COLLAGING CONTEXT:

TURNING VACANCY TO VIBRANCY IN THE MAGNOLIA PUBLIC WATERFRONT

by

ERIN FINCH STEVENS

(Under the Direction of Andrew A. Fox)

ABSTRACT

This thesis is a design application for the public waterfront spaces of Magnolia, a proposed brownfield redevelopment along the Ashley River on the “Neck” of the Charleston peninsula in coastal South Carolina. Currently, the site is primarily vacant with visible remains of an industrial past. The intent of the proposed design is to encourage ecological and cultural healing by connecting users and nearby traditionally marginalized communities with the site’s unique and inherent processes. A methodology based on contemporary landscape theory incorporates collage into the design process to more holistically illuminate the site’s cultural and ecological contexts. Collages are constructed throughout the research and design process, and the thesis culminates with a design for the public waterfront and an evaluation of the collaging process in landscape architecture.

INDEX WORDS: brownfield redevelopment, collage, photomontage, Charleston Neck, urban waterfront design, sweetgrass basketry

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CHAPTER 1

INTRODUCTION

Site Background

The South Carolina Lowcountry[1] has witnessed tremendous population growth over the past several decades. The patterns to accommodate this growth, however, have not always sufficiently accounted for the abundance of cultural and natural resources many newcomers seek to embrace. A study conducted by the Center on Urban and Metropolitan Growth shows that between 1982 and 1997, the metropolitan-area population increased by 18.3% while the area of urbanized land increased by 55.3%, resulting in an overall density decrease of 23.8% (Fulton, Pendall et al. 2001). These statistics demonstrate an overall trend of outward expansion—a dynamic that drastically increases the ecological footprint of the metropolitan area while neglecting potential growth sites within the city that may be tainted with poverty, urban waste, or abandoned industrial facilities.

Recently, however, Magnolia Development, LLC obtained and produced plans to develop over 450 acres of neglected industrial land located on the "Neck" of the Charleston peninsula that links the cities of Charleston and North Charleston. The development company published plans for four projects in the area, comprising the largest privately-funded brownfield redevelopment in South Carolina. The flagship project Magnolia is a 218-acre tract situated along two miles of the Ashley River waterfront (Magnolia Development Website).

[1]Lowcountry is a term that generally refers to the coastal regions of South Carolina, particularly surrounding Charleston, and sometimes parts of Georgia. In this document, the geographic definitions of the term are not particularly relevant; rather, the term Lowcountry refers to the unique culture of South Carolina's tidal regions.

Figure 1-1. Rendering of central boulevard of Magnolia. Prepared by DesignWorks, LC 2007 for the Magnolia Concept Plan (Magnolia Development and Charleston 2007).

On this site, the developers have proposed "a community of research facilities, multi-tenant and mixed use office buildings, office condominiums, and work/live units…[with a] wide range of housing options…to meet the needs of a cross-section of society" (Magnolia Development Website). The site's industrial contamination and location between two high-density areas make it a valuable target for brownfield redevelopment. Fortunately, due to its permeable waterfront location and former status as a global phosphate producer, the Environmental Protection Agency identified the site as a Brownfields Assessment Pilot and repeatedly funded contamination assessment and remediation that have rendered the site safe for occupation (USEPA 2004).

Although most of the site is uninhabited, development will greatly influence the surrounding communities. The site's location on the narrowest section of the Charleston peninsula has contributed to the site's history of dissection and displacement, potentially undermining the communities' attachment to place. In addition, waterfront location is a primary asset and value-determinant of Charleston private property. Public control of and access to the waterfront, therefore, should be established to help maintain the affordability of existing Neck communities and to enhance existing residents' quality of

life. The establishment of public access to the waterfront, marsh, and river will offer opportunities for community members to engage with and learn about this vitally important ecosystem while developing respect for the unique natural resources of their region.

In addition to its influence on real estate values, the salt marsh plays an important cultural role in the historic port city. Historically, the marsh has supplied food and jobs for local residents through its abundance of fish and shellfish and provided habitat for hundreds of species of birds, mammals, and sealife. The marsh also serves as a city-wide buffer for floods, hurricanes, and other natural disasters. The image of the salt marsh as a unique natural feature is inextricable from the Lowcountry identity, and its visibility should be emphasized in all communities to strengthen Charleston residents' senses of place. The purpose of this thesis is to explore how the public waterfront realm of Magnolia can be designed to inspire place attachment through an enhanced respect for the site's ecological and cultural value within the larger Charleston community.

Overview of Research

This thesis is a design application for the waterfront property of Magnolia Development. Chapter 2 considers recent and contemporary academic literature addressing place attachment and contaminated sites. This research establishes a design methodology that incorporates collaging into all phases of design to more effectively integrate multiple elements of the site's history and processes into a cohesive and meaningful place. Collages are constructed in the remaining chapters and culminate in a final schematic design for the public waterfront space. Chapter 3 explores the cultural history of the region, Chapter 4 addresses the past and current environmental conditions of the site, and Chapter 5 presents a site inventory and brief overview of the proposed Magnolia community. Chapter 6 integrates this research into a schematic

design for the public waterfront, and finally, Chapter 7 concludes the research with an evaluation of the design process.

CHAPTER 2

DESIGN THEORY

Site Context

Landscape is never finished or completed, like a can of preserves; it is an accumulation of events and stories, a continuously unfolding inheritance.

--Georges Descombes (Descombes 1999)

The Ashley River waterfront section of Magnolia Development is integral to the neighborhood's success as a sustainable community because it is a visible public space that can connect the new development to the natural surroundings of the Ashley River and marsh and to the existing adjacent communities. It is important, therefore, to create a space that is integrated with its unique cultural and environmental context. How, then, can this apparently vacant space be designed to foster a strong sense of place that reflects its complex cultural and environmental components?

Place Attachment

The complexities of place and the power of place attachment currently receive much attention in scholarly, political, and planning discussions (Kruger and Williams 2005). Due in part to the increasing trends of environmentalism, the social implications of physical place have recently garnered attention from traditionally non-place-oriented fields. In a 2006 edition of *Journal of Planning Literature*, Manzo and Perkins discuss the increasing awareness of the role that physical place plays in social and community planning. They explain that place-attachment theory "can help us to understand how particular preferences, perceptions, and emotional connections to place relate to community social cohesion, organized participation, and community development" (Manzo and Perkins 2006). Sociologists and planners are increasingly considering how

the physical forms of place are complexly intertwined with the social dynamics of communities.

As environment-behavior researcher and professor of architecture David Seamon relates, inspiring and lively cities encourage dwellers to contribute to their liveliness in a symbiotic relationship where “urban wholeness begets human wholeness and vice versa…there is a practical movement afoot in public policy and community design that attempts to understand useful societal change from the viewpoint of wholes healing themselves” (Seamon 2006). If people’s actions can potentially affect these physical forms that affect their community dynamics, the healthiest cities will be designed to increase the understanding of the relationships between city dwellers and their physical surroundings. Although these ideas are not new in landscape architectural theory, their recent popularity in other fields offers an increased opportunity for landscape architects to incorporate these elements into designed environments.

Indeed, architects, landscape architects, and social geographers have long discussed the social implications of place: for example, place theory developed by Allan Pred in the 1980’s defines place as “a social process of transforming and appropriating nature and space simultaneous with and inseparable from the transformation and reproduction of society” (Kruger and Williams 2005). In this definition, place is no longer a physical setting; instead, place is conceived as a process inseparable from societal development. This conception of place emphasizes its transience and its integral role in an evolving society. More recently, Kruger and Williams discuss the types of places effective at fostering attachment in users. Not unlike the trends Seamon discusses, these authors explain, “the most important aspect of the ‘specialness’ of places is a holistic character that involves past experience and social and cultural meanings identified with the place” (Kruger and Williams 2005). Designers of effective community spaces, then, must seek an understanding of the past cultural meanings of the site.

Indeed, these new planning and management ideas reflect the mid-twentieth century writings of architect and theorist Christian Norberg-Schulz that emphasize the role of *genius loci,* or "spirit of place" in creating culturally meaningful places. As he explains, places are defined by human perception, but these perceptions are often superficial. As the complexities of a physical place become less apparent, places lose meaning and value to society (Norberg-Schulz 1966; Norberg-Schulz 1980). Designers, therefore, should explore and seek to reveal the sometimes imperceptible layers of meaning present at sites.

Because the Charleston Neck communities have been continually moved and dissected by war, transportation routes, and industrial endeavors, they may, understandably, lack the sense of place integral to the environmentally and civically virtuous community members necessary to the holistic and healthy communities described above. The public spaces included in Magnolia, therefore, should be designed not only to acknowledge the rich histories of these Neck communities, but to welcome and encourage their participation in the evolving culture present there.

An Ecosystemic Approach

Undoubtedly, the important relationship between place and cultural memory has been acknowledged and abused throughout human history. Physical spaces and objects are not only tangible validations of a culture's existence, but they also serve as materialization of the cultural memory that helps to ground and orient a culture in its evolution through the present and into the future. In her essay "Choosing the Margin as a Space of Radical Openness" bell hooks describes this need for rootedness and place in developing identity:

> *…our struggle is also a struggle of memory against forgetting.* In much new, exciting cultural practice…there is an effort to remember that is expressive of the need to create spaces where one is able to redeem and reclaim the past legacies of pain, suffering, and triumph in ways that transform present reality. Fragments of memory are not simply

> represented as flat documentary but constructed to give a 'new take' on the old, constructed to move us into a different mode of articulation. (hooks 1989)

Designed spaces can offer an alternative to the "flat documentary" representation that she describes; more than images or texts, spaces can help ground a culture and make its history and evolution visible within a larger community. A spatial acknowledgement of a culture's past and present relationship to a site will help foster a sense of belonging and place-attachment that can, in turn, foster increased environmental and civic awareness and responsibility in traditionally marginalized communities.

Awareness of a site's natural history, processes, and resources is also important in fostering attachment to a specific place. In particular, the idea of bioregionalism has received attention for its supposed potential both to foster a sense of environmental responsibility in citizens and to strengthen communities. According to bioregionalist thought—as reflected in the works of Kirkpatrick Sale, Wendell Berry, Daniel Kemmis, Wes Jackson, David Orr, Lynn Miller, Scott Russell Sanders, and "a host of others"—regions determined by natural features and distinct ecosystems become increasingly self-sufficient and self-governing entities responsive to their unique environmental and cultural circumstances (Kalinowski 2004). Although the scale and context of the site at Magnolia cannot support the complete restructuring of political and social dynamics inherent in bioregionalist theory, the consideration of an application of its principles within the context of the existing Charleston community can hopefully encourage community involvement and environmental responsibility in traditionally marginalized communities through a stronger awareness of and attachment to place while also better integrating these communities into the larger systems of which they are a part.

Indeed, a major component of bioregionalism requires effective public places that encourage civic virtue and collaboration through a physical and philosophical common ground. As mayor of Missoula, Montana and state legislator Daniel Kemmis explains, a

sustainable and cooperative community occurs only when people are deeply connected to the habitat in which they dwell (Kalinowski 2004). This aspect of bioregionalism can appear in smaller-scaled designs through the inclusion of all organisms, natural processes, and relevant land and water features in the definition of community. Instead of perceiving land as mere property, humans should consider it a complex amalgamation of soil, energy flows, plants, and animal habitats. For humans to be members of a truly healthy community, they must understand the natural systems that sustain human life, as opposed to living an urban existence entirely removed from nature. As Franklin Kalinowski explains, "[l]ack of connection [to life-sources] leads to lack of restraint, and lack of restraint leads to exploitation" (Kalinowski 2004). In accordance with bioregionalism, people must live within natural limits and promote the health of the land to sustain their own culture. In this way, a bioregionalist perspective on the design of community spaces can strengthen the connections among humans and between humans and the non-human elements in their communities.

In their book *Cities as Sustainable Ecosystems,* Peter Newman and Isabella Jennings offer planning strategies to encourage the "holistic, ecological perspective on community phenomena" described above (Manzo and Perkins 2006). This ecological framework for community planning considers communities as systemic entities and requires an acknowledgement of the necessity of cooperation among diverse fields and diverse community members, as well as a respect for the role of non-human communities in creating healthy, sustainable places. The book is based on the premise that sustainable cities must embrace the basic principles of healthy ecosystems: "diversity, adaptiveness, interconnectedness, resilience, regenerative capacity, and symbioses" (Newman and Jennings 2008). These authors also emphasize the need to develop a strong sense of place to motivate people to actively care for their communities—both human and ecological—and the need to provide a cultural and

historical context to orient them toward the future by fostering a sense of rootedness and belonging. When people understand the value of diverse species existing in ecological balance, they will potentially apply these principles to their own human communities, promoting inclusive and thriving social dynamics as well.

The ideas described above are particularly relevant to the design of Magnolia's public space because the site carries connotations of both environmental and socioeconomic disrespect. Currently, the site is marked for complete overhaul—the vacant and highly-contaminated former industrial site will become an entirely new mixed-use development. In order to foster necessary cultural continuity and a distinct sense of place, a holistic approach to the site design should embrace the natural systems present at the site and the darker periods of the site's past.

Landscape Application

Much recent landscape theory applies these ideas to changing perceptions of landscape. According to the ideas described above, humans need places to reconnect to their historical relationships with nature and to demonstrate their roles in larger-than-human ecosystems. In the early 1990's James Corner discusses the potential for landscape to "rebuild an 'existential ground,' topography of critical continuity, of memory and invention, orientation and direction" in a culture increasingly disoriented by abstract theories, deconstructionist thought, and technological progress that allows humans to exist increasingly removed from nature (Corner 1991). Corner concludes that the most powerful and responsible approach to landscape architecture applies a hermeneutic theory that expects the landscape to evolve simultaneous with social change and with human understanding of nature:

> Through the building of such landscapes we may well be able to mine the illimitable resources of both culture and nature, bringing modern dwelling toward a greater significance with its present and restoring a sense of wholeness, continuity, and meaning to our lived relations with the landscape. To forge a landscape as a hermeneutic locus of both

> divination and restoration, prophecy and memory, is to help figure and orient the collective consciousness of a modern culture still caught in transition. (Corner 1991)

This evolutionary approach to landscape design is particularly relevant in post-industrial sites where human intervention has completely transformed the landscape and natural ecosystems in both visible and invisible ways. In the case of Magnolia, predominant cultural forces have marginalized and concealed the evolution of both the ecosystems of the site and the culture of its neighboring communities.

John Tillman Lyle promotes design ideas similar to Corner's in his conception of the "deep form" strategy (Lyle 1991). In Lyle's opinion, the proliferation of photographs and images in contemporary culture has created in the human psyche "an unreal world with human beings seemingly set apart from nature" (Lyle 1991). Design theory has merely encouraged this separation with its language of "line, form, color, texture, and so forth" (Lyle 1991). As a result, many landscape architects design in abstract visual forms and are preoccupied with the appearance of the landscape at the surface, a process that results in what Lyle terms as "shallow forms" (Lyle 1991). More appropriate designs respond to the invisible and infinite complexities of nature's processes. Instead of accepting a reductionist view of science, landscape architects should observe nature's processes at every scale:

> If we can observe that order at every scale and work with it, we can hope to bring our perceptions into congruence with nature's order. We can hope to restore humanity to its rightfully harmonious role in nature's scheme of things…Landscape architecture then becomes the joining of human perception and ecosystematic order and this, I propose, is the most promising direction in which the seeds of our profession can float. (Lyle 1991)

According to Lyle, properly designed places will foster ecological understanding in humans so that they can become active participants in human ecosystems based on nature's fundamental order. Design, then, should have roots in nature's systems to make this elegance and complexity legible. An essential element in these "deep forms" is the

acceptance of natural changes, whether traditionally beautiful or not, as part of the design. Although a thorough understanding of all of nature's processes at every scale is infinitely elusive, human perceptions of and interactions with designed landscapes should continually adapt to respond to these changes.

Swiss landscape architect Georges Descombes relates similar intentions in his inspiration for landscape designs. He describes his goal of making imperceptible forces visible to foster new perspectives and emotions associated with particular places. In Descombes view, his designs are not definitive landscape manipulations, but they are "speculative constructions…produced and transformed through continual reshaping processes: weather, seasons, light, growth, erosion, deposition" (Descombes 1999). According to both Lyle's and Descombes's lines of thought, landscape architects should embrace the dynamism of natural forces and make the revelation of these forces a function of the designed landscape.

A similar concept of designing to reveal ecological processes is explored in the 1998 special edition of Landscape Journal entitled *"Eco-Revelatory Design: Nature Constructed/Nature Revealed"* that presents twelve projects that exemplify the new concept of "eco-revelatory design"—human-initiated landscape intervention intended to make ecological processes more legible. In particular, the design *Wet Lands: Civic Stormwater + Contingent Spaces* by Kathy Poole embodies many of the ideas elaborated by Corner and Lyle (Brown, Harkness et al. 1998). Through the creation of public gathering spaces in typically marginalized wetlands, the design involves citizens in spaces dedicated to the typically invisible and mundane process of stormwater infiltration (Brown, Harkness et al. 1998). As Poole explains, the design for this traditionally marginalized communal infrastructure "neither complies to classical rules of beauty nor refers to some (supposed) constant set of virtues. It is a scruffy beauty, its form and aesthetic constantly changing, and its aesthetic is not of the monumental, but

Figure 2-1. Images from Georges Descombes's works. Clockwise from top left: Biljmer Memorial detail, concrete walk in Biljmer Memorial, The Swiss Path at Lake Uri. Photos from *Well Timed: The Works of Georges Descombes* by Mitchell Rason.

of the mundane—the literal, visceral, grimy world" (Brown, Harkness et al. 1998). In addition, the design approach appeals to users by combining science and metaphor; in consideration of the physical wetland material, Poole relates the metaphorical potential for historical and ecological revelation: "Wet Lands' stickiness and sponginess seem to hold their histories better than dry lands. They are sedimentary by evolutionary nature, composed of the detritus of time" (Brown, Harkness et al. 1998). This relation of physical form to cultural and ecological content is essential for designers to create spaces that embrace their cultural and ecological contexts and reveal these elements through experience.

The Issue of Waste

Direct interaction would seem to be the most effective way for humans to understand and appreciate the natural processes and life-sources supporting their communities, as well as the implications of their cultures' activities on larger natural systems. Depending on past uses and remediation efforts, however, interaction with environmental processes in post-industrial sites is often complicated by the presence of harmful contaminants in the soils and groundwater. Because direct contact with these toxins can be a health hazard and site disturbance can disrupt ecosystems and potentially kill large populations of organisms, the capacity for public interaction with a contaminated site's natural systems may be severely limited.

Rachel May explores this conflict in the waterfront designs for cities situated on rivers (May 2006). She argues that in this context, "the solution is not simply to exclude humans from the river ecosystem…Humans are, after all, the dominant species in urban ecosystems, so connectivity of all kinds must include a connection to us, and from us to systems as a whole" (May 2006). Because riverfront design that does not allow physical access to the river can still provide visibility and a symbolic connection to the river and its ecosystems, and because of humans' capacity for abstract understanding, people can develop ecological awareness of the river as an integral part of the larger city system without having direct access to the water (May 2006). Indeed, this systemic understanding of cities is integral to increasing both environmental and social awareness in contemporary culture.

In particular, the prevalence of post-industrial and other contaminated and/or obsolete land in cities with growing populations has made the appropriate redesign of these sites a recent topic of discussion in many fields. One major challenge in the development of these sites is the prevailing public opinion of waste and wastelands as dirty, unusable, and undesirable. Urban waste has been marginalized since the mid-

nineteenth century, and, as a result, people have distanced themselves both physically and psychologically from the waste created by a consumer urban culture (Melosi 1982; Lynch and Southworth 1990; Phillips 1990; Engler 1995; Murphy and Rathje 2001).

As environmental and global issues have become more apparent, however, people have begun to consider the implications of these negligent attitudes toward waste. Indeed, in the 1960's and 1970's waste became an increasingly popular subject for artists commenting on the ills of consumer society (Engler 1995). Eventually, this trend expanded into landscape design, and landscape architects, environmental scientists, artists, and engineers have begun creating waste landscapes that embrace their polluted pasts and make waste more accessible to the public. Biotechnology, art, and design now transform these traditionally marginalized and ignored sites into "waste museums", "waste parks", or "waste gardens" where waste and its associated processes become visible and interactive (Engler 1995).

Figure 2-2. Trash-o-saurus at the Children's Garbage Museum in Stratford, Connecticut. Photo from www.boston.com.

Although the designers of these waste landscapes have different approaches and goals, in her essay *Waste Landscapes: Permissible Metaphors in Landscape Architecture,* Mira Engler argues that the most effective designs employ an integrative approach that involves several disciplines to combine "scientific rigor with expressive metaphors…By connecting people with the cycle—the fate of our toilet flush and urban garbage—the integrative strategy teaches us the lessons of survival, as well as celebrating the experience of belonging to a larger ecosystem" (Engler 1995). Successfully designed waste sites can encourage "new social-economic rituals" that involve people in waste management. In addition, they can make visible the regenerative and productive natural processes present at sites previously conceived of as filthy and chaotic (Engler 1995).

