Enhancing Public Waterfront Accessibility in Downtown Boston

An Interactive Qualifying Project Report
Submitted to

The Faculty of the
WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

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Abstract

Chapter 91 licenses contain provisions that protect the public right to access waterfronts, however historically the information has been inaccessible to city planners and the public alike. This project involved designing a database containing Chapter 91 licenses and public amenities along Boston's Downtown waterfront and linking it to a GIS map. The project group developed system specifications based on user requirements of many key stakeholders. Moreover, the group provided analysis of issues regarding waterfront access and regulation.

Acknowledgements

We would like to thank Richard McGuinness, Deputy Director of Waterfront planning for the Boston Redevelopment Authority for his assistance throughout this project. In addition, we would also like to thank all the members of the following organizations for taking time out of their busy schedules to help us with this project:

Department of Environmental Protection
Michael Girvan
Andrea Langhauser
Ben Lynch

The Boston Harbor Association
Vivien Li

Urban Harbors Institute
Dan Hellin
Kristin Mallek
Jack Wiggin

Boston Redevelopment Authority
Carolynn Bennett
David Carlson
Rolf Goetze
Andy Sharpe
Catherine Sullivan
Robert Tumposky
Bradford Washburn
Carlos Montanez

Save the Harbor/Save the Bay
Matthew Wolfe

Massachusetts Office of Coastal Zone Management
Stephen Mague

Boston Environment Department
Bryan Glascock

Executive Summary

The Boston Harbor Cleanup, conducted between 1986 and 1999, was one of the largest environmental cleanup endeavors ever undertaken. The cleanup fostered the reemergence of waterfront property. After years of neglect, the waterfront has regained an important role in the city's future development. This investment has been proven to be well worth the state and municipal funds spent over the 13-year span.

The new attractiveness of harbor-side property has also created new tension along the waterfront between the public's right of harborfront access and the developers' desire to privatize parts of the harborfront. This situation demands a way of regulating the waterfront. In Massachusetts, this is accomplished through General Law Chapter 91. This piece of legislation determines the extent of public access along the waterfront, as well as rights of land owners between the historic mean high water line and the current mean low water line. These special licenses, issued under the law by the Department of Environmental Protection (DEP), specifically state the provisions for each project or activity undertaken. However, the Boston Redevelopment Authority (BRA), our sponsor, is responsible for maintaining and granting public access areas along the harbor. If a site falls under a Municipal Harbor Plan, the BRA has the right to change and increase the detail of the public access stipulations.

Our project's goal was to increase the availability of Chapter 91 license information by creating an electronic database of Chapter 91 licenses, along with mapping public amenities on the Harborwalk. Our area of concentration for this project is between Burroughs Wharf, which is located at the northeast corner of the North End, and Rowes Wharf, which is located near the entrance of Fort Point Channel. This scope was sufficient to populate the database with the licenses in that area, as well as amenities along the Harborwalk.

In order to create a sustainable database that can be used by people with limited computer literacy, we consulted with many state and local government agencies. The varying fields can be attributed to the organizations such as the Office of Coastal Zone Management (CZM), the DEP, and the personnel at the BRA. In addition, we contacted representatives of advocacy groups such as the Boston Harbor Association (TBHA) and Save the Harbor/Save the Bay, to gather some insight of what particular public amenities would be useful to map on a GIS layer. We mapped public amenities using a Global Positioning System (GPS) device to map the coordinates of each amenity.

We discovered how inconsistent the license details were from the different eras of licenses when we began importing the data into our database. We noticed that it is much easier to use an orthographic photograph to see where public amenities are located and therefore began using it for current mapping purposes.

Through meetings with the MIS department at City Hall, the final structure of the database and user interface was created. The user will click on a parcel in GIS, which is part of a group of one or more parcels called a project. This action will display all licenses issued for that parcel. The user can click on one of the licenses and display all of the license details.

Furthermore, the level of detail in older licenses fails to meet the same level as their newer counterparts. For instance, a license issued in 2005 will list the dimensions of particular entities and stipulate the type and arrangement of public amenities on the property. On the other hand, a license issued in 1975 would fail to depict the same information, but would leave it open to interpretation by the reader via the appended plans.

