

2011

Community Restoration: Reconciling the Legacy of Contaminated Sites Within Our Communities

Kristofer H. Kennedy

University of Massachusetts Amherst, khkenned@art.umass.edu

Follow this and additional works at: <http://scholarworks.umass.edu/theses>

 Part of the [Architectural Engineering Commons](#), [Art and Design Commons](#), [Environmental Design Commons](#), [Landscape Architecture Commons](#), and the [Urban, Community and Regional Planning Commons](#)

Kennedy, Kristofer H., "Community Restoration: Reconciling the Legacy of Contaminated Sites Within Our Communities" (2011). *Masters Theses 1911 - February 2014*. 620.
<http://scholarworks.umass.edu/theses/620>

This thesis is brought to you for free and open access by the Dissertations and Theses at ScholarWorks@UMass Amherst. It has been accepted for inclusion in Masters Theses 1911 - February 2014 by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

**COMMUNITY RESTORATION:
RECONCILING THE LEGACY OF CONTAMINATED SITES
WITHIN OUR COMMUNITIES**

A Thesis Presented

By

KRISTOFER H. KENNEDY

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

MASTER OF ARCHITECTURE

May 2011

Architecture+Design Program
Department of Art, Architecture, & Art History

© Copyright by Kristofer H. Kennedy 2011

All Rights Reserved

**COMMUNITY RESTORATION:
RECONCILING THE LEGACY OF CONTAMINATED SITES
WITHIN OUR COMMUNITIES**

A Thesis Presented

By

KRISTOFER H. KENNEDY

Approved as to style and content by:

Ray K. Mann, Chair

Kathleen Lugosch, Member

Frank Slegers, Member

William T Oedel
Chair, Department of Art,
Architecture, and Art History

DEDICATION

To my loving wife Alexis,
for her patience and encouragement.
Without her support this journey
would not have been possible.

To my family
for their continued love and support.

and

To David Dillon
for his lasting inspiration.

Thank you all.

ACKNOWLEDGEMENTS

A special thank you to Kathleen Lugosch for fearlessly shepherding my colleagues and I through the thesis process over the past year. We have all truly benefited from your insight, judgment, and leadership.

A special thank you to Ray K. Mann and Frank Slegers for assisting me with my research and design process during past year.

ABSTRACT

COMMUNITY RESTORATION: RECONCILING THE LEGACY OF CONTAMINATED SITES WITHIN OUR COMMUNITIES

MAY 2011

KRISTOFER H. KENNEDY

B. A., UNIVERSITY OF NEW HAMPSHIRE DURHAM

M. Arch., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Ray K. Mann

Separation, removal, and relocation are the initial steps in the “clean-up” of a contaminated site. While crucial to safeguarding the public health of adjacent communities and the surrounding environment, conventional remediation is subtractive from the community leaving many psychological wounds untreated. Architecture has the greatest potential to address the social concerns which contribute to the complexities of redeveloping a contaminated site.

Focusing on the 52 acre former General Electric Brownfield site in Pittsfield, Massachusetts, I have explored through design alternative approaches for the redevelopment of contaminated sites. My design research focuses on the ways in which architecture can be used as a tool to desensitize the legacy of post-industrial contaminated sites within our communities and create spaces of sustainable coexistence between for our greater economic, environmental, and communal interests.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	v
ABSTRACT.....	vi
LIST OF FIGURES.....	ix
 CHAPTER	
1. THE NEW AMERICAN FRONTIER.....	1
Introduction.....	1
The New American Frontier.....	1
Close to Home.....	4
2. ECONOMY, ENVIRONMENT, & EQUITY.....	7
Bringing Good Things to Life.....	7
Truth in the American Dream.....	7
All Good Things.....	8
3. DISPARATE SOLUTIONS.....	16
Ecology.....	16
Economy.....	18
4. ANALYSIS.....	22
Process.....	22
Pittsfield’s Cultural Shift.....	23
The William Stanley Business Park.....	27
Proposals from the Past.....	32
Designing for Community.....	34
5. PRECEDENTS.....	38
The Eco-Industrial Model.....	39
The “City of Tomorrow”.....	42
The City of Today.....	45

	Making a “Lifescape” from a Waste Hill.....	47
	Designing Within a Degraded Landscape.....	49
6.	DESIGN FOR A SUSTAINABLE FUTURE.....	51
	Design Process.....	51
	Mapping Forces.....	52
	Reimagining the New American Frontier.....	56
	Elevated Ecosystem.....	58
	Mass Decontamination.....	61
	Building Memory.....	64
	Silver Lake Energy Park.....	68
7.	PADDLING DOWNSTREAM.....	70
	BIBLIOGRAPHY.....	76

LIST OF FIGURES

Figure		Page
1.1	The New American Frontier: Mapping contaminated sites throughout the United States by the EPA.....	2
1.2	The William Stanley Business Park: Figure Ground and Diagrammatic Design Principle.....	5
1.3	Public Relations.....	6
2.1	Images from the Legacy of General Electric in Pittsfield.....	10
2.2	A Distressed Ecology: Dredging the Housatonic River.....	11
2.3	Existing Site Condition: East Street Area 2 North Complex.....	14
3.1	A Diagrammatic Section of Site Conditions.....	18
3.2	SASAKI Master Plan for William Stanley Business Park 2003.....	20
4.1	Diagrammatic Plan for Community Reconnection.....	23
4.2	Figure Ground Building Scale Analysis.....	26
4.3	Sectional Site Condition Study: Areas of subsurface contamination across site	28
4.4	Contextual Map of the City of Pittsfield.....	30
4.5	Contextual Map of the WSBP: Diagrammatic Connections.....	30
4.6	Figure 4.6 – Diagrammatic Site Response: Reuse of structural grid to avoid excavation of contaminated soils.....	31
5.1	The Ecological Industrial Process.....	40
5.2	Public Core of the “City of Tomorrow” Malmo, Sweden.....	43
5.3	Malmo Site Analysis Diagram: Open Space, Building Footprints, and Infrastructure, transposed on the William Stanley Business Park.....	44
5.4	Dockside Green, Victoria British Columbia.....	45

5.5	Dockside Green Site Analysis Diagram.....	46
5.6	An engaging public moment of James Corner’s Design for the Freshkills Landfill	48
5.7	Weiss/Manfredi’s Olympic Sculpture Park, Seattle WA.....	49
6.1	Mapping Forces.....	53
6.2	Mapping Forces.....	54
6.3	Schematic Site Plan.....	57
6.4	Elevated Ecosystem: Programmatic Diagram.....	58
6.5	Diagrammatic Section showing program within Elevated Ecosystem.....	60
6.6	Elevated Ecosystem axonometric aerial view.....	60
6.7	Street Level Schematic of Mass Decontamination.....	62
6.8	Process: Responding to Forces of Mass Decontamination.....	63
6.9	Process: Responding to Forces of Mass Decontamination.....	64
6.10	Building Memory Site Section.....	66
6.11	Building Memory: Diagrammatic Process.....	67
6.12	Silver Lake Energy Park.....	69
7.1	William Stanley Business Park: Site Model.....	73

CHAPTER 1

THE NEW AMERICAN FRONTIER

Introduction

The polluted environment as we know it today is primarily the resulting of the waste stream of progress beginning with the industrial revolution nearly two hundred years ago. Today our wastes from industrial systems have reached far beyond intensities and quantities that our environment and our communities can able to absorb. Whether we remember the Love Canal community in upstate New York built upon hazard waste or the more recent Deepwater Horizon oil spill in the Gulf of Mexico, the legacy of reckless industrial is a resounding trait of our nation's young history. The social, environmental, and economic legacy these disasters leave within their communities present major challenges towards their successful revitalization. However, I have come to believe through my research and design process that through careful analysis and thoughtful design we can engage and expose the industrial legacies within our afflicted communities. By doing so, we can use design to overcome the economic, environmental, and social challenges to redevelopment and redirect the legacy of post-industrial contaminated sites toward a more socially responsible eco-industrial future.

The New American Frontier

There is no question that our industrial practices and consumer habits have caused serious detriment to our environment. Nowhere else across our nation's landscape is the evidence of our social irresponsibility physically felt and environmental contamination more visible than in the disposal of waste by large industrial corporations. The sheer

scale and intensity of which large manufacturers operate within our fragile communities has devastated the American landscape, placing unnecessary economic and environmental pressure on society. According to the United States Environmental Protection Agency there is a growing list of more than 450,000 Brownfields and over 1,500 Superfund National Priorities List (NPL) sites across the American landscape (see Figure 1.1).

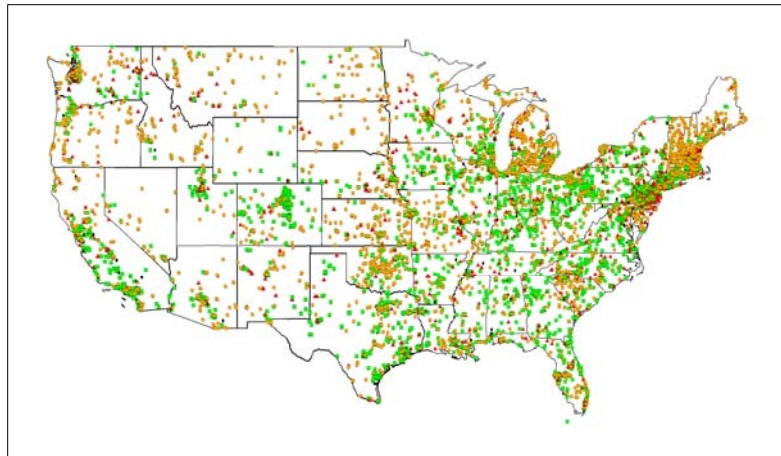


Figure 1.1 – The New American Frontier: Mapping contaminated sites throughout the United States by the EPA.

No longer the fertile prairies or towering hardwoods forests or early America, the “New American frontier” are the nearly 5 million acres of post-industrial hardscapes, abandoned buildings, barbed wire, and damaged ecologies in all of our communities, from shore to shore. Though often disregarded as wastelands, like the picturesque frontier of early America, this “New American Frontier” is fertile with opportunity. While these sites present clear challenges, Brownfields maintain the high value of their land for the same reasons they were once vibrant industrial sites: available space, a

developed transportation infrastructure, available resources, and densely populated communities supplying workforce security. This is the fruit of the new American frontier, albeit cultivated in damaged ecology. Reaching this fruit will require an alternative approach to the standard methods for restoring these distressed ecologies.

Traditional remediation practices isolate the afflicted site from the community, remove contaminated materials and stockpile them on site or in another location, out of sight. This process by nature is subtractive, invasive, and concealed with respect to the distressed communities, often alienating them from their own neighborhoods. This trauma is often preceded by an economic collapse within a community from the solvency of a major employer. These events coupled together further compound the distress within afflicted communities adding to the difficulties of redirecting the legacy of contaminated post-industrial sites. While these initial steps of remediation are essential to safeguarding the public's physical health, it is assumed that environmental remediation and an economic recovery in the form of job growth will suffice as treatment, largely ignoring the social psyche within an afflicted community. To properly address these communal wounds issues of ecology, economy, and community cannot be handled as separate entities in a generic linear progression. The complexities of revitalizing the most distressed landscapes within our communities requires a sensitive holistic design approach which simultaneously addresses concerns of equity, environment, and economy while integrating regional concerns unique to the individual site.

With my thesis research I have analyzed a current redevelopment proposal for a vacant Brownfield site within its community context, and have proposed alternative design approaches to addresses the unique social concerns of this community. To

develop an effective alternative approach to healing the communal psyche with regards to contaminated post-industrial sites I have focused my efforts on one specific site in western Massachusetts, within in my own community. Through my analysis and design I have realized the potential and responsibility of architecture to address the social pains caused by post-industrial contaminated sites. Through my design process I have rebranded the conventional industrial model from a system defined by guarded exclusion with respect to community to that of a system which can be engaging and inclusive. I have deviated from traditional prescriptive methodology to provide an alternative design approach to a often typical response to contaminated sites.

Close to Home

Though I could have chosen from any of the nearly 39,000 contaminated sites in our state, I chose one that has had lasting affects within my own community, the former world headquarters of General Electric, known today as the William Stanley Business Park in Pittsfield, MA. Listed as one of the Brownfield sites that plague our country, this site evaded definition as a Superfund on the EPA National Priorities List. However due to the irresponsible release of contaminated waste into the Housatonic River it has designated as a Superfund site by the EPA. Once a bustling center of manufacturing, today the William Stanley Business Park is vacant, inaccessible, and a constant reminder to the city of Pittsfield of irresponsible business practices and complete disregard of the health, safety, and welfare of a community. My approach will differ from traditional methods in that there will be an equal consideration to the importance of economy, ecology, and social equity.



Figure 1.2 – The William Stanley Business Park: Figure Ground and Diagrammatic Design Principle

My intention through design will be to heal a damaged ecology, engage the community, and provide the solid foundation for an alternative industrial system, capable of sustaining both a local economy and native ecology. Figure 1.2 represents an abstraction of my design goals, reconnecting a community through an environmental infrastructure. My investigation challenges the lack of sustainable design strategies within the existing master plan for the site, EPA guidelines for the generic treatment of Brownfield sites, and local zoning bylaws which restrict an integrated approach to redevelopment and potentially perpetuate the issues at hand. I will support my findings by providing alternative examples of “eco-industrial” practices that are economically, socially, and ecologically regenerative.

Quarantining a patient may be a practical response to protecting the greater health of a community; it cannot however be consider an effective treatment. Similarly, heavily contaminated sites, such as the William Stanley Business Park cannot be properly healed behind a curtain of barbed wire. This process act may unintentionally further separate the

patient from the most effective remedy: engagement with, interest in, and stewardship by the community. Contaminated sites are an unavoidable reality for the future of our communities, as designers we have the ability and thus the responsibility to repair these damaged ecologies and begin to heal our fragile communities.



Figure 1.3 – Public Relations

The dysfunctional relationship between communities and post-industrial contaminated sites I felt was clearly illustrated by this welcoming sign at the William Stanley Business Park. This is the reality of contaminated sites in our communities resulting from conventional remediation practices.

CHAPTER 2

ECONOMY, ENVIRONMENT, AND EQUITY

Bringing Good Things to Life

The relationship between industry and communities throughout America, such as General Electric and the city of Pittsfield is a filled with both prosperity and pain. Though the current legacy of General Electric is often regarded with disdain for the anguish it has caused the community, for years it had been a stable source of economy for many generations of Berkshire residents. At one point General Electric directly employed 18,000 people in the community and indirectly provided job opportunities for approximately three quarters of Pittsfield's workforce¹. My grandfather, a salesman, and my Grandmother, a switchboard operator, were both once proud employees of General Electric. General Electric provided the economic comfort upon which they were able to buy a modest home, grow their family, and retire with many years still ahead of them.