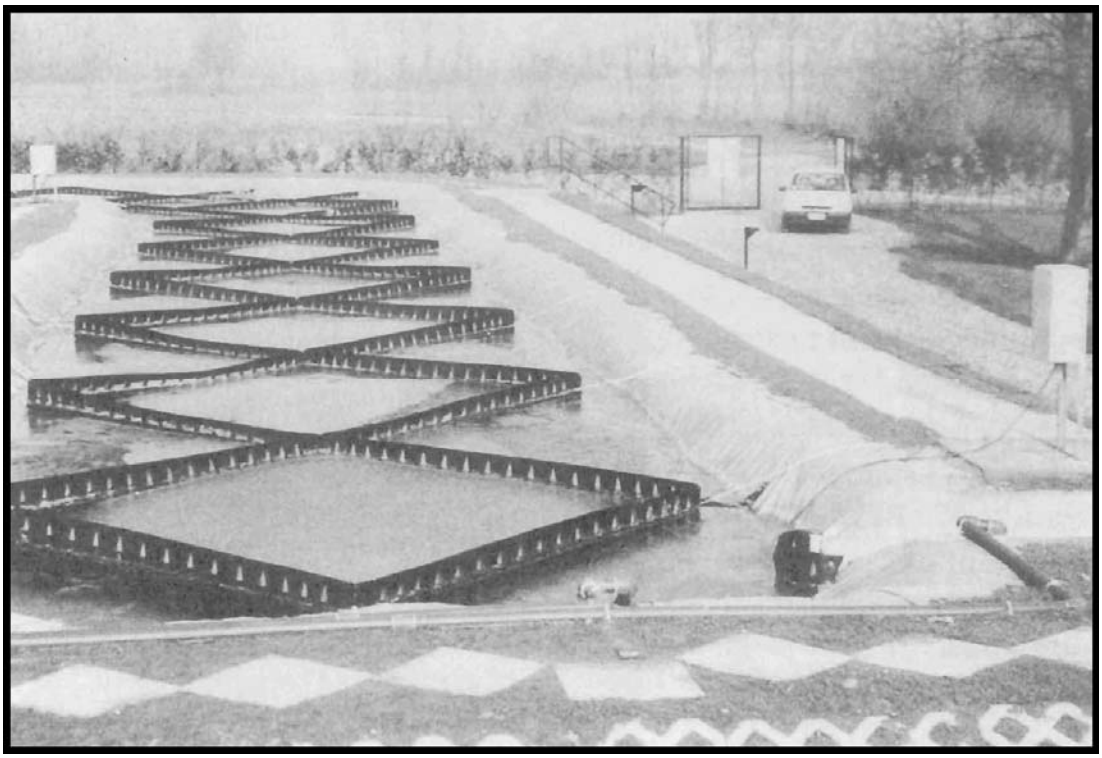


Figure 2-3. Water treatment plant in Gorgonzola, Italy. Artist and engineer Viet Ngo created "an artfully sculpted garden" that successfully treats the water of a polluted river (Engler 1995).

Although Engler's work is particularly concerned with garbage and urban landfills, her ideas are applicable to post-industrial sites where the physical landscape has been exploited and abandoned, not unlike an empty container. Her argument applies the self-sustaining and ecosystemic design approaches articulated earlier to the issues of urban waste and abandoned sites:

> Landscape design should not be used to wipe out technological guilt. Rather, it should be used to move the public to new levels of awareness, concern, and commitment. Our designs should invite people to see a fresh interaction of nature and culture—a process in which citizens play an integral role, in which their participation in the management of waste is as inevitable as their consumption of material goods, a process in which waste management is conceived of as not only a problem but an opportunity for designers and for citizens. (Engler 1995)

According to this thought, human culture will exist more harmoniously with nature if people understand how their consumption and disposal habits fit within the larger cycles of nature. Although—unlike the waste sites considered by Engler—post-industrial sites are not the result of common household trash, their existence as abandoned and exploited landscapes represents the throw-away mindset of consumer culture on a larger scale.

Increasingly, the potential for the use of vacant and abandoned spaces is recognized and considered an exciting opportunity for designers to create new places and potentially influence society's attitudes towards such spaces. The *Vacant Lots* competition sponsored by the Architectural League of New York and the New York City Department of Housing Preservation and Development in 1989 sought designs to transform municipally-owned vacant lots in Manhattan into public housing facilities. The entry by Tod Williams and Billie Tsien embraces the openness of the lots as an asset. They explain, "This proposal…does not accept the vacancy of the open space, suggesting instead that this exceptional condition implies a responsibility. It must retain its openness, but it must not be empty; the open lot must be inhabited" (Willis and

Genevro 1989). The entrants raise important points about cultural conceptions of vacancy and openness, where openness is an asset and vacancy is seen as an indication of worthlessness. In a development built on a vacant industrial site, public spaces should create a sense of place and historical continuity by maintaining openness while also reflecting former vacancy. Additionally, with regards to the Magnolia site, the salt marsh that surrounds the public space—though rich in natural processes and geographical and cultural imagery—can easily be perceived as a vacant landscape because of its flatness and lack of human utility. A successful design should engage users with the underlying complexity of this apparently vacant landscape and embrace its openness as an asset.

In 2003, Carla Corbin published V*acancy in the Landscape: Cultural Context and Design Response,* a discourse on concepts of vacancy in the designed landscape. In her argument for more holistic consideration of sites she explains, "[a]ny fragment of land, no matter how unobstructed the view across its surface, is inhabited by its cultural or natural history, has been shaped and marked in subtle or dramatic ways, and is occupied by forms of life and processes which register on many scales, macro or micro" (Corbin 2003). Similar to Engler's arguments for waste landscapes, Corbin suggests that the negative connotations of vacancy and vacant land should be erased for people to better understand natural cycles. She elaborates, "Public desire to fill emptiness can obscure or destroy local history, miss an opportunity to reconsider openness, or deny inevitable change" (Corbin 2003). In comparison to the larger natural systems of which humans are inevitably a part, decay is less acceptable in human environments.

Like Lyle and Descombes, Corbin insists on the use of temporal landscape features. She compares towns, cities, and industrial settings to agricultural cycles where fallow fields are integral to overall production (Corbin 2003). If vacancy is perceived as a necessary or even beneficial state for sites within urban environments, their

reinhabitation will be more acceptable and offer additional opportunities for the potentials of vacant sites to be explored.

The designer of a vacant site, therefore, has the responsibility to research, experience, and discover subtleties in the site's layers and processes. The designed site should be filled with expressions of this *genius loci* to orient it within the appropriate cultural and natural processes, thus providing meaning for the community and a strengthened sense of place, rooted in the site's unique cultural and natural context (Corbin 2003). In the case of a post-industrial site, "the vacancy and dereliction of the former identity [should] *read through,* maintaining the integrity of the setting as an industrial ruin" (Corbin 2003). Conventional practices of screening or covering landscapes perceived as unsightly with traditionally attractive design elements should be abandoned so that elements of the site's natural and cultural history and resources are legible.

A Process for Synthesis

Just as Lyle criticizes the shallowness of overly abstract design images, Corner—in his discussion of landscape recovery in contemporary culture—demands a reconsideration of images used in design representation. Because images and image-making condition designers' understandings of existing conditions and the designs they impose upon them, a new approach to landscape requires new imaging techniques. To properly recover landscape's role in contemporary culture, Corner suggests that designers develop eidetic images active in "engendering, unfolding, and participating in emergent realities" (Corner 1999). In this sense, "imaging" refers to a "mental conception...[that] may equally be acoustic, tactile, cognitive, or intuitive" developed by "more programmatic and metrical practices than solely representational…likened to a kind of mental map, or diagram, a spatio-organizational image that is not necessarily picturable but is nonetheless laconic and communicable" (Corner 1999). These

synaesthetic images can better account for the multiple layers of meaning and ongoing processes embodied in the landscape than traditional abstract and two-dimensional design images. Although the forms of these eidetic images vary greatly depending on the designer and the site, many designers have applied a similar methodology to landscape.

Figure 2-4. Collages constructed by James Corner for Toolonlahti Parks, Helsinki. Images from www.design.upenn.edu.

For example, Sebastien Marot discusses an approach to design that strives to create forms that incorporate both existing and past conditions of the site and its surroundings (Marot 1999). In this design process, Marot emphasizes the recollection of previous history, the recognition of landscape as process, the intricacies of apparently open space, and the significance of edges as zones of transition and/or integration. Similar to the eidetic images described by Corner, Marot explains that proper engagement with these key principles should incorporate "an amalgamation of new imaging procedures: photomontage, composite views, references to analogous

situations, texts, and so on" in contrast to conventional maps, plans, and elevations (Marot 1999). In comparison to traditional abstract design forms, this method more effectively incorporates multiple elements specific to a landscape and encourages new landscape perspectives in both individual designers and, hopefully, the societies within which they design.

Not unlike Corner and Marot, Corbin also suggests a design methodology in which the apparently open site is initially occupied by designers and researches "who see and interpret within a framework of individual perception and common cultural meaning" (Corbin 2003). Comparable to the active images promoted by Corner, Corbin suggests that concept drawings begin as blank maps that are progressively filled with images, text, and data so that "the site is then capable of dialogue with a program, rather than remaining passive, a non-reactive surface" (Corbin 2003). The designer then reveals these processes and pasts through selective expression. The site's content can teach users through perception of meaningful connections between themselves and both their culture and the site's cultural and natural processes.

In their exploration of the inclusion of feminine elements in post-industrial landscape design, Catherine Dee and Rivka Fine propose a similar collaging method for cultural research and design inspiration (Dee and Fine 2005). In this method, image making becomes an investigative tool that incorporates visual and spatial thinking in the research process to reveal relationships that may be overlooked by linear, textual research. In this image-based research, "The maker decides on [the relationships'] significance and meanings, keeps or rejects, and in this process renews, develops, or changes their understandings" (Dee and Fine 2005). The authors relate this process to the hermeneutic method discussed by Corner, in which the "repeated acts of reflective visual making…can be interpreted as a kind of feminine hermeneutical research" that incorporates typically overlooked feminine elements of landscape that include and

encourage partial, subjective, emotional, tactile, and immersive experiences of landscape (Dee and Fine 2005). These collaging techniques offer the designer an opportunity to observe and eventually express through physical form visual and experiential connections to otherwise invisible or overlooked processes and elements present in apparently vacant landscapes.

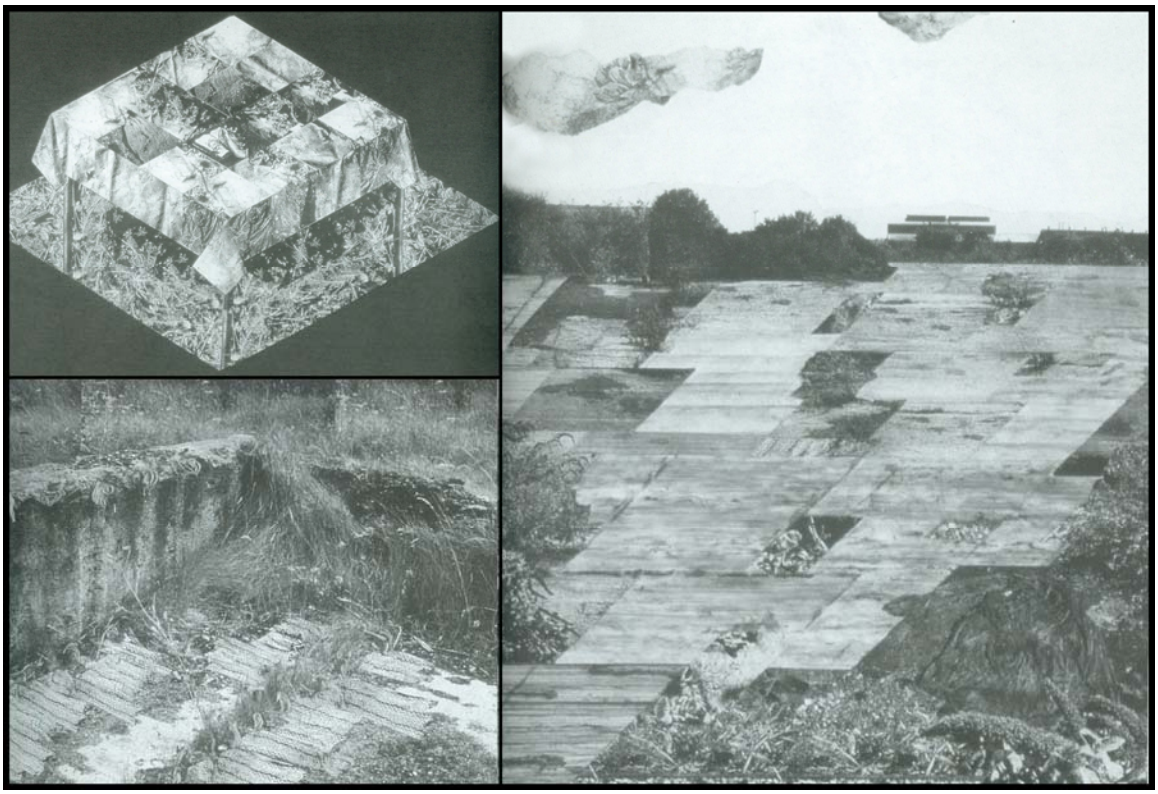


Figure 2-5. Collages constructed by Catherine Dee and Rivka Fine in two and three dimensions during their exploration of Brightside, a former steel factory in the United Kingdom (Dee and Fine 2005).

Arguably, a design approach that seeks to unfold and incorporate multiple layers of a site's culture and ecology gives a great deal of power to the designer in determining which elements are worth representation; that subjectivity, however, is relevant to the design methodology. The interpretation, like the site, acknowledges that it is shaped by individual perceptions, and that its history is not entirely objective. In addition, this

method embraces and plans for transition so that different elements of the site's meanings will be visible to different users—or even to the same users at different times—depending on conditions such as weather and time of day, and on the knowledge, biases, and previous experiences that each user brings to the site. The design does not attempt to tell a didactic story; instead, it aims to demonstrate the variations of individual experiences and the subjectivity present in human cultures and history within the context of larger ecological systems.

CHAPTER 3

CULTURAL HISTORY

Apparent Vacancy

Indeed, at first glance, the Magnolia site appears void of cultural value. Although small pockets of industrial activity remain, most of the site seems an abandoned wasteland. The cleared vegetation, broken concrete soil, water monitoring devices, and visible waste speak of human intervention, but the chain-link fences and padlocked gates enclosing the empty and overgrown fields imply long-standing abandonment. Historical and archaeological research, however, reveal a long history of the site's dynamic cultural relevance. When collaged together, these elements form significant patterns reflective of the site's unique cultural meaning. To help realize these patterns and make them active in the design conception, collages and photomontages were

Figure 3-1. Photomontage of existing Magnolia site. Photos taken by the author on July 23, 2008 facing inland from the water.

constructed during the research phases to create visual histories reflective of the site's multiple processes. These multi-layered images are included throughout the remaining

chapters to offer a visual complement to the textual discussions of the site's cultural and environmental histories and its existing condition. These images also illustrate how the collage/montage process informed the schematic through all stages of design development.

Pre-colonial History

Interestingly, often-abusive industrial activity uncovered evidence of the site's earliest known inhabitants: phosphate miners in the Neck area uncovered a stone hatchet, stone arrowheads, and human remains from a Stone Age settlement (Browder 2003). Prior to this discovery, the earliest known inhabitants of the Neck were Native Americans that camped throughout the peninsula. These Native Americans beat a trading path along the Neck's ridge known as the Broad or Big Path that connected the

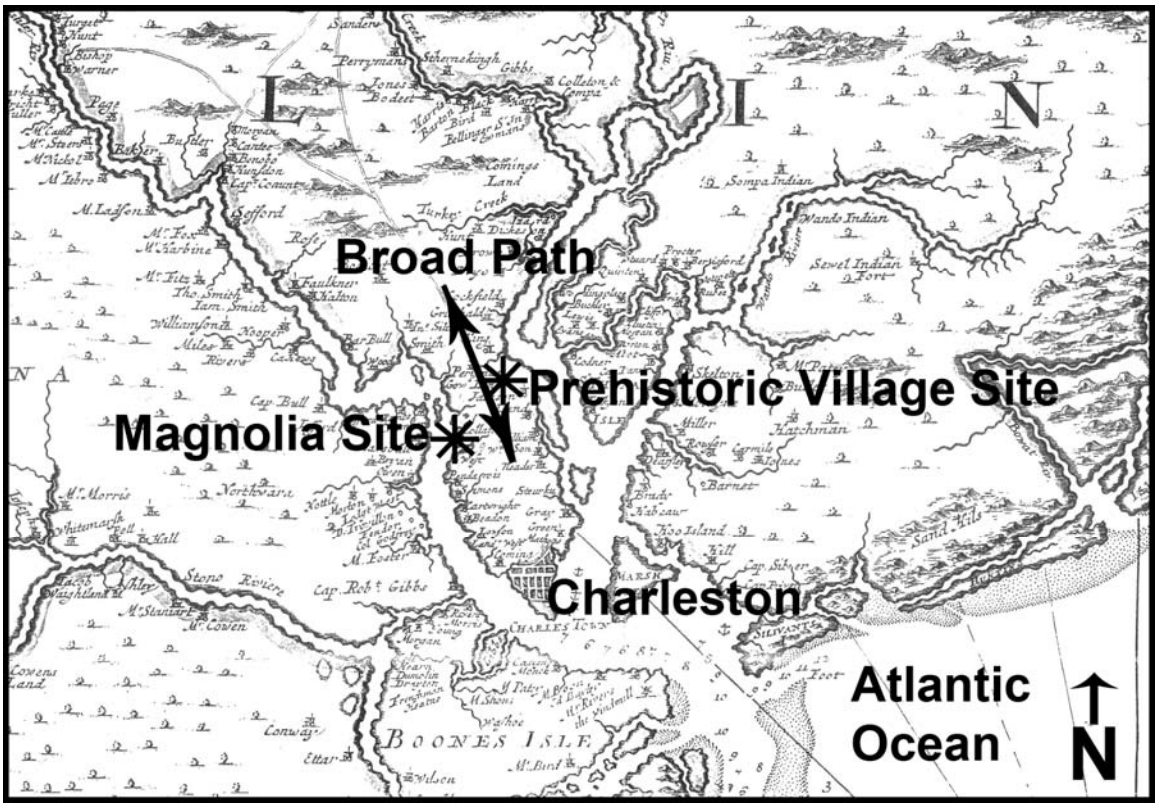


Figure 3-2. Location of known pre-colonial features with relation to Charleston and the Magnolia site. Base map drafted in 1699.

Charleston coast with the Smoky Mountains. Early colonists surveyed and identified this road as the Public Road to Charleston on numerous plats, and the path's location continues to serve the city of Charleston as King Street and King Street Extension (Browder 2003). Due to the geographical features of the Neck as the gateway between the city of Charleston and the mainland, the transitional and transporting dynamics of the Native American camping ground and the Broad Path are patterns repeated throughout the Neck's history.

Colonial and Antebellum Charles Towne

Between 1670 and 1672, the first European settlers in the Charleston area landed on the banks of the Ashley River across from what is traditionally known as historic Charleston. A draft of the Ashley River from 1671 shows the Neck as relatively uninhabited, while the area across the Ashley River is divided into several colonial plots (Browder 2003). The settlement's transfer across the Ashley River is first noted in a warrant from April 30, 1672 directing the British Surveyor General to plan a colony on 12,000 acres 'between Ashley River and Wandoe River'[2] (Browder 2003). As a part of this colonization process, the Neck area was divided and granted by King Charles II between 1672 and 1699 to colonists arriving on the First Fleet as part of their arrival rights (Browder 2003).

By the time of the American Revolution, almost 60 plantations were established in the Neck Area to produce primarily rice and indigo (Browder 2003). During this period, the Magnolia site was principally comprised of parcels that were part of Sans Souci Plantation, Rat Trap Plantation, and Samuel West's original land grant (Browder 2003). Although many were later subdivided, the majority of the Neck plantations originally spanned the entire peninsula from east to west, and regular ferry service up and down

[2] According to local history, Wandoe is the Native American name for the Cooper River, and Kiawah is their name for the Ashley River (Browder 2003).

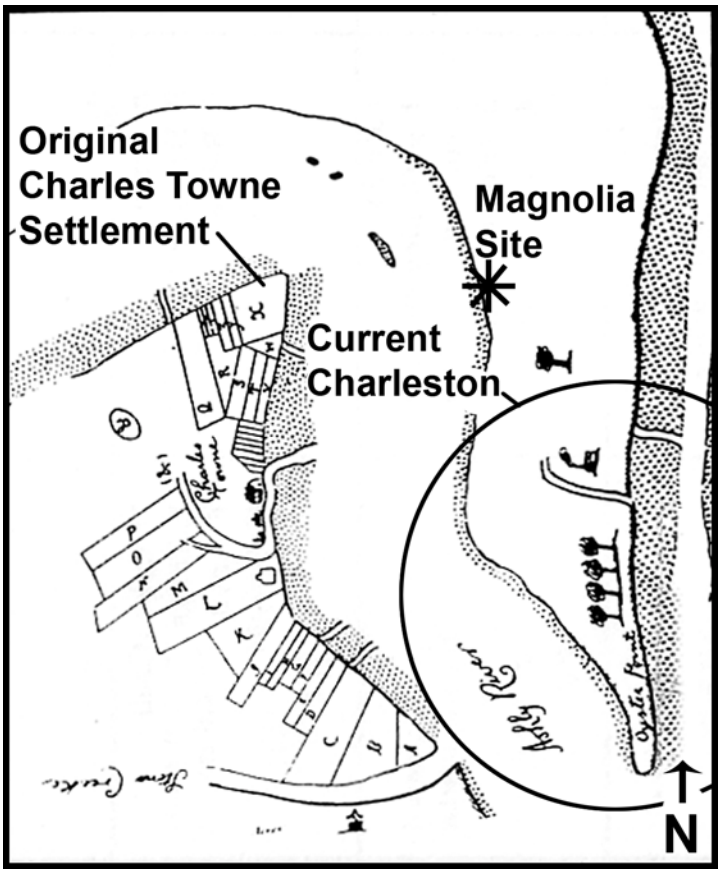


Figure 3-3. The earliest known draft of Charles Towne. This map, drafted by Culpepper in 1671 shows the original settlement across the Ashley River from current Charleston.

both the Ashley and Cooper Rivers connected these plantations to the city of Charleston. In addition to transportation convenience, the location of these plantations along a brackish and highly-tidal marsh was essential to rice production, as rice fields require regular flooding during production. The natural abundance of deer and loblolly pines (*Pinus taeda*) also contributed to the economic value of the Neck as deerskins, pitch, and tar became important exports from the Charles Towne colony and surrounding plantations (Browder 2003).