- We recommend that the BRA implement a plan to populate the newly created Chapter 91 database with current licenses in the city of Boston. This entails obtaining the respective licenses at the DEP and digitizing them. Then the information contained in the license can be entered into the database.
- We recommend that the TBHA use GPS to finish mapping signs and public amenities along the entire Harborwalk. These amenities include, but are not limited to, benches, trash receptacles, restrooms, parks and other descriptive signage.
- We recommend that the BRA use GIS layers to display an online map, such as the Boston Atlas. Once complete, the GIS layers we created will provide valuable information to city planners and property owners.
- We recommend that the BRA begin communicating with state and federal agencies to create a central database for waterfront permitting information. This will increase the exchangeability of information.
- We recommend that the DEP convert all licenses to digital PDF format. This task can be outsourced to a scanning company. The text in these documents can be searchable.

The BRA has a major role in the increasing of accessibility with regards to permitting information. Moreover, the BRA provides a link between the government regulation of the waterfront and vigilant advocacy groups. Our efforts will help the BRA to continue this movement of change, keeping the waterfront accessible.

Authorship

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- Background – Brendan Barschdorf, Dustin Bradway
- Methodology – Wolfgang Apel, Brendan Barschdorf, Dustin Bradway
- Results & Analysis – Wolfgang Apel, Dustin Bradway, Matthew Duplin
- Conclusions – Dustin Bradway, Wolfgang Apel, Brendan Barschdorf
- Recommendations – Brendan Barschdorf, Dustin Bradway, Wolfgang Apel
- Appendix A – Brendan Barschdorf
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Table of Contents

Table of Figures

1 Introduction

According to the *City of Boston Municipal Harbor Plan*, "Boston's seaboard location is its greatest asset. Boston is blessed with one of the finest deep-water harbors in the world...These natural advantages have long made Boston's port a center of life and commerce for generations of residents and businesses."(*City of Boston Municipal Harbor Plan, 1990, p. 2*) Prior to 1986, however, "one of the finest deep-water harbors" was filled with a variety of pollutants and toxins, rendering it one of the "filthiest harbors in the nation." This environment began to change after a pair of lawsuits inspired a movement to cleanup the harbor and the waterfront. "The Boston Harbor Project" was one of the largest public works projects at its time, increasing the water quality and revitalizing the adjacent waterfront. Programs such as the Harborwalk and the renovation of the Boston Islands have truly revolutionized the harbor's aesthetics and its public accessibility. (*The Boston Harbor Association [TBHA], 2007*)

The twenty-billion dollar Harbor Cleanup has opened up more opportunities for public and private interests alike. For several years public works projects, as well as private developments, have been granted the appropriate licensing and certification to undergo construction. However, the law states that waterfront construction "shall not impair the legal rights or remedies of any person." (The General Laws of Massachusetts, Commonwealth of Massachusetts, 2005) That leverage allows groups as small as 10 citizens to challenge licenses in many cases. Often developers, public interest groups, and state officials must negotiate the location as well as the scope of the concerned project, so a reasonable compromise can be achieved for all parties involved.

Rights and powers related to waterfront regulation of the concerned parties are outlined by Massachusetts General Law Chapter 91. Chapter 91 licenses are granted by the state's Department of Environmental Protection. This piece of legislation was designed to balance private property rights, public interest, and environmental protection within Massachusetts. (Gelpke, Giordano, & Campbell, 2002) In highly-active waterfront areas such as Boston, Chapter 91 licenses are tailored to the city's plan for development through municipal harbor plans. These plans allow city agencies to use state law for their own enforcement along the waterfront. In particular, the Boston Redevelopment Authority (BRA) develops municipal harbor plans for each section of Boston's Inner Harbor.

A major issue in local waterfront regulation is public access. While each municipal harbor plan contains special conditions regarding public accessibility, there are still many underutilized access points along the waterfront. These problem areas arise from both physical and perceived obstacles. In order to improve the effectiveness of the city's regulation of the waterfront, the BRA would like to increase access to waterfront permitting information, as well as maps detailing waterfront jurisdiction and amenity information. Similar work has been done in Massachusetts with regards to indexing Chapter 91 licenses via Geographic Information Systems. A pilot project with very similar objectives was conducted in 1999 in New Bedford, Massachusetts by two professors from the University of Massachusetts-Boston.

