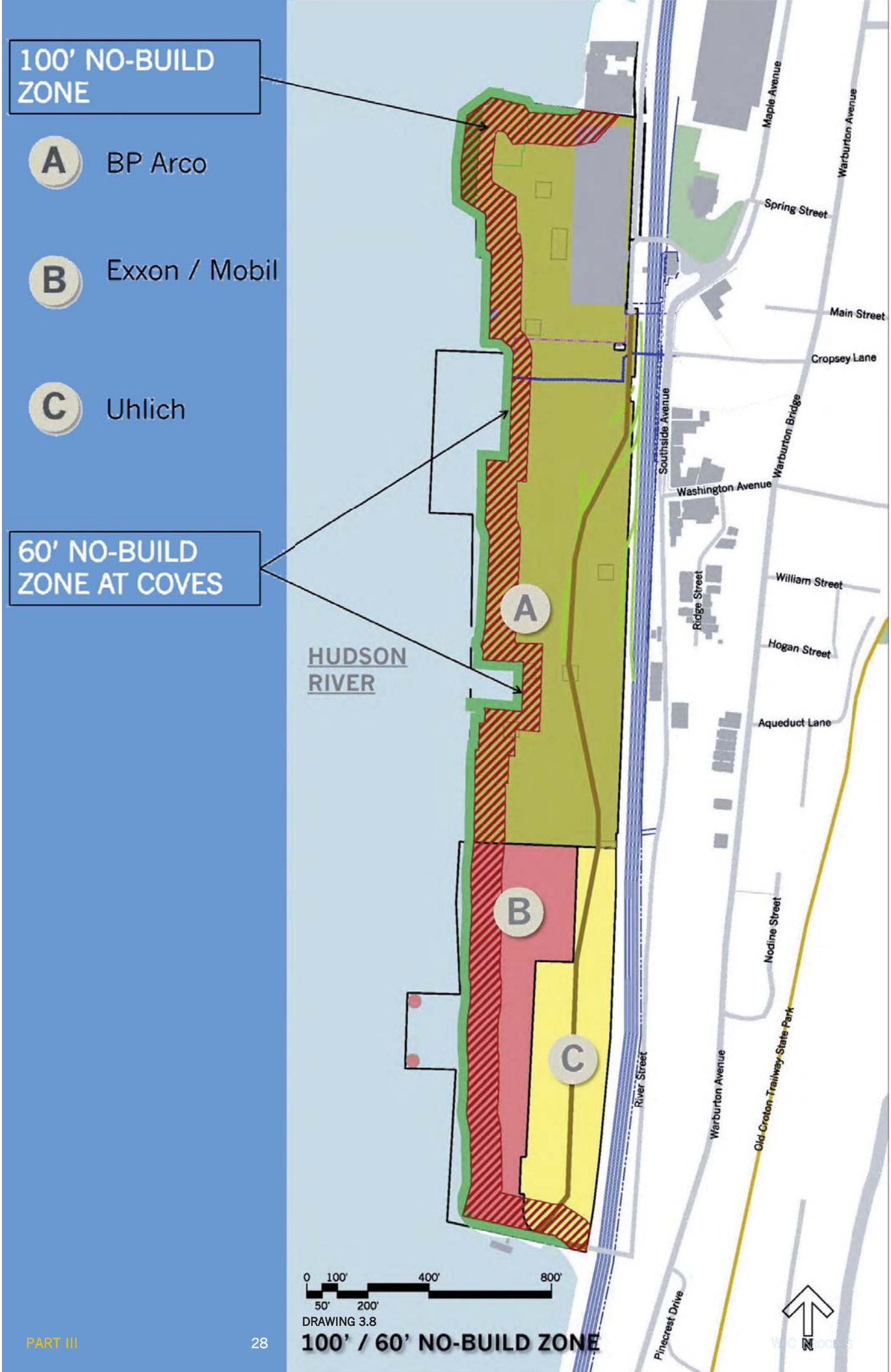
Total 38.19 acres

30' SHORELINE SETBACK

DRAWING 3.7

30' SHORELINE SET BACK

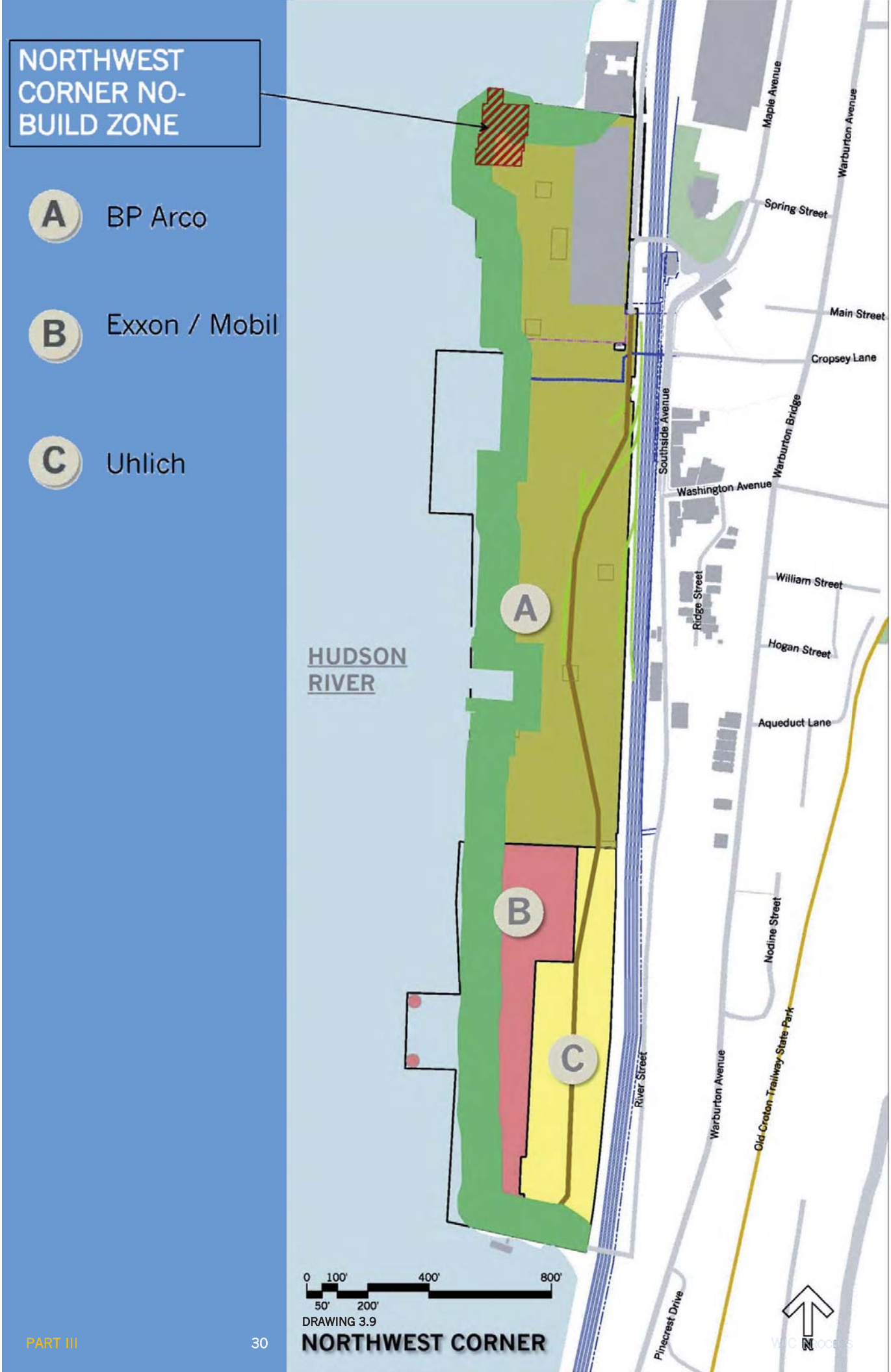
	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**
OU1	0.76			
Sub-total	27.41	7.89	6.33	**41.63**
30' No-Build Zone	-2.35	-1.03	-0.06	
Sub-total	25.06	6.86	6.27	**38.19**



DRAWING 3.8

100' / 60' NO-BUILD ZONE

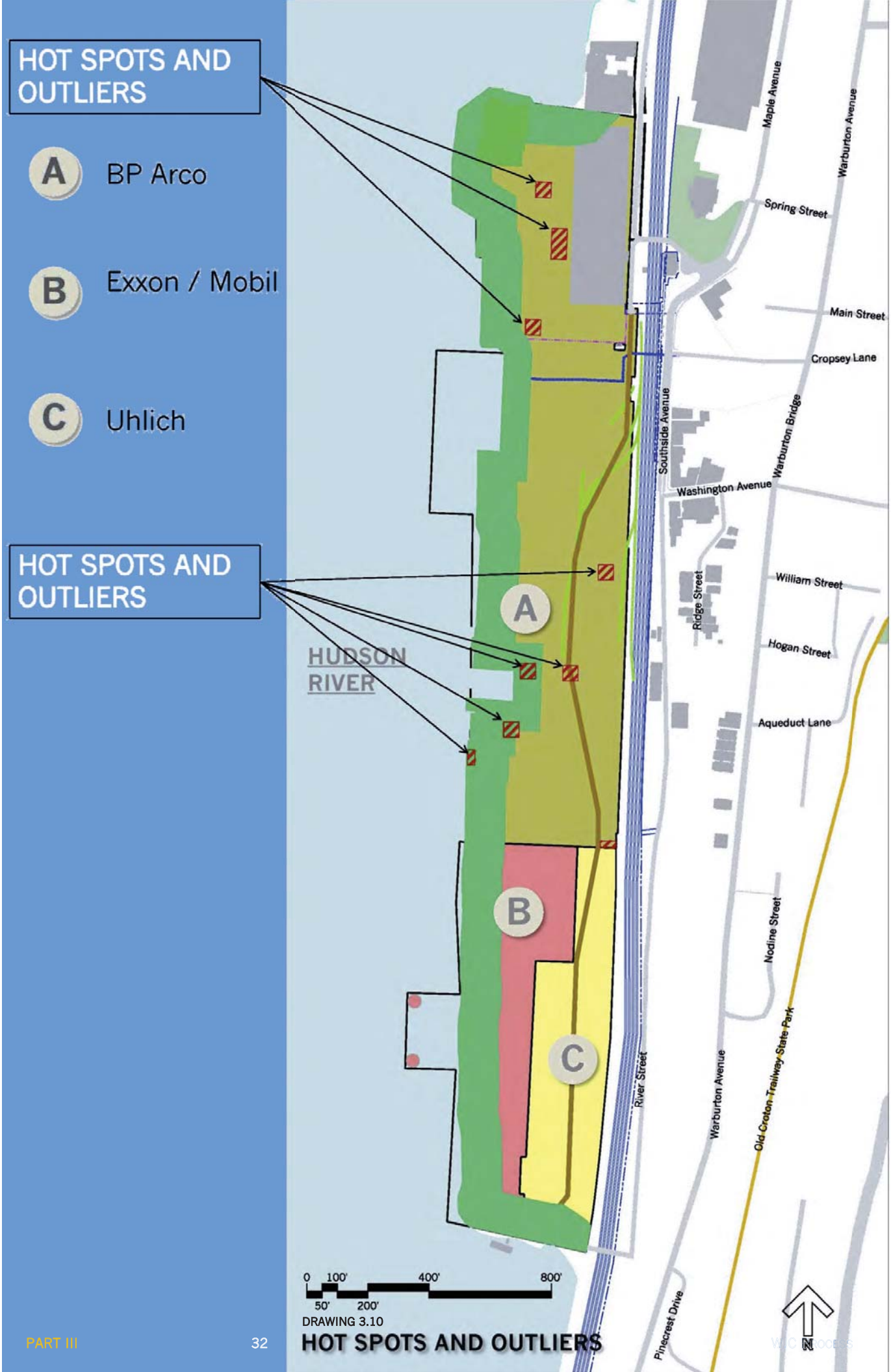
	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**
OU1	0.76			
Sub-total	27.41	7.89	6.33	**41.63**
30' No-Build Zone	-2.35	-1.03	-0.06	
Sub-total	25.06	6.86	6.27	**38.19**
100' No-Build Zone	-6.43	-3.09	-0.52	
Sub-total	18.63	3.77	5.75	**28.15**



DRAWING 3.9

NORTHWEST CORNER

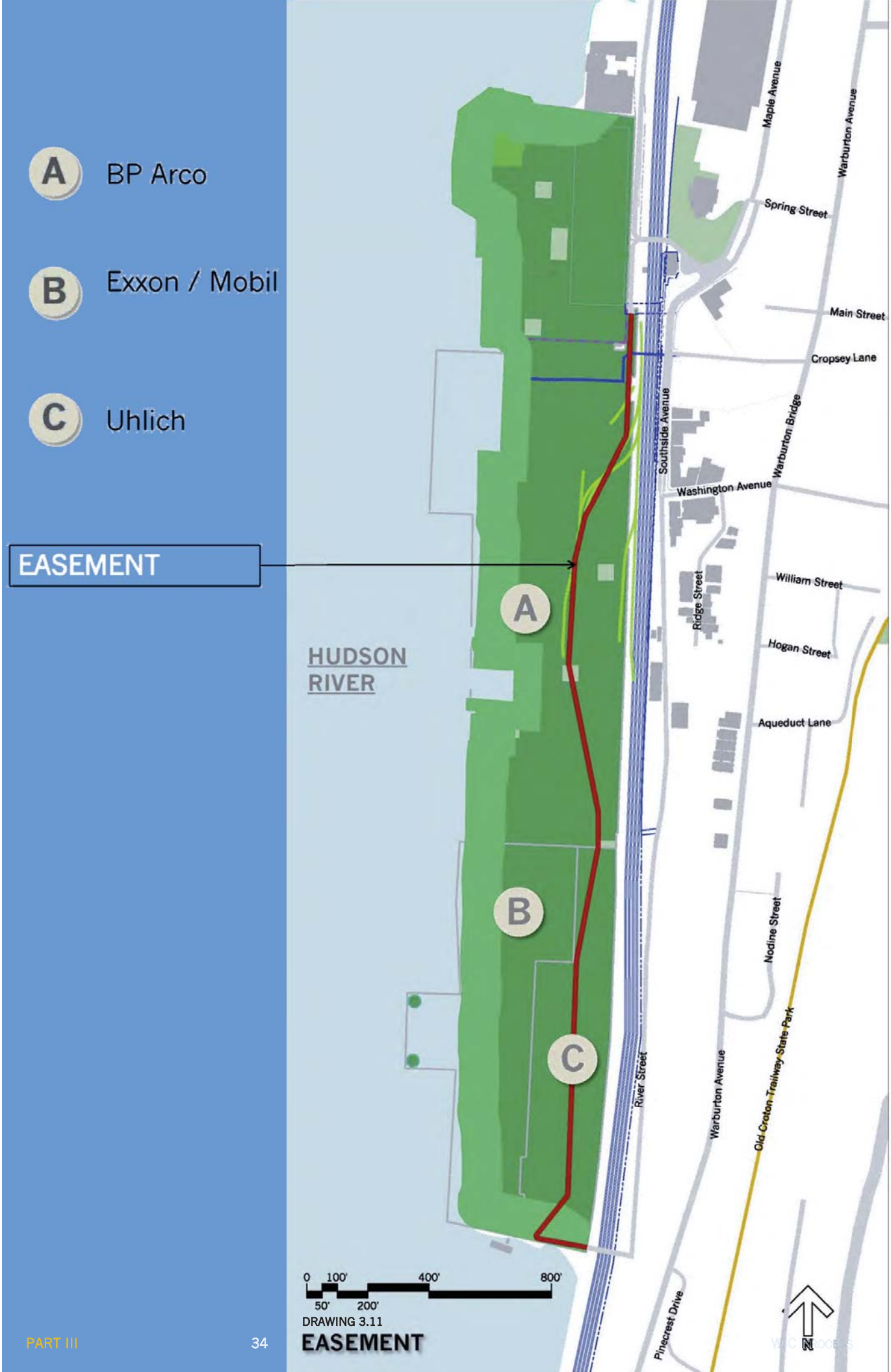
	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**
OU1	0.76			
Sub-total	27.41	7.89	6.33	**41.63**
30' No-Build Zone	-2.35	-1.03	-0.06	
Sub-total	25.06	6.86	6.27	**38.19**
100' No-Build Zone	-6.43	-3.09	-0.52	
Sub-total	18.63	3.77	5.75	**28.15**
Northwest Corner	-0.75			
Sub-total	17.88	3.77	5.75	**27.4**



DRAWING 3.10

HOT SPOTS AND OUTLIERS

	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**
OU1	0.76			
Sub-total	27.41	7.89	6.33	**41.63**
30' No-Build Zone	-2.35	-1.03	-0.06	
Sub-total	25.06	6.86	6.27	**38.19**
100' No-Build Zone	-6.43	-3.09	-0.52	
Sub-total	18.63	3.77	5.75	**28.15**
Northwest Corner	-0.75			
Sub-total	17.88	3.77	5.75	**27.4**
Hotpsots	-0.51			
Sub-total	17.37	3.77	5.75	**26.89**



DRAWING 3.11
EASEMENT

	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**
OU1	0.76			
Sub-total	27.41	7.89	6.33	**41.63**
30' No-Build Zone	-2.35	-1.03	-0.06	
Sub-total	25.06	6.86	6.27	**38.19**
100' No-Build Zone	-6.43	-3.09	-0.52	
Sub-total	18.63	3.77	5.75	**28.15**
Northwest Corner	-0.75			
Sub-total	17.88	3.77	5.75	**27.4**
Hotpsots	-0.51			
Sub-total	17.37	3.77	5.75	**26.89**
Easement	-0.62	-0.01	-0.50	
TOTAL	16.75	3.76	5.25	**25.75**