African-Americans played a significant role in the history of this area from the beginning of the colonial period; the first African-American slaves arrived in Charleston with colonial explorers in 1672. Because of Charleston's lucrative plantation economy

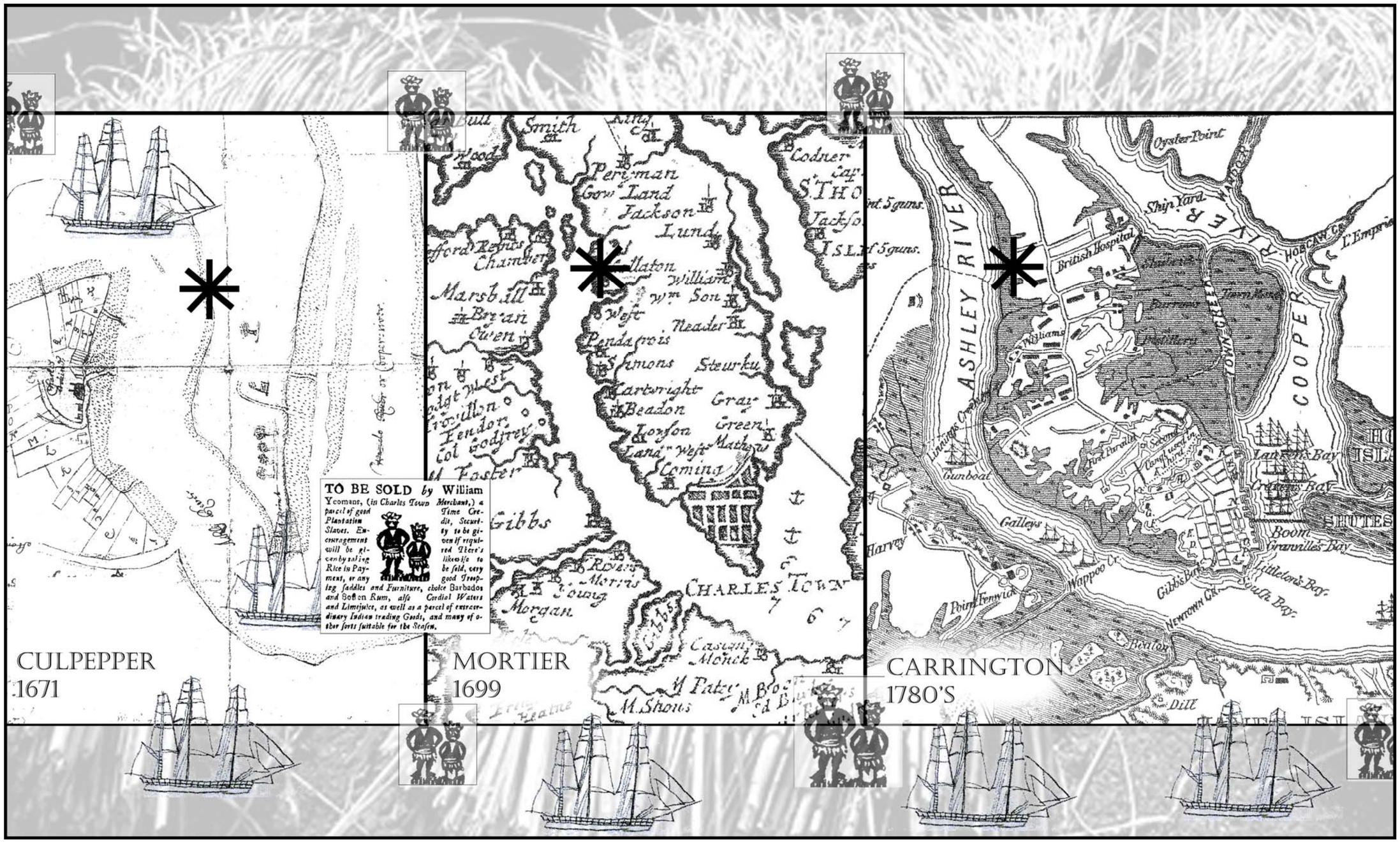


Figure 3-4. Collage of the Magnolia site and vicinity during Colonial and Revolutionary times. The variations among the maps indicate changing perceptions of the Charleston landscape. The maps become progressively less abstract and more representative of the physical features of the Charleston peninsula and surrounding landforms.

and its role as a port city, the African-American population soon exceeded that of the European settlers. By 1715, Charleston recorded 6,250 colonists and 10,500 slaves (Browder 2003). Unlike most traditionally African-American communities in the Charleston area, however, many of the earliest Neck neighborhoods did not develop after emancipation; instead, this region was settled by free African-Americans prior to the Civil War. Charleston was home to 90% of free African-Americans in the Carolina area, and though many of the members of these communities were active in urban Charleston life, social tensions and Charleston's peninsular shape encouraged their settlement in fringe areas north of the city (Powers 1994). Although these Neck communities were located south of the Magnolia site between the original plantations and the city, progressive gentrification and a growing urban core have continually pushed these minority communities northward and, today, many of the descendant communities dwell north of the site in the city of North Charleston. The location of the site at the edge of the city, therefore, carries traditions and connotations of displacement and marginalization.

Figure 3-4 compiles several of the maps of Charleston drawn during the Colonial and Revolutionary periods in Charleston's history. Their linear filmstrip-like arrangement reflects the changing perceptions of the Charleston area and its important features throughout this dynamic period in the region's history. Because Charleston's early economy was held together by the slave trade and slave labor, stamps of a slave couple taken from an advertisement in the Charleston paper are placed as if they are holding the maps of the region in place. In addition, the repetitive reproduction of this image reflects the valuation of humans as commodities that are plentiful, replaceable, and interchangeable, though essential to the culture's foundation. The ships are sketches of eighteenth-century British ships. They are placed throughout the maps to reflect the ever-visible but ever-changing European presence in the region: these ships are similar

to those that brought Europeans to the Native-American lands, those that carried African captives for trade in the Charleston slave market, and those that were fiercely battled by European settlers and descendants during the Revolutionary War. Finally, the image underlying the others is a photograph of rice: an element of the culture inherently tied to both the society and the economy of the region and to the unique landscape and natural forces present in the brackish tidal marshes flanking the Charleston peninsula. These changing perceptions of the landscape's elements reemerge in the final design through an array of temporal site elements that demonstrate changing attitudes and representations regarding the site's components, particularly in its more recent industrial history. In addition, attention to the powerful daily tides—as exploited by rice production—is enhanced in the final design to connect users with natural cycles important throughout the site's history.

A Cultural Artifact Arises

As described before, the design for the Magnolia waterfront should weave together multiple layers of the site's and the community's cultural and natural histories to create a meaningful place that fosters attachment and respect in its users. The site's history as a salt marsh, rice plantation, and factory paired with its adjacency to historically African-American communities and burial grounds converge on the still-active cultural practice of sweetgrass basketry that originated during the late seventeenth century on Charleston's rice plantations. As the following section and images demonstrate, this tradition grounds many Charleston-area communities—particularly the Lowcountry African-American community—in their cultural contexts and represents a unique Lowcountry icon. In addition, the current threats to the practice offer unique opportunities to answer the needs of an often-marginalized community and emphasize the importance of this cultural tradition.

A 2004 management study aimed at preserving this type of basketry claims that currently it is practiced “almost exclusively” by descendants of western African slaves brought to coastal South Carolina to work on rice plantations (Hart, Halfacre et al. 2004). As a result, the tradition of coiled basketry remains a continuous tie between African and Lowcountry African-American culture, and Charleston area baskets very closely resemble the contemporary baskets of Senegambia, Angola, and the Congo (Hart, Halfacre et al. 2004). The relatively continuous form and materiality of the sweetgrass baskets over the past three centuries attest to the invaluable strength of their design. In addition to providing “income and pride” for basket makers, the unique coiled baskets “have become an historical icon for the Charleston, South Carolina area” where the majority of this type of basketry is produced and sold (Hart, Halfacre et al. 2004). Now respected as a valuable art form, Lowcountry basket makers have received attention from the National Endowment for the Arts and the Smithsonian Institute, and local artisan Mary Jackson was recently named a MacArthur Fellow for her preservation of the craft and her efforts to “push the tradition in stunning new directions” (MacArthur Foundation 2008).

In the past three decades, several studies have traced the history of sweetgrass basketry to its African roots in rice production. Although the origins of rice in both western Africa and the Americas is unclear, by the late seventeenth century, highly-valued slaves with previous knowledge of rice cultivation from the “Upper Guinea Coast” or “Rice Coast” were brought to coastal South Carolina to transform the flat tidal marshes into productive rice fields (Rosengarten 1986). These African slaves also brought traditions of basketry as an essential element in rice production. The unembellished coiled basketry shown in Figure 3-5 was initially used for winnowing rice, or separating the grain from the chaff (Rosengarten 1986). The African basket forms were adapted to the native plants of the Lowcountry region and were initially constructed

Figure 3-5. Collage of sweetgrass basketry images. Photographs clockwise from top left show baskets used to winnow rice, the two primary components of the baskets growing together: sweetgrass and palmettos, baskets used for rice transportation, a map of major cities in the slave trade overlaid on an image of sweetgrass basketry, an artisan weaving a sweetgrass basket, a flooded rice field, and a basket used to winnow rice.

of black rush (*Juncus roemerianus*) and bound with splits of white oak (*Quercus alba*) and strips of saw palmetto (*Serenoa repens* [Bartram] J.K. Small) (Rosengarten 1986).

In addition to winnowing rice, these baskets were used for agricultural and household purposes and even sold by plantation owners for supplemental income (Hart, Halfacre et al. 2004). As Gia McKenzie explains, "Plantation masters ordered their slaves to make hundreds of bulrush baskets to winnow rice and storage baskets to stow, transport, and eventually export the grain…the coiled fanner basket became the signature form made by Africans in America" (McKenzie 2008). After emancipation, many African-Americans continued to produce baskets for agricultural and household uses. Throughout the past century, basketry has undoubtedly been an empowering task for many Charleston-area African-Americans by providing income, particularly during times of economic hardship such as the agricultural depressions of the late nineteenth century, hurricanes of the early twentieth century, and the agricultural infestation of the boll weevil that began in 1918 (Hart, Halfacre et al. 2004).

Around the turn of the twentieth century, the craft visibly shifted from utility to art when basket makers in Mount Pleasant, a suburb of Charleston, began making more intricate "show baskets" from the signature materials of sweetgrass[3] (*Muhlenbergia sericea*) bound with strips of palmetto (*Sabal palmetto* C. Loddiges) (Rosengarten 1986; Hart, Halfacre et al. 2004; Gustafson, Halfacre et al. 2008). Although their purposes have shifted throughout the past three-hundred years, sweetgrass baskets are culturally significant artifacts that tie together centuries of Lowcountry culture.

Figure 3-5 compiles multiple elements of sweetgrass basketry and its history into a cohesive image. The central map, illustrating important global cities during the height

[3] Sweetgrass (Muhlenbergia sericea) used in these coiled baskets is often described as a misnomer because it is a different from the more widely known sweetgrass (Hierochloe odorata) that grows in Canada and the Northern United States and is traditionally used in Native American basketry (Hart, Halfacre, and Burke 2004).

of the slave trade, is placed over an image of the sweetgrass coil to make visible the coiled basketry's relevance throughout the globe and the ability of the abstracted physical form of these coils to reflect the global circulation patterns important during this historical period. The other images tie the practice of sweetgrass basketry to the local cultures and landscape through the baskets' historical use, their incorporation of native Charleston plant resources, their manual and very tactile production, and their relevance in the exploited tidal marsh plantations. This form of coiled basketry informs the circulation patterns, design forms, plant materials, and programmatic uses of the schematic design proposed in this thesis to help ground the public waterfront in a unique cultural context that is both historically and presently relevant to the Charleston community.

Military History

During the wars of the eighteenth and nineteenth centuries, the Neck's traditions of marginalization and displacement became acutely visible as the Neck became a strategic location for military forces. During the American Revolution, British troops fortified this narrow strip of high ground to prevent goods from reaching the colonial city by land. Nearly a century later, the Neck became a Civil War battlefront for Union and Confederate troops struggling to control the economically and geographically significant city (Magnolia Development and Charleston 2007). African-American slaves built Confederate entrenchments across Rat Trap Plantation where wide expanses of marsh flanked a mere 300 yards of high ground. The entrenchments, located just south of the Magnolia property, could be flooded by a dammed creek from the Ashley River to create a physical boundary to the city (Browder 2003). The Neck's peace and wartime uses emphasize its dichotomous role as both invaluable gateway and neglected margin that reappear throughout the site's history.

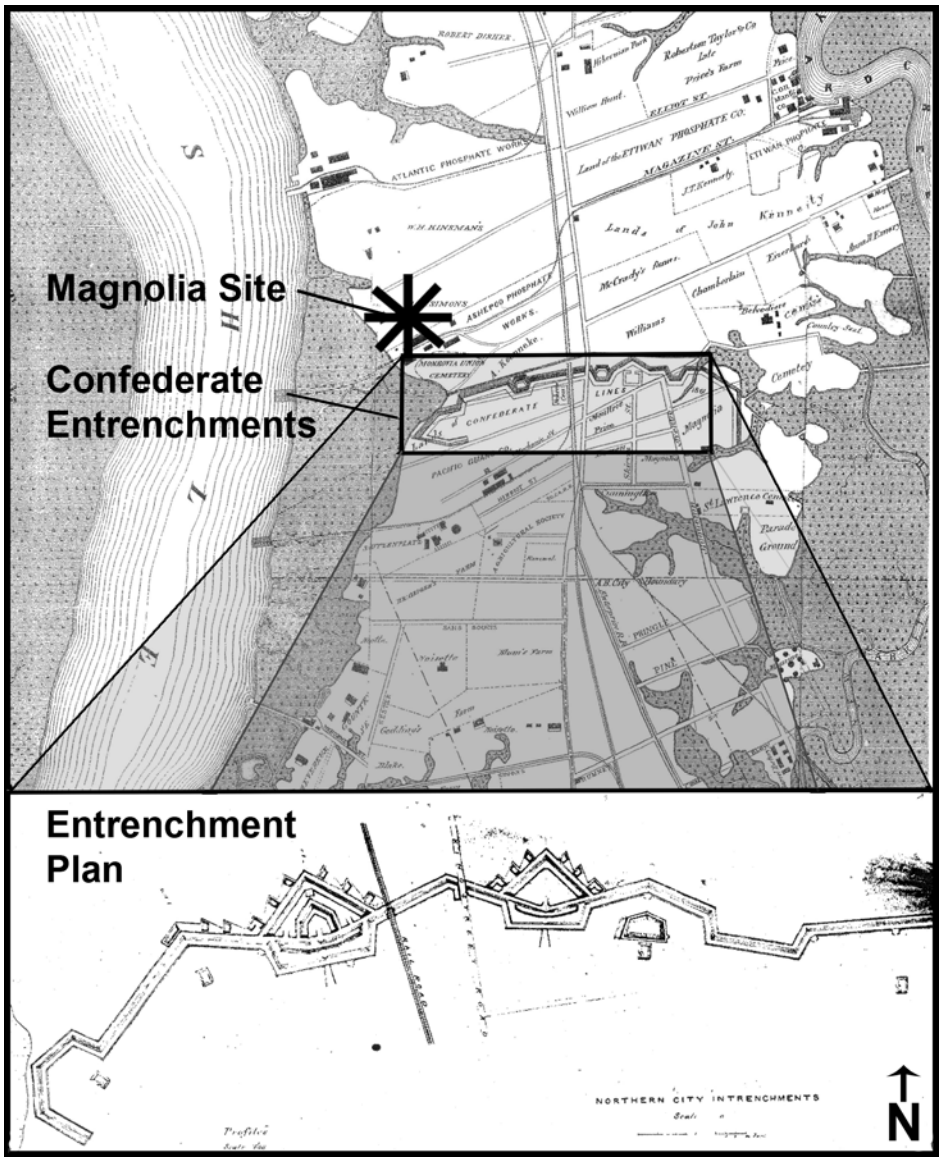


Figure 3-6. Confederate entrenchments built across the Charleston Neck. These fortifications were built to protect the city from Union forces during the Civil War. Images from Browder 2003.

These entrenchments, as illustrated in Figure 3-6, represent another essential and reappearing pattern throughout the site's history: the construction of harder waterfront edges that contrast with the marsh and offer protection and control over the constantly fluctuating landscape. This form reappears in the schematic design to allow public waterfront access where the land is not buffered by marsh and to contrast with softer natural edges.

Cemeteries

During the tumultuous time surrounding the Civil War, the Neck also became an important burial ground for many Charleston communities. Magnolia Development is actually named for Magnolia Cemetery, an active and traditionally Caucasian cemetery along the Cooper River founded in 1849 (McGahee and Edmonds 2007; Most 2008). In addition, several lesser-marked African-American cemeteries are adjacent to the main entrance of Magnolia Development along the marshes of the Ashley River. The largest of these, Monrovia Cemetery, is a 16-acre African-American burial ground established by a trust in 1872 and named for the capital of Liberia. Other burial aid societies established after the Civil War built several smaller African-American cemeteries

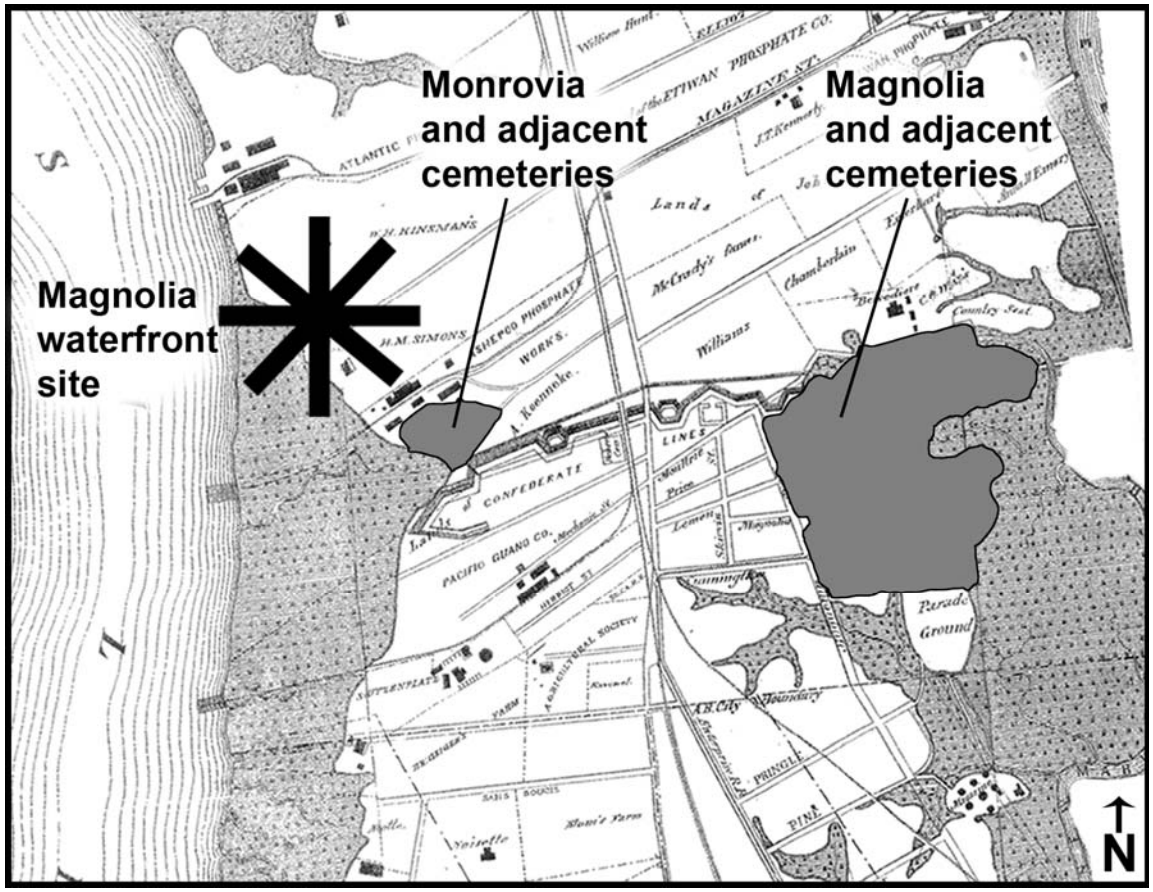


Figure 3-7. Location of historic cemeteries with relation to the Magnolia waterfront design site.

adjacent to Monrovia. The cemeteries and some of the societies remain active today (Browder 2003). Although Magnolia is named for the larger, traditionally Caucasian cemetery across the peninsula, it actually borders these smaller and traditionally African-American burial grounds. These cemeteries are one of the few indicators of continuous cultural activity in the Neck area, and their location at the entrance to the development makes them highly visible elements in the landscape.