The Suffolk Registry of Deeds maintains a copy of every legal document issued in Massachusetts, however locating a Chapter 91 license is difficult. The Department of Environmental Protection maintains copies of these licenses as well, but they do not have a comprehensive index. Overall, obtaining Chapter 91 licenses is difficult, especially if the license number is unknown.

The goal of this project was to develop an electronic database containing Chapter 91 licenses for the Boston Redevelopment Authority (BRA), along with mapping locations of public amenities and interfacing it with GIS. The team researched how current licenses were implemented, specifically in the area between Burroughs Wharf and Rowes Wharf, by studying the process in obtaining a license. Furthermore, the team consulted with organizations involved with license-related issues and mapped locations of public amenities along the Harborwalk. From this research an effective database design was created using Microsoft Access. The purpose of this database is to allow the BRA to analyze municipal harbor regulation and development. This will ultimately increase the transparency of public accessibility along Boston's Downtown harborfront.

2 Background

This Chapter describes important concepts that surround and affect our project. We begin by presenting information regarding the Boston Harbor Cleanup and how it inspired increased interest in the waterfront. Then we explain how state, local laws and regulations, specifically Chapter 91, influence waterfront development. Finally, we explain how Geographic Information Systems is used in urban planning.

Before going into further detail, the reader must be informed of the Harbor's geography and the scope of our project. The BRA requested for our project group to focus on the Downtown waterfront, which is located between the districts of North End and South Boston. More specifically, our project ranged from Burroughs Wharf to Rowes Wharf. *Figure 1* displays this geographically.

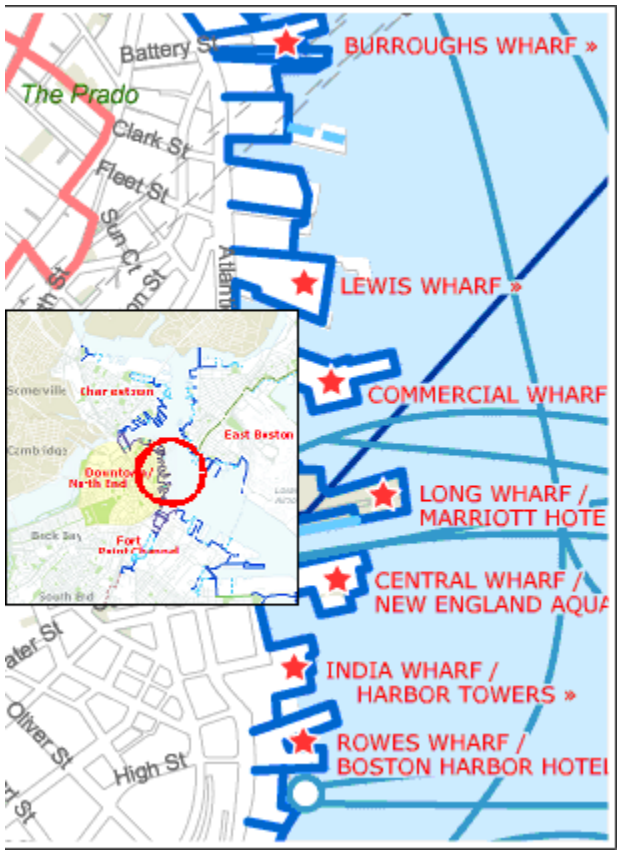


Figure 1 – Project Scope courtesy of bostonharborwalk.com

Though our project scope excludes most of the city's waterfront, it will be treated as a case study for similar projects to expand upon and follow.

2.1 History of Boston Waterfront Development

The original inhabitance of the City of Boston took place in 1630, when the Massachusetts Bay Colony was created under Governor John Winthrop. Protected by a natural harbor and located on the Shawmut Peninsula, the Boston settlement flourished due to its geography. In colonial times, the waterfront was the first means of economic development, providing access for shipbuilding and fishing industries.

Most importantly, however, Boston's location on the Atlantic Coast gave rise for international trade. During much of the 18th Century, Boston was New England's primary port. Although Salem, Massachusetts and Newport, Rhode Island challenged Boston's trading supremacy, the city never relinquished its title as "capital of New England."