DRAWING 3.12

DEVELOPABLE AREA

	A BP ARCO	B EXXON MOBIL	C UHLICH	TOTAL AREA (ACRES)
Original Total	26.65	7.89	6.33	**40.87**
OU1	0.76			
Sub-total	27.41	7.89	6.33	**41.63**
30' No-Build Zone	-2.35	-1.03	-0.06	
Sub-total	25.06	6.86	6.27	**38.19**
100' No-Build Zone	-6.43	-3.09	-0.52	
Sub-total	18.63	3.77	5.75	**28.15**
Northwest Corner	-0.75			
Sub-total	17.88	3.77	5.75	**27.4**
Hotpsots	-0.51			
Sub-total	17.37	3.77	5.75	**26.89**
Easement	-0.62	-0.01	-0.50	
TOTAL	16.75	3.76	5.25	**25.75**

PART IV

ANALYSIS

4 ANALYSIS

4.1 Bridge Access:

a. It became clear to the Committee that the existing Dock Street Bridge should be repaired or replaced in the near future due to deteriorating expansion joints, poor site lines, poor traffic lane alignment and an extreme grade change which would hamper the efficient flow of traffic.

b. It was assumed that a replacement Dock Street Bridge will be required by the MTA or NYSDOT in the future to allow for double decker freight trains. Although there exists no timetable for any bridge replacement, the Committee is incorporating into this report consideration for a bridge with an increased height, but is making no assumptions as to how it would be paid for or which entity would construct it.

c. As part of any new replacement bridge, the Committee recognized that other elevation changes would be needed to tie the bridge with connecting roads from the site:

- The increased height of a replacement bridge would require longer access roads on either side. The approach from Maple Avenue will likely cut into the hill on the south side of the library property so as to avoid a grade change and a major impact to the turn-round in front of the train station. One benefit of increasing the length of the approach ramp is that it allows the existing bridge to remain in place while a new one is constructed.
- Both ramps on the site (the river side of the bridge) would have to be rebuilt to accommodate the increased height of the replacement bridge. The south ramp from the bridge would lead to the raised grade of the waterfront site.

d. Layout:

- Increased turning radii from a new bridge can be accomplished in the air space above the train tracks to provide better site lines.
- Sidewalks and bike paths are proposed on both sides of the replacement bridge to tie into new sidewalks and bike paths on the site.
- In the event that Building 52 is removed, rush hour congestion at the train station can be eased by providing a secondary ramp and access road to the Waterfront site. This new road would extend westward from the tracks toward the river and gently arc to the south and onto the site. It is recommended that no buildings be constructed along the first portion of this access road, thus preserving the spectacular Hudson River and Palisades views from this area. If Building 52 were to remain, the road could extend above the building and possibly provide direct access to parking within the building.

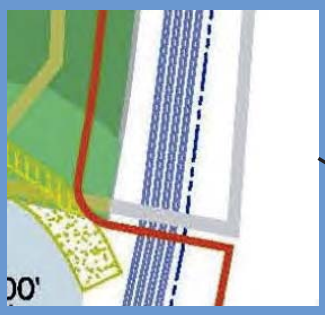
e. The Committee discussed the history of past pedestrian bridges onto the site and recommends adding a pedestrian bridge at the foot of Washington Avenue.

PHOTO 4.1

WEST VIEW OF DOCK STREET BRIDGE

The majority of visitors will access the site by car. Sidewalks and bicycle lanes should be added to both sides of new bridge.

Rotate new ramp parallel to train tracks



Sidewalks and bicycle lanes added to new bridge

DRAWING 4.1

VEHICLE ACCESS

f. The need for alternate entrances to the site, handicapped accessibility, bicycle access, stair clearance, train clearance, ongoing maintenance and the effects on the adjacent neighborhoods (i.e., the railroad tracks, Southside Avenue and private property on Southside) were all considered. Future zoning and development plans should consider these amenities and adjacent areas.
   - The Committee considered the need for a second vehicle bridge at the southern end of the site (replacing the Zinsser Bridge). Although a possible second bridge is outside the scope of the Committee's work, it became apparent that a second vehicular access to the site may be necessary for any significant density uses. Similarly, whatever road system is developed should contemplate this potential second bridge.
   - The Committee also recommends adding grade changes and contours to the relatively flat site. In addition to enhancing the aesthetics of the site, these grade changes could be used to mitigate the height differential from the bridge down to the finished grade elevation on the site. In addition to improving storm surge resiliency, grade changes can provide appealing landscape features.

4.2 Traffic Flow/Roads:

a. The Committee spent a great deal of time reviewing the issue of roads and paths on the site. We focused on the most important elements which helped define the layout of the roads and structures and, most importantly, defined the eventual blueprint for the infrastructure pathways:
   - The orientation and placement of the roads.
   - Whether there would be one or two main roads.
   - Pedestrian trails.
   - Bike lanes.
b. After considerable discussion and analysis of the flow of traffic and where to place utilities, etc., the Committee decided that the site would be best serviced by two primary roads.
   - One road would run north to south and be located on the middle of the two properties. It would be a meandering road that would have a somewhat rural flavor. It would intersect with or be adjacent to various walking and biking paths dispersed throughout the site.
   - The second road would be a limited access, more urban type of road situated on the eastern perimeter of the site, also running north south. It would be designed to carry the bulk of the traffic servicing the site, especially trucks and heavy vehicles. Mostly importantly, it would serve as the foot print for the infrastructure of the bulk of the onsite utilities providing for the entire utility infrastructure of the sewer lines and pumping stations, and the other pathways for the requisite manholes and other entryways to enable ready access to the utilities, without disturbing the cap in the future should access be needed for maintenance repair and upgrade of those utilities.

Terraced landscaping adjacent to new access road and ramp.

Ramps to site, Metro-North drop-off and service road.

Bicycle path network.

Rural type winding road. No truck traffic.

Active recreation area.

Service road.

DRAWING 4.2
SITE PLAN

4.3 Service Infrastructure Recommendations

General: The Committee proposes siting major infrastructure in below-grade accessible tunnels. Major infrastructure encompasses sewers (both sanitary and storm), potable water supply, grey water supply, electrical power, natural gas, communications (telephone, cable, fiber optics), as well as empty pipes and/or pathways to accommodate future technologies. It is anticipated and recommended that these below-grade tunnels have roads, sidewalks and pathways on top. Unlike the majority of the Village, it is recommended that power and low voltage distribution lines (telephone, cable, etc.) be placed below grade, dispensing without the need for unsightly utility poles. Required "point-of-entry" connections for future buildings will be made in the accessible portion of utility tunnels, without requiring excavation into the cap.

a. Redundancy: This proposal for waterfront infrastructure includes a single pathway for utilities to reach potential development sites. This approach will vastly simplify the infrastructure requirements on the site, but will also preclude future uses that are required by code or recommended standard of care to have two separate sources of water supply and/or electrical supply, usually from different streets, to the building. These uses include high rise buildings, hospitals and schools.

b. Sewers: there should be separated sewer flow. Sewers will be separated into at least two pipes, site drainage and sanitary, to minimize the amount of water sent to the Westchester County waste treatment plant in South Yonkers.
   - Site drainage will consist of catch basins in roads, public parking lots and open-space drainage and conveyance pipes located under streets. Site drainage should be delivered to an on-site filtration system. It is recommended that site drainage be tanked and stored on site for grey water uses, such as irrigation after filtration. (See sustainability section for concepts that may be employed to minimize the amount of runoff water that is delivered to the filtration system.)
   - A new sanitary sewer line should be placed under the limited access north-south road on the eastern perimeter of the site. Due to the length of the sewer, the pitch may be too great to fit within the proposed five-foot cap, meaning that either the majority of the pipe should be buried below the cap or that intermediate pumping stations may be required. Sewer mains rarely require maintenance, but each development will need to connect to the sewer main, so it is preferable that the plan allows for future connections running east west from the sewer with no penetration of the cap.

c. Potable water will be supplied through pipes in this main infrastructure tunnel. Potable water should not be used for irrigation. Instead, "grey water" should be recaptured and recycled for onsite uses such as irrigation.

d. "Grey water" is defined as untreated household waste water which has not come into contact with toilet waste. It includes used water from bathtubs, showers, bathroom wash basins (lavatories), and water from clothes washers

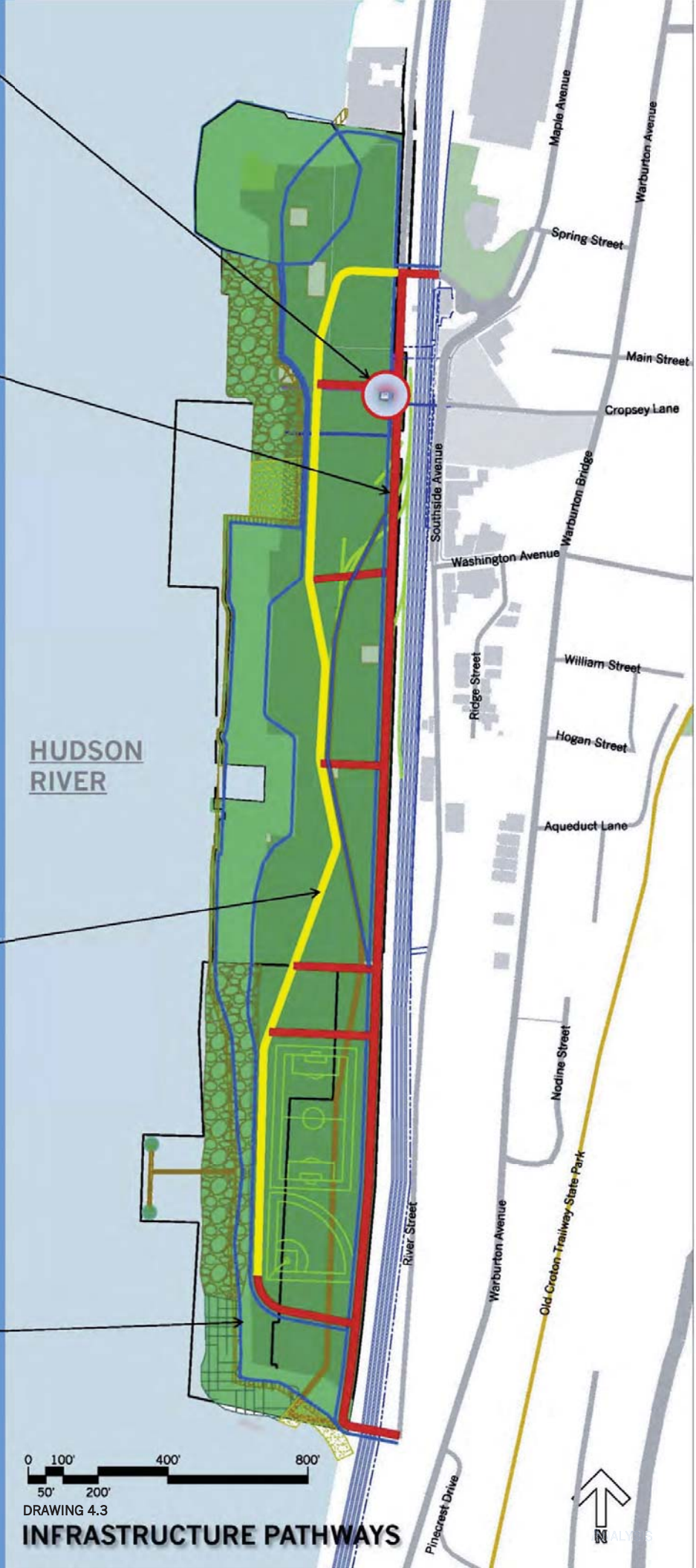
EXISTING SEWER PUMPING STATION:
•May require upgrade to handle additional loads – study required.
•Primary infrastructure will gravity feed to pumping station which will pump via existing piping over the tracks (at underside of bridge) to filtration plant in Yonkers.

PRIMARY INFRASTRUCTURE PATHWAY :
•Accessible tunnel under main service roads.
•Utility services for future private and public space development
- •Gas
- •Electricity
- •Potable Water Supply
- •Sewer
- •Telephone
- •Cable
- •Fiber Optics

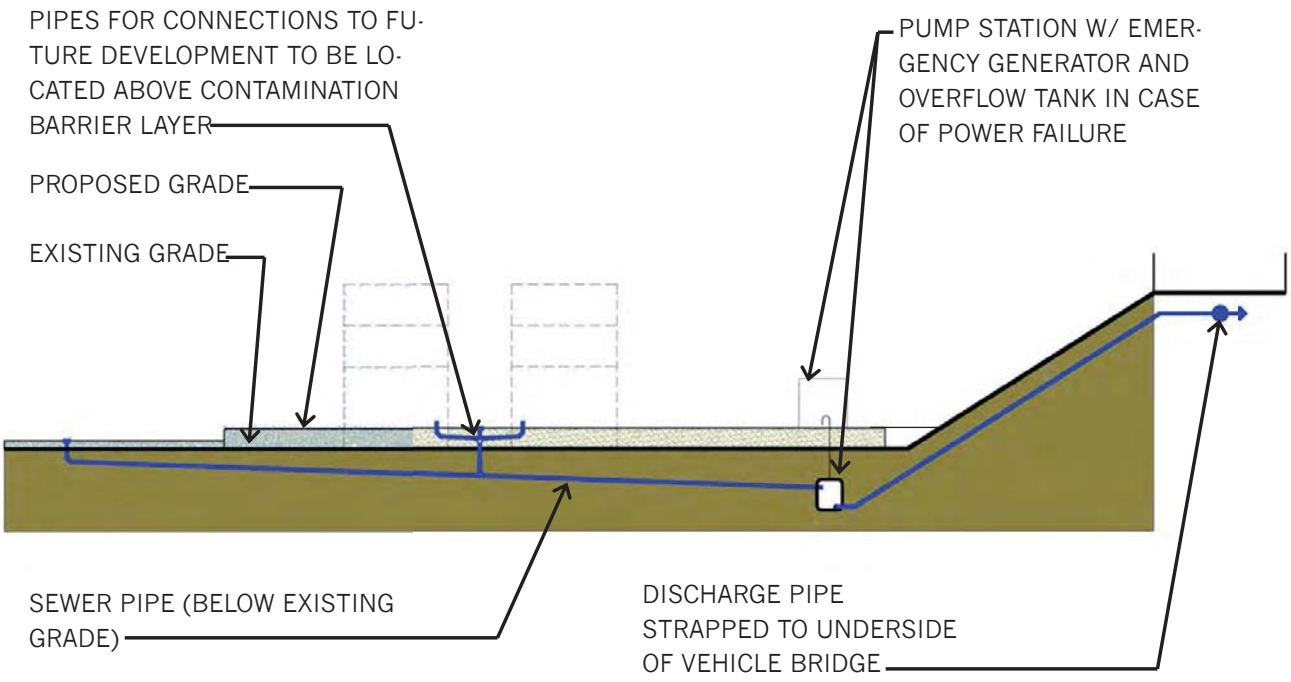
•Utility services for public spaces only
- •Emergency Power
- •Street Lighting
- •Fire Fighting Water Supply
- •Storm Water Sewer
- •Storm Surge Overflow
- •Emergency Communications
- •Empty for Future

SECONDARY INFRASTRUCTURE PATHWAY
•Underground conduit and piping with traditional manholes:.
•Utility services for public spaces only
- •Street Lighting
- •Fire Fighting Water Supply
- •Catch Basin Piping
- •Emergency Communications
- •Empty for Future

TERTIARY INFRASTRUCTURE PATHWAY
•Solar powered services
•Utility services for public spaces only
- •Pathway Lighting



DRAWING 4.3
INFRASTRUCTURE PATHWAYS



DRAWING 4.4
Conceptual Infrastructure Section

and laundry sinks. Grey water must not include waste water from kitchen sinks or dishwashers.

e. Incorporating private buildings on a public grey water system is difficult. Each building would have to deal with grey water internally; separating the grey water streams from each private building would vastly increase municipal piping and controls. However, a system including only public facilities could be implemented on a smaller scale, as a supplement to potable water to be used for landscape irrigation.

In this scenario, effluent from each public building's wash basins and showers would be diverted to grey water collection tanks. Filtration/disinfection and pumping systems would be provided in a central location and would include solids separation, biological treatment, and membrane processing. The grey water system would utilize pretreatment/settling tanks with trash screens, mixers, aerators and baffles to separate solids and provide biological (aerobic and anaerobic) digestion to reduce biological oxygen demand. A cross-flow membrane skid would produce the cleaned permeate, which would then be sent to a treated water holding tank to be chlorinated and pumped to the grey water distribution system. Any deficit in reclaimed water or a system shutdown or failure would be supplemented with municipal water as a back-up source.

f. Communications (phone/data) – main trunk lines should also be located under this eastern perimeter road.

g. Empty (future) – there should be room left in the infrastructure tunnel to accommodate future uses.

h. Storm surge – should be accommodated by empty pipes which would handle excess water from the pump storage tank in the event that a storm surge creates an overflow condition or temporary power outage to sewer pumps beyond the emergency power capacity.