Truth in the American Dream

General Electric began growing its roots in the Berkshires in 1903 when it purchased the Stanley Electric company in Pittsfield. The company rose to prominence following Roosevelt's enactment of the New Deal, a response to the Great Depression which saw the initiation of thousands of public works projects. General Electric was charged with manufacturing large scale transformers for many of these projects, such as the Hoover Dam. By the mid 20th century General Electric was producing the largest transformers in the world and its reach had extended globally². At this time General Electric was undoubtedly the economic center of Berkshire County and Pittsfield saw it

population grow to its highest level of over 50,000. Outside the gates of the booming General Electric manufacturing plants the community was growing too. Housing developments, with assistance from GE, were being laid out street by street to accommodate new arrivals to the city, additions were built for budding families, and small businesses grew to support the needs of this emergent community. There was truth in the American Dream.

All Good Things

Like any dream, the prosperous times of industry in Pittsfield, and across the country, could not be sustained. Oil shortages, cheaper international labor sources, and an inability to adjust with technological advancements in transformer technology led to General Electric's withdrawal from the community. Thousands of jobs were lost, small businesses closed and many families were forced with the decision to either move on or remain in their communities and struggle to subsist in a city where economic opportunity is scarce.

According to a report by June Nash and Max Kirsch in the *Medical Anthropology Quarterly* (1988) which specifically examined General Electric and the city of Pittsfield entitled, "*The Discourse of Medical Science in the Construction of Consensus Between Corporation and Community*" over fifteen years from 1970-1986 the number of employees at General Electric had decreased from 10,000 to 5,000 and today the plastics division now owned by SABIC International has only 150 employees. Even after General Electric's economic influence within the community had all but deteriorated, its policy decisions and legislative dealings with the local government continued to strangle the local economy. The report by Nash further identifies GE's influence on local

government noting, “General Electric has set the policy direction for local economic development. GE barred industries that would have competed with it in the labor market, and the city did not develop alternative plans for development while employment was strong.”³ To this day the community has been in a state of economic paralysis.

As the economic base of city of Pittsfield was eroding, the concerns about the release of harmful pollutants into the environment and their devastating effect on the public health and environment were beginning to take hold in the collective American consciousness. Among the industrial chemicals which were beginning to raise alarm was PCBs (Polychlorinated Biphenyls). PCBs were heavily used by General Electric as a fire-resistant insulating agent in the production of transformers. Animal studies have demonstrated varied effects of PCBs including neurotoxicity, immune suppression, altered thyroid and reproductive function, and liver cancer as reported in 2009 by the CDC⁴. The U.S. Department of Health and Safety’s Agency for Toxic Substances and Disease Registry (ATSDR) note that, “Based on the evidence for cancer in animals, the Department of Health and Human Services (DHHS) has stated that PCBs may reasonably be anticipated to be carcinogens. Both EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.”⁵

General Electric has admitted to disposing almost 20 tons of PCBs into the adjacent Housatonic River and surrounding community, while research and interviews of former GE employees conducted by the Housatonic River Initiative have found those numbers to be much higher. An American Rivers report on America’s Most Endangered Rivers of 2004 states, “The Housatonic River Initiative, citing information provided by a former GE employee pegs the number closer to 750 tons.”⁶



Figure 2.1: Images from the Legacy of General Electric in Pittsfield

For more than two decades there have been constant reminders of the troubled legacy of the William Stanley Business Park from headlines local papers to the invasive remediation process.

PCBs have been discovered in tissue samples of aquatic organisms and waterfowl in and around the Housatonic River, “Ducks taken from the most polluted section of the Housatonic contain PCB levels rarely seen anywhere else in the world. Average PCB concentrations in these waterfowl are more than 200 times EPA’s tolerance for human consumption, and their carcasses must be treated as hazardous waste.”⁷

The Massachusetts Department of Health and Human Services has listed a warning to refrain from eating any waterfowl associated with the Housatonic River and that fish should be treated strictly on a catch and release basis only. Unfortunately, however, this problem is not limited to Western Massachusetts alone. PCBs are easily transported around the world as vapor in the atmosphere or liquid and bio-accumulate through the food chain. According to the Housatonic Valley Authority the watershed of the Housatonic River is nearly 2,000 square miles and test samples have revealed PCBs along the majority of the 149 miles of river flow from the Berkshire Hills to the Long Island Sound. Today, the most heavily polluted portions of the Housatonic River have undergone an intensive, ecology altering dredging process illustrated in Figure 2.2.



Figure 2.2: A Distressed Ecology: Dredging the Housatonic River

Furthermore, PCBs have been discovered in high concentrations in areas that are far removed from industrial practices such as the Arctic atmosphere and the fatty tissue of Polar Bears. Furthermore the ATSDR's report on PCBs states in its opening paragraph, "PCBs have been found in at least 500 of the 1,598 current or former NPL (National Priorities List) sites. However, the total number of sites evaluated for PCBs is not known. As more sites are evaluated, the sites at which PCBs are found may increase."⁸ Gone are the days of believing that effective waste management is as simple as locating your mill adjacent to the nearest body of flowing water and sending effluent downstream. For as our polluted environment continues to appear in parts of the world considered far removed from any pollution source we must realize that we are all downstream from one another.

Recovering from the economic, environmental, and social wounds left by General Electric's negligent waste management practices has been painful for the city of Pittsfield. These pains have been still greater felt by the community immediately affected by the former industrial site. In addition to having to live with visible scars of the post-industrial site the Morningside neighborhood and greater Pittsfield community has

struggled to overcome betrayal by industry, government, and the local representatives. When discoveries were being made about the harmful effects of PCBs General Electric, already involved in local, state, and federal governments, began to flex its muscle. When employees began to question the high rates of cancer among their colleagues with high exposure to PCBs and initiate medical examinations, General Electric carefully controlled the studies by allocating funding and limiting the release of information to the public. The study by Nash and Kirsch noted that conclusions reached in initial epidemiological studies were at best questionable. “The findings, which appear to deny scientifically verifiable correlation between exposure to PCBs and cancer, are being disseminated to a limited audience and are reported in the local paper through press releases issued by the company. The discourse about the study is carefully controlled by company officials.”⁹. Inconsistencies in General Electric’s message were apparent. As they continued to deny the harmful effects of PCBs and expose their employees and community to the toxic chemical, public concern regarding use of PCBs was growing throughout the country and General Electric began to secretly develop plans to phase out the material due to its potential risks.

Additionally, legislative process were delayed for nearly a decade as officials from General Electric and other large corporations were included in the development of regulations for industry standards of practice. Even as concern about PCBs and public health mounted, GE continued the use and disposal of the chemical into the local environment while denying medical coverage for sick employees and increasing their influence on federal policy. A report produced in January 1972 by industrial users of PCBs, Westinghouse, McGraw-Edison, General Electric, and others was titled, “The

Need for Continued Use of Polychlorinated Biphenyls as Electrical Insulating Liquids.”

This sentiment was echoed four months later by a report entitled, “PCBs and the Environment” sponsored by multiple government agencies including the Department of Agriculture, Commerce, Health, Education and Welfare, and Interior, and the Environmental Protection Agency. The report concluded that, “the use of PCBs should not be banned entirely, since the continued use of the substance in transformers and capacitors presents a minimal risk of environmental contamination and is outweighed by the significantly increased risk of fire and explosion.”¹⁰ Only five years later the use of PCBs were banned altogether by the very same agencies that had defended its use.

Even as evidence to the hazards of PCBs mounted, the community of Pittsfield was unable to compete with the economic force of a large corporation such as General Electric and the local government was hesitant to challenge their city’s top employer. Community residents and city officials looked to their state and federal environmental agencies to regulate the irresponsible corporation. However, regulating authorities were just as negligent in their duties of protecting the interest of the public. The Nash and Kirsch report tell of the Pittsfield community’s struggle, “While the community is forced to walk the tightrope negotiated in the developing discourse between the corporation and government agencies, they have neither the resources nor the knowledge to play an effective role in changing the course of the policies that are developed within that framework. Employees who are the victims of the delays in bureaucratic and corporate functioning turn from the agencies to political representatives in a vain attempt to gain a hearing.”¹¹.

In addition to betrayal by corporate leaders, local government, state representative, and environmental agencies, Nash and Kirsch also note the questions that have been raised by community as to the objectivity of epidemiological studies performed by the medical community. Nash and Kirsch note, “Serious questions have been raised regarding both the source of the data and its manipulation. We have seen that the studies, often funded by the corporation and/or relying on information gained from their personnel files, have legitimized the company’s delays in responding to perceived danger.”¹²

I have had the first hand opportunity to explore the William Stanley Business Park. Beyond the barbed-wire fence that wraps the site there has been tremendous work to prepare the area for redevelopment. There have been many resources directed towards mitigating environmental damage and redeveloping the site to spur economic growth and yet from a communal vantage point progress is largely unidentifiable. The Housatonic River has been partially remediated and cleanup plans for the rest of the river remains stalled as the vacant William Stanley Business Park remains a blank canvas to echoing of industry past. As the site stands today, it is as I would imagine a cross between a war zone and a moon crater would appear: devoid of life, piles of earth and rubble, environmental monitoring equipment, and skeletons of former industrial buildings (see Figure 2.3).



Figure 2.3: Existing Site Condition: East Street Area 2 North Complex

This is progress according to the solutions developed by local, state, and federal agencies. Aside from a design charette that took place ten years ago and the largely unattended public hearings regarding the afflicted community, living within a stones throw of this site, has remained largely an aside to its redevelopment. This is inaction to involve and engage the community has fueled the frustration and distrust that has developed over the years between the community and the industrial neighbor. While these early remediation actions are necessary to safeguard public health, they have relied on prescriptive measures applied with a broad brush. Though they appear to adequately cover the economic and environmental problems of this contaminated, site these methods have been subtractive and invasive with regards to the local. While appearing smooth, a closer inspection of the canvas of a contaminated site reveals a surface that is textured with complexity. As we reframe the context of these damaged ecologies finer attention needs to given to the social needs of the distressed community than can be covered by the bristles of a broad brush.

CHAPTER 3

DISPARATE SOLUTIONS

Ecology

After years of litigation the EPA has developed an insufficient prescription for the treatment of the ailing William Stanley Business Park and adjacent Housatonic River. The solution will at best mitigate the damage, but fail to treat the disease. In fact, of the three solutions developed after years of General Electric funded studies, they had the audacity to propose to the community as a solution “to do nothing”. Unfortunately the EPA’s own legislation is only a bit more proactive, requiring GE to remediate the PCBs to a level that is safe enough for business occupation. This “level of safety” has required future businesses that wish to construct a building on the site reuse the existing footings from one of the former General Electric facilities which remain in the still partially contaminated subsurface, below the cap of concrete slabs. This requirement is meant to avoid breaking through any earth on the site because of the continued existence of PCBs throughout the “remediated” soil and potential risk to the health and safety of the sites occupants. In the EPA’s and MA Department of Environmental Protection attempt to appease corporate interests they have weakened their own environmental standards in favor of expediting potential economic opportunities and have produced an outcome that is the exact opposite. Not surprisingly a building lot on a site contaminated with hazardous material has proven to be a difficult selling point to potential business interests and thus has been an economic disincentive to the city. Figure 3.1 illustrates the relationship between subsurface and surface conditions.

Fortunately General Electric was not allowed to pursue their “do nothing” option, however the decision to dredge the most contaminated soils on the site and throughout the banks of the Housatonic River banks has not been without consequence. Avoiding incineration of the excavated hazardous material General Electric has been ordered to stockpile them on a portion of their property and cap the piles with clay and heavy plastic as is a traditional method of treating landfills. Two of these stockpiles of contaminated soil, the infamous “Hill 78” and the Building 71 Consolidation Area, have been sited directly adjacent to the Allendale elementary school in a poorer district of Pittsfield. It is hard to imagine the best solution developed by the U.S. EPA and MA DEP locates stockpiles of highly contaminated soil directly adjacent to and rising above the height of an elementary school. Additionally, this elementary school serves a residential neighborhood that is largely comprised of former employees of General Electric, whom now have to worry about their children being exposed to the same hazardous wastes that have brought so much trouble to their community already.

When the cleanup process is “complete”, the site will be turned over to the Pittsfield Economic Development Authority (PEDA) which will create enormous potential to redevelop the vacant site and reinvigorate the local economy. However, the remediation efforts as they are proposed today literally attempt bury the past, with negative sentiment persisting within the community. In order to properly address and redirect the legacy of this site, both community and industry will have to move forward together, cooperatively cultivating their shared interests of economy, ecology, and equity. It is in this role that I believe Architects have the greatest potential through design to

remediate the conscience of an afflicted community and change the course of industrial practices within our communities.

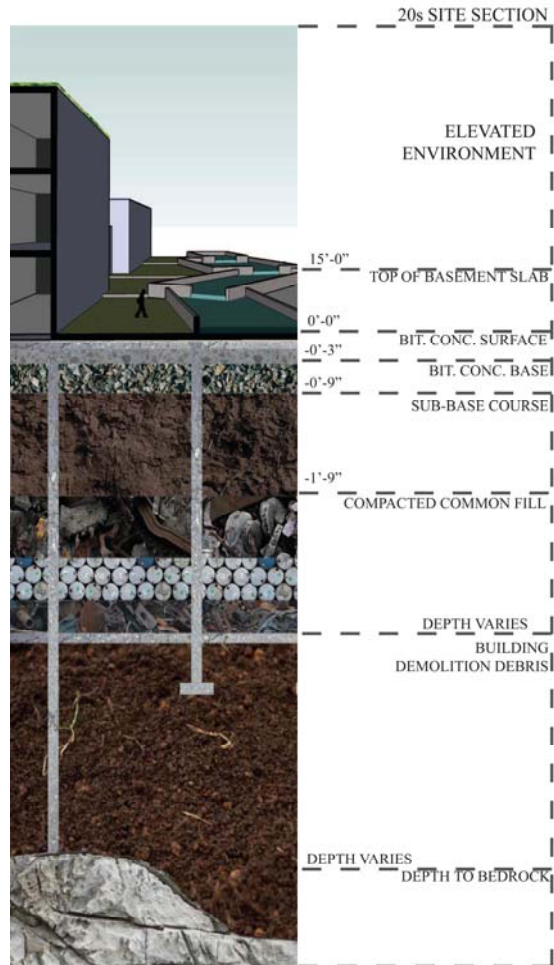


Figure 3.1 - A Diagrammatic Section of Site Conditions

Economy

In September 2003 the Pittsfield Economic Development Authority together with a group of architects and engineers produced a Master Plan for the redevelopment of the William Stanley Business Park. The nearly sixty page document thoroughly addressed many of the existing assets of the site and sought to produce a master plan which would effectively inspire economic revitalization in the city. Their process involved input from

officials from local, state, and federal levels. Community input was incorporated into the design development through a two-day design charette with community stakeholders, interviews with a smaller select number of stakeholders, and multiple public forums. The report concluded that effective redevelopment of the site should include a mix of industrial uses, business offices, open recreational space, community connectivity, and traditional building styles. While I agree with the prescription developed for dealing with the generic ailments of this site, I believe there are additional considerations of sustainable design as well as site specific considerations, such as mixed-use zoning, expansion of the creative arts district, and enhanced community involvement. Additionally the paradigms of industrial past need to be redefined to provide a system which is more inclusive, transparent, and educational in order to have a more sustainable presence within our communities.