Industrial History

Soon after the Civil War, phosphate ore was discovered on several plantations along the Ashley River. By 1888, the Neck and the North Charleston area had 21 fertilizer plants and provided one-fifth of the nation's total phosphate market. Even after phosphate mining diminished in the Charleston area, ores from around the southeast were brought to the Neck region for processing (Browder 2003). Eventually, the area was known as the "fertilizer capital of the world" (USEPA 2004). In addition to facilities for the fertilizer industry, a wood treatment plant was built on the Ashley River in the Neck area during the early 1900's on the central part of the Magnolia site (Magnolia Development and Charleston 2007).

Initially, emancipated African-American slaves supplied the majority of the Neck's industrial labor: by 1880 over 3,000 former slaves worked in the Neck's phosphate mines (Browder 2003). During the twentieth century, however, much of the area's industrial activity halted due to heightened environmental awareness and regulations. During the 1970's and 1980's, lighter industrial uses such as container storage and shipping replaced the labor-intensive heavy industry; however, the neighborhoods housing the once-necessary labor force remained despite fewer opportunities for employment. The four largest contemporary Neck neighborhoods—Rosemont, Four Mile, Silver Hill, and Union Heights—were initially built by industrial companies as housing for the area's labor force (Magnolia Development and Charleston 2007).

Figure 3-8. Collage of relevant Neck features during the late-nineteenth century. Photographs clockwise from top show images of Magnolia Cemetery, dead Confederate soldiers, Confederate troops in Charleston, industrial workers mining phosphate in the Charleston Neck region, and industrial workers processing phosphate ores in Charleston area factories.

Because of the area's changing economic context, the Neck communities remain highly-impoverished minority neighborhoods. Currently, the Magnolia site is located within a 7.3 square-mile federally designated Renewal Community comprised of 19 neighborhoods with a total population if 20,250. The designated area is 71% African-American with an estimated unemployment rate of 20% and a 1998 median household

income of $11,095 (USEPA 2004). Although most of the Magnolia site is uninhabited, development will greatly influence the surrounding communities. The potential volatility of large-scale development is enhanced by the site's sensitive socioeconomic context.

The construction Figure 3-8—a compilation of images, maps, and text from the site's late-nineteenth-century history—was particularly inspiring for the schematic design proposed later in this thesis. The visual exploration began with the central map labeled with important nineteenth-century elements. Next, images were placed under the map and arranged to follow their geographic locations. Almost immediately, patterns began to emerge throughout the arrangements. The text "Confederate Lines" became meaningful on several levels: the lines imposed upon the landscape in the entrenchments visibly contrast with landscape's organic lines, and the lines of men positioned to protect the city contrast with the lines of dead bodies that populated the American Civil War battle lines. The image of dead confederate soldiers placed next to the words "Confederate Lines" also touched the words "White Cemetery" describing the burial ground established on the Neck almost two decades before the American Civil War. The overlay of these two elements emphasizes patterns and rituals of death, acceptance, and renewal along the Neck region.

On the other side of the peninsula, the image of the African-American phosphate miners—almost too conveniently—aligns with "Black Cemetery" and, at first glance, even appears to illustrate African-Americans digging graves, though the men in this print are indeed mining phosphate in a Charleston-area mines. This overlay—combined with the manually dug entrenchments and other burial sites—inspire the mounds that appear in the final schematic design. Though not tied exclusively to any particular element of the site's history, the mounds recall intensive patterns of excavation and the rituals of burial characteristic throughout the Neck's history. They also contrast these dramatic

earthmoving practices with the slower land-shaping natural processes of the extremely flat tidal marsh.

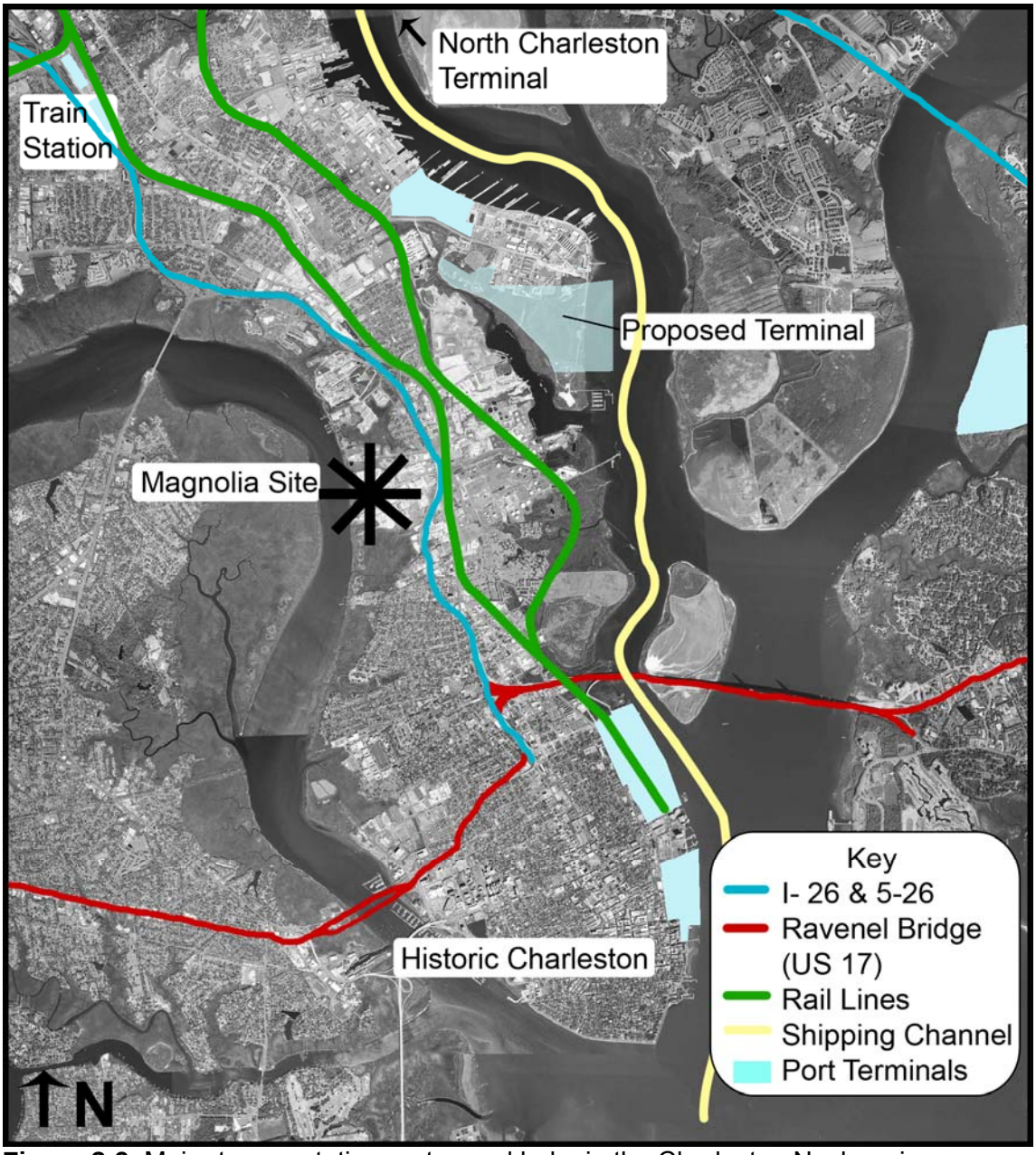


Figure 3-9. Major transportation routes and hubs in the Charleston Neck region.

Transportation History

The insecurity of the Neck communities' socioeconomic statuses is also reflected in the instability of the communities' physical locations. Because of Charleston's peninsular geography, communities based in the Neck region have been continually moved and dissected to increase—or in times of war prohibit—access to the city of Charleston. Beginning with the Native American Broad Path, transportation routes are integral to the Neck's history. Ferries and the shipping industry utilized the deep water resources adjacent to the Neck, and a railroad—built down the center of the Neck to connect Charleston to the mainland—is still a visible element in the Neck landscape. This railroad, begun in 1830, became "the primary lifeline for the phosphate and fertilizer industries" (Browder 2003). After industry and the railroad's usefulness dwindled, the construction of I-26 in the 1960's bisected the neighborhood from North to South, and the 2005 construction of the Ravenel Bridge displaced many residents and further separated the communities from downtown Charleston. If completed, the bridge planned to access the proposed port expansion from I-26 will further divide some of the longest standing Neck neighborhoods (Steck 2008).

The Marsh as a Relevant Resource

Indeed, the community's location on a narrow strip of high ground that provides the only land access to the growing city contributes to the site's history of dissection and community displacement. Because the Neck residents have been forced to relocate throughout the past, their attachment to place is limited by the insecurity of their geographic permanence. A connection between these communities and the adjacent marsh offers opportunities for community members to engage with and learn about this vitally important ecosystem while developing respect for the unique natural resources of their city.

Figure 3-10. Collage of marsh images.

The developers of Magnolia, therefore, should consider the role the marsh has played in the culture of Charleston in their treatment of the two-mile stretch of contaminated Ashley River waterfront. Although high rates of creosote contamination will prevent food harvesting on this particular site, the marsh has associations of sustenance as it provides habitat for shrimp, oysters, blue crabs, and other creatures integral to the unique Lowcountry cuisine. Fortunately, the inefficiency and illegality of developing the marsh has also preserved it as open space with views of the rivers and the vast array of birds, mammals, and sealife these wetlands support. In addition, the marsh provides a buffer for floods, hurricanes, and other natural threats and metaphorically represents the coastal city as the place where land and water come together to support a unique habitat. As a result, the image of the marsh has become essential to Lowcountry place-identity. An appropriately sensitive waterfront design will strive to connect the traditionally marginalized Charleston Neck people with the adjacent and restored marsh to support a more socially and ecologically inclusive community.

Figure 3-10 experiments with cultural and natural elements of the marsh located adjacent to the proposed Magnolia Development. The background image and the swatches of marsh grass are from photographs taken by the author onsite, so the vegetation, radio tower, and housing development in this image are, indeed, visible elements in the Magnolia waterfront. The photograph of the snake was also taken onsite and closely resembles the form of the marsh's winding creeks. The silhouetted man is throwing a cast net—a tool that also resembles this serpentine form—to catch shrimp or small fish that are, in turn often used as bait for larger fish. This practice closely resembles the fishing of the Great Blue Heron also depicted in the collage. These birds are common and extremely noticeable in the marshes along Magnolia, particularly during low tide. As an exploratory tool, Figure 3-10 illustrates the commonalities among the humans, animals, and the landforms that comprise the marsh landscape, but also

reminds the viewer of the ever-present industrial impact of humans on the salt marsh ecosystem.

CHAPTER 4

ENVIRONMENTAL CONDITIONS

Brief Overview

The cultural and natural features of Magnolia Development's site offer a prime opportunity to strengthen ecological awareness in both the existing and proposed communities. Currently, the site is a 218-acre tract comprised of 154 acres of high ground and 64 acres of marsh along the Ashley River. Because of the site's industrial past and its location adjacent to a significant waterway, intensive contamination remediation has occurred and successfully rendered the site appropriate for human use (USEPA 2008). The large portion of the property preserved as marsh and the industrial traditions of the land offer an opportunity to increase community understanding of both the unique marsh ecosystem and the implications of industrial landscapes.

Fortunately, the United States Environmental Protection Agency (USEPA) recognized several portions of the site as potential beneficiaries from investment through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (USEPA 2008). This act, passed in 1980, created a Superfund from taxes on chemical feedstocks and raw petroleum to assist in the investigation, evaluation, and cleanup of hazardous waste sites listed on the National Priorities List. The former Koppers wood treatment property was discovered by the USEPA in 1979, assessed in 1980, and listed on the National Priorities List in 1994. A Remedial Investigation/Feasibility Study was conducted in December 1996 (Applied Technology & Management 2008). USEPA-funded cleanup began in 1996 and was completed in 2003. In addition, two other Magnolia parcels—Ashepoo Phosphate/Fertilizer Works and Columbia Nitrogen Works—were regulated by CERCLA. Furthermore, the entire Neck

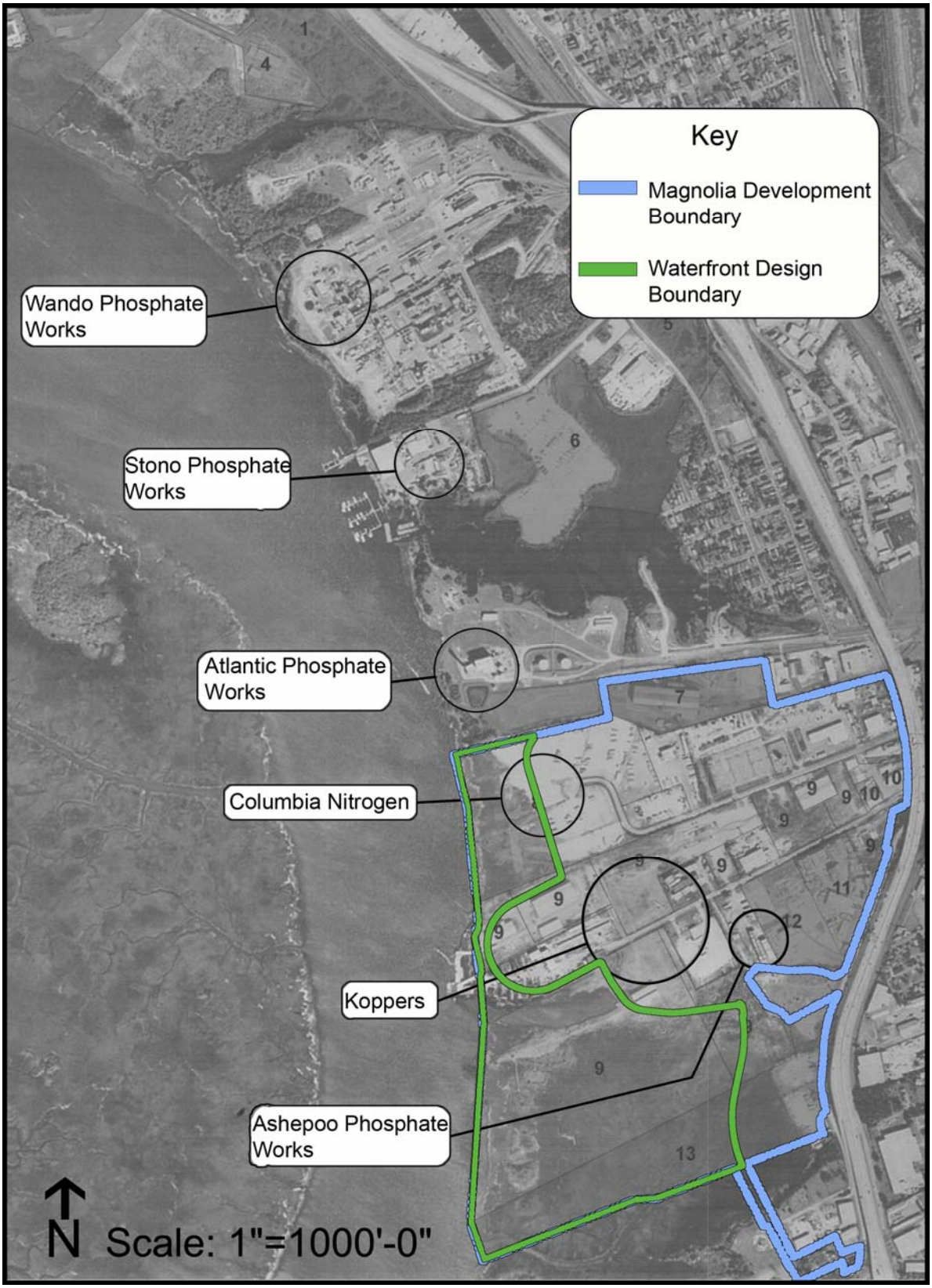
area received additional USEPA funding as a Brownfields Assessment Pilot in 1998 to stimulate economic growth and job opportunities through the redevelopment of the more than thirty brownfields in the area. Supplemental funding was granted to the Neck area through related brownfield grants in 2000, 2001, and 2004. This frequent federal recognition and funding has fostered intensive research, contamination assessment, and remediation activities in the Neck area.

Industrial Influences on the Landscape

The Magnolia site is comprised of the three major industrial parcels noted above: Ashepoo Phosphate/Fertilizer Works in the southern part of the site, Columbia Nitrogen in the northwestern part of the site, and Koppers, Inc. in the central part of the site. Ashepoo Phosphate/Fertilizer Works was the earliest industrial facility on the site and operated from around 1880 until 1970 to produce phosphate fertilizer. The Columbia Nitrogen site also manufactured phosphate fertilizer from 1905 until 1972 (Magnolia Development and Charleston 2007). The Koppers Company Product Facility was used for milling, wood treatment, and storage from the early 1900's until the late 1970's, but wood treatment at the site may date back to 1900 by other entities (Berquist, Dudley et al. 1993; Magnolia Development and Charleston 2007; Applied Technology & Management 2008).

During Koppers' operation, by-products from the wood preservation process—oily sludge, fungicide, creosote, and trace elements—were disposed of in onsite landfills (Berquist, Dudley et al. 1993). After Koppers closed in the 1970's, portions of the property were leased to Pepper Industries and Federal Service Industries primarily for waste storage. Pepper Industries abandoned the site in 1983 and left 980,000 liters of

Figure 4-1 (page 47). Location of Ashley River industrial sites within and immediately north of Magnolia Development. Image adapted from "Magnolia Properties" poster prepared by General Engineering and Environmental, LLC, 2006.


Key
Magnolia Development Boundary
Waterfront Design Boundary
Wando Phosphate Works
Stono Phosphate Works
Atlantic Phosphate Works
Columbia Nitrogen
Koppers
Ashepoo Phosphate Works
N
Scale: 1"=1000'-0"

hazardous materials—ship bilge and tank waste—in storage containers that eventually leaked waste elements into the soil (Berquist, Dudley et al. 1993; USEPA 2008).

In the 1980's, South Carolina Department of Health and Environmental Control (SC DHEC) also found leaks in the creosote tanks that Federal Service Industry used to store oily waste. This waste saturated the soil and pooled in several areas that were cleaned beginning in 1985 (Berquist, Dudley et al. 1993). Environmental investigation identified three major contaminated areas in the former Koppers site: the unlined pit used for dipping poles in preservatives, the drip pad and storage area for these treated poles, and the spoils area where sediment was impounded from the dredging of the barge canal in the 1980's (Berquist, Dudley et al. 1993).

Currently, the barge canal is one of the most remarkable landscape features of the Magnolia site. During the most active industrial period (1939-the 1970's), a mudflat isolated from the Ashley River by marsh grass appears in the location of the current barge canal in aerial photographs (Magnolia Development and Charleston 2007). After Koppers and Ashepoo Phosphate/Fertilizer Works closed and the land was used for shipping and storage, a barge canal was dredged to offer deep-water access to the site. Originally, a deep channel extended almost 1,000 feet inland from the Ashley River; sedimentation, however, has caused the canal to accrete, and smooth cordgrass (*Spartina alterniflora)* has established significant clumps throughout the former channel (Magnolia Development and Charleston 2007). Although much contamination resulted from later waste storage activities, the intensive dredging of the barge canal also revealed significant soil contamination from earlier wood treatment processes (Magnolia Development and Charleston 2007).