4.4 Shoreline Treatment

The Shoreline of the waterfront poses many challenges and opportunities. The type of shoreline material will help define future uses. The Committee explored and assessed the functional, aesthetic and performance impacts of various types of shoreline treatments which can be used to protect the shoreline from erosion. Some of these include:

a. Riprap *[Photo 4.13]* – is an effective method of protecting the shoreline in which random or structured large rocks are placed over a layer of geotextile fabric typically placed at a 1:1 to 3:1 slope. However, since most of the existing seawall is composed of vertical seawalls, changing to riprap would require the loss of real estate since it would not be possible to place the riprap seaward of the existing seawalls. Aesthetically riprap can be placed randomly or placed neatly providing various visual experiences. It has an indefinite

PHOTO 4.2

EXISTING PIERS AT WATER TOWER

PHOTO 4.3 EXISTING PIERS

PHOTO 4.4

EXISTING BULKHEAD WALL AND SHEET PILING

PHOTO 4.5

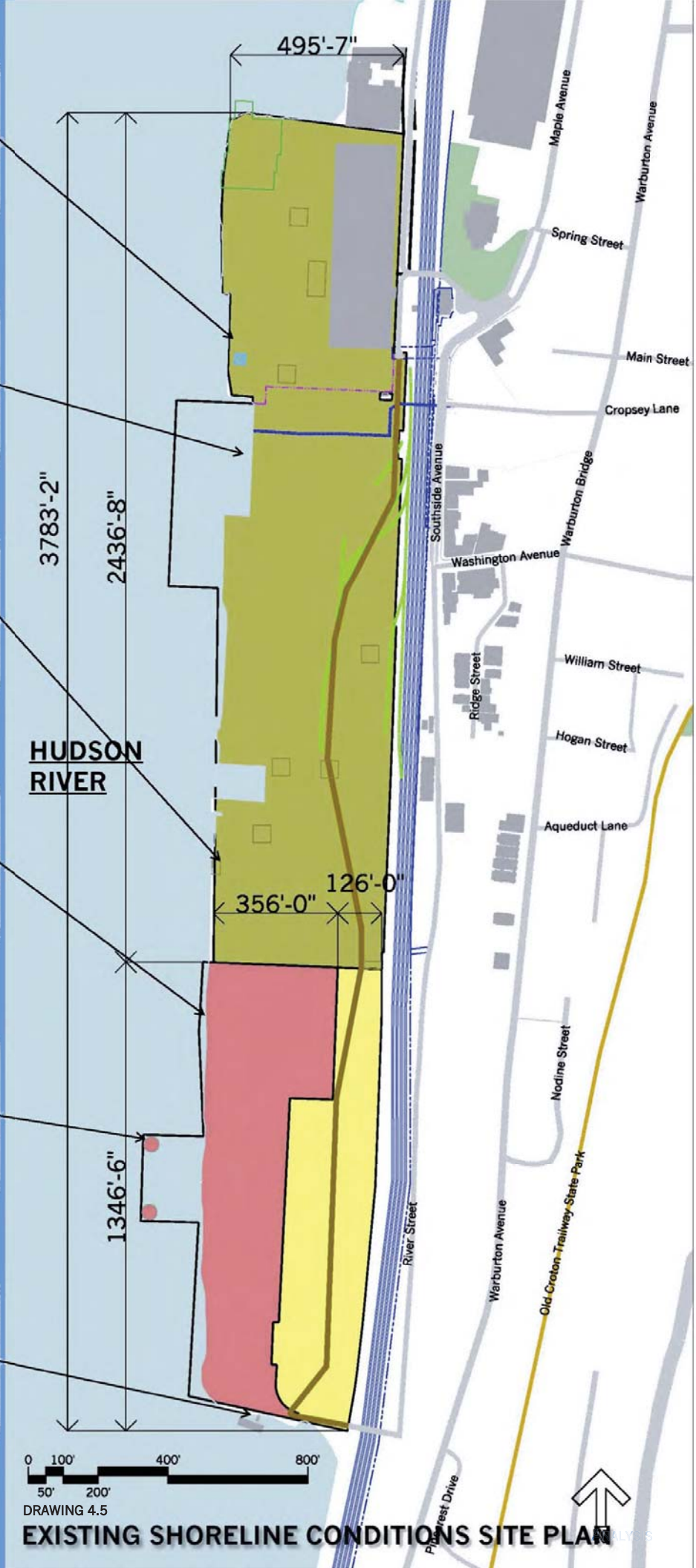
EXISTING SOFT SHORE

PHOTO 4.6

EXISTING IN-RIVER DOLPHINS

PHOTO 4.7

EXISTING RIP RAP AND SOFT SHORE



DRAWING 4.5

EXISTING SHORELINE CONDITIONS SITE PLAN

lifespan but requires regular maintenance. Stones which move as a result of storm action can be replaced.

b. Seawall or Bulkhead – this is typically a vertical wall constructed of steel sheet piling. However, this is a costly construction method. Such structures can have a life expectancy of approximately 30 to 50 years. Other materials often used for seawalls include vinyl sheet piling, timber or precast concrete planks set between vertical "H" piles. Seawalls typically require tiebacks to prevent overturning.

c. High Platform *[Photos 4.11 and 4.12]* – this takes the form of a pile supported platform with a cut-off wall on the landward side. One advantage of a platform is that the need for tiebacks is eliminated.

d. Relieving Platform – this low platform has a seaward bulkhead and a landward cutoff wall. Like the high platform, this platform also eliminates the need for tiebacks.

e. Beaches *[Photo 4.16]* , on the other hand, have a very shallow sloped soft edge. However, given the existing conditions and cleanup imperatives, it does not appear that they would not be a feasible option. Beaches would require sacrificing land so that a shallow slope could be created landward of the existing seawall which would require removal of significant amounts of onsite fill material, which may not be feasible due to the contaminated nature of the fill.

f. Soft Edges *[Photo 4.15]* – this softer, more gradual, living shoreline can provide coastal defense and natural habitat but would most likely reduce the amount of usable land at the site.

g. Special Edge Treatments – the use of rough, textured and porous surfaces can facilitate the attachment of both plant and animal marine organisms. Varying the characteristics of the material can provide habitat for different kinds of fish and invertebrates.

h. Curvilinear Shoreline – these non-linear shorelines reduce velocity, create micro-habitats that increase diversity, and improve hydrology of the riparian area. Given the existing shoreline of the site, this may not be feasible.

The Committee also considered whether filling in part of the Hudson was possible. State and federal regulations generally do not allow the filling in of waters unless mitigation is provided, usually in the form of cutting back the shoreline in a nearby location. Mitigation is usually required at a 2:1 ratio (i.e., expose 2 square feet of water for each 1 square foot that is filled).

Also considered and recommended is the widening of one or both of the existing coves to provide more and varied shore area.

The Committee also recommends providing access to the two off-shore structures (dolphins) at the southwestern portion of the site.

PHOTO 4.8
BOARDWALK

PHOTO 4.9
FLOATING DOCK

PHOTO 4.10
RIP RAP AND BULKHEAD WALL

PHOTO 4.11
HIGH PLATFORM

PHOTO 4.12
REVETMENT

PHOTO 4.13— RIP RAP AND SEAWALL

PHOTO 4.14 — HIGH PLATFORM

PHOTO 4.15 — BOARDWALK/NATURE TRAIL

PHOTO 4.16 — IN-WATER DOLPHINS

PHOTO 4.17 — SOFT EDGE

PHOTO 4.18 — BEACH

DRAWING 4.6

SHORELINE TREATMENT

Riprap in this location will mitigate the steep grade change and provide an attractive revetment at the edge of a major public gathering spot.

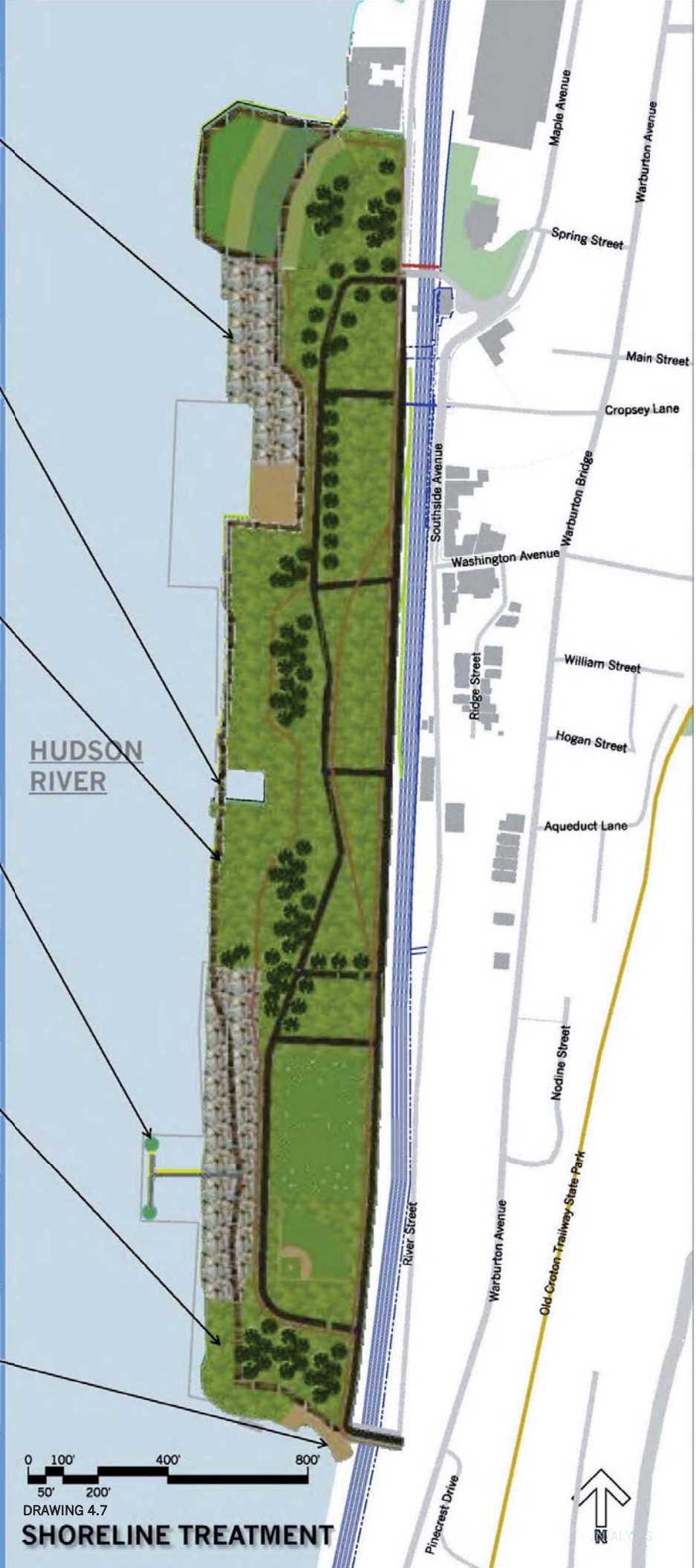
Boardwalk can extend over the water at the deep water port, linking the two shores.

Boardwalk can be sited directly above a sheet pile sea wall, without the need for a steep revetment.

Concrete dolphins in the water can become destinations accessed by gangways.

The southern corner is an ideal location for a natural "soft" shoreline.

The existing beach can be extended on to the southern portion of the site.



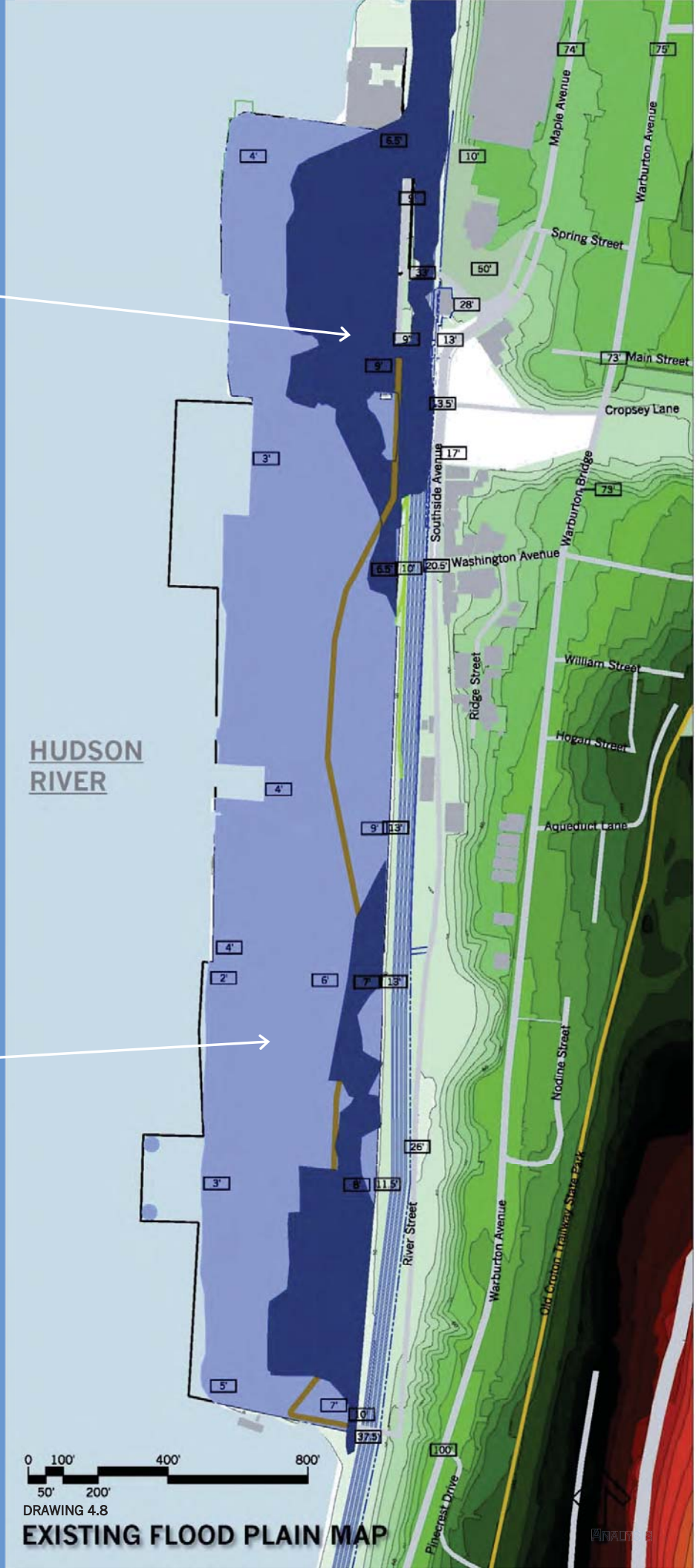
DRAWING 4.7

SHORELINE TREATMENT

4.5 Flood Plain and Grade Elevations

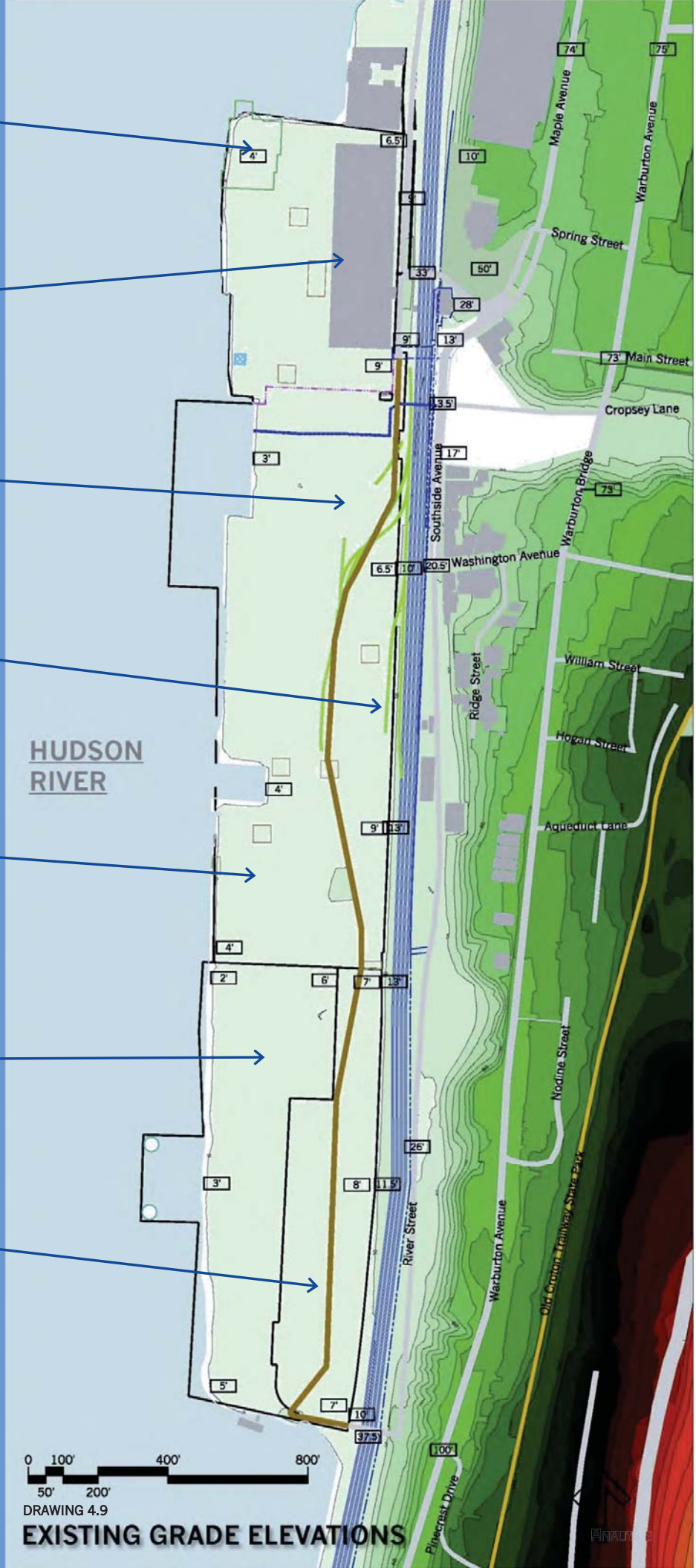
This site, adjacent as it is to the Hudson River, lies within the river's flood plain. Any future use must take into consideration the flood plain regulations.

a. Regulatory floodplains are defined by the elevation of the base flood in relation to the elevation of the ground. Base flood elevations are used to determine the required elevation of new buildings in the floodplain.
b. The new FEMA map has not yet been made official. It is expected that the new maps will raise the existing 100-year flood plain about an additional three feet which will cover the entire site. This means that, even when grade on the BP site is raised five feet per the Consent Decree, at least half the site will still lie within the revised flood plain. Without a significant increase in the elevation of the site, it is unlikely that any development will be permitted within the flood plain. It should be noted that, if the current 100-year flood plain is not changed, the five feet grade increase will remove most of the BP site from the flood plain. Obviously, any increase in the revised FEMA map would require a corresponding increase in the site's elevation.
c. The Committee recommends that the grade of the site be raised a variety of levels to assure that areas designated for development are above the 100-year flood plain.
d. In addition to providing enhanced flood zone assurance, site grade change will provide an opportunity to separate service and infrastructure levels from public access levels. In essence, services and utilities can be at the "back door" of a development accessed from a service corridor along the eastern perimeter of the site, while pedestrians and private vehicles can access buildings from a "front door" at a higher elevation in the interior of the site.
e. Another advantage to a variety of grade elevations is that surface parking can be concealed under a split level.
f. If employed strategically, grade change will dramatically reduce the risk of flood damage, maximize the resiliency of the site and reduce the cost of flood insurance. The increase in grade beyond what is required by the Consent Decree should bring the site into compliance with the new FEMA Base Flood Elevations.