Both the EPA remediation plan and redevelopment Master Plan address many of the issues that are essential to restoring the resources of a degraded site. Upon review of the remediation plans for the former General Electric site and without disregarding the efforts that have already been made, there are still opportunities to improve upon the methodology and potential to implement a more effective design plan. The current process for restoring contaminated sites unequally separates the basic components of a sustainable and potentially regenerative design.



Figure 3.2 - SASAKI Master Plan for William Stanley Business Park 2003

Additionally though sustainable design strategies must be incorporated into every aspect of a master plan for this site, I believe that there are many aspects to this site which would not benefit from a *sustainable* solution. The community within and the environment upon which this site rests have been so abused and neglected that any proposed solution has to be more than sustainable, it has to be regenerative to begin properly healing the wounds of the distressed community. Looking to existing examples of “closed-loop” eco-industrial techniques at home and abroad, we can imagine a system of businesses which feed their production processes using the “wastes” from adjacent industries. These eco-industrial systems, though rare, offer an alternative to the traditional industrial practices which have found Pittsfield and the surrounding environment in the battered shape it is in today.

The reality of overcoming the legacy of contaminated sites within our communities is an undeniably arduous process that may take many generations to overcome. Instead of using this reality as an excuse to discouragingly turn away from these sites and or choose an ineffective quick fix, we must embrace these realities for the opportunities they present to address social ills. I understand that even the most thoughtful redesign of this site can never solve all of the social distresses it has brought to a community, but rather provide the redirection for its forward progression, a prototype for reimagining the New American Frontier.

CHAPTER 4

ANALYSIS

Process

One of the primary issues that I have noticed in my investigation of site plan proposals for the William Stanley Business Park is that they have treated the site separately from the community within which it exists. This is partially the result of following suggested generic prescriptions for the treatment of Brownfield sites and the inability or disinterest in looking outside of the site context. However, as I have previously discussed, it is precisely the context which needs the greatest attention. My analysis of the William Stanley Business Park has focused at various scales, identifying common threads between master plans for the city of Pittsfield, proposals for the William Stanley Business Park, recommendations for the adjacent Morningside Neighborhood, and the metrics of sustainability and guidelines for “smart growth” as defined by the commonwealth of Massachusetts and LEED for Neighborhood Development. The intention is that within these studies and broad design guidelines, certain strategies can be developed that are contextually specific, unifying the economic, environmental, and social needs of the Pittsfield community. I illustrated my ambitions for the William Stanley Business Park early in the research phase of this process and would later carried these principles through the final design (see Figure 4.1.)

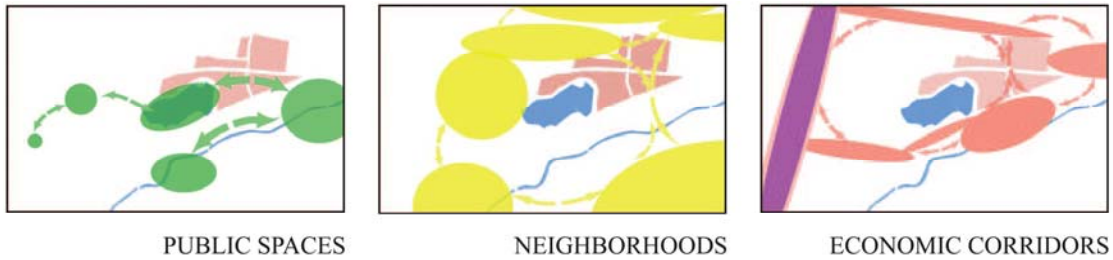


Figure 4.1 - Diagrammatic Plan for Community Reconnection

Pittsfield's Cultural Shift

As was discussed earlier, Pittsfield is a city in transition. Historically it has been the industrial center of Berkshire County, with General Electric as the primary employer. As manufacturing jobs have fled the city and country, Pittsfield has re-envisioned what it considers its economic future. Pittsfield is geographically centered along a cultural corridor that extends from the southern reaches of Berkshire County in Great Barrington, through the towns of Stockbridge and Lenox north to the town of Williamstown. Along the route 7 corridor there are myriad cultural attractions ranging from contemporary and classical art museums, outdoor symphony halls, botanical gardens, historic museums, and theatres. Pittsfield has already begun to rebrand itself to participate in and take advantage of the strong arts economy within the Berkshires. Much of the effort has been concentrated within the downtown of city. North Street has seen an influx of new restaurants, theatres, and a cinema, upgrades to the existing museum, and community events to bring attention to the downtown. A city interest in the storefront artist's project has provided artists studios and gallery space within empty storefronts has given the city an edge in the development of a contemporary creative arts culture within the Berkshires.

In 2008, a draft Masterplan for the city of Pittsfield was created by Saratoga associates. Though brief, Saratoga Associates touches upon the inexorable link between a community and industry noting the importance of design sensitivity towards their points of interface recommending to develop a design that offers benefits to both industrial and commercial programs to support local businesses and promote growth while respecting the communal fabric of the city. Though it is important to address the interaction between industry and community, this recommendation is too weak to successfully address the complex legacy of the William Stanley Business Park. I believe that an attitude based upon avoidance of conflict with the community is unrealistic and ignores the conflict that already exists. Engagement with adjacent communities does not have to result in conflict. Furthermore, a deliberate attempt to reconnect with the adjacent community can provide a catalyst to educate the community and move beyond any residual communal anguish.

Additionally the 2008 draft master plan for the city emphasizes the importance of connecting open space corridors, yet overlooks the importance of connecting urban infrastructure which in essence preserves open space as well. Overall the master plan perpetuates the existing zoning boundaries, overlooking opportunities to integrate zones for mixed uses. Another suggestion, which applies directly to the William Stanley Business Park, is to improve the walk-ability of Tyler Street, a busy commercial street with pedestrian travel. Though Tyler Street terminates at the northern end of North Street, the re-imagined cultural core of the city, there appears to be no consideration to improve pedestrian connections to the downtown. Furthermore, while importance was placed upon the preservation of industrial zones, pedestrian and bike access through

residential neighborhoods to the downtown are not proposed. Though the 17 mile Ashiwilticook bike trail is an enormous asset to the Berkshires it acts solely as recreational attraction and falls well short of providing a venue for safe alternative transportation. A bike path proposal has been put forth creating a loop around the William Stanley Business Park, eventually connecting to a Housatonic River Path and yet still fails to provide an adequate opportunity for alternative transportation. While most bike path extension plans completely avoid downtown Pittsfield because of the complexity of planning, it is the exact place to start the extension. Working from the most heavily populated areas outward into the community would begin to provide a sufficient space for alternative transportation. Recommendations by the Berkshire Regional Planning Commission (BRPC) in 2007 began this conversation suggesting more pedestrian friendly neighborhoods between the downtown and Morningside community. Their suggestions included the removal of on street parking or one lane of traffic in an effort to widen sidewalks and provide more open space, all of which could be implemented as part of a larger revitalization of the William Stanley Business Park.

While the city transitions away from an industrial economy, Pittsfield would still like to consider itself a city of innovation and production and thus still highly regards its industrial potential. After years of failed attempts to lure the next GE scale manufacturer to the city, local officials have come to the realization that the next step for economic redevelopment at this site will be of a varied scale, comprised of multiple businesses. To this point, it is imperative that the location and size of proposed programs respect the scale of adjacent programs, such as residential neighborhoods and open space. Previous

GE manufacturing plants would site sixty foot tall buildings directly adjacent a neighborhoods defined by their quaint New England aesthetic.



Figure 4.2 – Figure Ground Building Scale Analysis

This diagram illustrates in plan the historic (heavy tone) and existing disparity of scale between industry and residential neighborhoods at the William Stanley Business Park.

Pittsfield envisions its downtown future as the creative center of the Berkshires, desiring to maintain a vibrant hub of research and design at the William Stanley Business Park. While these two programs seem to be disconnected it is perhaps within this point between creative and industrial economies that there is the greatest potential to overlap programs and a foster collaborative environment for innovation.

The Housatonic River continues link communities to a troubled industrial history via a polluted ecosystem. With the William Stanley Business Park at the headwaters of the discord between industry and community it is essential to create a design principle for the redevelopment of this specific site around the reconnection of the community to its battered bodies of water, the Housatonic River and Silver Lake. Unfortunately, the

Saratoga master plan also falls short of mentioning the Industrial Zone's relation to these environmentally sensitive ecosystems which despite their suffered abuse, continue to be an asset to their local communities for recreation, education, and inspiration. This continued use of the river despite its condition, is a sign that the community is ready to return to the river as long as we are ready to provide that path.

The William Stanley Business Park

The William Stanley Business Park makes up the western most tip of an industrial wedge that has been driven into the city of Pittsfield from its eastern limits to within a half mile of the downtown. Enveloping the William Stanley Business Park are nearly all of the zoned uses in the city including, residential, mixed use, commercial, industrial, and recreational uses. In the past the structures erected on this site were sited and designed without consideration of these adjacent uses with the effect of sixty foot tall steel clad industrial buildings directly adjacent to two story residential structures, leaving the adjacent community in shadow. Today only a few of these structures remain. They embody the residual evidence of shear inequity of scale between these adjacent zones and the disregard for a sensitive transition between them.

As a result of years of litigation between General Electric and city, state, and federal agencies a Definitive Economic Development Agreement (DEDA) was reached between these parties specifying the responsibilities of all parties in the process of cleaning and preparing the site for prospective users. The result of this DEDA has been the classification of the site under chapter 43D under MA law, making it a Priority Development Site. This classification allows for expedited permitting and funding under

state statue and though this may prove a potential catalyst for economic development there is the potential danger of once again adversely impacting the environment and social conscience of the community if irresponsibly handled. Given the history, special consideration must be given to the environmental and social impacts of developing this site, even at the cost of expediting redevelopment efforts.

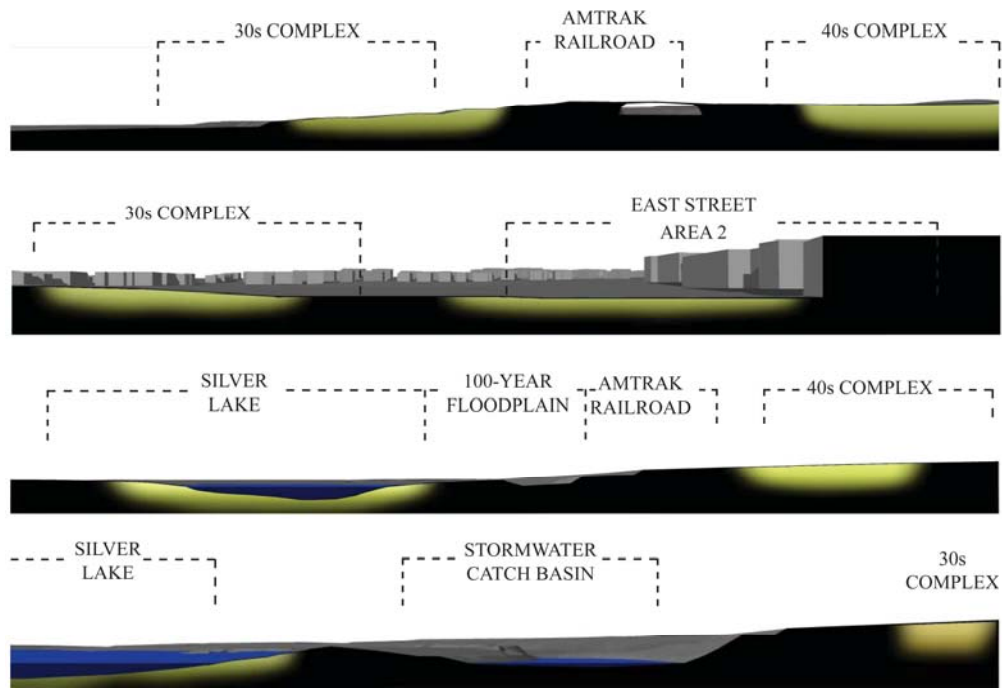


Figure 4.3 – Sectional Site Condition Study:
Areas of subsurface contamination across site

From a design and planning standpoint two major impacts resulted from the DEDA contract between GE and local, state, and federal agencies. The first being the strong recommendation to reuse existing subsurface structural elements and the other being a list of allowable and prohibited uses for the site. The reuse of existing foundations, footings, and columns is based upon the continued existence of

contaminated soil capped beneath concrete slabs throughout the site. The reuse of existing foundations potentially limits open design across the site, but is an essential consideration given the contaminated soils and demolition debris contained below the surface (see Figure 4.3). Though considered recommendations only, the excavation of the site and potential exposure to contamination for new building footprints or infrastructure is difficult to justify given the extensive subsurface infrastructure for potential reuse.

The list of allowable uses includes though is not limited to, warehousing and storage, product distribution, IT manufacturing and support systems, wholesale, assembly and light manufacturing, packaging, data processing and software development, and financial services (non-retail). Prohibited uses include, Residential uses, Educational facilities except adult education in conjunction with PEDDA and GE, Recreational and athletic facilities, daycare and elder care facilities, commercial retail uses, museums, galleries and libraries except as an educational facility, and food based businesses. These limitations were based upon expected levels of contamination following remedial action. Since the DEDA agreement the remedial action has been completed and test indicate levels of contamination below initial expectations. The DEDA contract allows for negotiation of both the limiting recommendation of foundation reuse and expansion of allowable uses at the site.

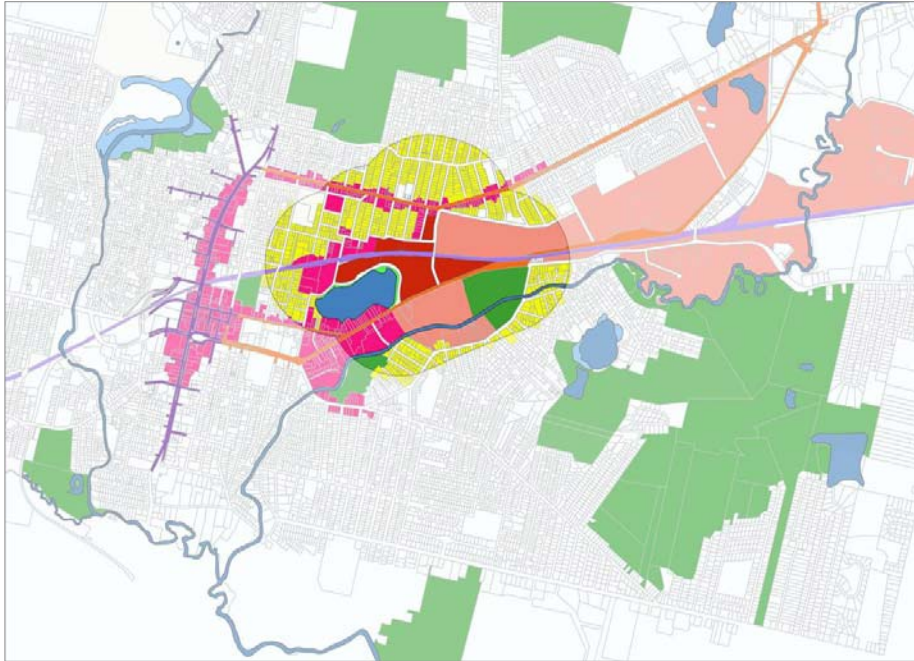







Figure 4.4 - Contextual Map of the City of Pittsfield



Figure 4.5 - Contextual Map of the WSBP: Diagrammatic Connections

- | | | | |
|---|-------------------------------------|---|------------------------------|
|  | — SITE BOUNDARY |  | — DOWNTOWN CULTURAL DISTRICT |
|  | — INDUSTRIAL ZONE |  | — OPEN SPACE |
|  | — COMMUNITY |  | — HYDROGEOGRAPHY |
|  | — AMTRAK COMMUTER & COMMERCIAL RAIL | | |

The opportunity to allow additional uses will be an important step in providing programs which adequately engage the community, such as a public gallery or museum space which is currently prohibited. Located a half mile from downtown North Street, the William Stanley Business Park could partner with or springboard from the energy that has been given to the creative economy within the city. Figures 4.4 and 4.5 illustrate that the William Stanley Business Park is not an island by showing the contextual framework that helps define the unique character of this site. Aside from economic benefits the creative arts are a natural medium for addressing social inequities and could provide an opportunity to address the legacy of the 52 acre William Stanley Business Park.