As industrialization swept throughout the Western World in the 19th Century, the Northern United States experienced migration from farming and fishing economies into manufacturing and mercantile economies. "Bostonians in the 1810s began to establish textile mills, first at Waltham in 1813 and then in new towns along the Merrimack River." In the latter part of the 1800's and into the 20th Century, the shipping industry became obsolete, when "ship-owners and merchants invested thenceforth in manufacturing, in railroads, and in the development of the rapidly expanding frontier." (*The Encyclopedia Britannica; a dictionary of arts, sciences, literature and general information*, 2006)

The pollution of Boston Harbor began as a consequence of population growth in the Greater Boston area. *Figure 2* shows the population rate increase during the 19th and 20th Centuries.

Year	Population	% change
1800	24,937	+36
1810	33,787	+36
1820	43,289	+28
1830	61.392	+42
1840	93,383	+52
1850	136,881	+47
1860	177,840	+30
1870	250,526	+41
1880	362,839	+45
1890	448,477	+24
1900	560,892	+25
1910	670,585	+20
------	**YELLOW**	**20% Decade Growth**
------	**GREEN**	**40% Decade Growth**

Figure 2 – Population Trends in Boston 1800-1910(Kennedy, 1992)

Due to this major increase in population during the 1800's, the city built one of the nation's first regional sewer systems. It pumped untreated, raw sewage directly into Boston Harbor. This resulted in worsening conditions of harbor waters, so the city decided to plan construction of primary treatment facilities on one of its islands. (*Massachusetts Water Resources Authority [MWRA], 2007*)

In 1952, the Nut Island Sewage Treatment Plant opened to sanitize waste for communities South of Boston. Although this plant provided primary treatment of sewage, the site wasn't able to treat waste from the Northern communities or from the city itself. In addition, sewage outfall ran toward the coastline, specifically toward the Quincy shoreline.

There were still issues with water cleanliness, however, even after the Deer Island plant opened in 1962. According to statistics, "15-20% of the sludge discharged with the outgoing tides returned near the harbor's shore areas with the next incoming tide." (*MIT news office:*

Urban studies and planning, 2007) The result was a shoreline riddled with trash and waste, thus leaving beaches unutilized for their stark appearance.

In 1972, the federal government passed the Clean Water Act, requiring secondary as well as primary sewage treatment. Boston failed to update its sewage system to meet those requirements and by the early 1980's the media was calling Boston Harbor the "filthiest Harbor in the nation"(*Save the Harbor/Save the Bay, 2007*) In 1982, William Golden, a state senator of Weymouth, was jogging along the shoreline in Quincy when he came upon washed-up sewage. Enraged by such an offensive sight, he along with the city of Quincy filed a lawsuit against the Metropolitan District Commission (MDC) "for causing unhealthy conditions on Quincy's shoreline." (*Mass Moments, 2007*)

The case was temporarily settled, but the most important result of this lawsuit was a new plan of cleaning up the harbor. Professor Charles Haar from Harvard Law School developed a 500-page report focusing on steps to create an organization responsible for sewage discharges. (*CLF: Boston Harbor, 2007*) In 1983, the Conservation Law Foundation followed up Golden's efforts with a lawsuit against the MDC and the Environmental Protection Agency (EPA) for violating the 1972 Clean Water Act. This suit proved to have the foundation required to begin implementing Professor Haar's plan.

2.2 Outcomes of Conservation Law Foundation vs. Metropolitan Districts Commission & Environmental Protection Agency (1983)

On May 8, 1985, Judge Mazzone of the United States District Court announced a detailed schedule for the construction of new treatment plants on Deer Island. The first plant was to be completed by 1995 and provide primary treatment to waste. The second plant was scheduled to be finished in 1999 and offer secondary treatment. (*CLF: Boston Harbor, 2007*) The newly-founded Massachusetts Water Resources Authority (MWRA) was to oversee the projects. The entire plan aimed at replacing the old treatment facilities on Nut and Deer Island with new primary and secondary treatment plants located solely on Deer Island, in what was known as the Boston Harbor Project.

Prior to Deer Island's completion of its first plant, a ground-breaking facility in Quincy opened in 1991 that transformed sludge into fertilizer through "high-temperature" sanitization techniques. (*MWRA, 2007*) Nevertheless, the primary treatment plant opened in 1995 and the secondary treatment plant was fully operational by the year 2000. (*MWRA, 2007*) In addition, a

9.5-mile "Outfall Tunnel" was built to send sewage further out into Massachusetts Bay, shown in *Figure 3*.