DRAWING 4.8

EXISTING FLOOD PLAIN MAP



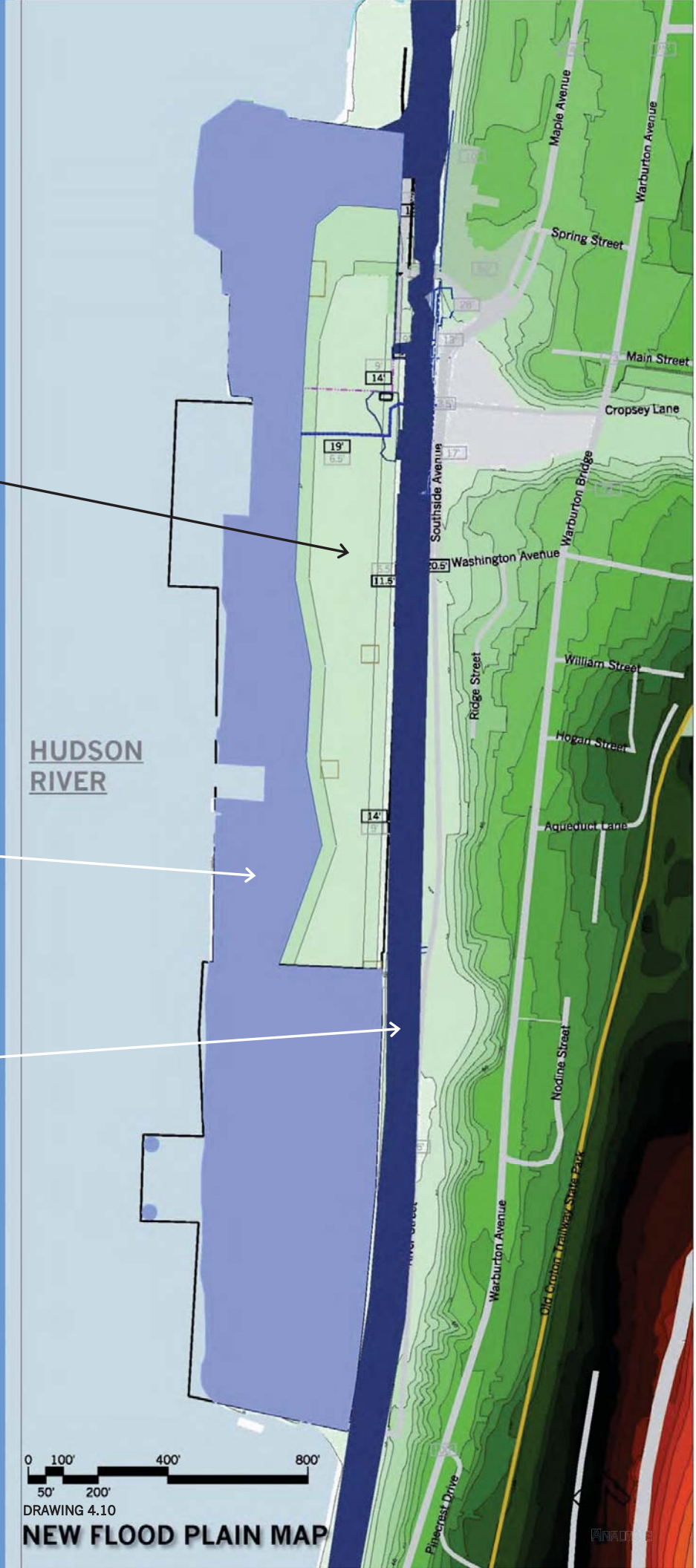
DRAWING 4.9

EXISTING GRADE ELEVATIONS

All areas shown in green are at elevations above the 500 year flood plain

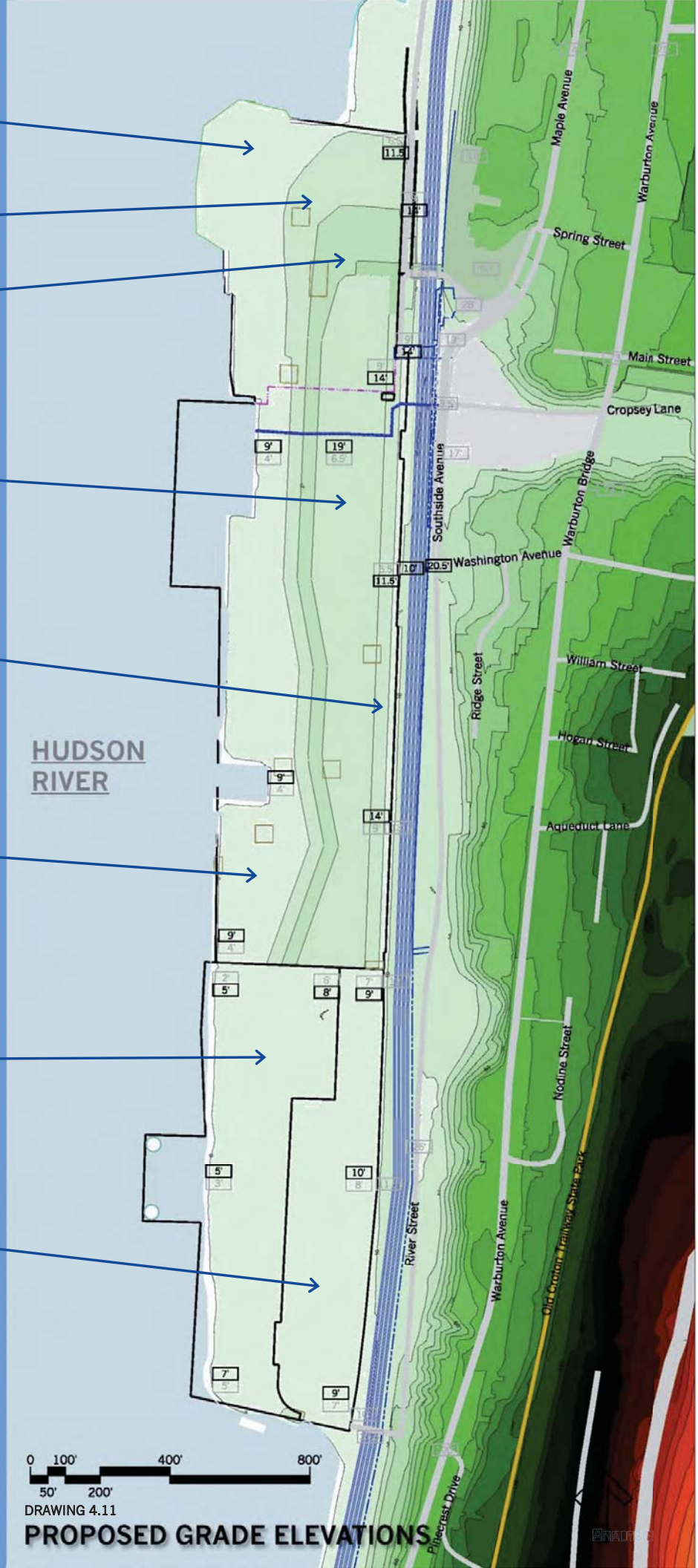
100 Year Flood Plain

500 Year Flood Plain



DRAWING 4.10

NEW FLOOD PLAIN MAP



DRAWING 4.11

PROPOSED GRADE ELEVATIONS

PART V

SUSTAINABILITY

5 SUSTAINABILITY

5.1 Renewable Energy

a. Renewable Energy. Site renewable energy opportunities are primarily driven by the physical site characteristics, such as the availability of open and sunny land or roof space for solar or the availability of wind. Renewable energy systems suitable for the waterfront site will also require an on-site load to consume the renewable energy. This is because current renewables policy allows for renewable energy consumed on site (on the customer side of the utility meter) to be valued at the retail rate of electricity. While the Committee did look into the possibility of exporting renewable energy to the power grid (to the utility side of the utility meter), it concluded that this would be difficult to achieve and that any generated power would only be valued at the wholesale rate of power, significantly less than the retail rate. It is most likely not feasible.

b. Solar energy can be generated in the form of electricity (solar photovoltaics, or "PV") or thermal energy (solar hot water). Both forms require significant amounts of ground or roof space in order to mount the solar PV or solar thermal panels. Solar hot water systems suitable for operation in the northeast are generally only configured to provide low grade heat suitable for providing energy to domestic hot water systems such as sinks and showers. This type of solar domestic hot water system is commercial and can provide reasonable rates of return. Any building designed for the site should consider solar hot water systems to meet domestic hot water loads. Solar thermal systems suitable for providing space heating in buildings are more difficult in the northeast climate, but can be considered during building design, especially as part of an advanced non-ground source heat pump system (Note: the use of ground source heat pumps is not recommended for this site due to the need to limit disturbance to the soil cap installed as part of the site remediation.)

c. Significant opportunity exists for solar PV energy generation on the waterfront site. However, allocating space for the PV panels can be difficult. As an extreme example, covering the entire 45 or so acres with a ground mounted solar power system would generate up to 8 MW of power, or enough to power 600-800 homes. A more likely scenario would be to not take up any valuable land area at the site for solar energy generation and instead integrate solar PV panels on to the roofs of any buildings constructed at the site. This type of solar configuration is becoming common in New York and is expected to offset up to 10%-20% of the electrical load of the type of buildings that may be constructed at the site.

d. Wind Power. The Committee studied the possibility of utilizing wind power at the site. According to a report generated on the New York State Energy Research Authority Small Wind Explorer web site, the Hastings- on-Hudson wa-

Terraced Green Roof or Building Preservation: Commuter Parking under green roof

Solar powered roadway and pathway lighting.

Separate storm and sanitary sewers. Allows for storm water harvesting.

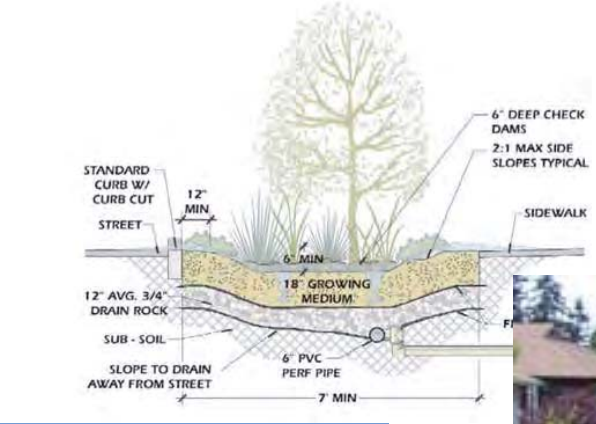
Filtration: Rural road and parking lots should utilize vegetated swales for run-off

Water sensitive urban design strategies: Conservation open space and rain garden for rain-

Soft Shoreline: natural shoreline protection, imitates natural systems

DRAWING 5.1

SUSTAINABILITY CONCEPTS



DRAWING 5.2

VEGETATED SWALE

PHOTO 5.1

VEGETATED SWALE

PHOTO 5.2

VEGETATED SWALE

terfront has a very poor wind resource potential. The report is found in Appendix V. This resource potential is based on calculating the expected energy generation of wind turbines installed on site relative to other areas on New York. While the wind does blow on the Hastings waterfront, and a wind turbine installed there would generate some energy, the overall amount of energy and the economic payback for the project would be very poor.

e. Extrapolating this data for the installation of large turbines at this site is relatively straightforward, i.e., the wind resource for a large turbine installation would also be considered poor. In addition, because a large wind turbine may generate more energy than can be used on site, the excess energy would be valued at the wholesale rate, therefore significantly decreasing the economic payback.
f. Economics aside, siting a wind turbine on the waterfront would be difficult, primarily due to permitting issues. Wind turbine projects are generally required to conduct environmental assessments. These assessments include how the wind turbine would affect local bird and bat populations, how they would affect view sheds for local residents and how much noise they would generate. All of these issues have created significant obstacles for siting wind turbines in populated areas in New York and would most likely be adverse to any use of the site.
g. Site and street lighting should be kept to a minimum to preserve the "dark sky" character of the site. All lighting should be "zero cut-off", meaning that 100% of the light produced is aimed downward toward the ground. It is recommended that lighting be solar powered and LED.
h. Heat reducing hardscapes are encouraged.
i. Permeable paving will enhance drainage.
j. Gas lines will deliver natural gas and the main gas tank line should also be located under the eastern perimeter road.

PART VI

Additional Recommendations

6 ADDITIONAL RECOMMENDATIONS

6.1 Additional Recommendations

a. Daylighting a portion of the stream that runs underground from the waterfall behind the Cropsey Estate, under the Metro North tracks and continues underground through the site to the Hudson River. The Committee studied day lighting only the portion of the stream that runs under the BP portion of the waterfront, on the west side of the Metro North train tracks. The recent Yonkers day lighting project at Larkin Plaza at the Yonkers train station was used as a frame of reference. Positive benefits of daylight include to the potential for pedestrian walkways, view preservation, storm water drainage and intrinsic beauty.
b. Bicycle path network: The committee recommends that a dedicated bike path be developed from the dock Street bridge all around the site, connecting to the recommended replacement Zinsser Bridge.
c. Walking path.

PHOTO 6.1

Daylit Stream in Yonkers

DRAWING 6.1

DAYLIT STREAM

Terraced landscaping adjacent to new access road and ramp.

Ramps to site, Metro-North drop-off and service road.

Bicycle path network.

Rural type winding road. No truck traffic.

Active recreation area.

Service road.

DRAWING 6.2
SITE PLAN

Building 52

As stated in the Introduction, part of the Committee's task was to present an infrastructure plan and recommendations that would work whether Building 52 were to remain or be demolished. In an effort to avoid developing a lesser plan as a compromise, we developed our plans as a blank slate. The site plan "Site Plan with Building 52" is provided to show how the plan will work if Building 52 were to remain. The plan is essentially the same as the "Site Plan without Building 52", with the following exceptions:

- the road extending from the new, raised Dock Street Bridge would "fly over" Building 52. Direct access from the road to the building may be possible, but would have to be studied and is not shown in this drawing;
- the terraced landscape from Dock Street Bridge landing to the northwest corner is replaced by flat landscaping at the new site elevation;
- a retaining wall is constructed around Building 52 to manage the grade elevation changes; and
- the pumping station and emergency generator are relocated from their current location to inside Building 52, as well as overflow or filtration tanks that are recommended elsewhere in this report.

DRAWING 6.3
SITE PLAN WITH BUILDING 52

PART VII

CONCLUSIONS

7 Conclusions

a. Planning should accommodate a variety of on-site circulation types: pedestrian, bicycle, passenger vehicles touring the site, passenger vehicles heading to a specific destination, delivery trucks, and service and emergency vehicles.

b. Public access to the shoreline should be continuous and uninterrupted.

c. Development should be toward the eastern part of the site to provide uninterrupted access to and views of the Hudson River and the Palisades. The primary service access road should run in a north/south orientation adjacent to the railroad tracks, providing direct access to areas designated as developable. Primary infrastructure pathways should be under the primary access road.

d. Infrastructure pathways should be below grade, straight, maintainable and upgradable, installed in such a manner as to eliminate the need to penetrate the cap to make connections for future development and construction.

e. Sustainability and resiliency measures should be built into the infrastructure.

PART VIII

Appendices

8 APPENDICES

Appendix A History of the Site

8.1 Appendix A – History of the Site

a. The Anaconda Site

The Anaconda site was created in the late 1800's and early 1900's from fill that was deposited in the river, consisting of a mixture of large stone, gravel, ash, slag, broken concrete, brick and glass, and other debris.

This fill material is approximately 10-20 feet thick along the railroad tracks, and 20-40 feet thick along the river. Beneath the fill layer lies the Marine Silt, which is a structurally weak clayey silt material that is approximately 40 feet thick along the shoreline. Beneath the Marine Silt lies the Basal Sand unit, a very dense sand and gravel material, into which all structural piles for site buildings were placed. Groundwater is approximately 2 to 8 feet below ground surface in the fill material, and is influenced by tidal variation. Groundwater in the Basal Sand unit is confined by the Marine Silt unit and is present in an artesian condition.