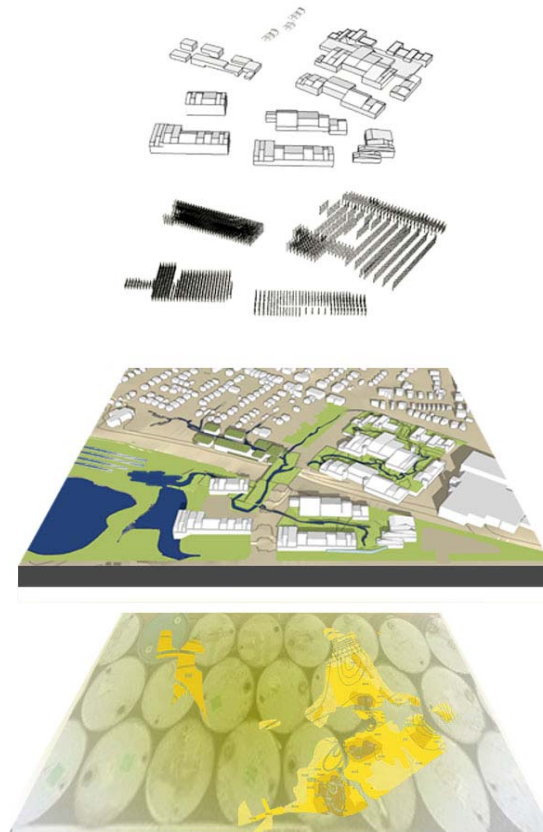


Figure 4.6 – Diagrammatic Site Response:

Reuse of structural grid to avoid excavation of contaminated soils

Proposals from the Past

As part of the DEDA the Pittsfield Economic Development Authority (PEDA) was formed and tasked with bringing new businesses to the area. After little success at luring another GE sized industry to the area, the focus has shifted to attract smaller service based and research and development based businesses. In 2003 a master plan reflecting these desires was developed by Sasaki Associates, Inc. (see figure 3.2) with input from PEDA, local planning boards, and the community. Additionally the Sasaki plan recognizes the disparities of scale between the site and its surrounding neighborhoods. They addressed this concern by recommending structures which provide an intermediate scale between the large manufacturing plants and two story residences. Overall the final plan was a thorough investigation of city needs as well as community and stakeholder desires. However, the final product did not reflect the unique connections between these communal entities.

Sasaki Associates did, however, recognize the importance of community involvement throughout the design process by holding a design charrette for interested community members as well as more personal interview sessions with relevant stakeholders. From these sessions Sasaki Associates was able to gauge a general positive attitude towards the prospect of redevelopment and a sense of a community vision for the site. Overall the sentiments toward the site were a sense of weariness for years of what has felt as disrespect toward the community, yet a resilience and readiness for change. Many of their programmatic visions centered on engagement with the site and included an artist community, museum of history, workforce training center, mixed-use facilities, and other potential incubator businesses. Also identified at the charrette and interviews

was a desire for a site design and architecture that was both inviting and unique to the site. However, in a critique of the final master plan produced by Sasaki and the associated renderings I believe it falls short of exploring the full potential of providing a reconnection to the community.

The Sasaki master plan with its supporting studies and research provides a good starting point for the redevelopment of the William Stanley Business Park. However, it is not without its shortcomings. The lack of depth into ecological considerations is one of the major limitations of the report. In the development of business programs for the site there was no mention of potential application of ecological industrial models in program development, no mention of LEED certified buildings, or restoration of the fragile ecosystem.

Although consideration was given to community involvement, it becomes lost in translation in the final plan as both public space and public programs become marginalized. Potential opportunities for the site as a community educational resource are never explored. The Master plan provides beneficial insights into city history, demographics, site condition, and community desires. It does not however address the uniqueness of the city and site surroundings, provide sustainable design strategies, or attempt to engage the sites legacy.

Just as the therapy following a surgery helps a patient move forward in their life, architecture provides the greatest opportunity to remediate the sentiments of a community and allow it to move forward following the remediation of site conditions. If ever there was a case to explore the full potential of the therapeutic powers of design it is in within

our treatment of the most degraded landscapes within our distressed communities to address the communal wounds created by contaminated post-industrial sites.

Designing for Community

One of the most significant adjacent zones is the Morningside Residential neighborhood to the Northwest of the site. The Morningside neighborhood was historically a neighborhood community for General Electric employees and their families, which has since fallen on hard times as residents have struggled to find employment opportunities that could equal those once provided by GE. The neighborhood has been classified by the city in 2008 as 40R Smart Growth Overlay District (SGOD) in compliance with Massachusetts design standards. As a result of this declaration a study was performed analyzing potential smart growth strategies for the Morningside neighborhood. These recommendations addressed the need for an appropriate scale of buildings in relation to adjacent structures, respecting both historic and contemporary aesthetics.

Smart Growth design standards place heavy priority on sustainable design strategies, noting the need for environmentally sensitive stormwater management, open space to serve as a “central organizing element”, and accessibility compliance with the Massachusetts Architectural Access Board throughout design, my design proposal attempts to implement all three. The Smart Growth report also recommends the incorporation of mixed uses within the Morningside neighborhood to increase development densities within more efficient structures that are less consumptive of energy and resources. An additional recommendation focuses on providing alternative

transportation opportunities to the neighborhood, such as increased bus service, bike paths, and pedestrian access to basic services. The report recommends the use of LEED-ND (Neighborhood Design) as a metric for designing a sustainable community. I will discuss this program and its applicability to this specific project later in this thesis.

Recently the city of Pittsfield was awarded a federal grant from department of Housing and Urban Development's sustainable communities grant program. The program provides their own guidelines for a sustainable community which was developed from other programs including the Energy Star and again the LEED for Neighborhood Development, New Construction, and Homes programs among others. Their guidelines recommend the creation of quality, affordable housing opportunities as a catalyst for an improved quality of life. Their definition of sustainability includes references to energy efficiency, environmental sensitivity, and designs that are healthy and of a universal design. They recommend promoting local economies by creating job training centers, career services, access to public and alternative transportation and partnerships with community based organizations.

The Department of Housing and Urban Development casts a wide net in its attention to social issues recognizing the interconnectedness of environment, local economies, and public welfare in successful sustainable communities. However, HUD's primary focus is perhaps heavy on the social concerns to the detriment of an intensive consideration of environmental design opportunities. For these procedures their report suggests referencing LEED for Neighborhood Development a sustainable design and construction metric system set forth by the United States Green Building Council.

LEED for Neighborhood Development (ND) recently emerged from its pilot program in 2009 and considers the larger scale of master planning while many of the other USGBC LEED certification programs considers sustainable design principles at the single building scale. LEED-ND draws from principles of Smart Growth, New Urbanism, and green infrastructure and building¹³. The guidelines emphasize design and construction elements that connect buildings and infrastructure into their community within a landscape that has both local and regional context. Ultimately sustainable neighborhoods are defined in this report by the Congress for the New Urbanism as those which are, “compact, pedestrian-friendly, and mixed-use” and as the USGBC defines it, “smart, healthy, green, compact, connected, diverse, and sustainable,” and “A contrast to neighborhood sprawl.”¹⁴

LEED-ND divides their sustainable guidelines along three major categories: Smart Location and Linkage, Neighborhood Pattern and Design, and Green Infrastructure. Smart Location and Linkage considers the implementation of alternative and multimodal opportunities, a diversity of community resources, and habitat preservation and restoration, specifically Brownfield redevelopment. The category also considers the importance of an architectural center or heart within a community, an enormous potential for the William Stanley Business Park within the Morningside neighborhood. Neighborhood Pattern and Design encourages social equity within healthy, pedestrian friendly and mixed-use communities. Design principles within this category which are most applicable to the William Stanley Business Park include walkable streets, compact development, access to public spaces, and spaces for community outreach. Green Infrastructure concerns the design and construction of energy and water

efficient buildings and infrastructure. USGBC specifically recommends certified green buildings that utilize renewable energy systems and passive heating and cooling strategies and waste management on a communal level. There are two additional categories, Innovation and Design and Regional Priority, which allow for additional LEED points. Of them the most applicable would be the principles behind the Regional Priority credit, which rewards the implementation of strategies which are regionally specific in their ability to improve the health of ecosystems, address social inequities, and or consider public health issues.

All of these guidelines are useful tools in addressing the ills of society in attempts to design a more sustainable future and they all provide their own unique road map to this shared destination. However, it is in the efficiency that these guides take you to their destination that many opportunities have been overlooked, primarily those concerning the communities most afflicted by the legacy of the William Stanley Business Park. It has been more than seven years since the Sasaki Master Plan was developed and the site itself has been vacant for nearly fifteen years. It is time to develop a new map.

CHAPTER 5

PRECEDENTS

To chart a new course for the William Stanley Business Park, I began by examining design approaches that run counter to the traditional methods of site remediation and have offered new insight towards redeveloping contaminated sites. I've explored design examples which I believe successfully addressed the complexities of contaminated site design at both the communal and human scales. My intention has been to focus on designers who have emphasized a social sensitivity within their designs for contaminated sites in search for ideas and inspiration to the unique composition of the William Stanley Business Park.

The shining example of Industrial Ecology, the city of Kalundborg, Denmark has informed a programmatic approach to my site design and I'll compare that project to an eco-industrial vision being tested in northern Vermont at the Intervale Food Center. Secondly, the city of Malmo Sweden, has given me insight into a community scale redevelopment of a Brownfield site which engages architecture, landscape, and legacy through a system of constructed wetlands in a mixed-use community. Additionally, the Dockside Green project in Victoria, British Columbia, has provided me with a more recent example of a sustainably designed community. This project seamlessly integrates wastewater reuse, open stormwater management, renewable energy harvesting, and many other LEED design principles at the district scale.

The Freshkills project designed by James Corner represents a unique vision and philosophy for working with degraded sites. Corner's design for the Freshkills landfill goes far beyond the transformation of a landfill into a public park, using machinery and

found objects to illustrate the impact of waste in our environment without shocking visitors into discomfort. Finally, I have further refined my understanding of building within a degraded environment through an exploration of the Seattle Olympic Sculpture Park by Weiss Manfredi Architects, in which through a thoughtful redesign of a Brownfield site a community is reconnected to its waterfront.

The Eco-Industrial Model

Traditional industrial systems are defined by their linear processes, the input of resources, their modification, and the output of waste. The industrial revolution sparked an unparalleled increase in the amount of materials our industries were able to produce for our consumption, and conversely the amount of waste being produced. For centuries we had convinced ourselves that the earth was able to infinitely absorb and dilute all of our effluent. Today, with decreasing ozone, mercury filled oceans, and toxic soils we can no longer ignore how finite the world is. In the wake of the alarming environmental signs and public health concerns, such as those in Pittsfield, there are corporate industrial leaders that are questioning the effectiveness of this linear system. Hardin Tibbs of the Global Business Network recognized the importance of the industrial “wake up call” in his 1993 article *Industrial Ecology: An Environmental Agenda for Industry*. In that article he states very early on that, “The ultimate drive of the global environmental crisis is industrialization, which means significant, systematic change will be unavoidable if society is to eliminate the root causes of environmental damage.”¹⁵ Though our instincts often separate industry and environment as distinct organisms Tibbs reminds us that “It is easy to forget that the industrial system as a whole, as it is now structured, depends on a

healthy natural global ecosystem for its functioning.”¹⁶ As global resources are continually depleted and the environment degraded, the time has come to re-imagine our ways of doing business. Fortunately, there are already pioneers exploring this vast terrain. From them we may be able to redirect the legacy of the William Stanley Business Park, in Pittsfield and other degraded industrial sites across our county.

The city of Kalundborg, Denmark is a leading example of what Robert Frosch and Nicholas Gallopoulos defined as “industrial ecology” in their 1989 article in *Scientific American*. The city of Kalundborg has developed a collaborative industrial process which, modeled like the natural ecology of a forest¹⁷, operates with closed resource loops. This philosophy runs parallel to what William McDonough refers to in his book *Cradle to Cradle* as, “waste equals food.” The industrial ecology process at Kalundborg relies on a relationship between businesses that is based on cooperation, not competition. Yet still, all of the businesses thrive in a market based economy, relying on input from each other and thus ensuring the longevity of their neighbor. So what does a power plant, a pharmaceutical company, a gypsum wall board manufacturer and local farmers have in common? As it turns out, quite a lot when you begin peel back the layers of industrial ecology at work in Kalundborg.

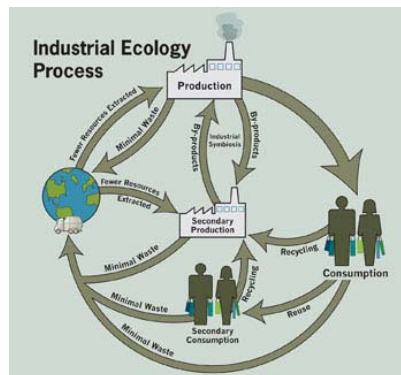


Figure 5.1 – The Ecological Industrial Process

The eco-industrial anchor to the Kalundborg model is the Asnaesverket Power Company which is able to recover approximately 70% of their waste heat and save 600,000 cubic meters of water annually¹⁸. They created these reductions by piping their waste steam to power engines at two companies: the Statoil Refinery and Novo Nordisk (pharmaceuticals). Additionally, waste steam heats 3500 homes, eliminating the need for oil furnaces and decreasing carbon emissions. Waste cooling water from the Power Company, now warm, is piped to fifty seven ponds at a fish farm which produces 250 tons of sea trout and turbot yearly¹⁹. Novo Nordisk uses waste steam for fermentation tanks to produce insulin and enzymes. This produces 700,000 tons of nitrogen-rich slurry a year. Instead of dumping it in the fjord, it is given to local farms as a fertilizer to help grow plants which are used to feed bacteria in the fermentation tanks. Statoil Refinery purifies waste gas to use internally, which is piped to the power company, and to a wall board manufacturer Gyproc as fuel. Sulfur removed from the waste gas is shared between Kemira, a sulfuric acid producing company, and Gyproc which converts it to calcium sulfate for their gypsum board²⁰. The city of Kalundborg has ensured the sustainability of its community, ecology, and economy by promoting a collaborative, capital driven eco-industrial system.