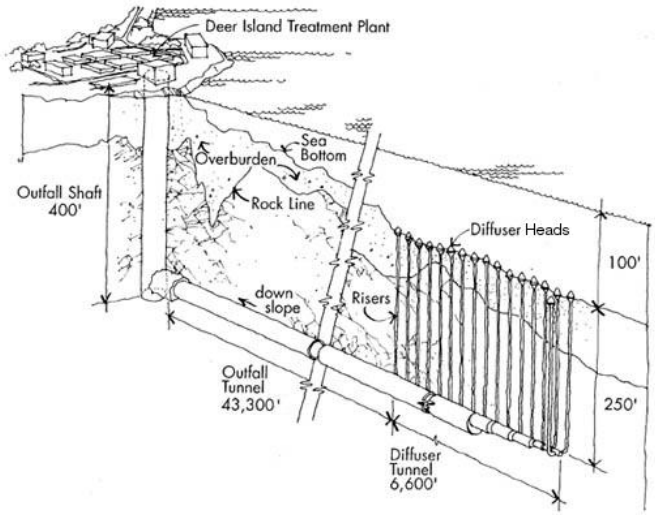


Figure 3 – Outfall Tunnel from Deer Island to Mass Bay (*MWRA - home.*)

Originally, the combination of the outfall tunnel and the primary treatment of waste was thought to be a sufficient discharge process. (*MWRA, 2007*) However, the ruling from the *CLF vs. MDC & EPA* case required both a primary and secondary treatment of sewage. At the end of the year 2000, all sewage was receiving primary and secondary treatment, and was subsequently discharged outside of Boston Harbor into Massachusetts Bay, shown in *Figure 4*.

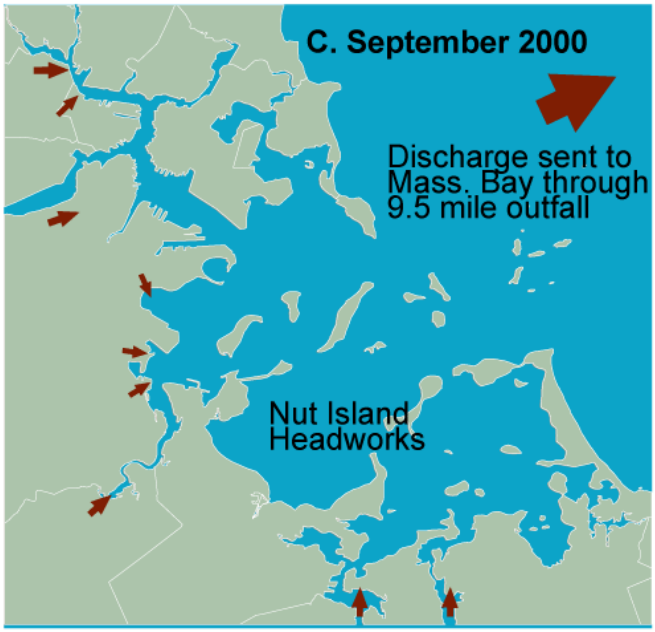


Figure 4 – Massachusetts Bay Area Sewage Discharge, September 2000

Although the harbor cleanup was funded and organized by the federal and state governments, non-government agencies (NGO's) were proactive in cleaning up the Harbor. In fact, one organization was created by Superior Court Judge Paul Garrity and State Senator William Golden, who both played an active part in starting the cleanup process. Save the Harbor/Save the Bay was created in 1986 as an advocacy group representing public interest in a clean and safe harbor for everyone to enjoy and utilize. Save the Harbor along with other advocacy groups provided an opportunity for citizen stakeholders to voice their opinions in harbor-related issues.

Another NGO that played a significant role in revitalizing the harbor is the Boston Harbor Association (TBHA). Created in 1973, TBHA has a large stake in public access to the waterfront and sponsors many harbor-related events to increase public awareness. More importantly, TBHA is one of the major organizers and overseers of the Harborwalk Project.