The shoreline shows signs of historical erosion due to storm events and wave action.

Low-lying parts of the site have been flooded during larger storms, most recently in 2012 during Super Storm Sandy which saw flooding across the entire site onto River Street.

The Anaconda site has been used for industrial and commercial purposes since it was created in the mid-1800's.

Early uses include a sugar manufacturing, pavement manufacturing, and cable manufacturing by a predecessor of Anaconda, National Conduit and Cable Company. From 1919 to 1977, the property was owned and operated by Anaconda and its predecessor, the Hastings Wire and Cable Company. It was used for manufacturing copper wire and cable, including a unique type of polychlorinated biphenyl (PCB) insulated cable made for the United States Navy during the World War II era.

The legacy of those cable manufacturing operations is the presence of elevated levels of PCBs that require remediation under the aegis of the DEC.

Most of the Anaconda site is now covered by pavement or concrete building slabs. All but one of the buildings has been razed. The remaining building on the site is known as Building 52.

The shoreline consists of areas of loosely-placed rip rap and concrete rubble in the north and decaying wooden bulkheads, docks and piers in the central area. Two former boat slips are present along the waterfront, both of which have filled in to a shallow depth with naturally-deposited sediment. The shoreline south of the South Boat Slip consists of modern steel sheeting.

Anaconda ceased operations in 1974. Wire manufacturing operations, especially those during World War II under the direction of the U.S. Navy, caused the release of PCBs and metals to site soil, groundwater and sediments. A site investigation was performed in 1986-87 in connection with a proposed

real estate development which led to the discovery of high levels of PCBs beneath the northwest corner of the site.

b. The Tappan Terminal Site

The Tappan Terminal site is an inactive hazardous waste disposal site and was formerly used for petroleum storage and the manufacture of dyes, pigments and photographic chemicals.

Like the adjacent Anaconda site, the Tappan Terminal site was created by the placement of fill into the Hudson River between 1868 and 1970. This fill material typically consisted of sand and gravel mixed with bricks, concrete, stone, timber, ash, slag, shells, and other debris.

Between 1897 and 1955 the site was owned by Zinsser & Company and used for the manufacture of dyes, pigments and photographic chemicals. In 1955, the Harshaw Chemical Company purchased Zinsser and continued operations at the site. In 1961, Tappan Tanker Terminal purchased the property and began operating a petroleum distribution facility on the western portion of the site. Beginning in 1964, Paul Uhlich & Company leased, then purchased, the eastern portion of the site for the manufacture of pigments. This operation later became the Uhlich Color Company. Mobil purchased the western portion of the site in 1975 and continued petroleum distribution operations. The DEC has identified the presence of the following contaminants at the site: chlorobenzene, semi-volatile organic compounds, and metals including copper, nickel and zinc.

When Mobil ceased operations on their property in 1985, a number of oil spills and bulk storage violations were discovered. In 1987, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York.

During a 1992 repair of a sewer pipe at the site, evidence of a petroleum release on both properties was discovered. Contaminated soil was stockpiled and later sent off site for disposal. The extent of petroleum contamination was investigated between 1992 and 1994. In 1994, an oil remediation plan was approved under the NYSDEC's Spill Response program and Mobil and Uhlich entered into a Stipulation Agreement to remediate this spill.

In 1996 Mobil entered into a Voluntary Agreement with the DEC to investigate petroleum contamination on the western portion of the site. Because none of the potentially responsible parties agreed to perform a comprehensive investigation of the entire site, the site was referred for a State-funded investigation in 1998. However, after 1998, Mobil conducted some focused investigations and technology pilot studies on contamination located on their portion of the site. The Uhlich Color Company ceased operations at the site in 2002, and most buildings at the site were demolished in early 2003. There are no structures on the site at the present time.

Appendix B Consent Decree Outline

8.2 Appendix B – Consent Decree Outline

a. In 1994 the Hudson Riverkeeper Fund, Inc. ("Riverkeeper") sued the AR in the United States District Court for the Southern District of New York, 94 Civ. No. 2741 (WCC). The Village subsequently intervened as a party plaintiff in the suit. The Riverkeeper and the Village alleged claims under the Resource Conservation and Recovery Act ("RCRA") Section 7002(a)(1)(B), 42 U.S.C. §6972(a)(1)(B) that the presence of PCBs in soil, water, and sediment at or near the Anaconda Site presented an imminent and substantial endangerment to health. An additional claim was asserted for response actions and response costs under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (42 U.S.C.§§9601 et seq.).

b. In 2003, the parties entered into a Consent Decree resolving the litigation. That Consent Decree established a broad set of remedies for the Anaconda site, the essential components of which include the following:

- Depths of Excavation of PCBs and Heavy Metals: The excavation of soils containing concentrations of PCBs greater than 10 parts per million ("ppm") as follows:
  - Throughout most of the 28-acre site, excavation of all soils containing concentrations of PCBs greater than 10 ppm and all lead hotspots;
  - in the Northwest Corner of the site, on approximately 1.25 acres, and along the shoreline in the vicinity of the Northwest Corner, excavation is to be to a depth of at least 7 feet; and
  - in the limited remaining area (consisting of a few acres) in the northern portion of the Site, excavation to a depth of at least to 9 feet, and, in an approximately 12,500 square-foot subportion of this area, to a depth of up to 12 feet (excavation to these depths in this area should remove substantially all soils containing PCBs in concentrations greater than 10 ppm).
- In those limited areas known as the Northwest Corner and the adjacent shoreline area, where total removal is not practical or safe for engineering or environmental reasons, the remaining pockets of contamination would be contained by underground walls, covered with 7 or more feet of clean backfill in the excavated area, and then sealed with the additional five-foot cap that is required for the entire Site, as described below, which is more than adequate to provide for human and environmental health and safety.

c. A five-foot cap is to be placed on the entire OU-1 site consisting of:
- a six-inch layer of asphalt or similar material at the Site's current elevation
- a demarcation layer to identify the cap and indicate the "no excavation" areas, for instance a snow fence or material of a different character
- a four-foot layer of clean fill; and
- a six-inch layer of topsoil

d. Installation of Bulkhead: installation of a new bulkhead along the shoreline of the Site.

e. Additional features:

- the designation of a minimum of 6.25 acres, and possibly up to 14.25 acres, of open space on the Site;
- public access to such open space areas that would allow for the creation of parks, riverfront promenades, or other desirable public uses;
- a 65-foot height restriction and 100-foot setback from the Hudson River (60 feet from the coves) for any buildings constructed on the Site;
- a prohibition against the use of any groundwater from the Site for drinking, irrigation or domestic purposes; and
- a prohibition against any detached single family residential homes on the Site; and a long-term financial commitment from BP to maintain the Site bulkhead and cap for a period of 100 years.

Appendix C
Village Survey

My Report
Last Modified: 06/05/2013

1. How would you get to the new park? Please check all that apply.

#	Answer	Bar	Response	%
1	Car		557	83%
2	By foot		494	73%
3	Bus		2	0%
4	Bicycle		239	36%
5	Train		20	3%

Statistic	Value
Min Value	1
Max Value	5
Total Responses	673

2. How long do you think you would spend at the park during a typical visit?

#	Answer	Bar	Response	%
1	A half-hour		33	5%
2	An hour		361	54%
3	2-4 hours		269	40%
4	All day		8	1%
	Total		671	

Statistic	Value
Min Value	1
Max Value	4
Mean	2.38
Variance	0.36
Standard Deviation	0.60
Total Responses	671

3. Please indicate up to six of the following recreational uses that you would engage in or like to see in the park.

#	Answer	Bar	Response	%
1	Athletic Fields		205	31%
2	Walking/Strolling		582	88%
3	Biking		311	47%
4	Playground		368	55%
5	Nature Trails		388	58%
6	Dog walking		212	32%
7	Sunbathing/Lounging		272	41%
8	Running track		173	26%
9	Picnicking		520	78%
10	Physical fitness course		171	26%
11	Community garden		192	29%

Statistic	Value
Min Value	1
Max Value	11
Total Responses	664

4. Please indicate up to six of the following amenities that you would use or like to see in the park.

#	Answer	Bar	Response	%
1	Restaurant/Outdoor cafe		442	67%
2	Concession stand		181	27%
3	Picnic area or pavilion		412	63%
4	Barbecue grills		120	18%
5	Restroom facilities		598	91%
6	Interactive fountain		123	19%
7	Band shell		219	33%
8	Small outdoor boat storage (kayaks, canoes)		192	29%
9	Benches for enjoying views		572	87%
10	Community boat house		164	25%
11	Landscape with indigenous plants		372	56%
12	Public Art		193	29%

Statistic	Value
Min Value	1
Max Value	12
Total Responses	659

5. Please indicate up to five of the following events and activities that you might engage in or like to see in the park.

#	Answer	Bar	Response	%
1	Farmers market		490	75%
2	Outdoor concerts & performances		596	92%
3	Fundraising events		119	18%
4	Environmental education programs		286	44%
5	Outdoor movies		382	59%
6	Arts & crafts fairs		397	61%
7	Flea market		220	34%
8	Community picnics		286	44%

Statistic	Value
Min Value	1
Max Value	8
Total Responses	651

6. Please indicate up to four of the following water-related uses that you might engage in or like to see in the park.

#	Answer	Bar	Response	%
1	Fishing pier		322	51%
2	Beach		381	61%
3	Kayak and canoe launching area		497	79%
4	Swimming/playing in water		271	43%
5	Marina with mooring field and/or docks		153	24%
6	Marina for transient boaters		94	15%
7	Pier or dock for tour boats/ferries		223	36%

Statistic	Value
Min Value	1
Max Value	7
Total Responses	627

7. Are you a resident of Hastings-on-Hudson?

#	Answer	Bar	Response	%
1	Yes		652	98%
2	No		10	2%
	Total		662	

Statistic	Value
Min Value	1
Max Value	2
Mean	1.02
Variance	0.01
Standard Deviation	0.12
Total Responses	662

8. Please indicate your gender:

#	Answer	Bar	Response	%
1	Male		260	40%
2	Female		393	60%
	Total		653	

Statistic	Value
Min Value	1
Max Value	2
Mean	1.60
Variance	0.24
Standard Deviation	0.49
Total Responses	653

9. What year were you born?

#	Answer	Bar	Response	%
4	1910		0	0%
5	1911		0	0%
98	1912		0	0%
99	1913		0	0%
100	1914		0	0%
101	1915		0	0%
102	1916		0	0%
103	1917		0	0%
104	1918		0	0%
105	1919		0	0%
106	1920		0	0%
107	1921		0	0%
108	1922		0	0%
109	1923		2	0%
110	1924		0	0%
111	1925		1	0%
112	1926		0	0%
113	1927		0	0%
114	1928		3	0%
115	1929		0	0%
116	1930		3	0%
117	1931		2	0%
118	1932		5	1%
119	1933		2	0%
120	1934		4	1%
121	1935		8	1%
122	1936		2	0%
123	1937		6	1%
124	1938		6	1%
125	1939		5	1%
126	1940		3	0%
127	1941		7	1%
128	1942		5	1%
129	1943		11	2%
130	1944		8	1%
131	1945		4	1%
132	1946		13	2%
133	1947		22	3%
134	1948		8	1%
135	1949		11	2%
136	1950		15	2%
137	1951		13	2%
138	1952		17	3%
139	1953		18	3%
140	1954		24	4%
141	1955		18	3%
142	1956		21	3%
143	1957		13	2%
144	1958		19	3%
145	1959		15	2%
146	1960		15	2%
147	1961		22	3%

148	1962		22	3%
149	1963		23	4%
150	1964		24	4%
151	1965		12	2%
152	1966		16	2%
153	1967		22	3%
154	1968		9	1%
155	1969		23	4%
156	1970		23	4%
157	1971		20	3%
158	1972		17	3%
159	1973		10	2%
160	1974		15	2%
161	1975		17	3%
162	1976		13	2%
163	1977		6	1%
164	1978		7	1%
165	1979		2	0%
166	1980		4	1%
167	1981		2	0%
168	1982		2	0%
169	1983		3	0%
170	1984		0	0%
171	1985		0	0%
172	1986		1	0%
173	1987		1	0%
174	1988		0	0%
175	1989		0	0%
176	1990		0	0%
177	1991		1	0%
178	1992		1	0%
179	1993		0	0%
180	1994		0	0%
181	1995		1	0%
182	1996		0	0%
183	1997		0	0%
184	1998		0	0%
185	1999		0	0%
186	2000		0	0%
187	2001		0	0%
188	2002		0	0%
189	2003		0	0%
190	2004		0	0%
191	2005		0	0%
192	2006		0	0%
193	2007		0	0%
194	2008		0	0%
195	2009		0	0%
196	2010		0	0%
197	2011		0	0%
198	2012		0	0%
199	2013		0	0%
	Total		648	

Statistic	Value
Min Value	109
Max Value	181
Mean	145.03
Variance	152.01
Standard Deviation	12.33
Total Responses	648

10. Do you have children under the age of 18?

#	Answer	Bar	Response	%
1	Yes		336	51%
2	No		324	49%
	Total		660	

Statistic	Value
Min Value	1
Max Value	2
Mean	1.49
Variance	0.25
Standard Deviation	0.50
Total Responses	660

11. Is there some other feature that wasn't listed that we should consider for the park?

	Text Response
1	Bathrooms are a must. Being with kids in Reynolds Park is a nightmare when they need to go to the bathroom right away.
2	security to keep the riff raf out and security like dobbs waterfront does. MUST be a resident of hastings. Proper residence pass must be on vehicle or pass like a pool pass in order to use facility. Too often have gone to waterfront to use a table to find it is
3	None
4	a parking lot
5	If there's enough space, a privately-run athletic facility/gym. Perhaps a driving range for golf. In an ideal world, a couple of tennis
6	A covered pavilion in which to host the weekly farmer's market.
7	bicycle racks
8	-lookout area, or dock with telescopes to view Palisades and river activity. / / -shaded areas for sitting / / inspired by Bryant Park;
9	Tennis courts / Badminton courts / Ping pobg table /
10	-Science barge, like Yonkers only bigger and maybe not just environmental focused. (DIY biohackerlab!) / -Seed library (take seeds from local bank for planting, bring more back at the end of season for next year)
11	I think the most important for me is to have a range of restaurants and cafes in the area (not only one) with some place to walk around and maybe some playground for the kids also with water features. Hastings is very poor on the variety of restaurants and cafes and that makes the town a bit bland. I think if this can be a new "going out" area for dining and having a few art stores
12	Might be cool to have some kind of coin activated binoculars (like they had at the top of the empire state building) - or an
13	I would recommend features, that a majority of residents can use and not only some of the residents which make it unattractive for the rest. Not everyone is into kayaking, athletic fields, or playgrounds. / / / I like picnic areas, however when I see other parks
14	energy generation; solar electric & thermal, biodigestion, tidal, wind. also composting & materials management. energy/environmental center, manufacturing. / hastings should be working to get off the grid. supply our own energy.
15	Access can be an issue - should be easy to access by foot and also for cars to pass through without congestion since downtown is
16	Horseshoe pits, petanque and bocce courts, and a quiet zone (no dogs, cellphones, radios, etc.).
17	Many great opportunities for a fabulous waterfront! Favorite concepts are the outdoor concerts, walking paths, benches, outdoor restaurant. Playground is a MUST! LOTS of kids in Hastings - one of the greatest things about it! However if taxes keep going up,
18	bocce
19	Wireless internet. Area for outdoor yoga, tai chi, pilates. Dedicated dog park.
20	Provide parking and consider that as Hastings grow, the number of people who will need to commute to NYC will grow. Parking structures or lots are not beautiful but we need them to be able to get to work.
21	Carousel
22	A playground beyond the basics could make big difference in keeping people there longer. Also a beer garden outdoor eating would be a huge asset, family friendly outdoor restaurant, maybe like Habana Outpost in BK. Art could keep in interesting as in facilitating creative projects that might be on rotation rather than permanent installations. Any housing should be low profile and
23	A small pier that juts out into the Hudson
24	Sculpture, especially commemorating famous Hastings people.
25	It would be great if the building were saved that we could use that as a way to attract outsiders (and revenue) to our town for music, art, shopping, restaurants or other activities. It would be good for part of the building to be used as parking spaces or a parking garage (that didn't destroy the beauty of the place) but that would make life easier for commuting residents who quickly run out of parking spaces. Reading spaces, gaming areas (even board games) and innovative kids' climbing and playground
26	Please allow community groups and individuals to schedule special events, so long as they are permitted. / / Consider at at-grade or underground (like Cold Spring) crossing of the tracks so people don't have to hump it up and down if they've parked, say, at the train lot, perhaps while carrying picnic or other stuff . In any event, easy pedestrian access is key to making this a success and not
27	The Marina facility should have dry land and/or indoor storage as well as in water storage
28	Kayak, canoe small boat rental / Information about indigenous wildlife / Possibly ice skating? / Skate park? / Outdoor activities for
29	security cameras
30	Completely 'green'
31	It would be great if the Hastings park can connect with the Dobbs Ferry park and beyond to create a long river-front trail or bike path. / / Also facilities and services related to fishing would also be great.. tackle bait shop, education, instruction, etc.
32	I would do a survey of other villages etc. that have undertaken this type of project.
33	No outsiders
34	It will need parking. Lights for the athletic fields would open up the range of events that could be held there.