On a smaller scale, yet closer to home, is the Intervale Food Center in Burlington, VT which is also designed around the industrial ecology model. The Intervale Food Center is based around four anchor facilities: an electric power company generated from biofuel (wood), agriculture, a waste wood depot, and a composting facility for the city of Burlington. Additional incubator businesses are run off of waste heat, such as a series of greenhouses, educational programs, and other light commercial businesses. Ambitions of

the site that have not yet been fully realized envisioned a further extended network of waste decomposition and material reuse through the integration of a brewery run off of waste heat from the power plant. Wastewater and mash from the brewery would be piped into adjacent greenhouses. Within the greenhouses a network of plants, mushrooms, and fish harvesting tanks would consume and detoxify the waste from the anchor facilities.

Industry represents a significant portion of the economic factor, which along with concerns for the environment and social equity according to McDonough's *Cradle to Cradle* provides a metric for determining the sustainability of a product, design, etc. The interface between industry and environment and community is therefore inevitable.

While this exchange has been largely to the economic benefit of industry and detriment of our global ecological and public health, the models of Kalundborg and Intervale Food Center provide alternative visions to standard industrial practices. While these models may remain anomalies until our economic systems begin to truly account for the environmental and social costs within industrial processes, they represent the continued growth of a collective social conscience towards sustainability. This conscience was a reaction to the irresponsible practices of industry past; it is time for industry future.

“The City of Tomorrow”

In the vastra hamnen (western harbor) region of the city of Malmo, Sweden is one of the most sustainably progressive communities. In this district they derive one hundred percent of their heat and energy from renewable resources, utilizing a combination of photovoltaic panels, geothermal and solar thermal systems, wind turbines, and cogeneration plants²¹. Cogeneration plants are fed with organic waste that is collected

from neighborhood recycling stations set up throughout the community. The “City of Tomorrow” as it is also known is certainly a model for the effective implementation of sustainable practices at a city scale.



Figure 5.2 – Public Core of the “City of Tomorrow” Malmö, Sweden

A former Brownfield site, the City of Tomorrow is now defined by its open space and engaging water treatment systems, replenishing the harbor with clean water while educating the public. This space is further accented and given life by the use of an architecture that is unique, yet complimentary to the existing community.

It is hard to imagine, that less than ten years ago the vastra hamnen region of Malmö was known as environmentally degraded and economically depressed, similar to position that the city of Pittsfield finds itself in today. In 2001, a sustainable housing exhibition (Malmö Ekostaden) showcased visions of a sustainable future in which people, ecology, and technology existed in a harmonious balance. As a result of this exhibition the city decided to realize these visions in one of the most degraded former industrial sites within the Malmö, the vastra hamnen (western harbor). The vastra hamnen Barchiterownfield was in an abandoned declared state as the country transitioned from an industrial based to a service based economy with the loss of many industrial manufacturers, a story not uncommon to the residents of Pittsfield.

Realizing the district's relation to water, the treatment of this resource became paramount to the design of Bo01, the City of Tomorrow. Instead of traditional stormwater management techniques of diversion into storm drains where polluted stormwater combine with other sources and is directed untreated to the largest body of water, a decidedly alternate option was employed at Bo01. Though a largely hard-scaped environment, stormwater throughout the vastra hamnen district of Malmo has been managed through an open system of vegetated roofs, drainage swales, ponds, pools, and small wetlands. The creative integration of the stormwater treating landscape and pedestrian accommodating hardscape not only serves the environment, but engages the community. The creation of neighborhood recycling centers and district wide distribution of renewable energy strengthens the bonds with a community. The decision early in the design process to engage the community, both directly and subtly, has served to educate a community for a future of environmental stewardship and has begun to heal the wounds from legacy of environmental degradation.

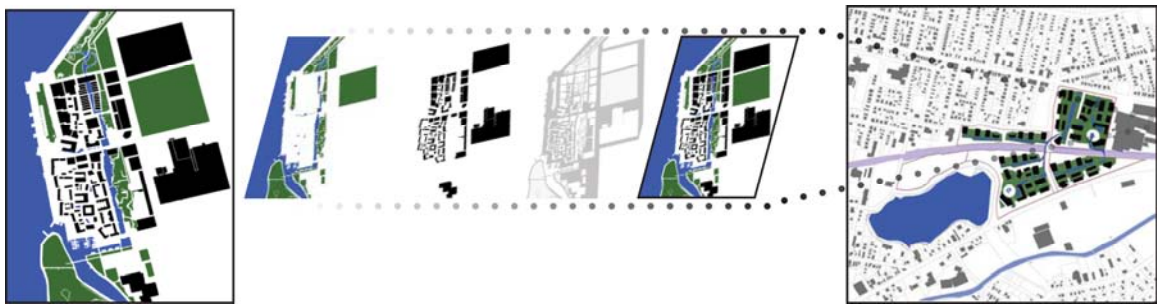


Figure 5.3 – Malmo Site Analysis Diagram:

Open Space, Building Footprints, and Infrastructure, transposed on the William Stanley Business Park. I repeated this visual exercise with other precedents to understand how their sites were ordered. I separated them into design elements and then applied them to the William Stanley Business Park to inform the design process.

The City of Today

While Kalundborg provided an excellent example of the eco-industrial model and Malmo a direction for water-centric Brownfield revitalization, Dockside Green in Victoria, British Columbia provides a more contemporary precedent of a sustainably designed community. A LEED Platinum community designed by Perkins and Will completed in 2008, the Dockside Green project reclaimed fifteen acres of post-industrial Brownfield waterfront on Vancouver Island. The project is focused around a central greenway with an integrated system of constructed wetlands, engaging the public and purifying stormwater before it replenishes the harbor.



Figure 5.4 – Dockside Green, Victoria British Columbia

Dockside Green has been designed as a mixed-use community providing architecturally unique spaces for residential, office, retail, commercial, and light industrial programs. This project also incorporates sustainable systems throughout its eco-district, harvesting waste water and utilizing waste to fuel principles. Dockside Green treats 100 percent of its sewage on site and reuses the water for irrigation and other

greywater uses, decreasing the effluent loads on the local waste water treatment facility and therefore the harbor. Additionally Dockside Green converts waste to energy with an on-site gasification plant that efficiently converts specific wastes collected on site and off to heat energy for use throughout the complex. The site also incorporates multimodal opportunities such as, bike and walking trails, bus stops, and ferry access to limit automobile use without limiting transportation for residents and visitors alike.

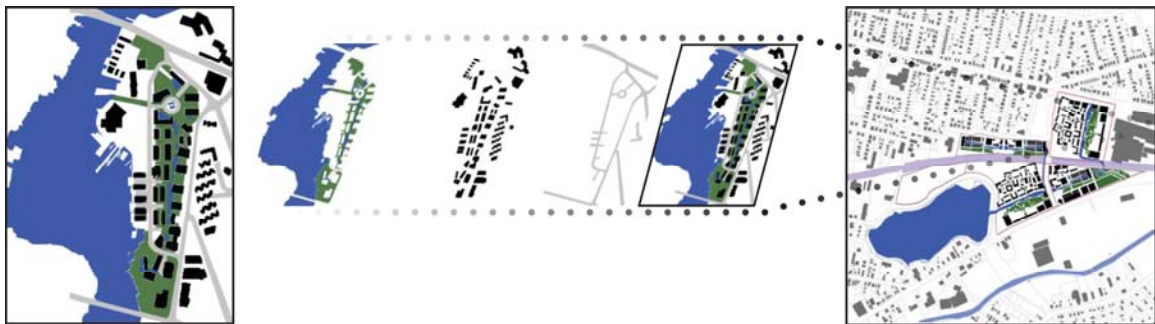


Figure 5.5 – Dockside Green Site Analysis Diagram

Dockside Green presents a unique case for thoughtful integration of enjoyable multi-use spaces, sustainable design strategies and systems, and reclamation of a post-industrial Brownfield site. This project is most applicable to the William Stanley Business Park for its creative waste and stormwater management in concert with open space. The success of Dockside Green relies heavily on the influx of residents to sustain many of the accessory uses. The William Stanley Business Park however already has the community and needs to provide the accessory uses. The question for the William Stanley Business Park remains whether or not a design such as Dockside Green, one that is able to offer a mix of residential, professional, and enjoyable public spaces, can also

effectively integrate the complex needs of industrial programs. A successful integration of these programs at the William Stanley Business Park may provide the solid base from which to rebuild the communal conscience.

Making a “Lifescape” from a Waste Hill

The poor reputation of the William Stanley Business Park in the community is understood following the years of disrespect to the Pittsfield community by General Electric. Undoubtedly this has led to a hesitation by businesses and institutions establishing themselves at this site. Addressing this legacy within the community will be a necessary first step to realizing the full potential of the site. The community is the foundation upon which to build an industry, without its support the whole structure is weak and unsustainable. To successfully manage this feat, I looked to the methodology employed by James Corner of Field Operation with his “lifescape” design for the Freshkills Landfill, in Staten Island New York. His concept focuses on the same considerations developed by William McDonough though under the titles of Program (equity), Habitat (ecology), and Circulation, (economy). No matter how you define it, understanding the interconnectedness of the varied cycles of our world is the first step in creating sustained communities. Furthermore his integrated Landscape Urbanism design approach is further bolstered by his insistence that it is a multidisciplinary process which includes landscape architecture, urban design, landscape ecology, engineering, etc. I believe that many of the failings of the efforts at the William Stanley Business Park to date and the shortcomings with future plans are directly related to a lack of integration among disciplines.

As we push further out into the unspoiled ecologies of our communities in search of undeveloped land, Corner's philosophy emphasizes the need to regenerate the health of our most disturbed ecosystems. This is a perfect model for the reestablishing the weave of industrial, environmental, and communal fibers at the former General Electric site. The use of the fence has been effective in protecting the community from potential harm of dangerous chemicals, the next challenge is to open the gates to the hearts and minds of community once the site is suitable for occupation. James Corner's method for repurposing the Freshkills landfills provides the key to this essential phase.



Figure 5.6 – An engaging public moment of James Corner's Design for the Freshkills Landfill

Though the problems faced at the William Stanley Business Park connect with those of Freshkills Landfill through the healing of damaged ecologies, it is their contextual framework that distinguishes them. The William Stanley Business Park is situated within an urban context which relies on both industrial opportunities and community connectivity. Corner did not have to contend with these urban programs at Freshkills, where the site was treated more as destination than as an integral part of the community. The presence of existing manufacturers at the William Stanley Business

Park and local zoning that facilitates additional industrial growth sets up a context within which to work. Though it is tempting to turn away from industrial proposals for this site based on the city's relatively recent history, there are undeniable economic benefits to be gained from a healthy industrial ecology within a community. As designers we can provide the catalyst for changing traditional industrial practices, by re-envisioning the relationship between industries and their communities as we take on the challenge redesigning the New American Frontier.

Designing within a Degraded Landscape

Like James Corner's Freshkills project, the Olympic Sculpture Park at the Seattle Art Museum designed by Weiss Manfredi Architects creates an engaging space for a community where only previously existed a scar worn by an abused environment. The site was a former industrial site along Seattle's coast adjacent to a major freeway and busy city street. Yet Weiss Manfredi overcame these constraints to develop an architectural work that engages the community at its core, a public sculpture garden in concert with the Seattle Art Museum. More landform than building, the Sculpture Park reconnects the Seattle community to its once degraded waterfront. The lone structure, the PACCAR Pavilion and Gates Amphitheatre seemingly evolves from the built landscape, blurring the distinction between natural and built environments. The program allows space for art installations, dance performances, and opportunities to educate the community.



Figure 5.7 – Weiss/Manfredi’s Olympic Sculpture Park, Seattle WA.

Environmental considerations involved Brownfield remediation, salmon habitat restoration, and sustainable design techniques. This project, gives insight into potential opportunities of engaging community within built environment and proving the case for the salvation of the contaminated sites across our new frontier. Like Corner’s Freshkills Weiss Manfredi’s Olympic Sculpture Park desensitizes the legacy of post-industrial contaminated sites by transforming them into safe public spaces, which are transparent engaging, and educational. Weiss Manfredi’s design for the Olympic Sculpture Park provides testament to the ability of architecture to reframe a community’s perception towards a degraded environment and speaks to an instinctual human desire to be connected to the rehabilitation and reconciliation of our most distressed ecologies.

CHAPTER 6

DESIGN FOR A SUSTAINABLE FUTURE

Design Process

While working with much of the same information as the designers who preceded me and yet with a basic aspiration to arrive at an alternative design for the William Stanley Business Park, I concluded early in the design process that my analysis of information had to deviate from the conventional remediation design procedures. The most fundamental being a challenge to the assumption that the distressing legacy of a contaminated site is best left buried with the past. In contrast with this hypothesis, I believe that sunlight is truly the best disinfectant. Through exposure of and education on the legacies of contaminated sites we can begin the slow yet steadfast rehabilitation of our communities and lead with a light foot through the New American Frontier.

As with many spoiled ecologies, the William Stanley Business Park has literally been under the microscope for more than two decades, with volumes of test results, demolition plans, remediation procedures, and condition assessments with professional assessment and opinions throughout. The sheer amount of this information reflects to a degree the impact this process has had upon the local community and ecology. To differentiate my process I began with three design principles that I believe distinguish my proposal from its predecessors. The most essential design principle was a desire to reconnect the Morningside neighborhood to its natural resources by providing a safe passage through enjoyable open spaces. Secondly, I wanted to use architecture as a tool to desensitize the most agonizing aspects of this sites legacy with respect to the community. Finally, I wanted to restore the damaged ecology while providing an

engaging and transparent space for both industry and the community to set the stage for a future eco-industrial park.

Mapping Forces

Being connected to the broader community as I continued to sift through the mass of information regarding this site I continually checked the data with my first hand knowledge of the site and its legacy. What developed out of my research was an understanding of varied pedestrian, vehicular, environmental, and historical forces acting around and within the site and its adjacent community. To further understand the design implications of these forces, I abstracted the information and diagrammatically transposed it over images of the site.

Through abstraction all environments, such as the greater community of the William Stanley Business Park can be reduced to a series of simultaneous forces. Within this region pedestrian forces are channeled along the edges of orthogonal street grids, intensifying in popular commercial zones and dissipate within residential neighborhoods. Concurrently, turbulent vehicular forces at moments bisect these pedestrian zones creating barriers to connection while at the same moment interchanging with pedestrian forces along the transitional edges between vehicular and pedestrian space. Perhaps one of the greatest barriers to reuniting the Morningside community to its environment is the Amtrak Rail. This commercial and commuter rail system bisects the William Stanley Business Park along the East-West axis leaving the northern Morningside community physically disconnected from pedestrian access to Silver Lake and Housatonic River to the South. However, as I continued the process of diagrammatically mapping environmental forces acting on the site opportunities of reconnection emerged.