The Remedial Investigation/Feasibility Study revealed several contaminants in various site elements. Free creosote was discovered underground at three places on the site and also in the surface water and sediment of drainage ditches that discharge storm

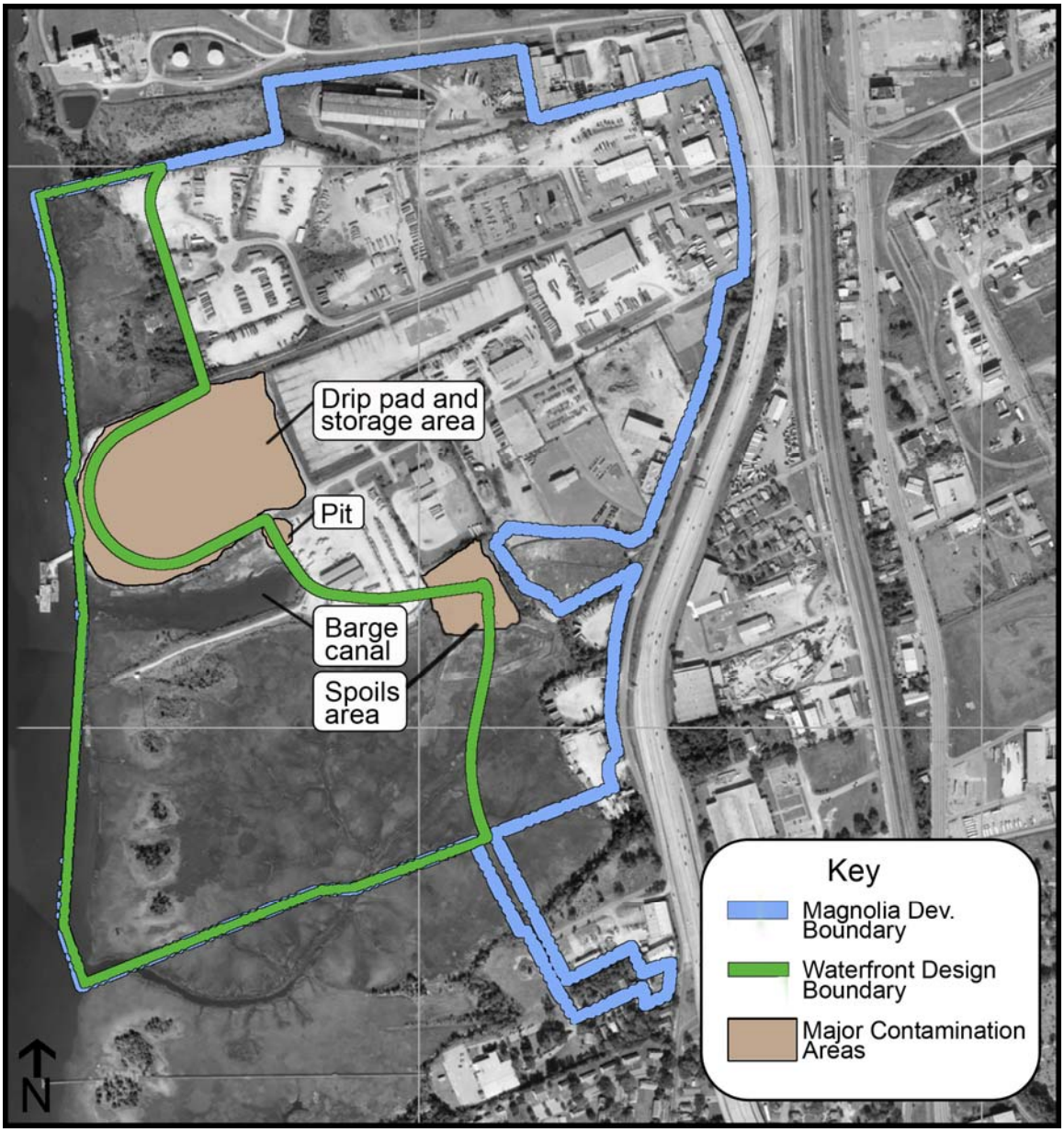


Figure 4-2. Location of primary contamination zones within the Magnolia site detected by initial USEPA tests in 1988.

water runoff into the Ashley River (Applied Technology & Management 2008). Polycyclic Aromatic Hydrocarbons (PAHs), contaminants present in creosote, were detected in the soil, groundwater, sediment, and surface water (USEPA 2008). Other industrial contaminants such as dioxins, lead, and arsenic were found at elevated levels in the soil, sediment, and surface water of the site (USEPA 2008). In addition, pesticidal

contaminants were present in significant quantities: pentachlorophenol (PCPs) were present in the soil and sediment, and dieldrin was present in the sediment and surface water (USEPA 2008).

On this site, timely remediation of these contaminated soils and sediment is particularly relevant because of the land's immediate adjacency to wetlands and a major river. During the wood treatment operations, storm water runoff from the site flowed through open canals that discharged into the Ashley River, and excess runoff was discharged through a culvert into the marsh located south of the site (Berquist, Dudley et al. 1993; Applied Technology & Management 2008). Indeed, ecologically significant levels of toxicity were indicated in the sediment of the eastern area of the Ashley River and its marshes during the Remedial Investigation/Feasibility Study (Applied Technology & Management 2008).

The National Oceanic and Atmospheric Association (NOAA) has studied the adjacent marsh and river because these natural features provide habitat for several NOAA trust species, and high levels of contamination—particularly in the Ashley River surface water, bottom substrate, and wetlands—potentially threaten these species (see Table 4-1). The estuarine emergent wetlands, both within and adjacent to the Magnolia site and across the Ashley River, provide spawning, nursery, and adult habitat for a variety of species (Berquist, Dudley et al. 1993). NOAA trust resources with significant populations near the site are spot, Atlantic croaker, spotted sea trout, red drum, American oyster, and blue crab. In addition, several other species of fish, shellfish, and eel inhabit, spawn, and mate in the lower Ashley River and its adjacent wetlands (Berquist, Dudley et al. 1993).

NOAA has indicated concern regarding the significant levels of PAHs and Polychlorinated biphenyls (PCBs) as well as elevated concentrations of cyanide, arsenic, chromium, copper, lead, mercury, nickel, silver, and zinc found in soil, surface water,

Table 4-1. NOAA fish and invertebrate species commonly found in Charleston Harbor and the Ashley River, Charleston, South Carolina. Copied from Berquist et. al, *Koppers Company, Inc*. 2003.

Species		Habitat			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Comm.	Recr.
ANADROMOUS/ CATADROMOUS SPECIES						
Shortnose sturgeon [1]	*Acipenser brevirostrum*					
Atlantic sturgeon	*Acipenser oxyrhynchus*			♦		
Blueback herring	*Alosa aestivalis*			♦		
American shad	*Alosa sapidissima*			♦		
American eel	*Anguilla rostrata*		♦	♦		
Striped bass	*Morone saxatilis*		♦	♦		♦
ESTUARINE SPECIES						
Bay anchovy	*Anchoa mitchilli*	♦	♦	♦		
Sheepshead	*Archosargus probatocephalus*		♦	♦		
Atlantic menhaden	*Brevoortia tyrannus*		♦	♦		♦
Atlantic spadefish	*Chaetodipterus faber*		♦	♦		
Spotted sea trout	*Cynoscion nebulosus*	♦	♦	♦		♦
Sheepshead minnow	*Cyprinodon variegatus*	♦	♦	♦		
Mummichog	*Fundulus heteroclitus*	♦	♦	♦		
Spot	*Leiostomus xanthurus*		♦	♦		♦
Atlantic silverside	*Menidia menidia*		♦	♦		
Southern kingfish	*Menticirrhus americanus*		♦	♦		
Atlantic croaker	*Micropogon undulates*		♦	♦		♦
Striped mullet	*Mugil cephalus*		♦	♦		
Summer flounder	*Paralichthys dentatus*		♦	♦		♦
Southern flounder	*Paralichthys lethostigma*		♦	♦		♦
Black drum	*Pogonias cromis*		♦	♦		
Bluefish	*Pomatomus saltatrix*		♦			♦
King mackerel	*Scomberomorus cavalla*		♦	♦		
Spanish mackerel	*Scomberomorus maculatus*		♦	♦		
Red drum	*Sciaenops ocellatus*		♦	♦		♦
INVERTEBRATE SPECIES						
Blue crab	*Callinectes sapidus*	♦	♦	♦	♦	♦
American oyster	*Crassostrea virginica*	♦	♦	♦		
Hardshell clam	*Mercenaria mercenaria*	♦	♦	♦		
Grass shrimp	*Palaemontes pugio*	♦	♦	♦		
Brown shrimp	*Penaeus aztecus*		♦	♦		
Pink shrimp	*Penaeus duorarum*		♦	♦		
White shrimp	*Penaeus setiferus*		♦	♦		
Common rangia	*Rangia cuneata*	♦	♦	♦		

1 This species is federally endangered

and sediment screenings of the grounds and in the drainage canals. Although sediment from the adjacent wetland indicated PAH contamination, the Ashley River surface water and sediment tests did not indicate that PAHs were present in the river (Berquist, Dudley et al. 1993).

Remediation Strategies

Fortunately, intensive remediation efforts began in the mid 1990's. Beginning in 1996, contaminated sediment was excavated along the drainage ditch, and a closed pipe system replaced the open canals to discharge storm water runoff. Extraction wells along the former drainage ditch were installed to recover free-phase creosote and to prevent groundwater from running offsite (Applied Technology & Management 2008). In 1998, the EPA issued a final remedial strategy for the site to be approved for human exposure that required excavation and off-site disposal of 12,000 tons of soil, installation of a 30-acre engineered soil cap, reconstruction of drainage ditches, continued extraction of contaminated groundwater and free-phase creosote, installation of a sand blanket along the Ashley River and Barge Canal, and restoration of any impacted marshes (Applied Technology & Management 2008).

In 2003, the EPA issued *Explanation of Significant Difference to the Final Record of Decision Koppers Co., Inc. (Charleston Plant) EPA ID: SCD980310239 OU 01 Charleston, SC* that changed two of the original remediation prescriptions. An intensive sedimentation analysis of the Ashley River and Barge Canal demonstrated that natural sedimentation in the Barge Canal could potentially add up to 1.2 feet of sediment per year, and the naturally deposited sediments contained only background PAH concentrations. The EPA confirmed that this natural process would sufficiently cap the contaminated soils within the Barge Canal. In addition, studies of the creosote in the northwest corner indicated that removal of creosote located 12-14 feet below the

surface was impractical, and stabilization and solidification would sufficiently control the substance (Applied Technology & Management 2008).

Although bioremediation is an increasingly popular low-impact cleanup strategy for contaminated soils, this thesis does not explore the option because contaminants have been controlled sufficiently through other means. In addition, natural remediation of creosote-contaminated water and soil has been tested under several circumstances with mixed results. Mueller et al. found that the indigenous microflora in Pensacola, Florida were successful in remediating small amounts of creosote, but they were not capable of remediating highly contaminated sites, particularly within a short period of time (Mueller, Chapman et al. 1989). Similarly, Arvin and Flyvbjerg found in 1992 that bacteria had the capacity to break down creosote components in both aerobic and anaerobic conditions and to stop them from spreading to adjacent locations, but this method may also not be effective in highly contaminated sites (Arvin and Flyvbjerg 1992). More research is necessary on the potential for bacteria and microflora to break down creosote components, on the implications of introducing these species into the Magnolia ecosystem, and on the particular contamination levels still present at the Magnolia site before concluding whether bioremediation is an appropriate or necessary solution to Magnolia's remnant contamination. Regardless of whether indigenous species can effectively remediate the specific pollution present, however, reestablishment of marsh habitat will be effective in physically stabilizing contaminated or excavated marsh land and in reestablishing a healthy native ecosystem.

Currently, no part of the Magnolia site is listed on the National Priorities List. Although the proposed and conducted remediation strategies are designed for light industrial development and not residential or mixed-use communities, the EPA has declared contaminants controlled sufficiently for human exposure. The long history of industrial use, toxicity, and contamination, however, should not be forgotten in the

design for Magnolia. In particular, the natural processes such as sedimentation and succession that are reclaiming the site should be inspiration for and apparent in an appropriate public waterfront design.

Figure 4-3 was composed to help visualize significant landscape elements during these highly industrial times that could inform the schematic design. As described in the previous chapter, the images of African-American men digging phosphate mines partially inspired the mounding that is integral to the final design. The recently uncovered phosphate boats in Figure 4-3 bear striking resemblance to remnant piers currently decomposing in the site's surrounding marsh, and both of these elements were integral to the placement of the rows of pilings along the fishing pier in the schematic design. This schematic design element was also inspired by the seemingly infinite piles of treated logs apparent in the image of Koppers in Figure 4-3 that contrasts with the early pine forests of the Magnolia site. These contrasting images are further enhanced by the uprooted tree in the background of one of the mining images, and in the caption that reads "Charleston Grows"—a statement with multiple meanings throughout history: population growth, economic growth, destruction of forest growth, growth of crops, and production of fertilizer to help other crops grow. The growth and decay of each of these processes cycle throughout the Neck's history, and the schematic design proposed in this thesis strives to illuminate multiple historical periods while simultaneously expressing these essential processes of growth and decay.

Figure 4-3 (page 55). Collage of industrial images from the Neck. Clockwise from top left: African-American men working in the Neck's phosphate mines (Powers 1990); another image from the same print set; photograph taken onsite by the author of existing remains of shipping piers; the Malcolm boat, a phosphate boat recovered in the Charleston area (Browder 2003); piles of treated timbers at the Koppers plant (Browder 2003); another view of the Malcolm boat (Browder 2003); industrial facilities that remain on the Neck (Browder 2003).

Photo of Koppers facility from Charleston Grows.

CHAPTER 5

SITE INVENTORY

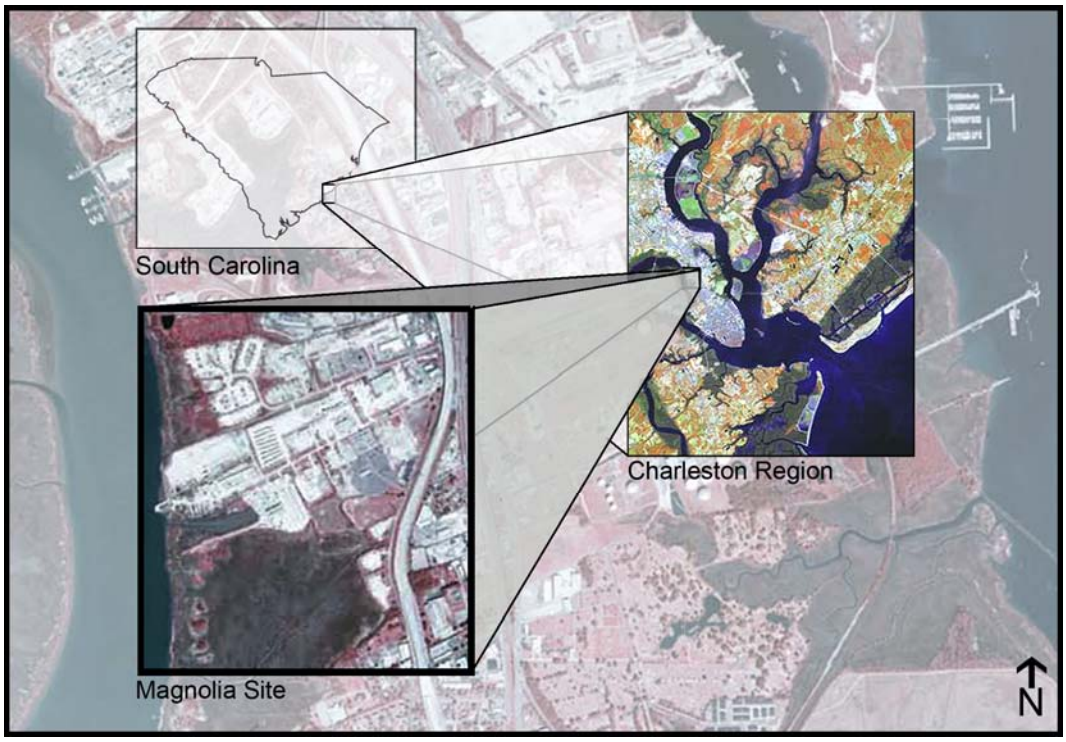


Figure 5-1. Regional context of Magnolia Site.

Site Location

As described before, the site of Magnolia Development is a 218-acre tract along the Ashley River on the western edge of the Charleston Neck, the narrowest part of the Charleston peninsula that connects the historic city to the mainland (Magnolia Development and Charleston 2007). The Charleston peninsula is formed by the confluence of the Ashley River to the west and the Cooper River to the east. The rivers meet below the peninsula in Charleston Harbor, and the historic city of Charleston has grown upward from the southernmost tip of the Charleston peninsula. The Magnolia site

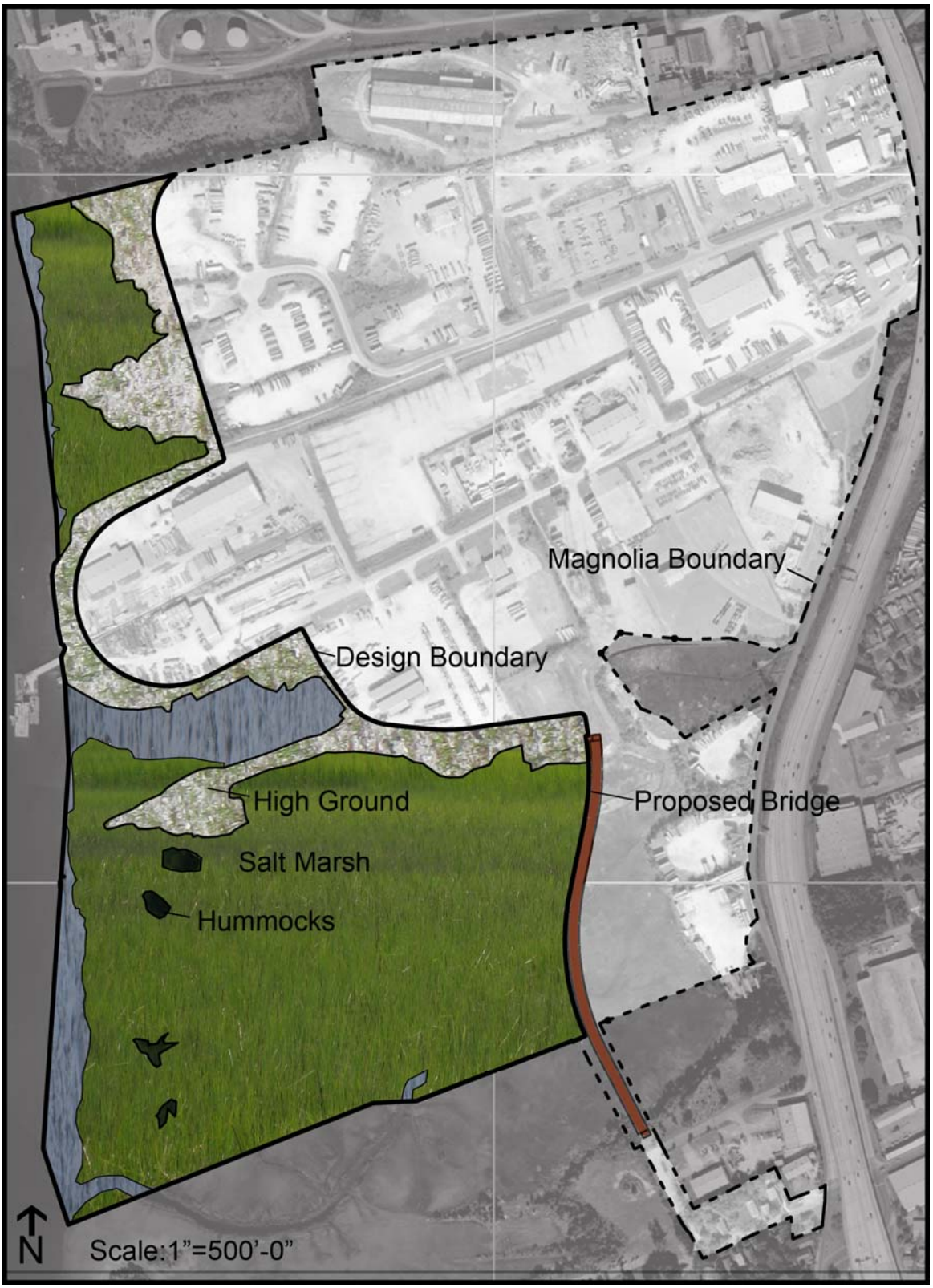


Figure 5-2. Public waterfront design boundaries and major landscape features.

is approximately 8 kilometers upriver from Charleston Harbor and 14 kilometers from where Charleston Harbor empties into the Atlantic Ocean (Berquist, Dudley et al. 1993).

The public waterfront area included in this thesis is approximately 79 acres, consisting of approximately 14 acres of high ground and 65 acres of wetlands. Of the 14 acres of high ground, about half an acre is comprised of four hummocks, or small islands emerging from the marsh. The wetland area is primarily tidal estuarine marsh and also includes the 4.5-acre former barge canal, small fragments of a tidal creek along the southern property line, and approximately 4 acres of river beyond the marsh, all of which are regularly submerged in water.

Figure 5-3. Photograph of existing site conditions. Photo from of DesignWorks, LC 2007.

Site Boundaries

The northern, western, and southern boundaries of the design area are determined by the property lines of Magnolia Development (see Figure 5-2). The northern property line crosses approximately 50 feet of the Ashley River, 167 feet of tidal marsh, and 381 feet of high ground along the southern edge of Plant Hagood, a South

Carolina Electric and Gas generating plant. The western edge lies entirely within the Ashley River, and the southern edge lies within an estuarine marsh and crosses a small tidal creek.

The eastern edge of the design area, however, lies within the proposed Magnolia Development and runs along the back-of-curb of the proposed roads. Although the thesis does not address the adjacent building, street, or park designs, a brief outline of the proposed development is useful to give context to the waterfront design. For the purpose of this thesis, the design presented by Magnolia Development, LLC and the City of Charleston in the 2007 *Magnolia Concept Plan* will be referred to as the proposed design.

Beginning in the northeastern corner, the design edge runs along the primarily residential North Park sub-district that also features an inland park designed primarily to serve residents of the new neighborhood. Although the design of this inland park will not be addressed in this thesis, its location and function will be considered to promote the continuity of green spaces throughout the development. South of the North Park neighborhood, the design edge borders the Maritime Center sub-district that will be devoted to entertainment, hospitality, residential, and civic uses. Southeast of the Maritime Center, the design area is adjacent to another mixed-use sub-district that features Magnolia's main shopping street and the primary entrance into the development. Within all three adjacent sub-districts, the buildings nearest to the waterfront design area will be 55 feet or less in height, although building heights of up to 120 feet are proposed within Magnolia Development. The remainder of the design edge is formed by the proposed Magnolia Bridge that runs over the tidal marsh and will serve as the primary connection between Magnolia Development and the Charleston peninsula. The proposed bridge accommodates pedestrian and vehicular access and will be a highly visible element in the marsh landscape.