11. Is there some other feature that wasn't listed that we should consider for the park?

	Text Response
35	Re-use of Building 52 for an art museum plus artists' work spaces and cafe--similar to the DIA center. Or, re-use of Building 52 for small retail, dot com offices, restaurants--similar to the re-used former industrial buildings on the Irvington waterfront. If they can
36	I wish Hastings had a pool that was not so expensive to join, or free to residents. I have severe arthritis and have to swim, so I swim at the Theodore Young Pool in Elmsford, but it's more expensive for me as I am considered a non-resident (even though we pay Greenburgh taxes, as well), but it's far less expensive than the Hastings pool. It's really a hardship for a lot of people today, even
37	Basketball and tennis courts
38	My wish - a path for bike riding, jogging, and walking with river views.
39	Trees
40	Shops
41	1. An Astronomy Park area, with observation markers for Solstices and Equinoxes. Can expand to moon markers over time. The park could tie in with the Planetarium at the Hudson River Museum. The schools could use this for educational purposes. The cool thing about learning the basics of "naked-eye" astronomy is that the knowledge will be accurate for your entire life, and for everywhere you travel on planet earth (and within our solar system). Any time there is a comet, a solar eclipse, lunar eclipse, a cool planetary line-up, Venus visible in the daytime, northern lights (it's rare but I've seen them over the Hudson here in Hastings) - this could be the gathering place to see it. A celebration of our amazing viewscape. / / 2. A few well placed high quality remote-controlled PTZ cams to enable observations and recorded pictures and video of the Rivar - (tides and boat traffic for example), the
42	No. Just keep it simple. Nothing commercial. Just for enjoyment of the river like the Scenic Hudon Park in Irvington.
43	The park with softball/baseball fields on the Irvington waterfront is lovely.
44	Why live on the water if you can't go in?
45	Boardwalk, ferris wheel, carousel
46	I'd like to have selected all of the uses (including interactive fountain) that you listed, but was limited to six... I selected BBQ grills thinking it wd have to include a picnic pavilion of some sort. I think some place selling food is also a good idea. / A bandshell is a good idea for music, as sound gets very undirected by the river with so much open water. Maybe athletic fields would be a good idea there to accommodate all the school teams - and Reynolds Field could remain an actual field, and you could put artificial turf/EPDM down on the river for the football team with lights for night games if you really needed those too. / I'd like to see
47	I believe that the exhisting saw tooth Building should be filled in and capped like the rest of the waterfront and saved for public space, or they could remove 6' of contaminated soil systematically without integrity issues with the structure and rerplace with clean fill. There will still 15' + or of ceiling height. / / Soil can be removed from underneath the water tower without removing it with a simple temporary footing scenario that would allow for escavation, removal and replacement of the for footings to save the tower. If 1 million is spent to take down the tower then it will never be reinstalled again. / / If Arco adds the costs to remediate the
48	Business/ conference space
49	There should be a heavy emphasis on "place-making," as defined by the Project for Public Spaces in New York City, one of the global leaders in the field of community design of parks and public areas. It would be exciting to have a number of destination
50	SoftBall and Soccer fields more specifically.
51	Keep parking areas out of the sight lines.
52	no
53	/ Quiet zones/hours? / / I hope it will be possible to have areas to sit on the grass or picnic where dogs can't go.
54	food trucks/carts rather than brick restaurant/cafe
55	something that will attract wild birds
56	Accessibility to fresh water for drinking / bike racks / mounted telescopes/binoculars
57	A great cafe.
58	signs identifying trees
59	It should be fun but highly attrative, not commercial like Hastings.
60	Wi-Fi?
61	Would love to have movie showings in the park during the summer. Also, it would be nice to host a "Taste of Westchester" food festival where restaurants around the county could set up a booth and offer food samples.
62	Just public docks, not so much a Boat Club. / I really feel the area is way too big for just a park, no need for it that size. / Housing should definatly be intergraded, as well as multiple bars resturants and such.
63	Shopping? An upscale movie theater like the Sundance one being considered in Dobbs Ferry?
64	No.

11. Is there some other feature that wasn't listed that we should consider for the park?

	Text Response
65	I hope to see a similar survey about the use of the private areas: store fronts, restaurants and apartments. / I think that knowing what options are being considered would have effected some of my answers to these questions.
66	dog run
67	I cant believe you actually have benches as a choice!
68	Resident only usage. Similar to Dobbs Ferry.
69	Excellent nighttime lighting. / Emergency Call Box - unfortunate necessity in our times. :-(/
70	place for outdoor fitness classes, yoga, t'ai chi, dance etc.
71	Water to drink? / Skating Rink(seasonal)
72	A Community Sailing Association modeled after the Charles River institution where I learned to sail. / I would love to help you develop this if you sense there i9s any interest. / It implies multi-use of docks and boat housing faciulities. /
73	Basketball court(s). Lights
74	Facilities for kayaking and small boats for kids and a restaurant with lots of outdoor seati g on the river. Something like juniper-fresh bot not very expensive. And a concession stand for ice cream hot dogs etc.
75	Extra trash cans with approriate lids like the green ones in town so that the park can remain neat and clean. / / This town needs more trash cans all over . A new trash can is especially needed near Amos deli on Farragut pkwy which has a plastic open trash
76	A senior and community center with ample parking not on hills. Contrary to the one in town!
77	Make the terrain three dimensional, not just flat as it is now. Daylighting the Ravine Stream could also add interest to the landscape. Obviously trees will need to be planted, selecting a variety could be desirable, even if they cost more. They should be
78	open field area (not necessarily sports fields) - more dual purpose than sports fields, e.g could be used for baseball, soccer, or kite
79	Focus on Hastings family needs not grandiose schemes of attracting people to Hastings for big events. Serve the local community. Yes, bringing in festivals and the like brings money into Hastings. AND TRAFFIC and TRAFFIC CONGESTION. Serve the needs of our people not the needs of Hastings to make a splash. Quiet and serving the people is better than loud and bringing crowds of people
80	artillary range; the cliffs are just beckoning....
81	Some environmental project/educational facility like The Science Barge at the Yonkers Pier? / Room for kite flying/model
82	One small touch might be to have some place where a visitor can read a bit about the history of the waterfront. Perhaps in-line with the history project Hastings already has with markers around town.
83	archery area / / bocce court / /
84	Plenty of shade for people who cannot tolerate sun (like me), either from natural sources such as trees, or from man-made
85	You mentioned dog walking, but what about a dog park / Wi-Fi and electronic charging stations
86	Lighting for night events and games! /
87	Heated swimming pool
88	Water fountain & running water spigot.
89	Views up and down the Hudson, especially of Manhattan. / / I hope that the southern portion of the site, in particular, is a park.
90	No, you've covered all.
91	Make it a destination for pleasure boaters with bathrooms and docking so they walk up to town to shop and dine. Support our
92	perennial garden
93	Amphitheater
94	Bike racks/storage
95	Destination Resort/ Hotel that will give the community access as a public private partnership
96	Carousel
97	Like to have a good deal of green/park space but do also realize there has to be buildings/ businesses to bring revenue .
98	Not that I can think of right now.
99	Please consider natural barriers to flooding such as tall grasses and marshes. Please build everything on stilts in case of flooding.
100	Museum, upscale boat club, agricultural course for Hastings students, expansive dog park, reception hall, Audubon society, bring
101	something retail that will provide tax dollars so that the costs will be borne by them and not the citizens
102	art workshops...outdoors/educational / education workshops about the hudson river and hudson valley...and hastings!! / a covered
103	The scale is important there should be a center area like a fountain or clock to emanate from the main area not spread ever where it should all be site specific to our villages and river towns not out of context or cold. / / The coloring needs to reflect hastings
104	community yoga spots.....community tai chi spots.....maybe limited electronic access for writers and/'or music listenung

11. Is there some other feature that wasn't listed that we should consider for the park?

	Text Response
105	none
106	Soccer fields
107	A compost to which people in the community could add their waste. The composted soil could be used in the garden there. / I wanted to click outdoor movies, too. I think that's a great idea and a good draw to the park in the evening especially if there's a
108	Drinking water fountains.
109	skating area / bike path
110	Encourage business to increase tax base
111	An area where small/local food vendors can set up concessions? Much like Brooklyn Bridge Park is doing: http://www.brooklynbridgepark.org/visit/concessions-restaurants / / It would be awesome if we had a brew pub along the
112	Preservation of the river view from intersection of Spring Street/Southside/Library/train station. Open views essential, park would
113	1) The original Kinally cove plan included an artificial "sandbar" or walkway that stretched from the beach into deeper water in the river (perpendicular to the beach).- this was not included in the final product. I am a frequent user of the cove to launch windsurfers, paddle board, and kayak, and it is awful to walk through the mud to get from the beach to the deeper water. The addition of this walkway would greatly facilitate the launching of most non-motorized watercrafts into the river. I hope I am clear-I apologize for not using the right terminology. If you you need further explanation please contact me: Jose Luchsinger: 914-
114	Reynolds Field renovation should be considered with the Waterfront renovation
115	The athletic field that is being proposed for Reynolds Field would be a much better fit on the waterfront where more parking and space is available. We need more fields for kids sporting events and outdoor entertainment.
116	Bike racks. / Paved, handicap accessable walkways (for pushing wheelchairs and baby strollers).
117	Build a water park! We don't need any more passive parkland in the village.
118	The parking should be for residents only...it can be opened up for certain events, like at the park in Dobbs Ferry, they allow non-
119	I would like the park to be open to all and not only to residents. Art classes and sailing classes could also be ffered (at reasonable
120	views of NY City, soccer field.
121	Semi active recreation--e.g., frisbee, kiteflying, birdwatching, photography/art/drawing. Wi-fi. Parking lot.
122	Adequate night lighting ,except in defined winter months.
123	Softball and baseball fields! We need that badly... never enough for our LL program!
124	Safe activities/events for teenagers and young adults. Sculpture/art exhibits.
125	sunlighting the creek
126	Low profile Parking, forethought towards flooding/storm surge, replacement/rebuilding of our iconic water tower,bus routes
127	I don't know if "the park" constitutes the full space, but I am not averse to some low-rise apartments that add to the tax base of the
128	I would like to see the absolute mimimum of buildings. would like to see it as a walking area with trees / and grass. If developmemt goes beyond walkways, benches etc., the swimming and kayak / launch facitlities sound good to me. thanks
129	Trees. Shade will be nice on sunny summer days. I also like the feel of MacEachron Park since the split rail fence was removed. It
130	Shade -- shade trees, umbrellas, canopies, or some form of shelter from sun / / Not sure what interactive fountain is, but drinking water fountain is welcome / / Recycling containers for trash everywhere
131	Wheel chair/transport chair access.
132	some sort of commercial endeavor to help increase our tax base. Possible ideas: wind power, indoor/outdoor theater as a destination for city dwellers, commercial building for offices, definitley restaurants, maybe a small college or institute.
133	Perhaps, during winter, a "portable" ice skating rink. Don't know if possible but would provide people with winter exercise.
134	Interactive children's nature center (adjunct to Greenburgh Nature Center?)
135	No
136	Hours of operation? / Restricted to Hastings residents or not? / Ice skating rink in the winter /
137	No /
138	Dog run. Public water fountain.
139	adult education in a learning shell / and public talks and discussions / and outdoor exercise program
140	Parking for train station.
141	A giant Ferris wheel Mini golf. Swinging benches for adults along the after front
142	Indoor/year round pool. That would be the awesomest thing ever. /
143	Can't think of any right now.
144	I have always thought a carousel (similar to what is in Greenport, NY) would be a great attraction.

11. Is there some other feature that wasn't listed that we should consider for the park?

	Text Response
145	Ice skating. Sprinkler park. Shops.
146	Shade for individuals-- trees? structures?-- and for events with larger groups. / Some covered or flex areas to provide shelter during inclement wet weather (eg if a class is scheduled for a lesson, or if a group is holding a reading, etc.) / / Natural-feeling area with
147	PLEASE EXCLUDE DOGS AND OTHER PETS. THERE IS NOWHERE WE CAN GO TO WALK OR RUN WITHOUT RUNNING INTO DOGS, DOGS OFF LEASH, DOGS ON SUPER LONG LEASHES THAT EQUATE TO NO LEASH, DOGS POOPING AWAY, DOGS JUMPING ON US....WE ARE SICK AND TIRED OF DOGS ON THE TRACK, DOGS ON THE AQUADUCT, DOGS IN HILLSIDE WOODS.
148	I really enjoy that commuters can be found taking pictures of the palisades from the metro north platform in the mornings. this suggests to me that even those who get to see our waterfront every day can be taken aback by its beauty. i hope for design solutions that continue and advance this. / / I would also like to see aspects of the park which reflect indigenous plants, cultures and activities in the Hudson valley. anything that can be done to return the water's edge to its original ecological condition, while
149	The park should not be flat, rolling terrain with differing views would be good. Various surfaces should be used, grass, planting,
150	A promenade running south to north connecting to the tennis courts, MacEachron Park, Kinnally Cove and someday, connecting to
151	Indoor/outdoor swimming pool. No decent indoor pool near this area.
152	I would just like I ensure that the park and waterfront remain open to the public in all aspects. I am a firm believer that the river
153	Renewable Energy Center - would there be space for solar / wind / tidal energy generation that could feed into our local grid?
154	Kid safety play ground equipment.
155	because of the water level rise to be caused by climate change, uses on the waterfront should be resilient, i believe the whole waterfront should be recreational and designed as a showcase for sustainable planning.
156	Ball fields and courts severely limit general accessibility.look how much more user friendly Dobbs is vs. Irvington. And I am a life long ball playing jock - but don't build fields and courts on the water; there's plenty of other venues for that, which we already have
157	Kayak launch
158	Please keep it natural and do not build buildings! They will only obstruct peoples' views and detract from the beauty of the area.
159	Definitely restaurants with outdoor seating. / Trails to the aqueduct. / Please do NOT make any kind of dog run or animal area. /
160	What about some sort of museum? A tourist attract of some sort.
161	Theatre or performing arts center.
162	Please don't let concessionaires monopolize parking, as is currently the problem with Harvest on Hudson. I'd like to see a portion exclusively for residents, similar to what you see in Irvington where one of the best parks in Westchester is for residents only.
163	bocce
164	Ice skating!
165	Educational markers similar to "museum on the streets" identifying landmarks across the river, history of HoH waterfront area, etc.
166	Those post-mounted binoculars you put a quarter in.
167	My main concern is that there be open space for all. What I don't want to see are exclusive restaurants or luxury condominiums. And I don't want to see any development that will separate the waterfront from the village. That was the big mistake made in
168	I think access via the river for boaters traveling past Hastings to tie up and explore Hastings could be good for our town and local
169	Some revenue sources. Shopping, commuter parking and housing developments on a long term ground lease to the ground lessor. Ground lessor could be Relstedd Cxompanies or Vernado or Toll Brothers. /
170	Additional train parking
171	All sounds good, this is very exciting!
172	Hastings is one of very few deep water ports on the Hudson. It would literally be criminal to waste this asset on mere walkways with river views and the like. We need a town landing, both for small boats (so boaters can come here to our shops and
173	Maybe a community compost site that utilizes waste from residents and local restaurants (and reduces the amount of village
174	A public boat ramp with permits for Village residents and fees for outsiders. This would give access (and income for the village)
175	tax base to offset residential taxes
176	Remove existing water tower (view obstruction) but preserve its memory by incorporating it into a sculpture (seek suggestions from local artists). Renovate existing warehouse (brick) buildings into mixed use loft residences/ commercial space. Create
177	This is highly depend on the actual land discussed, but it would be great to see a multi-use facility that would offer opportunities to generate needed revenue, attract visitors / tourists, and provide small business openings. Something along the lines of what was
178	It would be great if there was electricity so they could do the farmers market there. Also on site parking for users of the space (not
179	Keep it as open as possible. / Look to the Scenic Hudson Park in Irvington for a good mix of uses. /
180	No. Everything is covered.