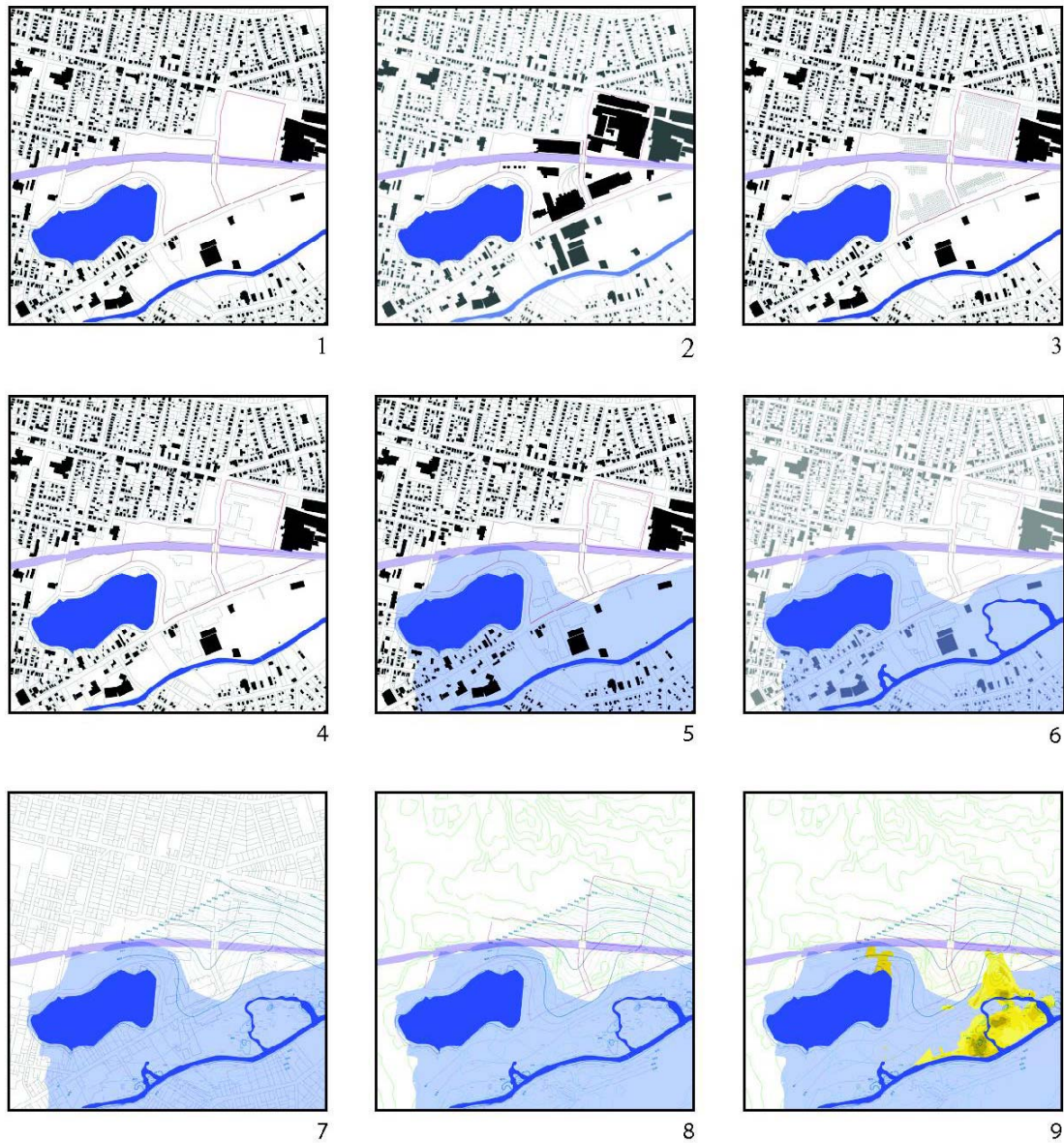


Figure 6.1 - Mapping Forces

- 1) Community Footprint 2) Historical Industrial Footprint 3) Historical Structure 4) Industrial Ghost 5) 100-year Floodplain 6) Historic Oxbow 7) Groundwater Elevations 8) Hydro-geography 9) Historic Contaminant Spill

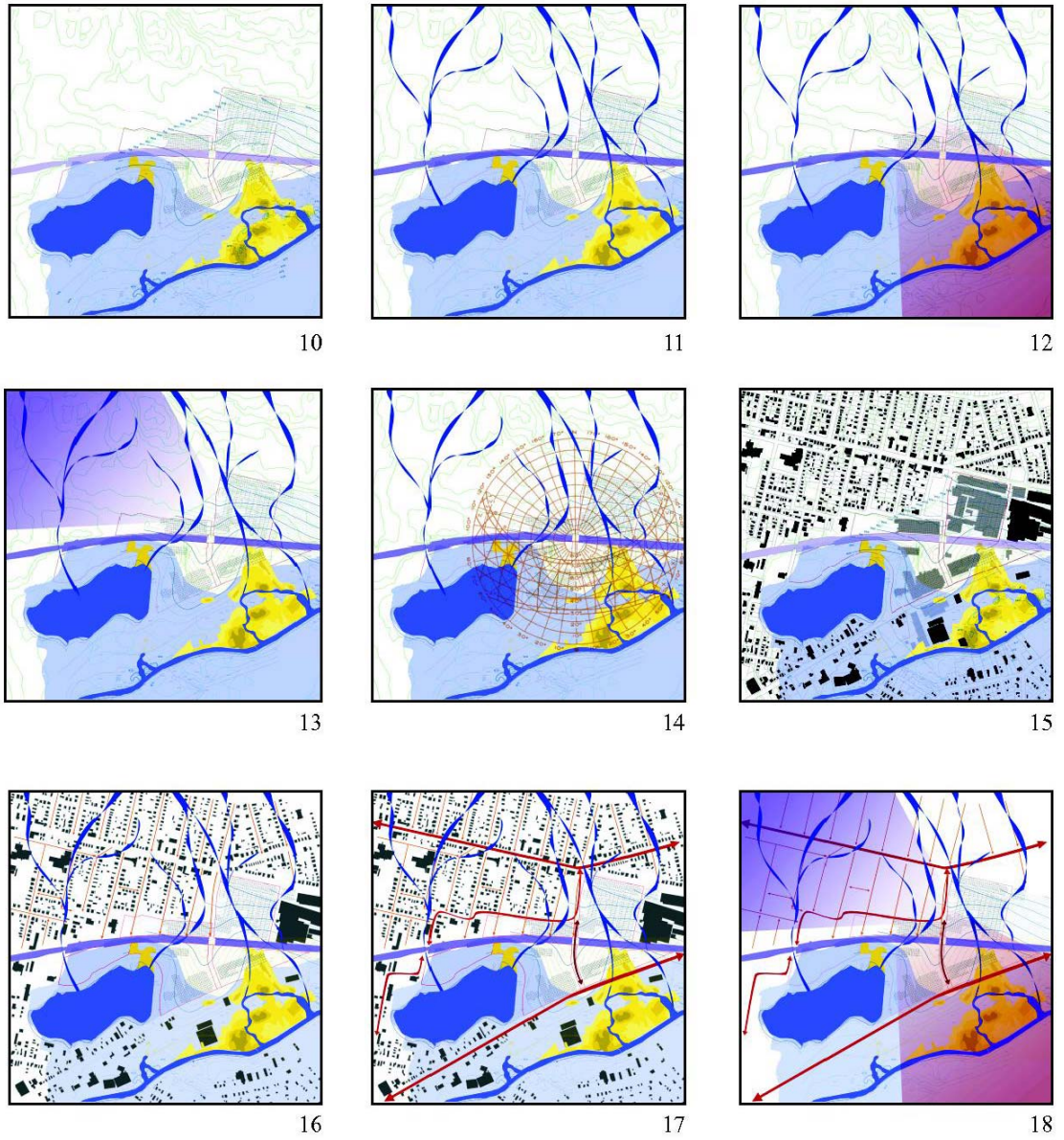


Figure 6.2 - Mapping Forces

- 10) Historic Structure and Hydro-geography** **11) Stormwater** **12) Prevailing Summer Winds** **13) Prevailing Winter Winds** **14) Solar Path** **15) Community Restoration** **16) Pedestrian Flow** **17) Vehicular Flow** **18) Force Abstraction**

With a desire to reverse the trajectory of the legacy of ecological degradation, specifically groundwater and soil contamination, I focused the mapping of environmental forces around site hydrology, exploring stormwater flows as a response to topographic characteristics and the how subsurface groundwater elevations can inform surface design conditions. Emerging from this exploration was a particular flow of hydro-geography which reached out into the community, through the site, and discharging into Silver Lake and eventually the Housatonic River. The combination of this hydraulic force with the aforementioned pedestrian force provided a clear path to reconnection and opportunity for reconciliation.

However, in order for reconciliation to be complete an industrial component still needed to be seamlessly integrated with the ecological corridor for pedestrian passage that was beginning to develop. To bridge the gap between open space and the built environment I abstracted a series of maps which attempted to represent the historical significance of the site. I mapped out former building footprints and structural grids to visually understand the force they historically had within their community. This process led to the discovery that the reuse of an historical structural network provided the dual opportunity of both minimizing site excavation and thus contaminant disturbance while also subtly memorializing the understated positive force these institutions once had in helping to grow their community.

As I continued to explore this process of analyzing and representing site forces at the communal scale, a clear basis for design was materializing. I continued the procedure to account for additional environmental forces including, prevailing seasonal winds and solar paths which could later inform the site design as it was further developed. The next

step was to take the information that I developed at the communal scale and refocus my attention to the site scale. During this transition I refined the knowledge that resulted from the process of diagrammatic mapping and applied it towards the development of an alternative approach to designing within a degraded environment.

Reimagining the New American Frontier

Utilizing the information that resulted from the analytic mapping process, I had developed a clear direction for reuniting the Morningside Community to its environment. As part of the reconciliation process this pedestrian path is woven through an industrial system that is intended to engage with and educate. To further develop this reconciliation process I refined my investigation of both the historic and existing site conditions. This second look at the 52 acre site revealed myriad conditions, reinforcing the notion that the preceding broad brush solutions fail to account for the unique conditions that vary across the site. Without a full comprehension of these complex conditions as they migrate and transform across the site, the chance to reverse the negative aspects of an industrial legacy becomes just another missed opportunity and communal wounds remain untreated.

In recognizing the unique combination of site conditions at the William Stanley Business Park I have developed four alternative design responses to remediation efforts at various locations throughout the site. Each response is unique to each one another, though bound in their design principles to reconnect a community, restore a damaged ecology, and desensitize the legacy of negligent industrial practices in order to provide the catalysts for a re-imagined eco-industrial system. The East Street Area 2 North site is

the largest portion of the William Stanley Business Park and became an opportunity to directly connect to the Morningside neighborhood at its busy commercial center. The 40's complex response became an opportunity to spatially explore how the damaging legacy a contaminated institution can be reversed through design to provide access to open space and opportunity to engage with an adjacent community. The response to the 20's complex treats the site similar to a disaster zone, treating the former industrial footprint and a contaminant spill as an opportunity to build memory and education into a site. Finally, I have expanded upon proposals to reestablish the banks of Silver Lake as a public park, incorporating the larger design considerations and existing resources to create an engaging and educational experience for the greater community.



Figure 6.3 – Schematic Site Plan:

- 1) Elevated Ecosystem
- 2) Mass Decontamination
- 3) Building Memory
- 4) Silver Lake Energy Park

Elevated Ecosystem

With regards to my final design The East Street Area 2 North complex can be considered the headwaters of two converging forces, community and industry. At this portion of the site, the two forces become intermingled through a proposed open stormwater management system which winds through the site, highlighting the path of public space. Additionally, this design reuses the existing column footings and foundation walls of previous structures, avoiding any unnecessary excavation of subsurface contaminants. Programmatically the North limits of this complex border a residential neighborhood. The proposed design thus responds to the inviting scale of a residential neighborhood, providing a scale of space that is ideal for mixed-use residential, retail, and small office programs. This “inviting edge” also provides a buffer between the residential neighborhoods and the industrial scale spaces which are located further into the heart of the site.

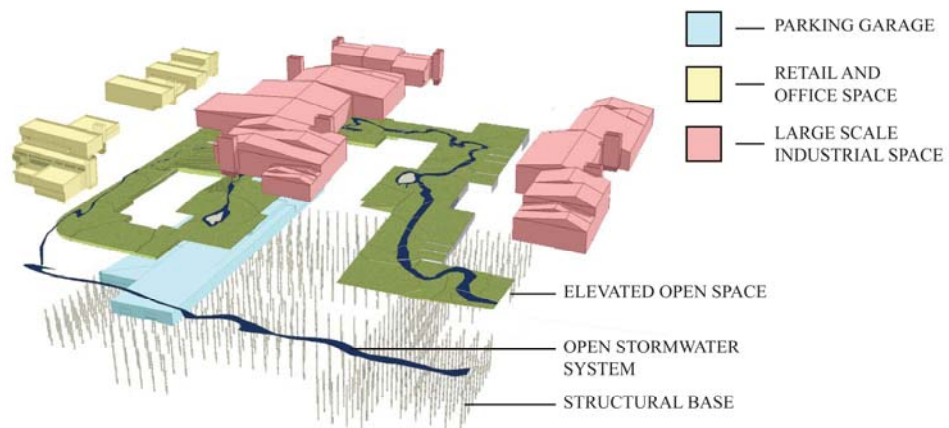


Figure 6.4 – Elevated Ecosystem: Programmatic Diagram

To provide the necessary parking and loading access to serve the amount of mixed-use and industrial programs that I propose, I have provided a parking garage between these two zones of program. The parking garage is then topped with a vegetated roof system and open stormwater system, creating an “elevated ecosystem”, diagrammatically illustrated in figure 6.4. This elevated ecosystem serve extends from the heart of community through the mixed-use space to industrial core. At this industrial core, the community visitors would be educated on and encouraged to watch manufacturing processes in an effort to promote a transparent industrial system. Additionally, to desensitize the legacy of the former GE site the faces of the adjacent monolithic buildings of the former General Electric plant provides another opportunity to engage with the community. The shear face of these buildings provide the potential to display community murals, show outdoor films and sporting events, and or broadcast the inner operations of the industrial plants on site as a way to generate communal interest in this dynamic space. The more a space engages with a community, the more readily it is adopted by the people.

As part of the design of an Elevated Ecosystem was the repurposing of an adjacent parking lot as a new prototype for a sustainable community. This community is directly connected to the adjacent industrial park through the shared open stormwater management system. The design of this residential community was an opportunity to explore the extent of the connective reach my design principles could have between the Morningside neighborhood and the William Stanley Business Park. Though only developed to a schematic level, this new neighborhood could easily employ the LEED doctrines for Neighborhood Development (ND) and New Construction (NC).

Furthermore, this prototypical neighborhood would share infrastructure with the adjacent industrial park, benefiting from on-site renewable energy production, stormwater harvesting, and open park space, weakening barriers between commercial and industrial interests. Conceptual renderings illustrating these design principles are shown in Figures 6.5 and 6.6.