Zoning and Land Use

The entire Magnolia Development Site has been zoned as a City of Charleston Gathering Place District, a designation created to foster mixed-use and pedestrian-oriented communities (Magnolia Development and Charleston 2007). According to the

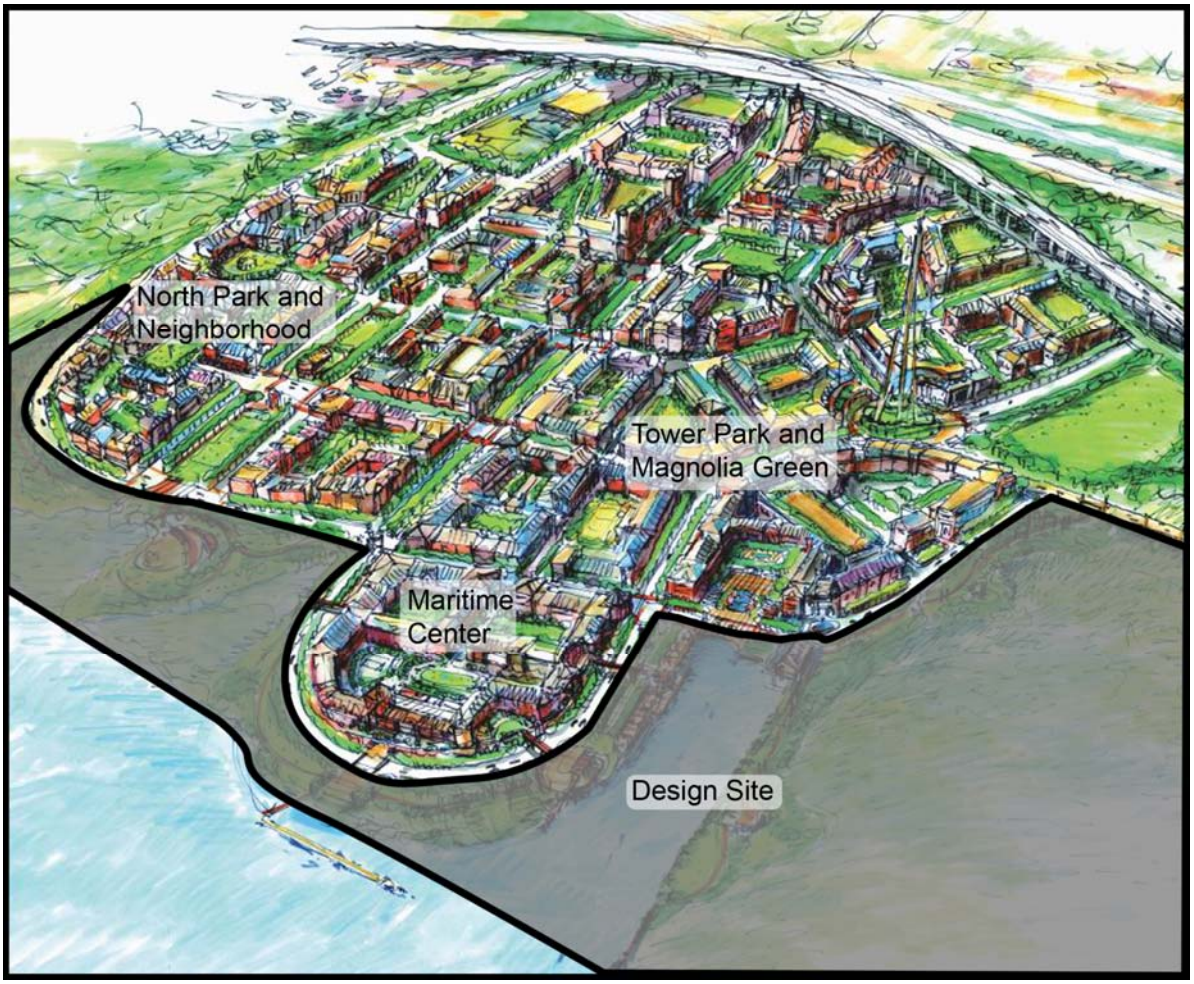


Figure 5-4. Rendering of proposed Magnolia Development prepared by DesignWorks, LC 2007. The design site addressed in this thesis is denoted with the gray overlay.

published Concept Plan, “Magnolia includes a mix of residential, retail, office, hotel and civic uses, creating a true urban community where visitors and residents live, work, shop, dine and recreate” (Magnolia Development and Charleston 2007). The visioneering session conducted by the developers and designers of Magnolia

incorporated input from community charrettes and local government agencies to produce the following goals for the development:

> •Create a place that is respectful of history and the surrounding communities;
> •Create a place of continued recognition for its geographic and economic importance;
> •Create a place of diversity in age, income, and race that is knit into a genuine community;
> •Create a nationally recognized sustainable community to complete the environmental healing process;
> •Create the highest quality Public Realm;
> •Create a place that is embraced by Charlestonians. (Magnolia Development and Charleston 2007)

The goals for the community outlined above correlate with the ideas presented in previous chapters of this thesis and will be extended into the design of the public waterfront spaces. The waterfront design incorporates these goals to connect the new development with both the surrounding communities and the natural features of the site.

Wind and Sun Patterns

In pursuit of several of the goals listed above, the designers of the new development conducted sun and wind studies for the area. Hot summers and abundant ocean breezes are an important part of the subtropical coastal climate, and the location of the Magnolia waterfront is optimal for utilizing the cool spring and summer breezes from the southwest and for screening the colder fall and winter winds from the northeast with buildings (See Figure 5-5). The temperate climate also encourages the use of outdoor facilities throughout the year, and the solar angles are important in placing structures and plants to enhance summer shade and foster access to sunlight in winter. In addition to enhancing user comfort, harnessing these natural forces can contribute to the community's sustainability through increased energy independence.

High Ground

Because of the site's long history of intense industrial use, few natural features of the landscape are visible. The high ground section of the waterfront site is primarily flat,

impervious, and lacking vegetation. The ground gradually slopes downward toward the marsh and river at gradients typically less than one-half percent (.5%) (Magnolia Development and Charleston 2007). The ground surface of the design area is primarily an impervious combination of compacted gravel, asphalt, and buildings. Some small grasses have emerged since the industrial sites were abandoned, but little existing vegetation is present. The majority of the native soils have also been displaced by industrial activities. Much of the high ground within the design area is fill from industrial activities of the late 1800's and early 1900's, and most of the remaining upper soil layers throughout the site were excavated during industrial activities and environmental remediation procedures (Magnolia Development and Charleston 2007).

Hummocks

A series of several hummocks surrounded on all sides by marsh line the Ashley River within the Magnolia site. These hummocks comprise only approximately half an acre of the design area, but they are highly visible interruptions to the flat salt marsh landscape. Because the Ashley River was once a major shipping thoroughfare serving the fertilizer and wood processing factories of the Charleston Neck, systematic dredging maintained the depth and width of the channel to accommodate barges and other large vessels. These hummocks are the result of accretion around the spoils deposits from these dredging activities (Stevens 2008). Although the landforms originated from industrial activity, their inaccessibility has allowed natural accretion and plant succession to progress undisturbed. As a result, these hummocks inform the designer about plants and ecosystems that may thrive in the larger site—information particularly beneficial in a site with almost four hundred years of human disturbance to the native ecosystem.

Marsh and River

Beginning at the critical high ground line, the ground slopes down toward the river at an approximately 10 to 1 (horizontal to vertical) slope until it reaches

approximately -5-foot North American Vertical Datum 1988 (NAVD 88) contour (Applied Technology & Management 2008). Beyond this depth, the marsh turns to river, and the ground drops at a 2.5 to 1 slope to the -25-foot NAVD 88 contour (Applied Technology & Management 2008). The central channel of the Ashley River adjacent to Magnolia ranges from approximately -27 feet to -30 feet NAVD 88 (Applied Technology & Management 2008). The river's substrate is primarily mud and sand (Berquist, Dudley et al. 1993).

The tidal marsh section of the design area appears significantly more pristine than the adjacent high ground. The estuarine vegetation is dominated by smooth cordgrass (*Spartina alterniflora*) and rushes (*Juncus spp.*) with small pockets of freshwater wetlands (Berquist, Dudley et al. 1993). Although the salinity range of the lower Ashley River—17 to 22 ppt (parts per thousand) depending on rainfall, saltwater intrusion, and urban runoff—is significantly lower than the average 35 ppt of the ocean, water with salinity content over 17 ppt is considered saltwater. This highly saline quality makes the relatively protected marshes of the Ashley River an important nursery and breeding habitat for several marine species (Berquist, Dudley et al. 1993).

Tides and Floods

In addition to the migration of marine species, the marsh's visible tides emphasize the site's relationship with other coastal waters and estuaries. There are two high and two low tides per day, with mean and spring ranges of 5.6 and 6.1 feet, respectively, and during major storm events, this tidal nature becomes even more apparent (Applied Technology & Management 2008). Approximately 11.5 acres of high ground and all of the wetland areas are designated as FEMA velocity zones which indicates susceptibility to wave heights of 3 feet or greater during a 100-year storm event and susceptibility to flooding during smaller storms (Applied Technology & Management 2008). An additional 2 acres of high ground lies within the 100-year flood zone,

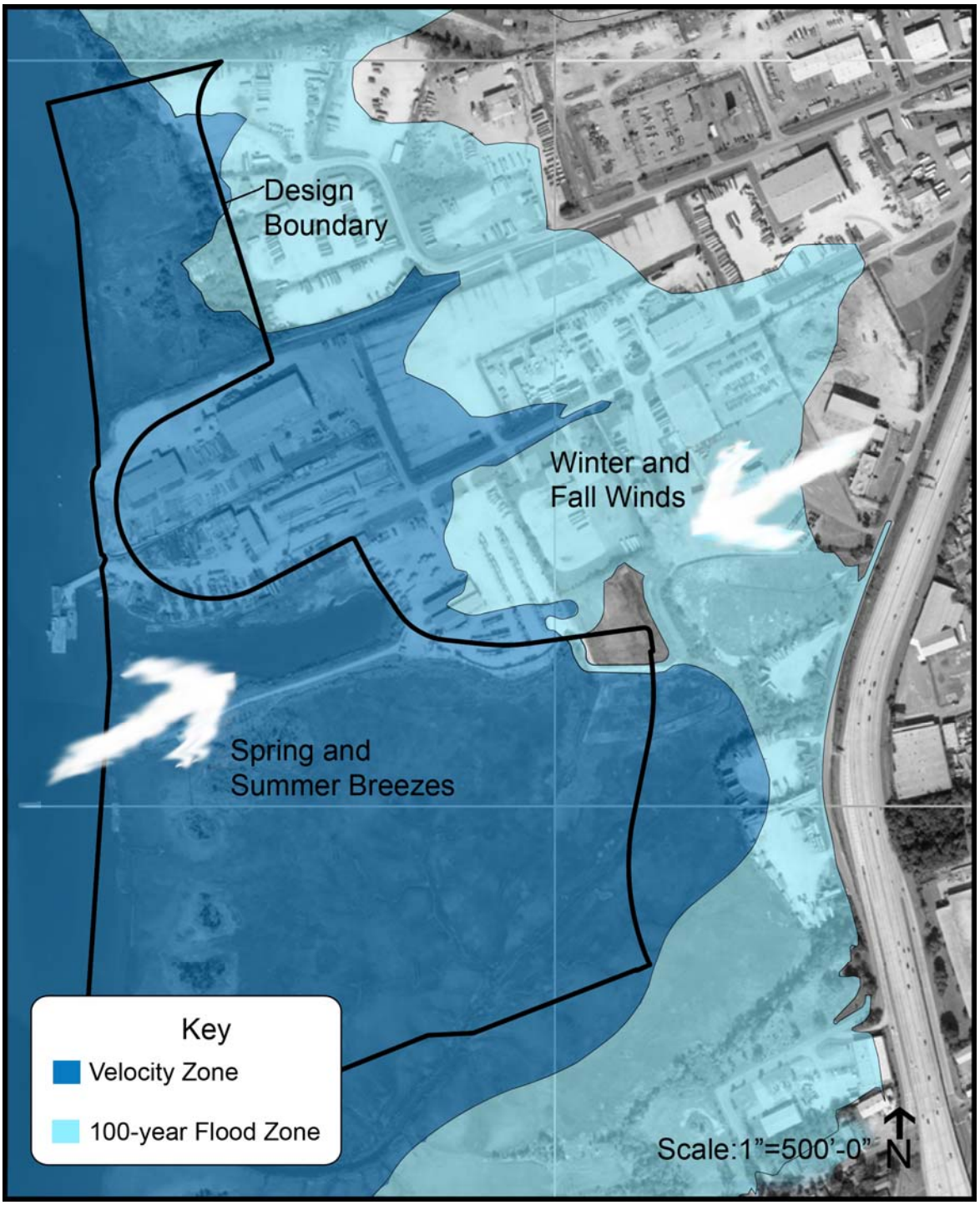


Figure 5-5. FEMA velocity and 100-year flood zones with seasonal wind directions.

indicating susceptibility to flooding in a 100-year storm event, and only approximately half an acre (.57 acres) of the 79-acre site lies outside of the 100-year flood zone. The

potential for flooding must be considered in the design of the waterfront, both in the selection of plants and in the design of new structures within the public land. In addition, the dynamic presence of water in the landscape should be emphasized to connect users to the natural cycles and processes occurring onsite.

Figure 5-6 illustrates the apparent tidal changes over a period of six hours as observed onsite by the author. The powerful and ever-active tides contrast with the less consistent human forces also visible onsite. The collage juxtaposes these forces, and reflects growing research that suggests that harnessing natural forces—such as tides and winds—can be more efficient and less intrusive than traditional industrial equipment. Contemporary design, as proposed in this thesis should strive to combine human industry with nature's forces for more sustainable energy and a more apparent connection between cultural and natural processes.

A Collaged Inventory

In addition to the historical and environmental inventories explored through collage in the previous chapters, photographic inventories conducted onsite by the author were essential to the development of the final schematic design. These photographs serve as a visual inventory, and when they are arranged—both next to other photographs and next to sketches and historical images, they highlight important landscape patterns and reflect still-visible elements of the diverse cultural and natural processes essential to the site. These arrangements—both those presented as figures and more casual observations conducted by the author—inform the design and serve as rendering tools in the final chapters. Elements of all the collages compiled in Chapters 3 through 5 reappear throughout the concept collages, design graphics, and illustrative renderings. The visibility of both the design/collaging process and of consistent or reappearing imagery throughout this thesis support the contextual-based design approach that highlights patterns in the site's processes as essential design elements.

Figure 5-6. Collage of barge canal images. Photographs taken by the author during high and low tidal extremes on July 23, 2008.

Figure 5-7. Collage of photographs taken by the author looking toward the design site from the Ashley River.

Figure 5-8. Collage of photographs taken by the author onsite.

CHAPTER 6

DESIGN APPLICATION

Design Intent

The design for the public Magnolia waterfront strives to foster a distinct sense of place by collaging the site's unique cultural and natural processes into a functional public space that offers opportunity for active and passive recreation. The design's forms integrate multiple artifacts and processes unique to the site into an engaging space open for interpretation or simple enjoyment. In addition, the design communicates with the proposed Magnolia community to create greenspaces and pedestrian routes that permeate the design boundaries.

Serving a Cultural Need

In this design, consistent plant materials tie the scattered spaces together. In addition to enhancing the spaces with color, texture, and movement, and reclaiming a polluted site with indigenous species, the primary materials in the designed sites serve a cultural and economic need. The majority of contemporary sweetgrass baskets are comprised of sweetgrass threads bound with palmetto strips and enriched with longleaf pine needles (*Pinus palustrus* P. Miller) and cuttings of black rush (*Juncus roemerianus* G. Scheele) for tone and texture (see Chapter 3). Of the four main components, sweetgrass is both the most essential and the most difficult for basket makers to obtain (Hart, Halfacre et al. 2004). Naturally, sweetgrass grows in clumps landward of the second dune line on barrier islands and between the marshes and maritime forests of the mainland. Primarily because of real estate development, this resource has become increasingly difficult for basket makers to gather. In addition to destroying habitat for sweetgrass, coastal development has limited basket makers' access to existing

populations through the privatization of these water- and marsh-front locations (Hart, Halfacre et al. 2004; Gustafson, Halfacre et al. 2008). Furthermore, fire suppression methods in the coastal dunes have decreased the population of mature sweetgrass and allowed hardier species to out-compete the low-growing grass. As a result, many basket makers now buy material from gatherers in Florida and Georgia which, in turn, inflates both their production costs and the prices of their crafts (Hart, Halfacre et al. 2004).

Through surveys and statistical research, Hart et al. conclude that "[t]here exists a realistic threat that this culturally and economically significant form of basketry may soon disappear if raw materials become increasingly difficult to obtain" (Hart, Halfacre et al. 2004). The results from their surveys of local basket makers demonstrate almost unanimous agreement that devotion of local land to sweetgrass cultivation (87% agree) and education on how to cultivate their own crops of sweetgrass (74% agree) would assist in their acquisition of necessary supplies.

The Magnolia public waterfront is a potential site for cultivation of sweetgrass for basketry. Although greatly altered from its natural state, the waterfront historically lies at the conjunction of a salt marsh and a maritime forest, one of the two native habitats for sweetgrass. Indeed, research has demonstrated the need for a large-scale farm-like facility to sustain the current demand for sweetgrass (Hart, Halfacre et al. 2004), and the incorporation of the native species into a public park will significantly limit the production rate when compared to an agricultural space; however, the placement of a productive crop in the public space will increase awareness of the unique cultural practice which can, in turn, promote its continuation through outside assistance. In addition, many property owners with sweetgrass on their private land fear that the practice of "pulling" the grass will damage the attractive plant, but "many basket makers insist that 'pulling' the grass helps it to grow more vigorously" (Hart, Halfacre et al. 2004). Perhaps if these property owners see the continued health of the harvested public plants, they will be

more inclined to allow access to their own resources. Furthermore, 74% of the interviewed basket makers agreed that education would increase availability by allowing them to produce sweetgrass in their own yards. In that regard, the sweetgrass plots at Magnolia could serve as teaching and experimental sites for methods of cultivation.

Indeed, further research on the suitability of varieties of *Muhlenbergia sericea* for basketry is necessary, as significant variations occur within the plant species. Collectors often distinguish between a coarse textured grass that grows in sunny areas, a finer textured grass that grows in deep shade, and a "medium-gauge grass that is especially versatile for basketry" (Hart, Halfacre et al. 2004). In addition, basket makers often prefer local "wild" varieties to those harvested elsewhere for qualitative reasons (Gustafson, Halfacre et al. 2008). Scientific tests and controlled plantings confirm significant genetic differences affecting growth habits between specimens of *Muhlenbergia sericea* harvested in South Carolina and in Texas, the east and west extremes of the species' native habitat. In addition, the growing popularity of *Muhlenbergia sericea and Muhlenbergia capillaris* as an ornamental urban plant has brought nonlocal specimens into the area which may or may not be suitable for basketry and may or may not affect the persistence of local varieties (Gustafson, Halfacre et al. 2008). Indeed, significant research must be conducted before useful plants are selected for the Magnolia site, but it remains a potential site for cultivation, education, and experimentation.

Finally, the management study described earlier concludes that suburban growth has displaced many sweetgrass basket makers from the roadside sheds that traditionally served as their places of production and business (Gustafson, Halfacre et al. 2008). The public Magnolia waterfront located adjacent to a high-density mixed use community and tourist destination offers a prime location for basket production and sales.

Through native and historic plant selection, place designation, and a commercial environment, the waterfront design of Magnolia can effectively integrate the presence of

the often marginalized basket-making community into the newly established public landscape. Symbolically, the sweetgrass basket draws upon multiple layers of the site's history—the integration of native plant materials, the ties between plantation slaves and African culture, the influence of these African cultural elements on the productiveness of rice plantations, the relevance of minority groups in the region's culture, the industriousness of human innovation, and the remediation of an industrial site by natural processes—and beautifully weaves them into a object unique to the South Carolina Lowcountry that has perpetuated largely unaltered through centuries of cultural and ecological change.

Design Components

Collages prepared throughout the previous sections engaged the author with diverse forms and materials—for example the sweetgrass basket and the military entrenchments—from a variety of the site's processes and layers and highlighted significant patterns among apparently diverse entities. As illustrated in Figure 6-1, these materials and forms were integral to the schematic design development.

At the largest scale, the linear nature of the waterfront and the large central protrusion into the marsh demand a design that emphasizes both internal and connective circulation and that deconstructs the visible lines between land, water, and marsh to create spaces that embrace all elements of the waterfront, thus transforming an "edge" into a "place." Five differently programmed piers and several paths extend over the marsh to engage a variety of users with this ecosystem. In addition, a day dock for boaters encourages access to the public space from the water. In particular, the two nodes at the base of the central protrusion become integral to tying the waterfront with proposed adjacent community and to unifying the disparate sections of the waterfront design area.