11. Is there some other feature that wasn't listed that we should consider for the park?

	Text Response
181	Dog run woud be great. Bike racks to lock up bikes. Kayak rental concession in a Japanese teahouse/ smoothie bar.
182	outdoor theater, live concerts and outdoor movies! / here is a waterfront park about the same size in portsmouth nh that has fantastic summer programs: http://www.prescottpark.org/index.cfm / you give a donation to come to the shows. /
183	Tennis courts
184	Amusement park, amphitheater
185	Preserve open space for the great views of the river and Palisades. Much of Hastings is very treed-in; the waterfront, if left unobstructed, would provide an opportunity to observe migrating birds and, at night, one of the best places to examine the sky -- better than Draper Park, currently used by the Westchester Amateur Astronomers. Perhaps there could be a link to the astronomy
186	a nature center or children friendly art musem like in katonah or music museum something that represents hastings.
187	Indoor sports facilities that can generate income: e.g. indoor soccer, ice rink or pool / Public pier for tour boats, historic ships and other visiting boats / A small hotel to cater to the transient boaters and kayakers
188	Ampitheater
189	While I appreciate the arts and performances, as an accomplished, classically trained artist myself, I believe that Hastings needs a more meditative space. We are filled with these activities, which I acknowledge help with a sense of community. I would be happy to see quality arts experiences of a more classical nature - and also want to encourage a more "high minded" and less "common denominator" element, which already exists in other outdoor locations: i.e., Farmer's market, picnics, swimming. / / I believe environmental awareness and respect / quietude are key components to a healthier and progressive village. / / I sincerely hope I
190	Dog park
191	need some area for parking other than the train parking. More people will go if they can easily get there to see a sunset for
192	I am Karolyn Wrightson, former resident, former Village Historian and former President of the Hastings Historical Society. I started studying the Hastings waterfront shortly after moving to Hastings on Memorial Day 1973. You may have seen my video on the history of the waterfront. I no longer live in Hastings, but I still care about it very much. I based my answers on what I would love to have had there when I was raising my children there -- assets that I occasionally accessed at parks in other river towns. And, I
193	Not really
194	Public wifi access. / / Use of solar power for any facility with educational display
195	dog park
196	Carousel or attractive feature like that....
197	Chairs and tables like at Bryant Park. A croquet, table tennis, bocce ball or some kind of game situation. Fountans are nice. Food trucks. Seating but with umbrellas for when it is too hot (during sunset in the summer).
198	Lockers, so could come off train or from shopping in village and jog or take a walk without having to carry things. / / Basketball courts, which attract much more night-time play and play all winter, unlike most athetic field uses -- also conducive to greater diversity and permits play for one person or small group of two or three instead of just large team sports. Certainly we already have many more tennis courts than basketball courts in this town. Also, basketball is much more fun to watch and games finish faster so there can be more turnover and sharing of usage. Go see the courts in Irvington's Scenic Hudson park. / / Large river-immersed swimming pool or natural pond like the great Ponds of Hempstead Heath in London -- Londoners swim in the Ponds all winter long -- no changing rooms or lockers or showers needed. most people swim nude and bring one towel -- there are three
199	It doesn't have to be in the park per se, but i'm hoping that there would be some use of the waterfront that would relate to theater,
200	The sport facilites on the Irvington waterfront are great - we should try to build something similar (btter!) in Hastings. The ability to play night games is especially attractive. What is missing in Irvingion is a cafe/concession stand near the sports facilities - it would raise lots of money and would provide a place for parents to wait while their kids are playing sports. The idea of open air movies is
201	no
202	Please consider the waterfront part as an alternative location for the high school track and football field, which would allow for the conversion of the current facilities into a limited use facility without the cost or local impact of the contemplated expansion.
203	I think we should be trying to incorporate energy solutions into the park. Can we for example make shaded areas with solar roofs and supplement our common power usage in town. Potentially other ideas with wind turbines and/or trun\bines that could take advantage of the tidal energy.. Wouldnt it be great even if we could have no energy bill for common spaces and street lights in
204	- make Hastings a model by making the waterfront a net-zero energy space, or better yet, a net energy producer for the village; utilize some area (the building if it survives) for solar power generatoin, and put dynamic hydro generation in the river; mayb
205	Public tennis courts would be a major plus for hastings. Partitioned playgrounds and bandshell would be great recreational
206	As much as I love the idea of using all of that land for a park, I hope the town is also considering ways to factor in businesses and apartments, or other ideas that would generate additional tax revenue.
207	baseball and softball fields; soccer fields
208	A "mall" area, an extra wide cobbled or rustic stone walkway, even packed earth/gravel, that would accomodate community activities, gathering, dancing, pop up exhibits, fairs. Definitely NOT asphalt or concrete pavement. / A roofed shelter as part of the

Appendix D
Traffic Study

TRAFFIC STUDY PREPARED BY:

BFJ Planning and Pratt Institute PSPD (2014)

- *"REPRINTED WITH PERMISSION"*

Traffic Impact and Parking Analysis for Hastings-on-Hudson Waterfront Development

Hastings-on-Hudson, NY

Pratt 125

PROGRAMS for SUSTAINABLE PLANNING and DEVELOPMENT

BFJ Planning

Traffic Impact & Parking Analysis for Hastings-on-Hudson Waterfront Development

Introduction

The Village of Hastings-on-Hudson is situated in Westchester County about twenty miles from mid-town Manhattan. The Village covers two square miles in area, stretching from Saw Mill River Road on the east to the Hudson River on the west. Almost two miles of Hudson River waterfront lie within the village, but access to the river is limited due to the Metro-North Railroad rail line. The area with the greatest development potential is the fifty acres of filled land that extends west of the railroad tracks. These lands have historically been used for industrial purposes, and the waterfront holds some of the most environmentally constrained lands in the Village. The significant contamination of the site will, by law, be cleaned up in the coming years (remediation is in process).

In the fall 2013 semester, led by Professors Jonathan Martin, Toby Snyder and George Jacquemart, a studio of urban planning graduate students from Pratt Institute's City and Regional Planning Program explored urban design opportunities for the redevelopment of the waterfront. Through the urban design process, students familiarized themselves with existing and emerging conditions related to the study areas and their surrounding neighborhoods, reviewed existing documents and proposals for the sites, expressed existing and emerging conditions in diagrammatic form, and developed conceptual design recommendations. The studio produced three design proposals for the waterfront. These were presented to two representatives of the Village of Hastings in December, 2013.

The main barriers to river access from upland areas of the Village are the Metro-North Railroad tracks and the steep slopes just inland from the tracks along much of the riverfront. The West Main Street Bridge is located at the Metro-North Railroad station and the Zinsser Bridge is located at the far southern end of Southside Avenue. The Zinsser Bridge, due to its substandard condition, was closed to vehicular traffic in 2003. There was a scheduled reconstruction as part of the NYS Transportation Improvement Plan (TIP) beginning Fiscal Year 2009. However, this failed to attract a project sponsor, which must be a governmental agency that would agree to undertake the project. Accepting that the Zinsser Bridge is unlikely to be improved in the near future, primary access to the waterfront site will rely on the existing West Main Street Bridge.

This report evaluates existing and potential future traffic conditions at the two intersections of West Main Street with Southside Avenue and River Street near the Hastings-on-Hudson train station. The analysis was performed using a hypothetical program developed as part of the studio project (see Table 2 below). This report also includes a shared parking analysis for the site based on the proposed program.

Existing Traffic Conditions

A traffic movement count was undertaken at the two intersections in October 2013 during the morning and afternoon peak hours. The counts were performed over a 50-minute period and were recorded in 5-minute intervals. To be conservative we picked the intervals with the highest 5-minute volumes and multiplied them by 12 to project worst-case hourly volumes. Figure 1 shows the AM and PM worst-case hourly volumes at the two intersections.

Currently the two study intersections are controlled by stop signs. The intersection of Southside Avenue has a stop sign for the eastbound traffic and the intersection of River Street has all-way stop signs. We performed a

traffic capacity analysis based on the 2000 Highway Capacity Manual method. Traffic conditions are described in the Highway Capacity Manual (HCM) in terms of level of service (LOS) with the levels ranging from LOS A, which represents the best traffic flow conditions, to LOS F, which represents long delays. Level of service D is generally considered reasonable level of service during the peak hours. Level of service E is at or near the capacity of the roadway or intersection and generally involves unacceptable delays.

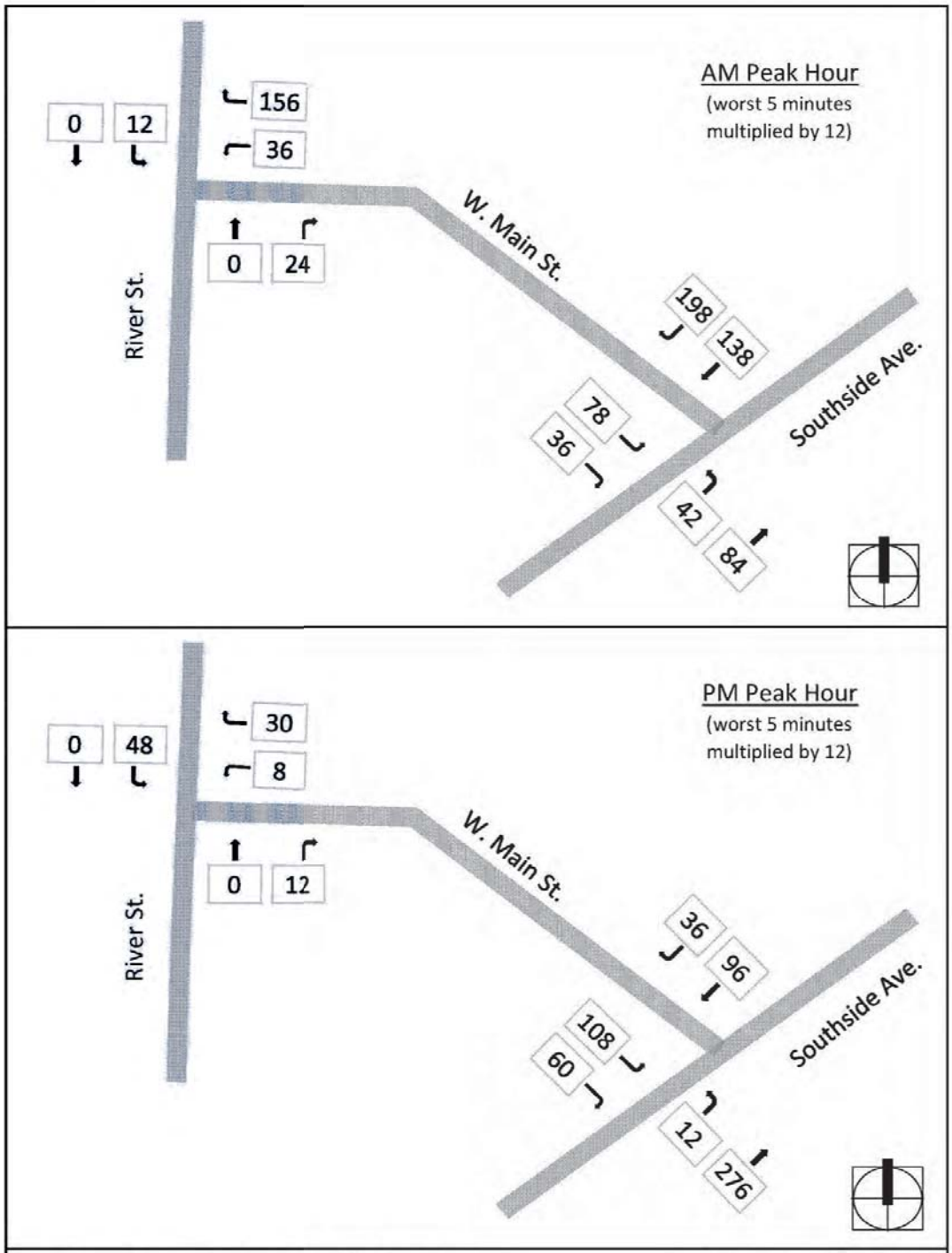
Level of service analyses for un-signalized intersections are based on average control delay, defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The total delay for a particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Table 1 shows the existing levels of service and delays for each intersection approach. As mentioned earlier these conditions represent the worst 5 minutes in the AM peak (before the departure of the 8:35AM train) and the worst 5 minutes in the PM peak (after the arrival of the 5:51PM train).

Table 1- Existing Traffic Conditions

Intersection	Lane Group/ Movement	Existing Conditions			
		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Southside Avenue & W. Main St.	Eastbound	B	12.4	B	12.6
	Northbound	A	2.9	A	0.4
	Southbound	A	0.0	A	0.0
River St. & W. Main St.	Westbound	A	7.5	A	7.2
	Northbound	A	6.9	A	6.7
	Southbound	A	7.6	A	7.7

As can be seen all approaches are currently operating at LOS A except for the eastbound approach of the Southside Avenue intersection operating at LOS B during both peak hours.



River Street Development Traffic Analysis Hatings-on-Hudson,NY

Figure 1- Existing Traffic Turning Movements Count Date: October 2013

Future Traffic Conditions

Table 2 shows the selected development program among the other potential scenarios and also the size of the mixed-use components.

Table 2- Program Summary

Land Use		Size	Unit
Residential	Studios	88	DU
	1 Bed.	115	DU
	2 Bed.	90	DU
	3 Bed.	17	DU
Live/Work	30 Res. Units	42,000	S.F.
	Office Space	30,000	S.F.
Restaurant		15,000	S.F.
Health/ Sports Club		10,000	S.F.
Retail		5,000	S.F.

Table 3 shows the traffic generation rates for each land use. For the residential units we used the traffic generation counts for the Hudson Park apartments in Yonkers, NY performed by BFJ Planning in 2008. For the live/work residential units we used the same rate (surveyed by BFJ) and took 30% credit for the residents who work in the live/work spaces. For the rest of the land uses we used the rates from Trip Generation Handbook 9th Edition (Institute of Transportation Engineers- ITE). Please note that the ITE rates are based on the land uses in sub-urban areas with no or minor access to transit. The proximity to the mass transit station and the fact that residents/visitors, restaurant patrons, retail customers and employees would be able to use transit instead of driving to/from the development will reduce the vehicular trips.

There are trips that might be entirely within the mixed-use development called internal capture or internal trips. This will reduce the vehicular trips to and from the development as well. We took a transit/internal trip credit for each land use.

Table 3- Traffic Generation Rates

Land Use		Internal Trip/ Transit Credit	Traffic Generation Rates					
			AM Peak Hour			PM Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Residential*		N/A	0.02	0.12	0.14	0.11	0.04	0.15
Live/Work	30 Res. Units**	N/A	0.01	0.08	0.10	0.08	0.03	0.11
	Office Space***	80%	2.13	0.27	2.40	0.40	2.27	2.67
Restaurant ***		70%	0.00	0.00	0.00	5.00	2.47	7.47
Health/ Sports Club***		70%	0.47	0.47	0.94	1.30	1.00	2.30
Retail ***		70%	0.30	0.20	0.50	1.30	1.20	2.50

* Rates developed by BFJ for similar TOD project (Hudson Park, Yonkers, NY)
** Hudson Park rates with a 30% credit for the live/work unit resident
*** Trip Generation Manual 9th Edition, Institute of Transportation Engineers (ITE)

Table 4 shows the potential riverfront development traffic volumes as depicted in Figure 1. There would be a total of 64 additional vehicles in the AM peak hour and 110 additional vehicles during the PM peak hour.

Table 4- Potential Development Traffic Volumes

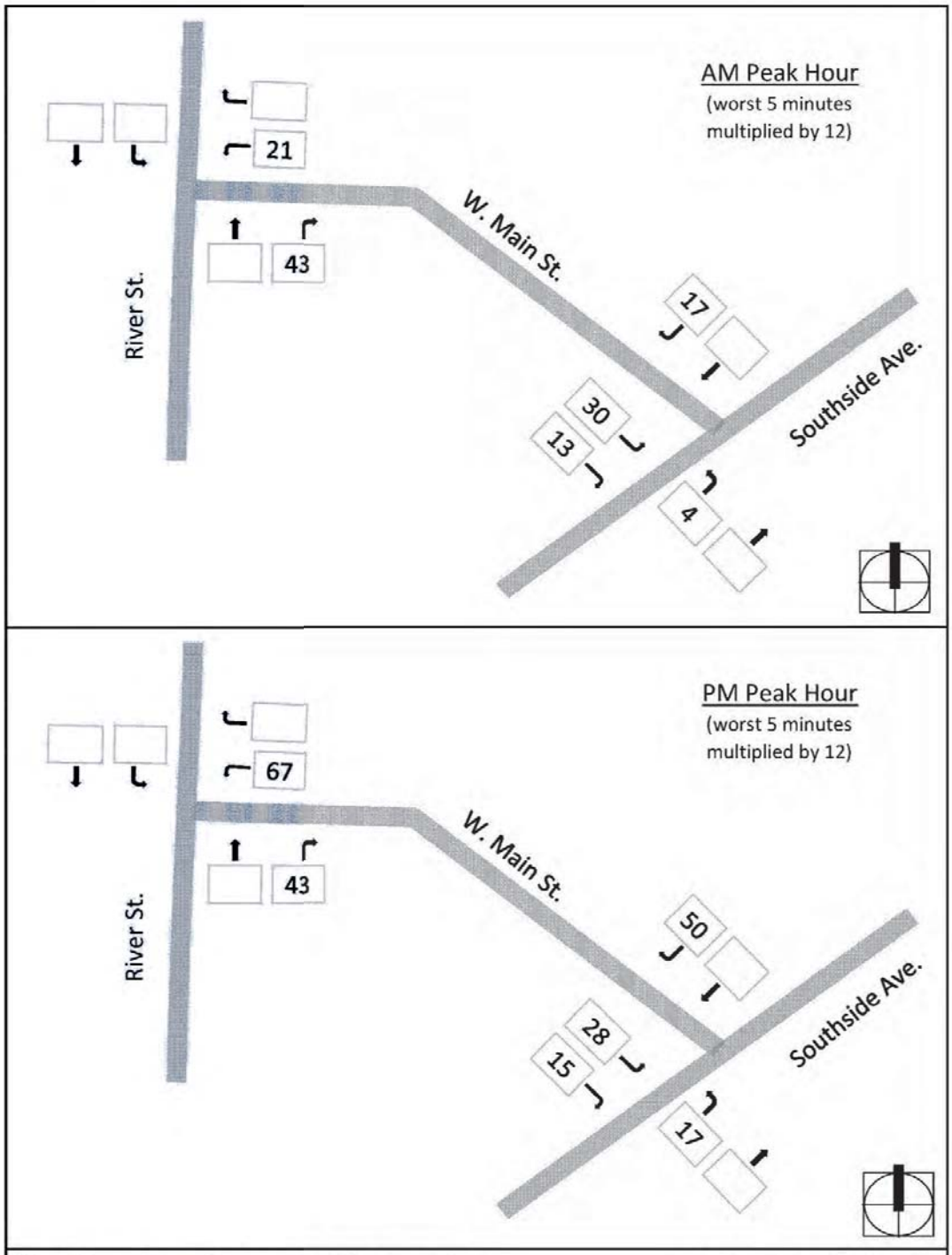
Land Use		Size	Unit	Volumes					
				AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Residential		310	Units	6	37	43	34	12	46
Live/Work	30 Res. Units	30	Units	1	3	4	2	1	3
	Office Space	30,000	S.F.	13	2	15	2	14	16
Restaurant		15,000	S.F.	0	0	0	23	11	34
Health/ Sports Club		10,000	S.F.	1	1	2	4	3	7
Retail		5,000	S.F.	0	0	0	2	2	4
Total				**21**	**43**	**64**	**67**	**43**	**110**

We assigned the additional traffic using the existing traffic distribution pattern. It means that for example all the outgoing vehicles at the West Main Street intersection make a right. Then at the intersection of Southside Avenue 65%/70% (AM/PM) of vehicles make a left and the rest make a right. Figure 2 shows the additional traffic by the potential development assigned to the two intersections of River Street and Southside Avenue. Figure 3 shows the total traffic volumes with the proposed development program.