Figure 6.5 – Diagrammatic Section showing program within Elevated Ecosystem



Figure 6.6 – Elevated Ecosystem axonometric aerial view

Mass Decontamination

Located to the Southwest of the “Elevated Ecosystem” proposal, responses to the conditions at the 40’s complex provided another design alternative for responding to the conditions of contaminated sites. Similar to the Elevated Ecosystem site, the 40s complex is directly adjacent to a residential neighborhood. My final design proposal responds to the appropriate neighborhood scales and pedestrian forces by lightening and breaking up building masses, creating moments where pedestrian forces could flow into this site. Pedestrian flow is again demarcated by an open stormwater system flows from points in the community through a central artery at the 40s complex, eventually joining with the hydraulic and pedestrian flows from the Elevated Ecosystem site. These flows converge at a central point along Woodlawn Avenue, the only vehicular crossing of the Amtrak railroad line. My design expands the area of this crossing, shifting its priority from that which has been vehicular to one that provides safe pedestrian passage over the rail system to Silver Lake and the Housatonic River on the South side of the site.

While the site considerations share many of the same qualities as the Elevated Ecosystem approach, my design considerations at the 40s complex are unique in the manner that the building form responds to historic remediation actions. Before the 40s complex was demolished it was extensively tested for high levels of contaminants. Areas that were indentified as heavily contaminated with PCBs were selectively removed during the demolition process and stockpiled on site separately from typical building demolition debris in controlled environment. In developing a design response for this site, I again sought to reverse interpolate this information on areas of heavy contamination as a safe space for public occupation.

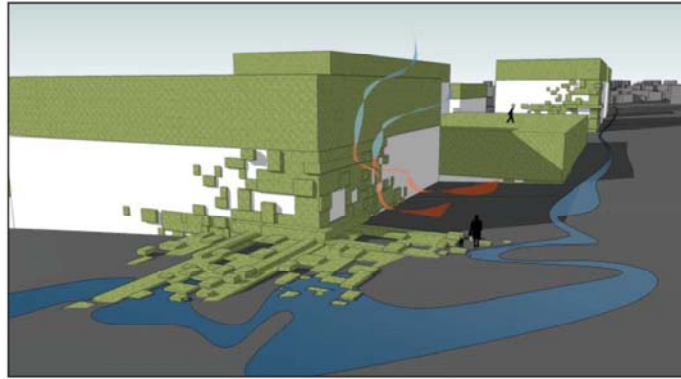


Figure 6.7 – Street Level Schematic of Mass Decontamination

Following this process resulted in a recreation through CAD models of the former industrial structures. I then distilled out the space the uncontaminated and contaminated masses within the structures. These masses were then analyzed with respect to the communal forces acting upon this specific site as identified from the early analysis mapping process. Finally I transformed the massive areas of contaminated space to areas of mass decontamination, being areas of open space, transparent materials, and or vegetated roof systems. This approach attempts to subtly redress the invasive and veiled nature of the remediation process, by countering with a design of inclusion and openness.

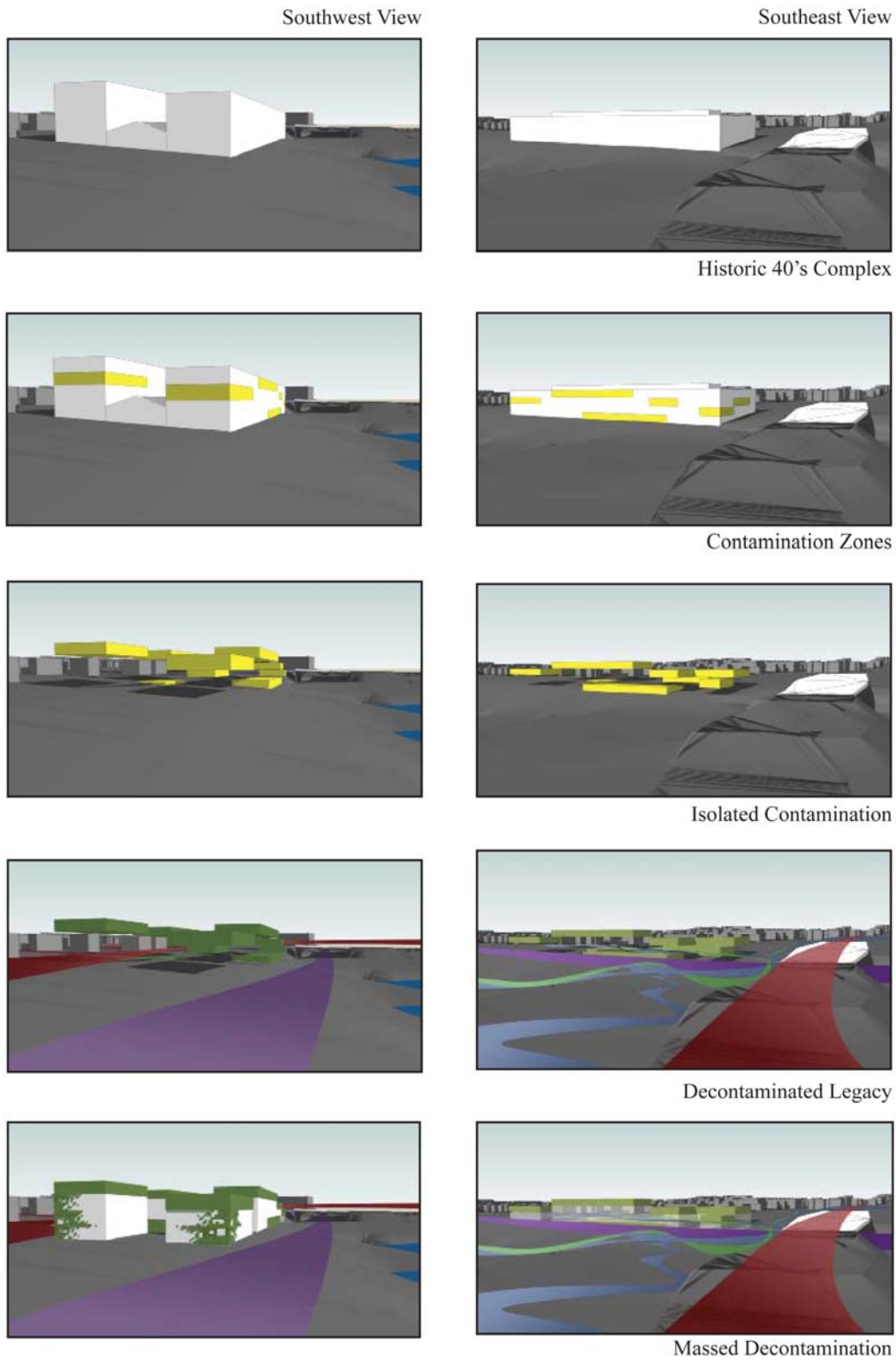
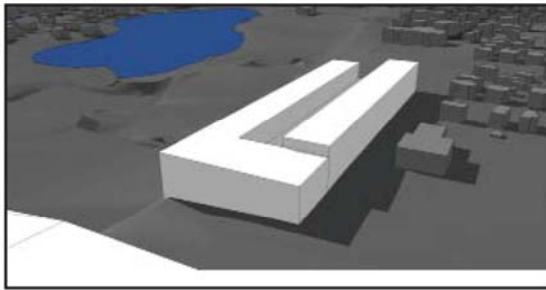
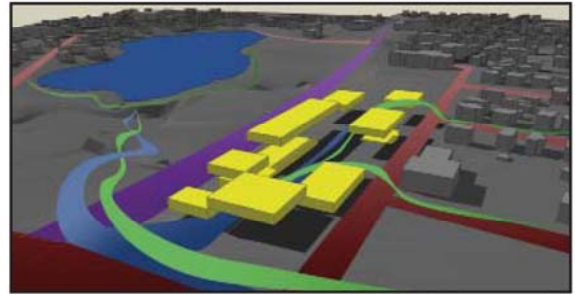


Figure 6.8 – Process: Responding to Forces of Mass Decontamination

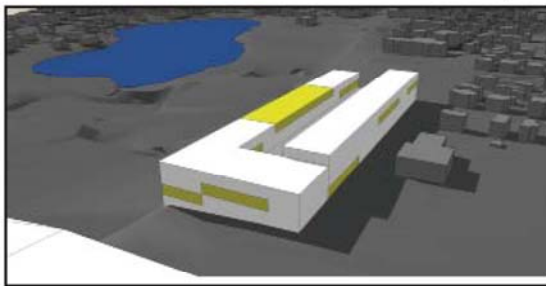
Northeast Aerial View



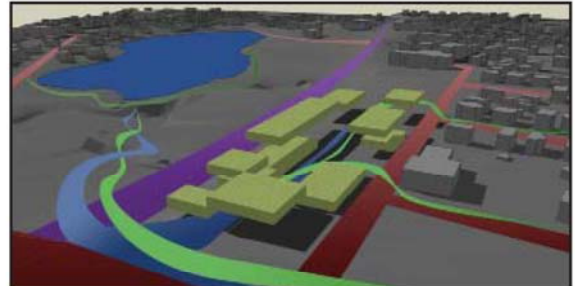
Historic 40's Complex



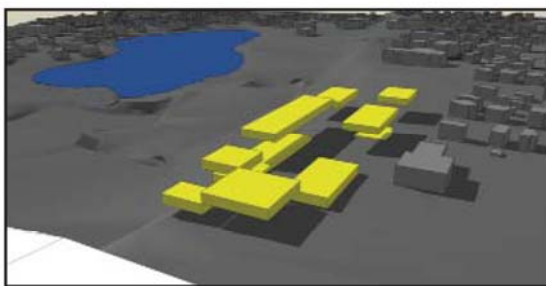
Community Forces



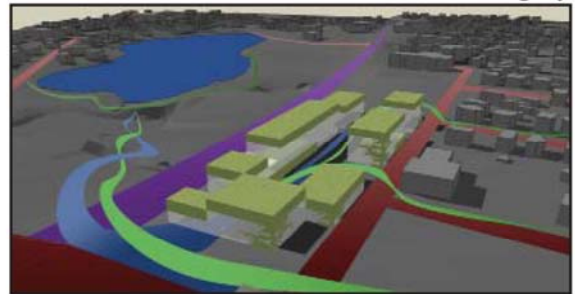
Contamination Zones



Decontaminated Legacy



Isolated Contamination



Massed Decontamination

Figure 6.9 – Process: Responding to Forces of Mass Decontamination

Building Memory

As with the two previous design developments, the 30s complex is similarly connected through a system of hydrology and stormwater management. The 30s complex also draws upon the historical significance of the industrial spaces that once occupied this particular site. The design that I developed for the 30s complex differs from the two previous sites primarily in the manner that it spatially explores a

juxtaposition of positive and negative historic legacies. Believing in the importance to correct errors of the past I began by exploring the more distressing events relating to this site, specifically a PCB contaminated subsurface oil plume. The result of mishandling chemical fluids, this PCB rich oil plume covered acres of the 30s complex and adjacent properties.

Though this area of contamination has been remediated, as part of the reconciliation process I sought to reinterpret the information recorded on this incident in a manner that could build memory into the site. My intent to preserve this disturbing event is based on the desire to explore and sustain a valuable lesson of environmental injustice. I have attempted to do this again through a process of a reverse interpolation of data, developing open spaces of ecology abstracted from the data on a severe oil spill. The result is an occupiable vegetated roof system that offers distant views of the pristine Berkshire Mountains, while offering an intermediate space between structures that could be utilized as a zone for public gatherings, education, and reflection on a troubled past yet promising future.

My desire to reconcile the impact of a contaminated site within a community has admittedly focused my attention towards the distressing history of General Electric and the city of Pittsfield. However, as mentioned in my early historical analysis, General Electric was once a beacon of hope to the community. As I further developed a design for the 30s complex, I desired to explore the potential of a site design to simultaneously commemorate legacies of a dissimilar nature. As a memorial site to the progressive industrial past of this space I treated the former footprint of the 30's complex as a sacred space unmarred by development, envisioning it as space for the restoration of a degraded

landscape. New structures are sited in previously undeveloped areas of the site extending their reach up to the former 30s complex footprint. This design consideration defines the limits of a three dimensional void space that memorializes the monumental scale of the former industrial building which once occupied this site and helped to grow an entire community. The open space created by the memorial links to the memory of contaminant spill, both of which than link through hydrology to the greater William Stanley Business Park.