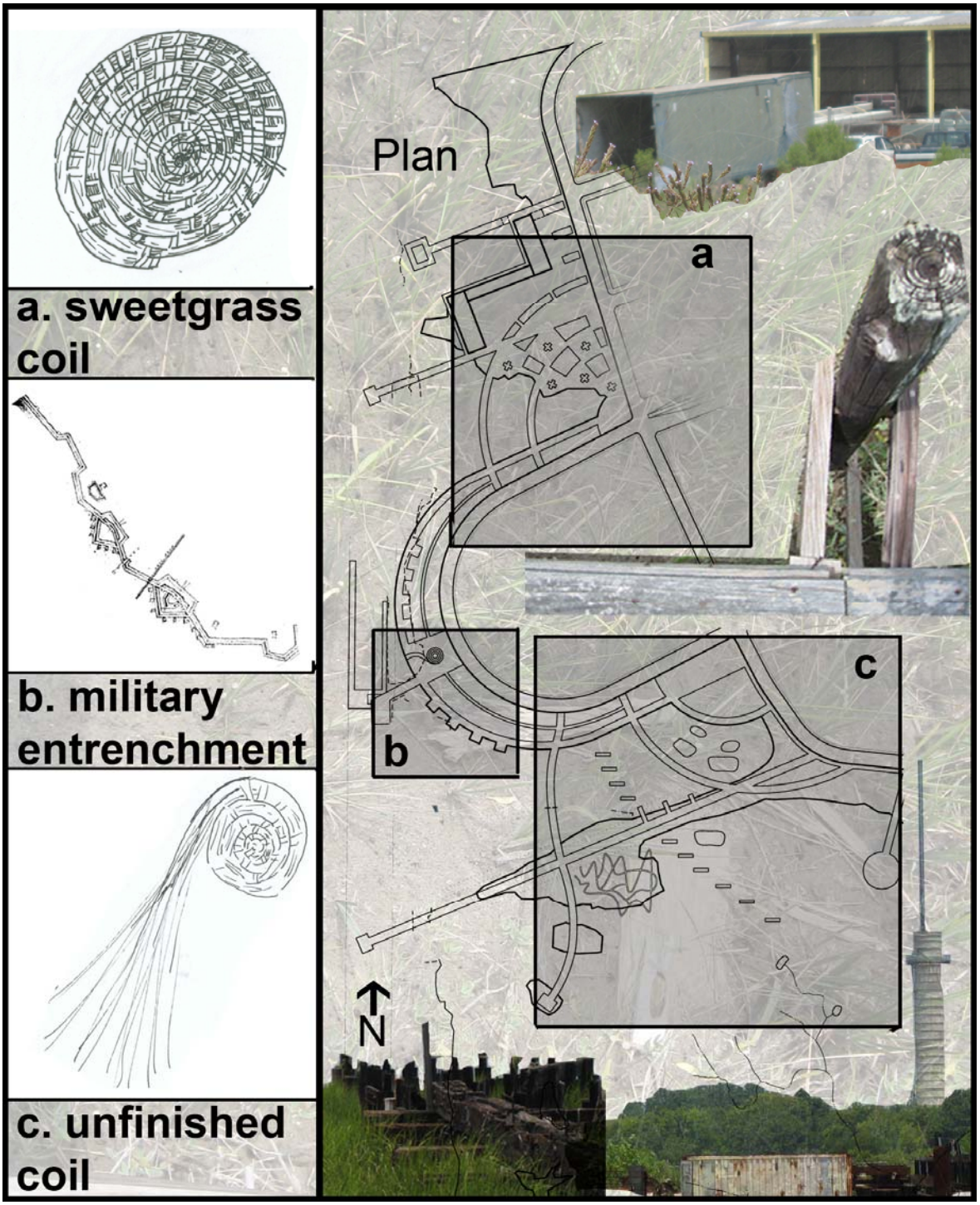
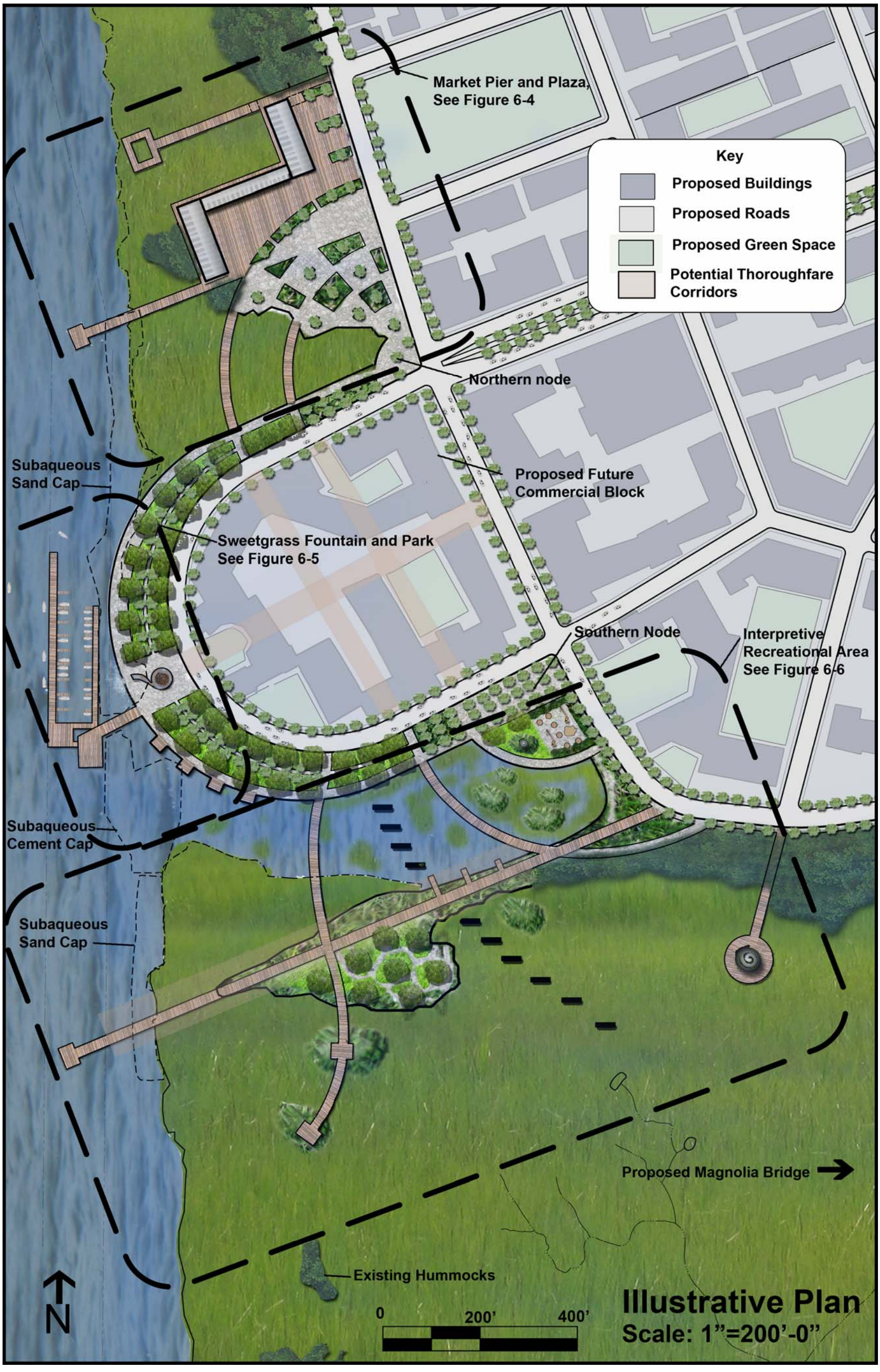


Figure 6-1. Collage of conceptual design elements. Abstracted forms from the sketches on the left define the spaces denoted in the outlined plan. Surrounding photographs were taken onsite by the author. The forms, materials, and textures depicted in these photos resurface in the design details described in the remainder of this chapter.

At these two nodes, the design embraces an abstracted form of the sweetgrass basket to foster distinct but communicative spaces. The northern node's form represents the tightly knit coils to create a more symmetric and highly-patterned space programmed for commerce and active engagement. The forms of the southern node represent these coils weaving together—or pulling apart—the spaces to foster passive recreation and interpretive engagement with the variety of materials and processes that unite to form this particular site. The abstracted sweetgrass form was chosen because of its cultural relevance, its simple elegance, and its ability to weave together multiple components into a cohesive and functioning unit. Where the waterfront edge is not buffered by marsh, the design is informed by the historical entrenchments, as described in Chapter 3 and illustrated in figures 3-7 and 3-8. In addition, multiple design elements were inspired by the onsite observations depicted in the photographs scattered throughout Figure 6-1.

Although this thesis does not address the proposed design for Magnolia Community, the beige lines in the illustrative plan delineate potential corridors for circulation and/or views between the public waterfront and the proposed interior spaces. All lines cross proposed greenspaces and circulation zones within the proposed development and intersect the buildings where widths are narrow. If sidewalks, alleys, or other paths cannot be built in these spaces, windows or other visual cues should be employed to create visual continuity between these spaces to enhance the unity of the entire site. In addition, the materials of the site are woven into the community through the use of palmettos as street trees that define axes and circulation routes and provide culturally significant and indigenous plant material for texture and color in the urban fabric. Furthermore, the narrow single trunk of the palmetto with foliage limited to a

Figure 6-2 (page 75). Schematic plan of public waterfront.


Market Pier and Plaza,
See Figure 6-4
Key
Proposed Buildings
Proposed Roads
Proposed Green Space
Potential Thoroughfare Corridors
Northern node
Subaqueous
Sand Cap
Proposed Future
Commercial Block
Sweetgrass Fountain and Park
See Figure 6-5
Southern Node
Interpretive
Recreational Area
See Figure 6-6
Subaqueous
Cement Cap
Subaqueous
Sand Cap
Proposed Magnolia Bridge
Existing Hummocks
N
0
200'
400'
Illustrative Plan
Scale: 1"=200'-0"

dense crown make this tree ideal for defining and formalizing axes without creating visual or physical boundaries between spaces.

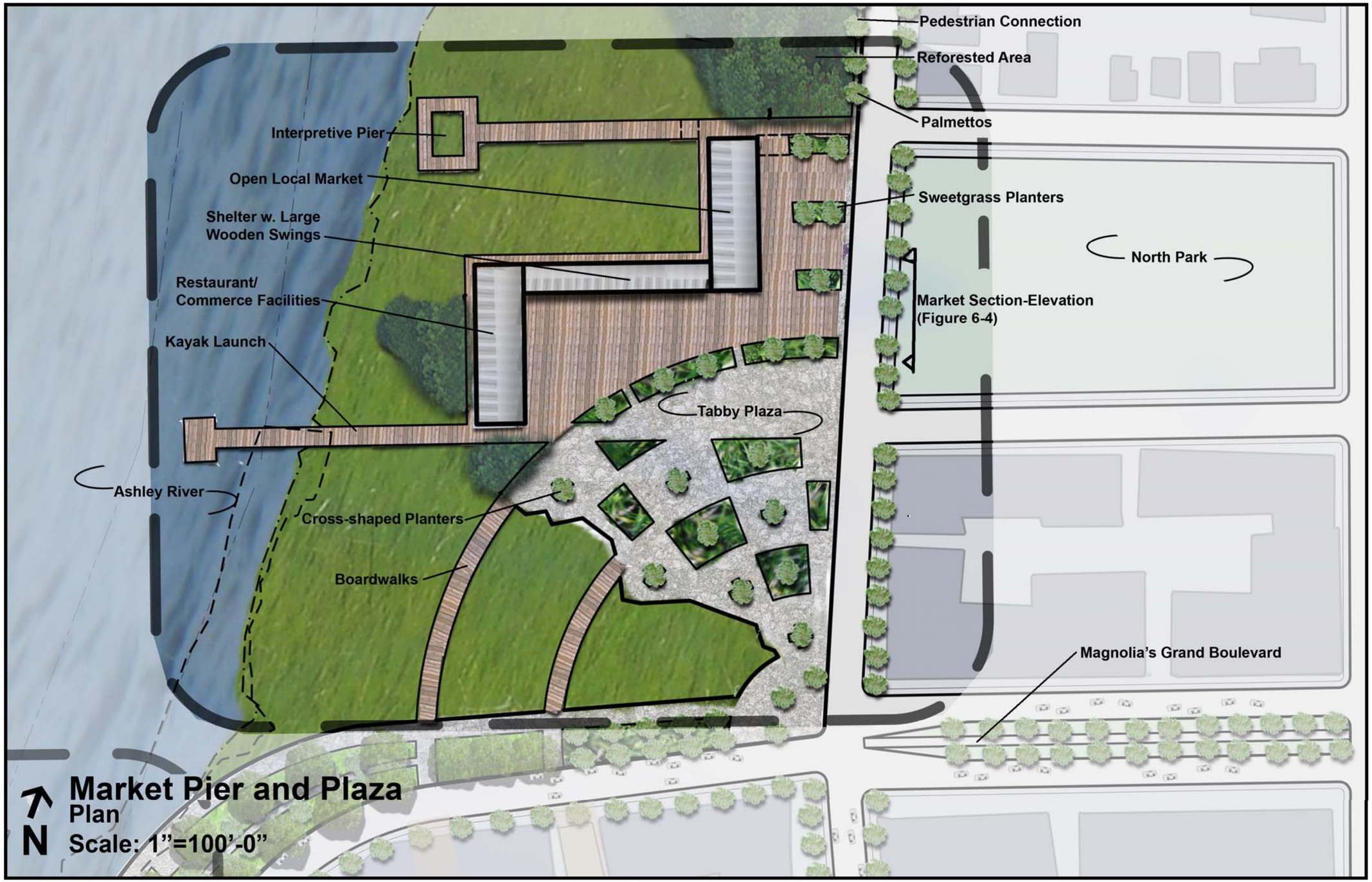
At the northern and southern boundaries of the site, the public land is reforested with indigenous species typical of local maritime forests and provides circulation routes to the sidewalks in the northernmost section of Magnolia and to the proposed Magnolia Bridge south of the design site. Historical evidence, such as the Culpepper map adorned with sketches of palmettos (*Sabal palmetto*) in 1671 (See Figures 3-3 and 3-4), and knowledge of the colonial trade of tar made from loblolly pines (*Pinus taeda*) offer significant insight into an appropriate native forest ecosystem. In addition, the spaces between the forests and marsh can be planted with sweetgrass for harvesting at regulated times by local basket makers. The forest serves as a buffer between the heavily used public space and the South Carolina Electric and Gas generating plant located directly north of the site. It also provides a natural gate to the highly designed elements that channels pedestrians to these areas and frames these interactive spaces within a reestablished native ecosystem. In addition, the reforested area assists in the remediation process by reestablishing functional and visible natural processes on a significant portion of the highly disturbed site.

The waterfront site is designed as a unified public space, but for the purposes of textual description and small-scaled graphic representation, the design is divided into the three major areas elaborated below: Market Pier and Plaza, Sweetgrass Fountain and Park, and the Interpretive Recreational Area.

Market Pier and Plaza

The northernmost section of the design area is the most highly constructed part of the design and is programmed to host onsite commercial activity. The Market Pier is

Figure 6-3 (page 77). Market Pier and Plaza Schematic Plan.


Pedestrian Connection
Reforested Area
Palmettos
Interpretive Pier
Open Local Market
Sweetgrass Planters
Shelter w. Large
Wooden Swings
North Park
Restaurant/
Commerce Facilities
Market Section-Elevation
(Figure 6-4)
Kayak Launch
Tabby Plaza
Ashley River
Cross-shaped Planters
Boardwalks
Magnolia's Grand Boulevard
Market Pier and Plaza
Plan
N
Scale: 1"=100'-0"

juxtaposed with North Park, an interior Magnolia park space, and is designed to encourage flow between the two spaces. The pier is traditional boardwalk construction with three large structures with corrugated metal roofs to reflect the few existing industrial buildings currently onsite. The northernmost structure is an open air market; its primary use is for the production and sales of sweetgrass basketry and other local goods and produce. The middle structure is also open with large wooden swings and benches offering places of repose within the active market area. The southernmost structure is enclosed to potentially house a casual bar and seafood restaurant with outdoor seating. Additional shops, cafes, and restaurants may also be incorporated depending on space requirements and adjacent facilities within Magnolia development.

The northernmost pier provides additional passive recreation and seating. Its construction around a marsh viewing area encourages engagement with tidal, plant, and animal processes that occur below; it also serves as a reciprocal experience to the boardwalk located in the Interpretive Recreational Area that, conversely, is a platform surrounded by grass. The second pier in the Market Pier and Plaza section offers a kayak launch to allow direct access to the surrounding river and creeks. The kayak launch is strategically placed so that it is close to, but protected from, the motorboat docking facilities. In addition, the boardwalks that connect the Market Pier and Plaza to the Sweetgrass Fountain and Park Area extend over the marsh to offer multiple options for circulation and to engage people with the often inaccessible marsh ecosystem.

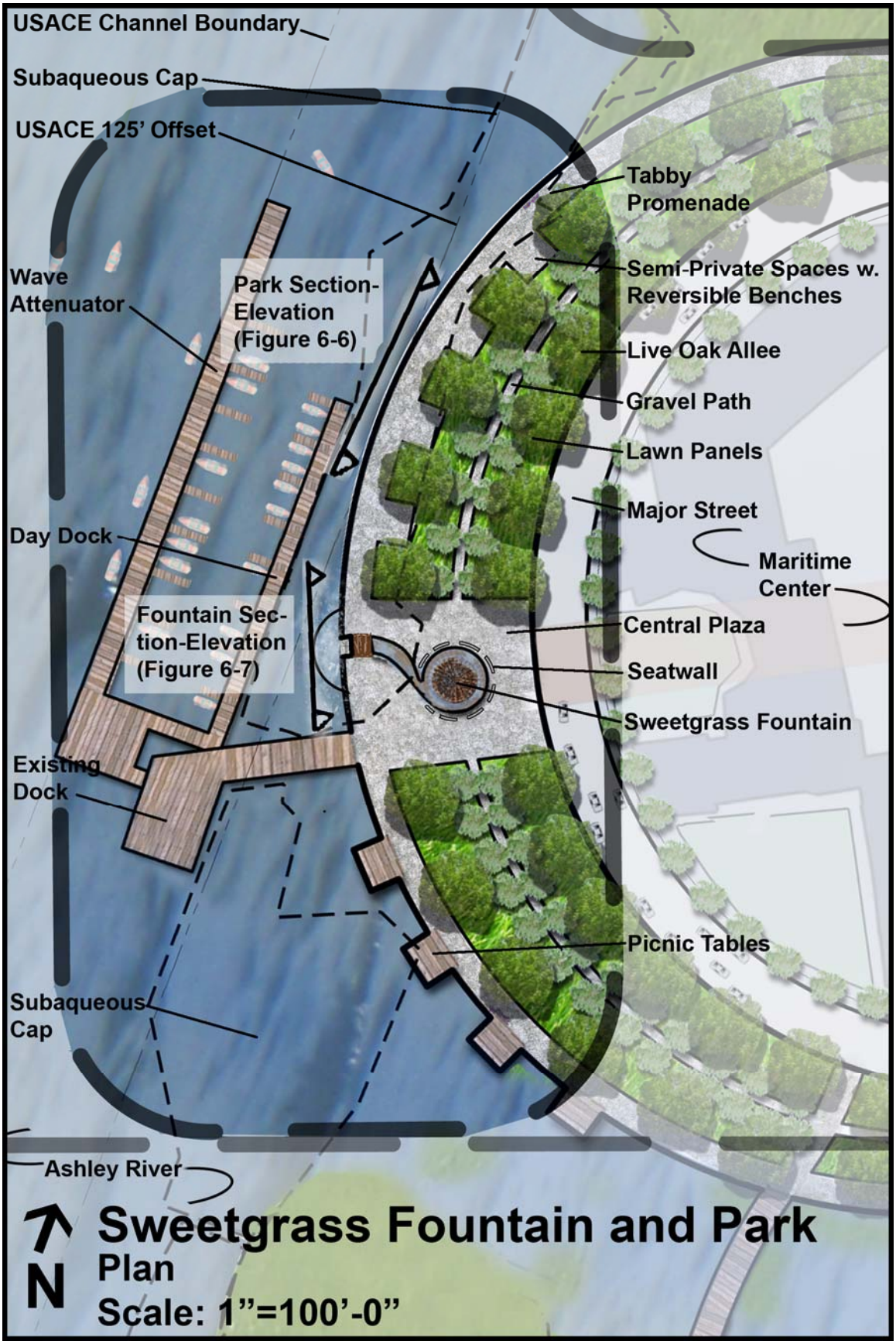
The plaza is hardscaped with some form of tabby that incorporates local shells. Although local tabby is typically made from the calcium of discarded American oyster shells (*Crassostrea virginica*)—ideal for a connection to this marshfront location and for recycling waste from human consumption—recent speculation over the health of the national oyster population may inhibit the large-scale use of oyster shells that could, alternately, be used to reseed living beds. To offset this demand for oyster shells,

Figure 6-4. Illustrative section-elevation looking southwest toward the Market Plaza and Pier from North Park.

another species’ shells could be used. The northwestern edge between hardscape and marsh is intentionally left jagged to contrast with the smooth edge of the area across the marsh and to emphasize the sometimes harsh interaction of human construction and natural ecosystems. The edge is lined with a fence composed of vertical steel cables that affords views of the marsh and reflects the form of the vertical reeds of marsh grass in an abstracted industrial aesthetic. Both the hardscape and fence materials are consistent throughout all parts of the public waterfront unless otherwise specified.