Table 5- Traffic Conditions with Potential Riverfront Development

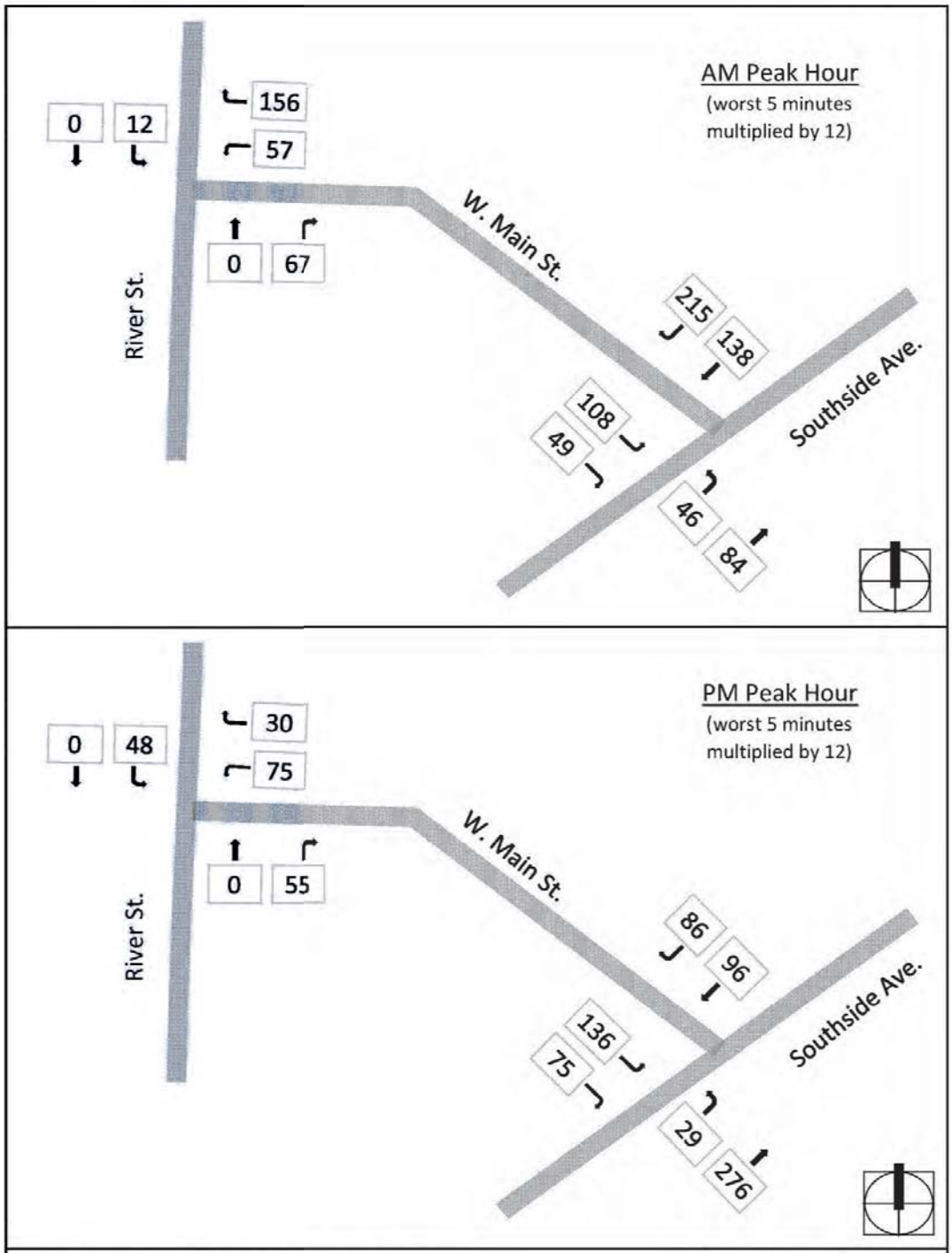
Intersection	Lane Group/ Movement	Existing Conditions			
		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Southside Avenue & W. Main St.	Eastbound	B	13.5	B	14.6
	Northbound	A	3.1	A	0.9
	Southbound	A	0.0	A	0.0
River St. & W. Main St.	Westbound	A	7.9	A	7.8
	Northbound	A	7.1	A	6.9
	Southbound	A	7.8	A	7.7

Table 5 shows the traffic condition with the potential development. As can be seen the levels of service will remain the same as the existing condition. We conclude that the potential development would not have any significant impact on the two intersections adjacent to the development and the train station.



River Street Development Traffic Analysis Hatings-on-Hudson,NY

Figure 2- Additional Traffic by the Potential Development



River Street Development Traffic Analysis Hatings-on-Hudson,NY

Figure 3- Total Traffic Volumes with the Potentail Development

Parking Analysis

Table 6 shows the required parking spaces based on the village code. The parking rate for the live/work units is based on similar uses in Watkins Mill Town Center in Gothenburg, MD[1].

Table 6- Required Parking Spaces

Land Use		Size	Unit	Parking Rate	Req. Parking Spaces
Residential	Studios	88	DU	1.25*	110
	1 Bedroom	115	DU	1.50*	173
	2 Bedroom	90	DU	1.75*	158
	3 Bedroom	17	DU	2.00*	34
Live/Work	30 Res. Units	42,000	S.F.	2.5/ Unit**	75
	Office Space	30,000	S.F.		
Restaurant		15,000	S.F.	10/1,000SF*	150
Health/ Sports Club		10,000	S.F.	4/1,000SF*	40
Retail		5,000	S.F.	3/1,000SF*	15
Total					**755**

* Source: Village of Hastings-on-Hudson Codes

** Source: Watkins Mill Town Center, Gothenburg ,MD

The total number of required parking spaces would be 755 parking spaces without shared parking. Table 7 shows the shared parking analysis for the proposed mixed-use. By sharing the parking supply between different uses the overall parking demand peaks at 516 parking spaces between 7PM to 8PM, a saving of 239 parking spaces compared to a scenario without shared parking.

It should be noted that the shared-parking scenario assumes that no parking spaces can be reserved for individual users. Parking would be on a first-come, first-served basis. However, all residents and employees with monthly permits will always have a guaranteed parking space.

Table 7 also shows that with a parking supply of 516 spaces (to satisfy the peak evening demand) there will be sufficient parking spaces to accommodate 116 rail commuter cars during the typical working hours (516 minus 400 lunch time peak). However, the parking supply of 516 spaces would have to be increased by about 35 spaces (30% of the 116 commuter cars) to allow for the commuters that return after 7PM.

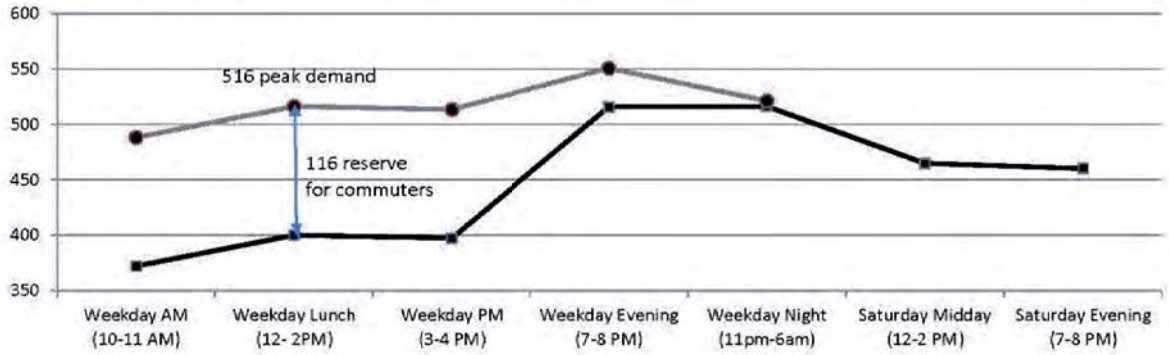
To conclude, a total supply of 551 spaces (516+35) would satisfy the parking demand of the proposed waterfront development plus 116 commuter cars. This would allow the Village to shift 116 commuter spaces from one or two commuter lots and redevelop these lots for more productive use.

[1] Final Staff Analysis Report- Page 4
http://www.gaithersburgmd.gov/Documents/mc_bkd_12/110512/ASDP_0641_2012_Watkins_Mill_Town_Center.pdf

Table 7- Shared Parking Analysis

Building Use	Size	Unit	Peak Parking (individual peaks)	Shared Parking Calculations													
				Weekday AM (10-11 AM)		Weekday Lunch (12- 2PM)		Weekday PM (3-4 PM)		Weekday Evening (7-8 PM)		Weekday Night (11pm-6am)		Saturday Midday (12-2 PM)		Saturday Evening (7-8 PM)	
				% Present	Cars	% Present	Cars	% Present	Cars	% Present	Cars	% Present	Cars	% Present	Cars	% Present	Cars
Residential	310	Units	475	45%	214	45%	214	45%	214	70%	333	100%	475	60%	285	60%	285
Office/Residential	42/30	1,000 SF/DU	75	100%	75	85%	64	90%	68	35%	26	35%	26	30%	23	5%	4
Restaurant	15	1,000 SF	150	30%	45	60%	90	50%	75	70%	105	10%	15	75%	113	100%	150
Health Club	10	1,000 SF	40	70%	28	50%	20	75%	30	100%	40	0%	0	75%	30	20%	8
Retail	5	1,000 SF	15	70%	11	85%	13	75%	11	80%	12	0%	0	100%	15	90%	14
Total			755		372		400		398		516		516		465		460
Savings from shared parking:				32%													

Notes: 1. The peak parking column represents the amount of parking that would have to be supplied if each use was built independently. These ratios may be the ratios required by Village zoning or those provided given for each use by the ITE publication "Parking Generation" 4th Edition, 2010 and adjusted for the modal split.
2. The percentages for the presence of each peak parking demand by time period are based on "Shared Parking" by the Urban Land Institute 2005 Second Edition, "Parking Generation" 4th Edition, Institute of Transportation Engineers, 2010, and on BFJ experience.
3. It is assumed that the residential spaces are all shared, not to be assigned and not reserved



Appendix E
Wind Study

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Small WindEXPLORER

Customer Wind Resource Report

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Landowner : Hastings On Hudson
Location : Waterfront, Hastings On Hudson, NY 10706

Wind Energy Potential

- Very Poor
- Below Average
- Average
- Above Average
- High

Recommendation is based on atmospheric models and historical weather data speeds and system productions will vary with terrain, location obstacles, and turbine selection. For more information on the Wind Energy Potential categories, please see the FAQ page. Contact a NYSERDA eligible installer with this wind resource report for further consultation.

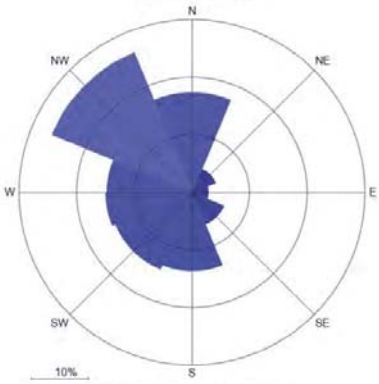
Estimated Wind Resource and Annual Net Energy

Wind Resource	80 ft (24.4 m)	100 ft (30.5 m)	120 ft (36.6 m)
Average Annual Wind Speed	9.1 mph (4.07 m/s)	9.55 mph (4.27 m/s)	9.95 mph (4.45 m/s)
Annual Net Energy	**80 ft (24.4 m)**	**100 ft (30.5 m)**	**120 ft (36.6 m)**
5 kW Turbine	2300 kWh - 3000 kWh	2800 kWh - 3600 kWh	3200 kWh - 4200 kWh
10 kW Turbine	3300 kWh - 4400 kWh	4000 kWh - 5200 kWh	4600 kWh - 6000 kWh
20 kW Turbine	7400 kWh - 9700 kWh	8800 kWh - 11500 kWh	10200 kWh - 13300 kWh
50 kW Turbine	22000 kWh - 28600 kWh	26200 kWh - 34100 kWh	30400 kWh - 39500 kWh

100ft Wind Resource Map

Latitude = 40.99506' Longitude = -73.8858', Elevation = 3 ft (1 m)

Wind Rose



Percent Energy by Sector

AWS Truepower

IMPORTANT NOTICE AND DISCLAIMER: The wind map and wind rose were created by AWS Truepower, LLC using the MesoMap® system and historical weather data. Annual energy estimates were calculated using the local wind resource, estimated loss factors, and the manufacturer supplied power curve. For more information on the program's methodology, please refer to the Help page. AWS Truepower and NYSERDA do not guarantee the above estimates and are not responsible for the contents of this report. For applications requiring greater accuracy, the wind resource estimates should be confirmed by measurement. For more information on NYSERDA wind incentives, please refer to NYSERDA's webpage.

PART IX

Definitions

100 Year Floodplain - A **one-hundred-year flood** is a flood event that has a 1% probability of occurring in any given year. The 100-year flood is also referred to as the 1% flood, since its annual exceedance probability is 1%,[1] or as having a return period of 100-years. The 100-year flood is generally expressed as a flowrate. Based on the expected 100-year flood flow rate in a given creek, river or surface water system, the flood water level can be mapped as an area of inundation. The resulting floodplain map is referred to as the 100-year floodplain, which may figure very importantly in building permits, environmental regulations, and flood insurance.

Boardwalk - A **boardwalk** (board walk, boarded path, promenade) is a constructed pedestrian walkway along or overlooking beaches; or as walking paths and trails over bogs and wetlands and above fragile ecosystems, usually built with wood. Many of the original boardwalks in the United States have developed to be so successful as commercial districts and tourist attractions that the simple wooden pathways have been replaced by esplanades made of concrete, brick or other construction, sometimes with a wooden facade on the surface and sometimes not. Indeed in many parts of the U.S. today the term *boardwalk* often carries more the connotation of a waterfront, pedestrian, entertainment district than the original meaning of a wooden path.

Bulkhead - A **bulkhead** is a vertical structure that acts as a retaining wall usually constructed parallel to a shoreline.

Bulkhead toe revetment - A sloped stone structure placed on the channelward side of a bulkhead.

Elevation - The **elevation** of a geographic location is its height above a fixed reference point. NGVD 29 stands for National Geodetic Vertical Datum of 1929. It is a system that has been used by surveyors and engineers for most of the 20th Century. It has been the basis for relating ground and flood elevations, but it has been replaced by the more-accurate North American Vertical Datum of 1988 (NAVD 88).

Estuary - An embayment of the coast in which fresh river water entering at its head mixes with the relatively saline ocean water. When tidal action is the dominant mixing agent it is usually termed a tidal estuary. Also, the lower reaches and mouth of a river emptying directly into the sea where tidal mixing takes place. The latter is sometimes called a river estuary.

Grade - the pitch of a slope such as a hill, road or railway.

Infrastructure - Technical structures (pipes, tunnels, utility poles, catch basins, etc.) that support development, such as roads, bridges, potable water supply, grey water supply, fire water supply, sanitary sewers, storm sewers, normal electrical power, emergency electrical power, telecommunications, (telephone, cable, fiber optics, emergency), street lights, as well as empty pipes and / or pathways for future technologies.

Integrated vegetation buffers - Create or enhance wetland and riparian buffer vegetation along gradient from mid-tide landward to upland area; allow native vegetation to grow without frequent mowing or add new wetland and riparian buffer vegetation, e.g. trees, shrubs, deep-rooted grasses, perennials, and ground covers. May require bank grading. Replace waterfront lawn with ornamental grasses, native shrubs and small trees.

Nearshore water depth - The vertical distance between the water surface and the submerged bottom usually referenced in feet below the mean low water elevation (e.g. – 2 ft MLW). **Shallow -** at 30 ft. channelward from MLW, water depth is < 3 ft. **Deep -** at 30 ft. channelward from MLW, water depth is > 3 ft.

Riprap - **Riprap**, is rock or other material used to armor shorelines, streambeds, bridge abutments, pilings and other shoreline structures against scour, water or ice erosion. It is made from a variety of rock types, commonly granite or limestone, and occasionally concrete rubble from building and paving demolition. It can be used on any waterway or water containment where there is potential for water erosion.

Revetment - A sloped structure constructed with large, heavy stone or other material (riprap) placed against the upland bank for erosion protection. The size of a revetment should be dictated by the wave height expected to strike the shoreline.

Sheet Piles - a pile that is pressed or molded from sheet metal or vinyl so as to interlock with other such piles to form a retaining wall or other piling installation.

Shoreline - The intersection of the land with the water surface. The shoreline shown on charts represents the line of contact between the land and a selected water elevation. In areas affected by tidal fluctuations, this line of contact is the mean high water line.

Soft Edge - Soft engineering is defined as the use of ecological principles and practices to reduce erosion and achieve the stabilization and safety of shorelines and the area that surrounds rivers, while enhancing the habitat, improving aesthetics, and also saving money. It is achieved through use of vegetation and other materials to soften the land-water interface, thus improving ecological features without compromising the engineered integrity of the shoreline or any river edges.

PART X

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