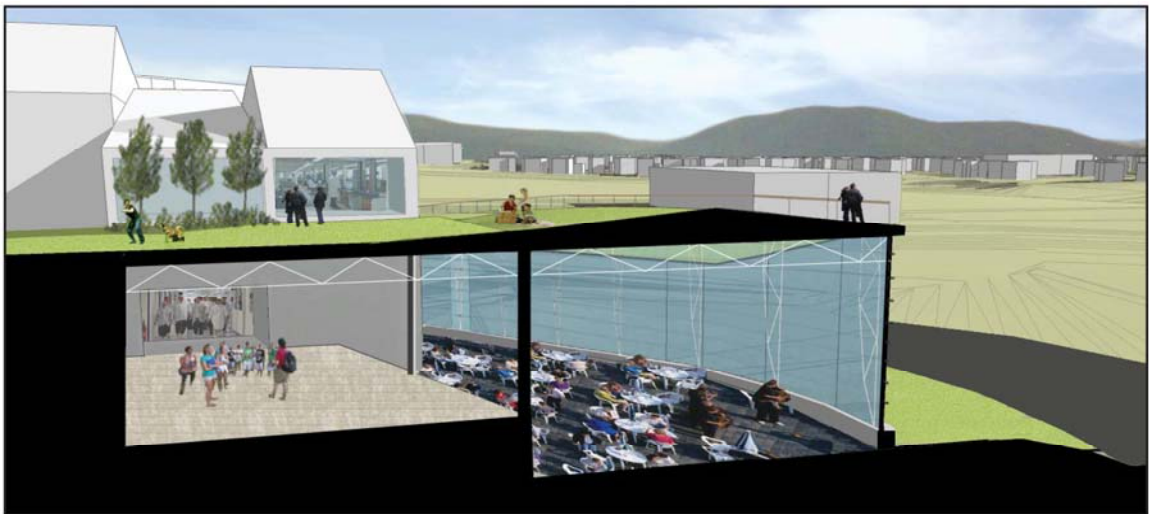


Figure 6.10 – Building Memory Site Section

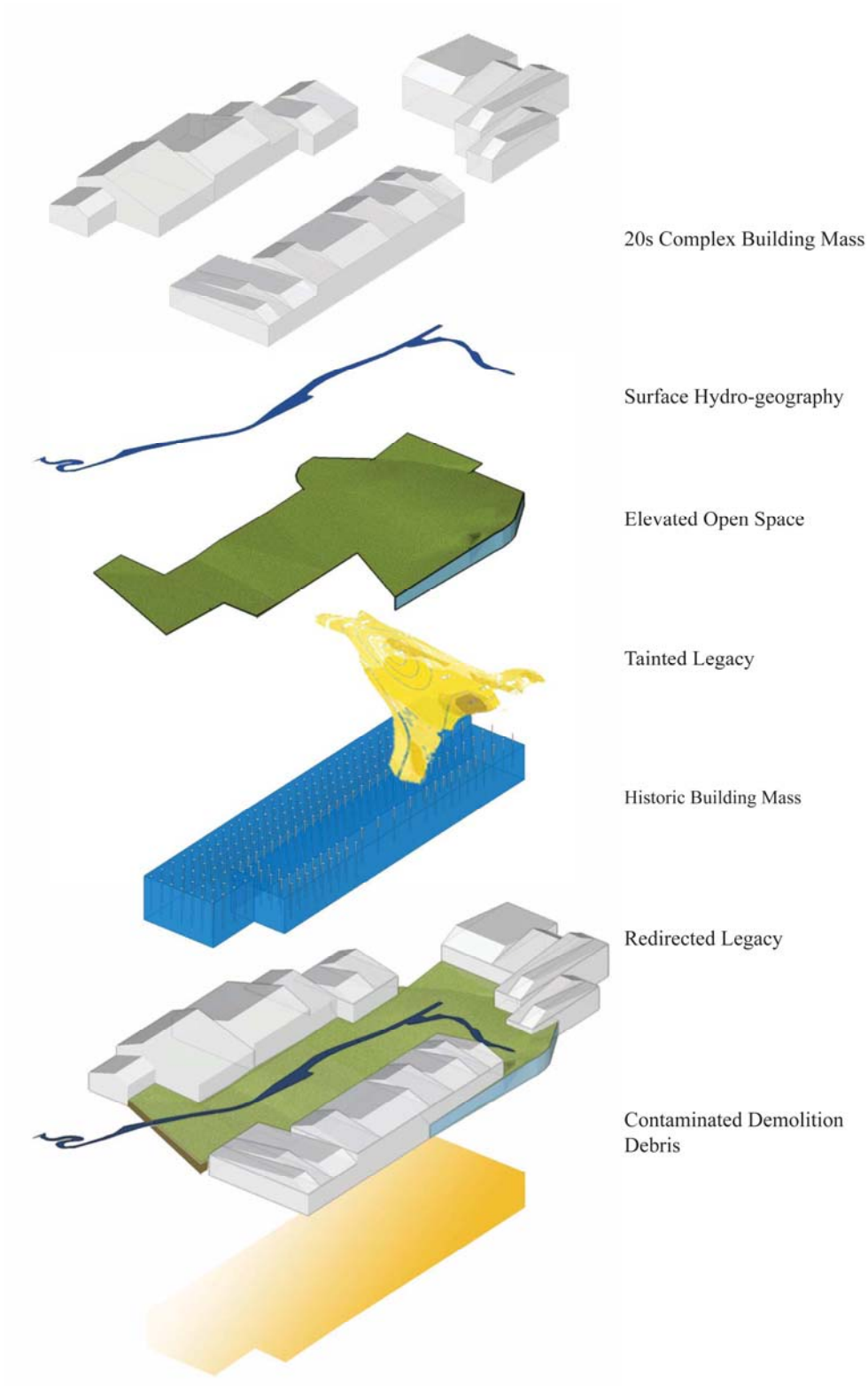


Figure 6.11 – Building Memory: Diagrammatic Process

Silver Lake Energy Park

The final space that I sought to redesign was the waterfront of Silver Lake, the principle dumping ground for polluted effluent from the General Electric site before it was discharged into the Housatonic River. The lake shore and associated soils, once rife with PCB contamination, have been remediated to an acceptable level of occupation according to EPA standards. Today a portion of the site is occupied by a 1.8 megawatt photovoltaic field run by Western Mass Electric. Current design proposals for the lakefront call for a park along three quarters of the lake's shore. However, without providing connection to the park from any of the adjacent communities it is essentially a "park to nowhere", where as a reconnection to this resource has been an essential design principle of my proposal. The first step in the creation of the Silver Lake Energy Park is to decommission the vehicular purposes of the highly underutilized Silver Lake Road and to reestablish the street as a public walk, integrated with design principles developed throughout the rest of the site.

The three design alternatives that I have developed are unique in their process though interconnected via a system of hydrology and open space. The Silver Lake Energy Park that I am proposing expands upon this notion. Once again referring back to my early force diagrams, the area around Silver Lake is within the 100-year flood plain providing an opportunity to restore an ecology that is designed to filter stormwater. In essence the Silver Lake Energy Park becomes the culminating public experience for the William Stanley Business Park, where forces of pedestrian travel, renewable energy, stormwater purification, industrial process and ecological restoration become interconnected. Occupants of this space are able to witness first hand how a social

responsible industrial park replenishes Silver Lake and consequently the Housatonic River with purified storm and wastewater. This interconnection creates fertile grounds for community education, engagement, and restoration and therefore potential for reconciliation.



Figure 6.12 – Silver Lake Energy Park

CHAPTER 7

PADDLING DOWNSTREAM

The banks of the Housatonic River rest within the shadows of the colossal manufacturing plants which were once the life force of our community. Today the William Stanley Business Park is but a shell of its former self. Its presence reminds our community of the prosperous times gone by and the many challenges that still lay ahead. Though General Electric has all but pulled its processes out of Pittsfield, the scars left in the pastoral Berkshire landscape are as lasting as those which remain in the hearts and minds of our community.

Buried deep within the sediment of are decades of exploitation and neglect. Similarly, Silver Lake, adjacent neighborhoods, and various dumping locations throughout the county have received this mistreatment. The psychological toll of a depressed economy, years of litigation and deceit, and the continued stress on our environment has been difficult for Pittsfield and the county to recover from. Still the Housatonic River does not easily show the abuse it has taken over the years. On any given day it will reflect without resent, all the wonder of the seasons from the pale green of early spring to the intense palette of the sky in the final hours of a winter day.

Just as the waters of the Housatonic River continue their charge to the sea, so too are the people of this city resilient to the abuse they have received. On any given day one can see runners racing around a track that encircles a little league baseball field that has been built adjacent to the former plant. The team races out to their positions as their parents cheer from the stands. After the game they will most likely shuffle across the

street for a pizza at the East Side Café. Despite all the years of abuse and neglect, shattered dreams and continued struggle, life is resilient. People, animals, and plants have all remained or returned, a bit battered, but steady nonetheless. While corporate accountability is extremely important to our community there is a sense that it is time to push on, not back.

As I paddle downstream of General Electric in the most contaminated portion of the Housatonic River, I can barely hear my own thoughts over the croak of the bull frogs. Bank swallows dart in and out of their nests carved into the sandy cliffs of the river bank. Up ahead a beaver warns us with a slap of his tail that we are in his neighborhood now, as startled waterfowl call to each other and head for the sky with a flap of their wings. There is a lesson to be understood in this everyday experience on the Housatonic River. All of the pain and anguish should never be forgotten, but it is evident from the natural world that life moves on a forward path, there is no time for resentment.

The General Electric industrial plant of Pittsfield has been the cause of much strife within the local area, but I believe just as the natural world has already moved on the people too are ready to move on. The days of General Electric and the Pittsfield Community having their backs towards one another must past. Within the story of GE and Pittsfield is a valuable lesson on the costs of American “progress”. There is much to remember, to learn, and to teach. The site is damaged ecologically and economically, though I believe there is great opportunity to heal its wounds. This site, just as any severely damaged communal ecology, requires special attention that prescriptive measures and traditional techniques cannot provide. Hardin Tibbs stresses this point in his essay on Industrial Ecology stating, “It (Industrial Ecology) must also involve

concern about the risk of catastrophic failure of industrial operations, stressing design that is intrinsically incapable of acute environmental impact.”²²

I believe that as we venture into the New American Frontier we must work to regenerate the ecological health of our environment, bridge the divide between industry and community, and address the legacy of the degraded landscapes according to a sustainable code. Borrowing from tested Eco-Industrial precedents, I believe that a solution can be developed which sustains the local economy, regenerates the local ecology, and begins to heal the psyche of the community. General Electric has had a mixed relationship with the city of Pittsfield, historically prosperous yet recently distressing. When we reconcile arguments, both parties must be involved in the resolution. It is to this notion that I believe a thoughtful design provides the arena for reconciliation between community and industry, though the concessions need to be made by the parties themselves. For the community, compromise will be in the form of forgiveness, trust, and acceptance. While an industrial force such as General Electric must have an active role in the providing resources and technologies towards the rehabilitation of the communities they have damaged. GE has caused tremendous strife within the Pittsfield community, however being the largest industrial corporation in the world, their resources are seemingly infinite. GE is a leader in the development of solar energy, wind power, wastewater reprocessing technologies, and many other systems which could be directly applied towards the development of an eco-industrial park in the city of Pittsfield.



Figure 7.1 – William Stanley Business Park: Site Model

The health of one of our community's greatest resources, the Housatonic River, has been compromised for many generations and for this our community expects a great deal in return from General Electric. While what form the conciliation takes depends on whom you ask, I believe at the communal core we solely desire an acceptance of responsibility. By becoming an active agent for progressive change within a community they had once damaged, General Electric can accept responsibility and move toward reconciliation with the afflicted community.

I pause to let the currents of the Housatonic carry the boat downstream and imagine all of the potential that exists behind those fences. I am aware of the shame it holds in the soil beneath its surface, though I am equally aware that it is still fertile, the fowl returns year after year as do the teams taking to the ball field. This is the future of Pittsfield. Taking down fences and reshaping the wastelands of yesterday to create a sustainable mixed-eco-industrial center which reconciles errors of the past and provides economic opportunities for the future is the potential of a social responsible industrial system. The alternative designs that I have developed through my research are by no means meant to be the final. Rather they intend to begin a new discourse on how we designers can re-imagine the New American Frontier for a sustainable future.

¹ Pittsfield Economic Development Authority

² Pittsfield Economic Development Authority

³ June Nash and Max Kirsch. "*The Discourse of Medical Science in the Construction of Consensus Between Corporation and Community*" *Medical Anthropology Quarterly*.

⁴ Centers for Disease Control and Prevention. 2009. *Fourth National Report on Human Exposure to Environmental Chemicals*.

American Toxic Substances & Disease Registry. "Public Health Statement for Polychlorinated Biphenyls (PCBs)"

⁶ American Rivers' report, "America's Most Endangered Rivers of 2004."

⁷ American Rivers' report, "America's Most Endangered Rivers of 2004."

-
- 8 American Toxic Substances & Disease Registry. “Public Health Statement for
Polychlorinated Biphenyls PCBs)”
- 9 June Nash and Max Kirsch. “*The Discourse of Medical Science in the Construction of Consensus
Between Corporation and Community*” Medical Anthropology Quarterly.
- 10 June Nash and Max Kirsch. “*The Discourse of Medical Science in the Construction of Consensus
Between Corporation and Community*” Medical Anthropology Quarterly.
- 11 June Nash and Max Kirsch. “*The Discourse of Medical Science in the Construction of Consensus
Between Corporation and Community*” Medical Anthropology Quarterly.
- 12 June Nash and Max Kirsch. “*The Discourse of Medical Science in the Construction of Consensus
Between Corporation and Community*” Medical Anthropology Quarterly.
- 13 United States Green Building Council. 2010. *LEED for Neighborhood Development*. Washington,
D.C.
- 14 United States Green Building Council. 2010. *LEED for Neighborhood Development*. Washington,
D.C.
- 15 Tibbs, Hardin. “*Industrial Ecology: An Environmental Agenda for Industry*” Global Business
Network
- 16 Tibbs, Hardin. “*Industrial Ecology: An Environmental Agenda for Industry*” Global Business
Network
- 17 Benyus, Janine M. *Biomimicry: Innovation Inspired by Nature*.
- 18 Bélanger, Pierre. 2008. *Wasteland: a visual reportage of the Kalundborg's waste recycling
network in Denmark*. Arcade. vol. 27
- 19 Benyus, Janine M. *Biomimicry: Innovation Inspired by Nature*.
- 20 Benyus, Janine M. *Biomimicry: Innovation Inspired by Nature*.
- 21 Novotny, Vladimir, Jack Ahern, and Paul Brown. 2010. *Water Centric Sustainable Communities:
Planning, retrofitting, and building the next urban environment*. John Wiley and Sons, Inc.
Hoboken, NJ
- 22 Tibbs, Hardin. “*Industrial Ecology: An Environmental Agenda for Industry*” Global Business
Network

BIBLIOGRAPHY

- American Rivers. 2004. *America's Most Endangered Rivers of 2004*. Washington, D.C.
- American Toxic Substances & Disease Registry. 2000. *Public Health Statement for Polychlorinated Biphenyls (PCBs)*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service
- Bélanger, Pierre. 2008. Wasteland: a visual reportage of the Kalundborg's waste recycling network in Denmark. *Arcade*. vol. 27: 20 -23
- Benyus, Janine M. 1997. *Biomimicry: Innovation Inspired by Nature*. New York: HarperCollins Publishers, Inc.
- Centers for Disease Control and Prevention. 2009. Fourth National Report on Human Exposure to Environmental Chemicals. Department of Health and Human Services. Atlanta, G.A.
- Harr, Jonathan. 1995. *A Civil Action*. New York: Vintage Books.
- Jones, David Lloyd. 1998. *Architecture and the Environment: Bioclimatic Building Design*. New York: The Overlook Press.
- Livesey, Graham. 2009. A Look at Landscape Urbanism. *Canadian Architect*. 11 (01): 45-47.
- Leigh, Mary Beth, Petra Prouzova', Martina Mackova', Toma's Macek, David P. Nagle, and John S. Fletcher. 2006. Polychlorinated Biphenyl (PCB)-Degrading Bacteria Associated with Trees in a PCB-Contaminated Site. *Applied and Environmental Microbiology*. Apr. 2006: 2331-2342.
- McDonough, William and Michael Braungart. 2002. *Cradle to Cradle*. New York: North Point Press.
- Michel Jr., Frederick C., John Quensen, and C.A. Reddy. 2001. Bioremediation of a PCB Contaminated Soil Via Composting. *Compost Science & Utilization*. 9 (4): 274-284.
- Nash, June and Max Kirsch. 1988. The Discourse of Medical Science in the Construction of Consensus Between Corporation and Community. *Medical Anthropology Quarterly*. 2 (2): 158-171
- Novotny, Vladimir, Jack Ahern, and Paul Brown. 2010. *Water Centric Sustainable Communities: Planning, retrofitting, and building the next urban environment*. John Wiley and Sons, Inc. Hoboken, NJ

- Pittsfield Economic Development Authority. 2003. *William Stanley Business Park of the Berkshires: Master Plan*.
- Shuman, Michael, Alissa Barron and Wendy Wasserman. 2009. *Community Food Enterprise: Local Success in a Global Marketplace*. Arlington: Wallace Center at Winrock International.
- Sullivan, Robert. 2008. Wall-E Park. *New York*. Nov. 23: 30-35, 106-107.
- Tigini, Valeria, Valeria Prigione, Sara Di Toro, Fabio Fava and Giovanna C Varese. 2009. Isolation and characterisation of polychlorinated biphenyl (PCB) degrading fungi from a historically contaminated soil. *Microbial Cell Factories*. 8 (5): 1-14.
- United States Environmental Protection. 2009. *Building a Sustainable Future: A Report on the Environmental Protection Agency's Brownfield Sustainability Pilots*. Office of Brownfields and Land Revitalization.
- Zeihner, Laura C. 1996. *The Ecology of Architecture: A Complete Guide to Creating the Environmentally Conscious Building*. New York: Whitney Library of Design.