The planters throughout the plaza and pier emphasize the pattern of the coiled sweetgrass basket. Additionally, they are planted with sweetgrass (*Muhlenbergia sericea*) and palmettos (*Sabal palmetto*), the two primary components of this form of coiled basketry. The planters create an interesting circulation pattern within the plaza and offer many options for users. The cross-shaped palmetto planters also divide the plaza into more intimate gathering spaces and provide placement for benches, trash receptacles, water fountains, and other public amenities. Additionally, the plaza can

Figure 6-5 (page 80). Sweetgrass Fountain and Park Schematic Plan.


USACE Channel Boundary
Subaqueous Cap
USACE 125' Offset
Tabby Promenade
Semi-Private Spaces w. Reversible Benches
Live Oak Allee
Gravel Path
Lawn Panels
Major Street
Maritime Center
Central Plaza
Seatwall
Sweetgrass Fountain
Picnic Tables
Wave Attenuator
Park Section-Elevation (Figure 6-6)
Day Dock
Fountain Section-Elevation (Figure 6-7)
Existing Dock
Subaqueous Cap
Ashley River
N
Sweetgrass Fountain and Park
Plan
Scale: 1"=100'-0"

facilitate farmer's markets or craft fairs because it allows for easy placement of individual booths and kiosks within an accessible public space.

Sweetgrass Fountain and Park

The central portion of the Magnolia waterfront design is the most traditional and parklike area in the design. A hardscaped promenade twenty feet in width lines the edge of the marsh and the river. The hardscape materials, fence, and site furnishings are consistent with those of the Market plaza to create continuity between their spaces. Along this promenade is a series of indentations that can be used as semi-private outdoor rooms. On the northern side, these indentations are hardscaped squares that intrude into the lawn that separates the promenade from the street. These spaces feature benches similar to those used in the Thea Foss waterfront in Tacoma, Washington. These benches have levered backs that are easily adjustable to face either the waterfront or the recreational lawn area. The forms along the southern edge of the promenade are wooden and extend over the marsh featuring picnic tables. The forms of these spaces reference the military entrenchments and fortifications once built in the Neck region (see Figure 3-5). The promenade and adjacent streets are separated by a lawn panel that features a smaller gravel path lined on both sides with live oaks (*Quercus virginiana*) and palmettos (*Sabal palmetto*) to provide a naturally shaded venue for both passive and active recreation.

This central portion of the site also features a dock with day slips that make public space is accessible by water. The designed feature utilizes an existing concrete dock to avoid disruption of the subaqueous sand and cement caps and additionally incorporates two extended boardwalks with internal slips. The outermost structure serves as a wind and wave attenuator to protect boats and passengers accessing the Magnolia waterfront. The construction of this dock will require a variance from the US Army Corps of Engineers (USACE) because it lies within 125' of the channel edge

Figure 6-6. Illustrative section-elevation looking east from the promenade across the oak allees.

(Applied Technology & Management 2008), but, as designed, the docks do not intrude upon the navigable channel maintained by the USACE.

The promenade, the gravel paths through the lawn panels, the ramp to the boat dock, and an axis through the larger Magnolia Development terminate in a central hardscaped plaza. The tabby plaza is built around a central fountain based on the sweetgrass basket form as a symbol of the site weaving together multiple strands of cultural and ecological processes. A seating wall encircles the fountain with breaks for circulation and water access. The fountain flows over the basket shaped form, through an open channel with a bottom molded to look like reeds, under the bridged sidewalk, and visibly falls over the edge of the promenade where it is caught in a basin above the river and recycled through the fountain. This dynamic movement toward the water combined with the sound of the waterfall will draw land-based observers’ attention to the water and water-based observers’ attention to the land, further unifying these elements into a cohesive space. In addition, the fountain allows users to have tactile interaction with water, further enriching their experience of the waterfront space.

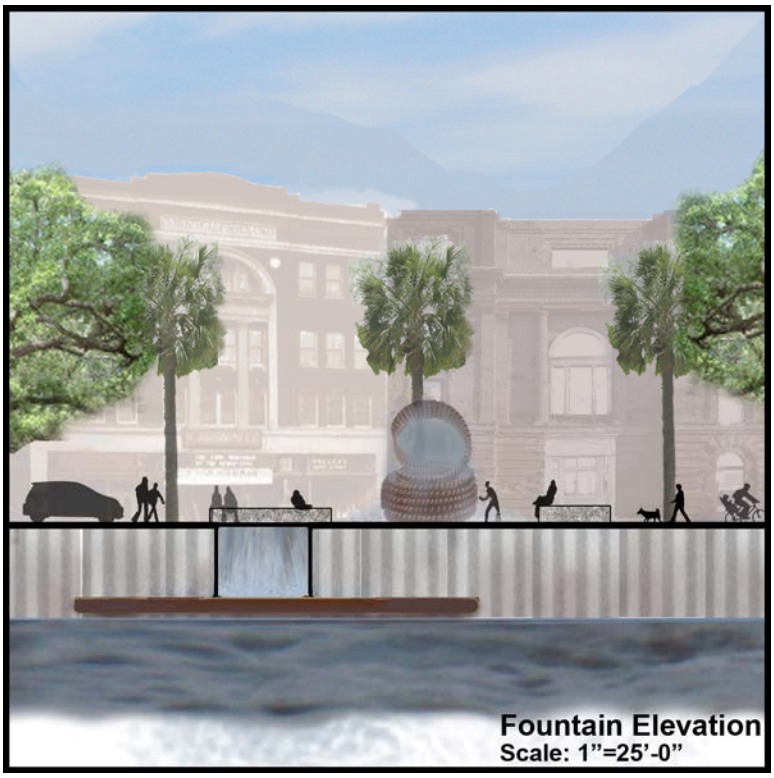


Figure 6-7. Illustrative section elevation looking northeast toward Sweetgrass Fountain from the Ashley River.

Interpretive Recreational Area

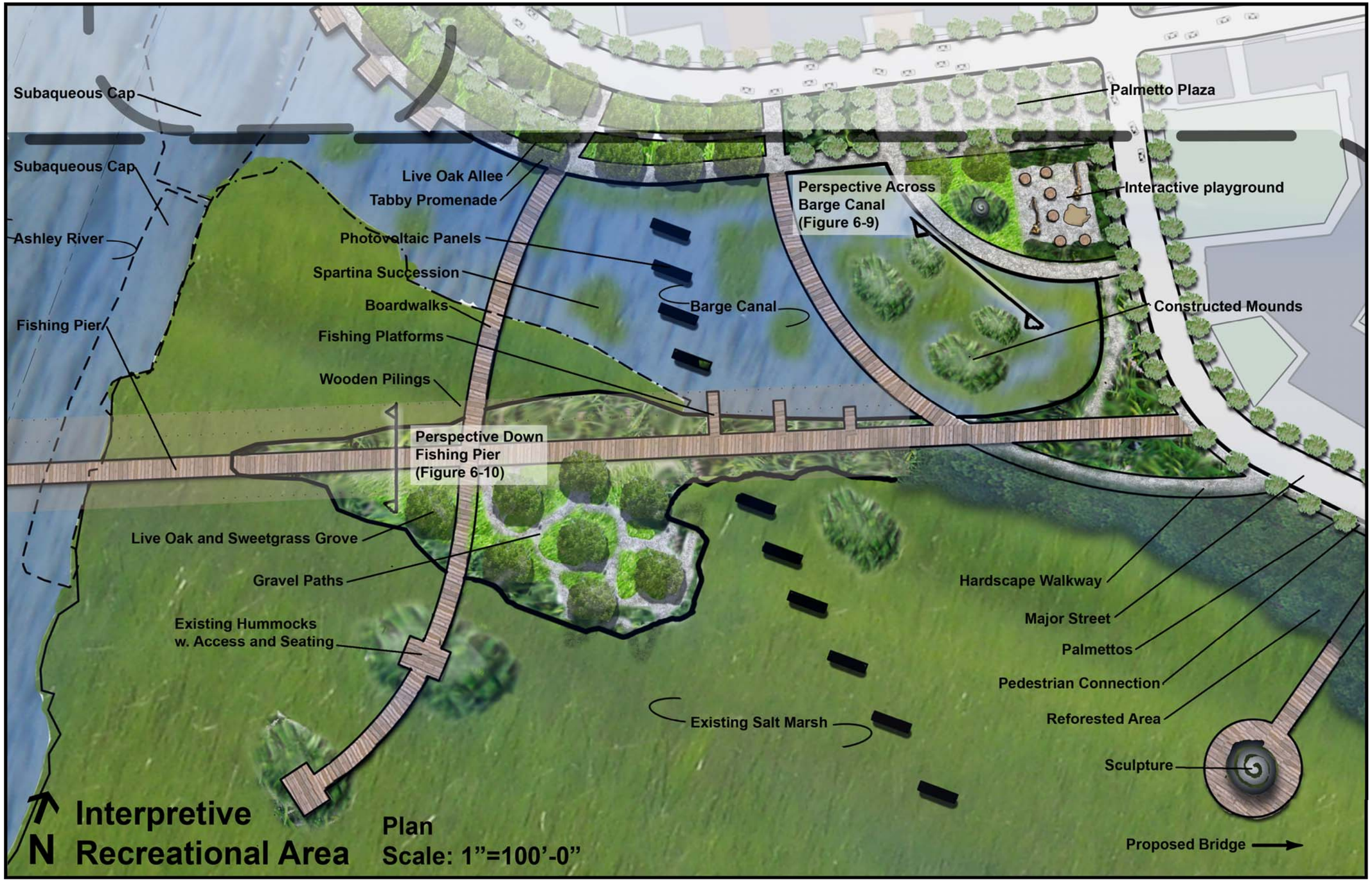
The final area of the design is built to encourage exploration of landscape experiences and is perhaps the most complex area of the site. The northernmost plaza of this area features hardscape, benches, and a grid of palmettos that connect the recreational spaces with the proposed commercial facilities directly across the street. A playground distills the essential elements of the entire park into a child-scaled venue for interpretive play. Merry-go-rounds, climbing structures, swingsets, and slides are custom built to reflect the forms of the sweetgrass basket, the pier sculpture described later, and industrial equipment such as cranes and movers. A sandbox allows children to reenact the earthmoving characteristic of the entrenchment building, mining, dredging, burial, and landfilling integral to the site’s history. In addition, a vegetated mound similar to

those described in the following paragraphs is also installed in the playground for less-structured play along with oak trees for shaded supervision.

As described in earlier chapters, the former barge canal offers a unique opportunity for land-based observation of the estuarine processes of the river and tidal marsh. A remarkable feature in the Lowcountry landscape is the sheer flatness of land, marsh, and river. As elaborated before, the average slope across the entire Magnolia development is less than half of a percent (see Chapter 5). In this landscape, almost any change in elevation is noticeable. The proposed design calls for the construction of five mounds, similar to the larger existing hummocks to be placed within the existing wetlands: four within the barge canal, and one just beyond the barge canal in the marsh. The mounds rise a few feet from the existing marsh and are planted with native grasses so that the marsh appears hilly. These mounds reflect the intensive earth moving practices that have occurred onsite, draw visitors' attention to the marsh, water, and existing (man-initiated) hummocks, and emphasize the dramatic flatness of the Lowcountry landscape. Indeed, the construction of these mounds may cause accretion within the barge canal, but—as explained in Chapter 4—enhanced sedimentation will serve to expedite the remediation process by augmenting the cap that stabilizes the contaminated soils.

The barge canal and adjacent marsh are crossed by several boardwalks that offer access to the interpretive recreational area from multiple places throughout the larger waterfront site. One of the piers grants access to the closest two existing hummocks and, as described before, reciprocates the experience of the northernmost pier within the Market Pier and Plaza area. The longest boardwalk is placed upon an existing roadbed that extends along the narrow spit of high ground south of the barge

Figure 6-8 (page 85). Interpretive Recreational Area Schematic Plan.


Subaqueous Cap
Subaqueous Cap
Ashley River
Fishing Pier
Live Oak Allee
Tabby Promenade
Photovoltaic Panels
Spartina Succession
Boardwalks
Fishing Platforms
Wooden Pilings
Perspective Down
Fishing Pier
(Figure 6-10)
Live Oak and Sweetgrass Grove
Gravel Paths
Existing Hummocks
w. Access and Seating
Palmetto Plaza
Perspective Across
Barge Canal
(Figure 6-9)
Barge Canal
Interactive playground
Constructed Mounds
Hardscape Walkway
Major Street
Palmettos
Pedestrian Connection
Reforested Area
Existing Salt Marsh
Sculpture
Proposed Bridge
N
Interpretive
Recreational Area
Plan
Scale: 1”=100’-0”

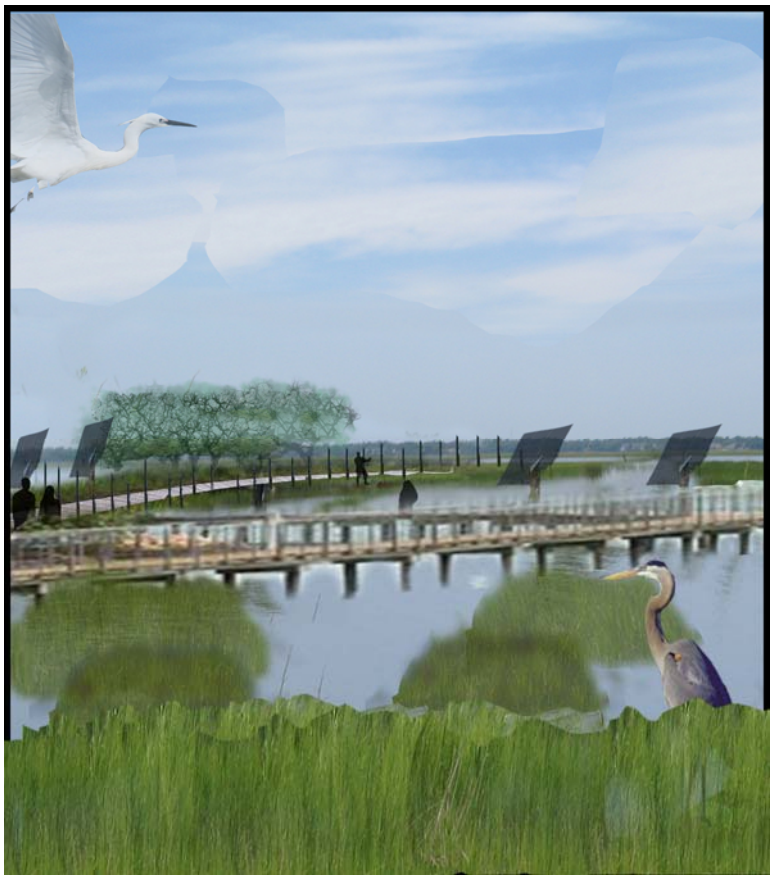


Figure 6-9. Perspective looking southwest across the barge canal to the Ashley River.

canal. Parallel to this pier, three rows of pilings extend from the neck of the spit into the Ashley River. The pilings, like the boardwalk, are wooden, but they are untreated and intended to decompose and vary in height, with the tallest around 10-15 feet above the marsh substrate. These pilings represent multiple layers of the site's history: their abundance reflects a forested woodland, but their rhythmic placement and lack of foliage reference both the agricultural and wood treatment facilities that later exploited the site.

Their placement parallel to the pier implies a connection to the shipping industry whose influence on the physical site remains evident through existing and quickly decaying wooden structures throughout the marsh, and their form and linear arrangement resemble the exterior lighting fixtures and the carefully placed single-trunk palmettos lining the adjacent streets within the proposed design.

Figure 6-10. Perspective looking southwest down the fishing pier to the Ashley River.

In addition to providing large-scale references for tidal changes, these pilings should be allowed to decompose naturally. Their presence in the water will attract a variety of sealife, and three short fishing piers are located within the barge canal for recreational use during high and medium tides. The terminus of the major boardwalk is

Figure 6-11. Perspective looking southwest across the marsh from the proposed Magnolia Bridge which will serve as the community's primary entrance.

also a fishing pier that extends into the Ashley River. Although current contamination levels inhibit healthy consumption of fish and shellfish caught in this section of the river, recreational fishing offers an invaluable connection with the marsh and water and their ecological processes.

In sharp contrast with these decaying pilings, a row of photovoltaic panels cross the barge canal and emphasize the frayed coil forms of this section of the public space. These panels harness the sun's energy and offset costs for street and accent lighting and for other utilities by converting renewable solar power to electricity. The juxtaposition of these highly technical panels with the pilings and trees emphasize the variety of processes occurring on the site.

The terminus of the spit widens into an oak grove supplemented with sweetgrass, lawn, and gravel paths for passive recreation and observation of the site

and its surroundings. The edge of this high ground remains soft to enhance the naturalistic experience of the landscape.

The final feature of this section of the designed site is a single pier that extends through the reforested area into the marsh and encircles a highly visible and vertical sculpture. The sculpture's form reflects the spirals of basketry, local shells, and perhaps time. It is composed of a highly industrial metal that is allowed to rust and weather. The sculpture is placed next to Magnolia Bridge, the primary entrance to the new development and will be visible to those crossing the bridge and potentially to people in nearby neighborhoods. The sculpture draws attention to the newly public and designed waterfront and reflects the forms that are integral to its spaces.

CHAPTER 7

CONCLUSION

The design proposal for Magnolia seeks to weave the layers of the site's complex cultural and ecological history into an integrated and functional public space that will serve diverse members of the Charleston community. Without implementing the design, however, an evaluation of the validity of design process is difficult and limited by the author's inexperience with long-term design projects or the translation of her designs into actual spaces. However, this thesis can evaluate the design process because it approaches design with an unconventional (and currently untaught) methodology that incorporates collage into the design and rendering processes.

As elaborated in Chapter 2, many contemporary landscape thinkers demand new forms of imaging for the development of landscapes relevant and appropriate in current society (Corner 1999; Marot 1999; Corbin 2003; Dee and Fine 2005). According to these writers, designers should abandon traditionally abstract landscape design imagery along with the perception of sites as passive canvases and, instead, collage together multiple meanings of a site into non-traditional images so that the site's characteristics and histories become active in the design conception. Truly, the collaging and consideration of two- and three-dimensional elements from the site's varied cultural and ecological processes were crucial to the final design product of this thesis.

For example, the archaeological report prepared by Browder in 2003 described the history of the Magnolia site chronologically. Although the report acknowledged the site's history as the location of entrenchments, burial grounds, phosphate mines and dumping grounds interspersed with other major uses, the repetitive digging and earth-moving patterns of the site's history were not apparent until the preparation of the

collage in Figure 3-7. This dynamic became essential to the final design, particularly in the construction of the interpretive mounds in the former barge canal, marsh, and children's play area and in the forms used in the Market Pier and Plaza.

Although the earth-moving pattern described above seems obvious in hindsight, the linear nature of the chronological history report inhibited its conception until the elements were visibly collaged together. Furthermore, two-dimensional and abstract concept diagrams would not have drawn on the inherent similarities of these activities. This dynamic of discovery through collage and incorporation into design was repeated several times throughout the research project; this practice's potential for revealing undetected patterns attests to the value of using realistic and textural imagery in the design process, particularly when images are arranged together that are typically perceived independently. In essence, these collages become metaphors for the site because they simultaneously overlay multiple and seemingly unrelated elements to create a unified whole.

Additionally, digital collage is becoming an increasingly popular presentation tool in design fields. For the designer, digital collage can be an efficient rendering process and also enhance the unity and appeal of a design package. Although an initial compilation of preexisting high-quality textures, plant materials, and other design components may be daunting, the availability of digital cameras and images assists a designer in quickly building a comprehensive library of elements. In addition, collage can incorporate both traditional hand sketches and digitally produced images to create a potentially rich layering of interpretations (see Figure 6-1). Furthermore, digital layout programs ensure that the same elements can be transformed, distorted, and combined in infinite compilations for a variety of visual effects.

In any particular project, an easily repeated high-quality texture or plant material, for example, can quickly unify the plan and supporting graphics while maintaining

realistic and evocative qualities. Moreover, for the design audience, recognizable photographic qualities are more legible than traditional landscape architecture symbols. If presented properly, these realistic qualities can powerfully evoke the essence of a designed—but not yet built—place. People unfamiliar or uncomfortable with more abstract design images are understandably drawn to collages of more recognizable elements because the immediate legibility allows for a potentially emotive experience instead of a more analytical “reading” session.

Indeed, real world pressures often inhibit time devoted to gathering extensive images reflecting a site’s complexities or to exploring new design and presentation methodologies; however, new computer programs and the propagation of digital images make collage an increasingly accessible and efficient tool for designers and researchers. Because this practice can significantly enrich the meaningfulness of designs and renderings by illuminating connections between disparate elements of site’s unique processes, collage is arguably a worthwhile investment throughout multiple stages of design conception and representation.

Perhaps collaging is not realistic in every design project; however, designers should partake in the collaging process at least once to help them construct future integrated imagery, even if these images remain mental conceptions. In particular, collage can benefit designs for projects with apparent vacancy, diverse users, or complex cultural and/or ecological histories. Limiting the process to these designs, however, may be problematic because subtler layers of meaning may be neglected in a site perceived as common or simple. As early as 1966 Norberg-Schulz proclaimed, “The world ‘is’ not as it immediately appears to each of us. We always have to take into consideration that our perceptions may be superficial or even wrong” (Norberg-Schulz 1966). Indeed, without intensive exploration and representation of invisible processes, designers may miss powerful opportunities to create meaningful places.

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