The Boston Harborwalk was created in the 1960s, however it experienced its greatest strides in 1984 when new regulations were set in place. The project's goal is to connect the city to the waterfront, by building a continuous 47-mile path along the shoreline. The Harborwalk extends from the Northern sections of the Outer Harbor down to the Dorchester Bay area. There are many sights and public access spots along the path for recreational use, including parks, promenades, and historical landmarks. As of December 2006, 34 of the 47 allotted miles were completed. (*The Boston Harborwalk, 2007*)

While the main focus of the Harborwalk is to create the actual path, the project also includes strategic placements of promenades, parks, and other sites. In 2006, the Institute of the Contemporary Arts relocated from its inner city locale to the waterfront, making the Harborwalk and waterfront even more attractive. (*TBHA, 2007*) *Figure 5* shows the Harborwalk project scope. In addition, *Figure 5* also points out which sections of the Harborwalk are completed and those sections that need to be finished.

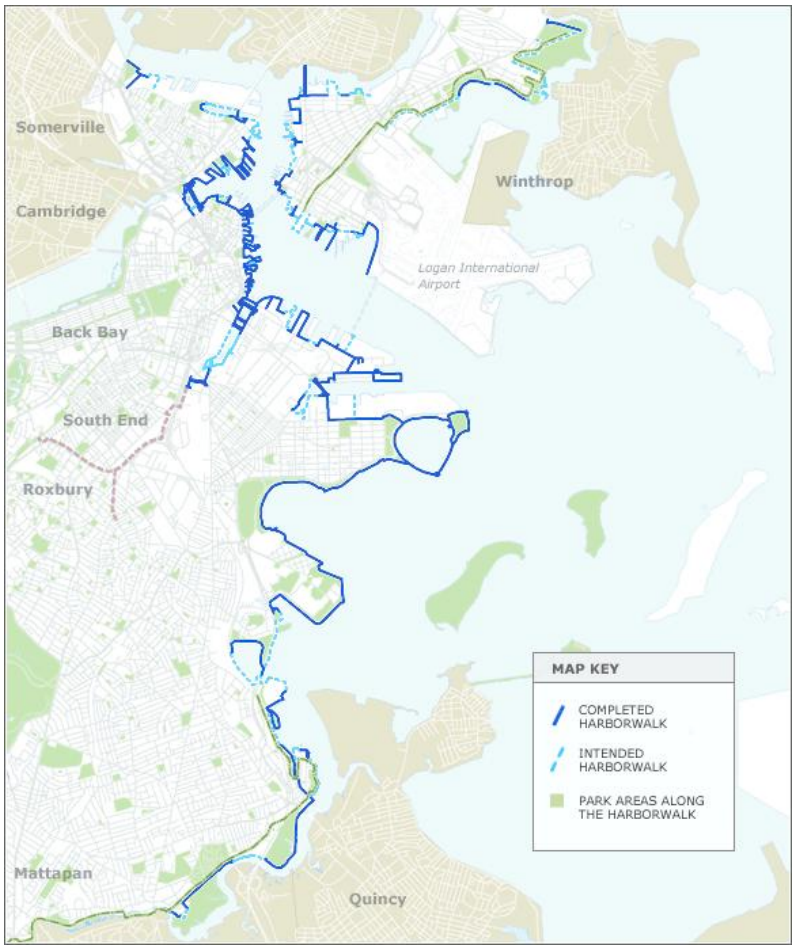


Figure 5 – Map of current status of Harborwalk

The Harborwalk provides the general public with a gateway to connect to the waterfront. However, many problems still exist along the Harborwalk that deter potential users. Inappropriate signage can prove to be confusing to many Harborwalk users. For instance, some areas are marked as private, when in actuality the area is open to the public. (*TBHA, 2007*)

The Boston Harbor Association conducted a report with the help of a graduate student at MIT. "State of the Harborwalk: A Progress Report," provides a comprehensive review of the Harborwalk's status in 2005. In this study, topics of interest such as the accessibility and condition of the Harborwalk, along with other criteria, were evaluated. Recommendations were also given to finish the remaining 25% of the Harborwalk as well as to improve Harborwalk accessibility, especially regarding signage.

2.3 Regulation of Land Use Along the Harbor

The growing attraction of Boston Harbor and the city's waterfront has fueled an ongoing battle between private developments and public interest. Therefore, new waterfront projects require several permits and authorizations from all levels of government. The first step in this process requires the applicant to obtain a wetland permit from the local conservation commission. Once a wetland permit has been issued, the applicant would then apply for a Chapter 91 license granted by the DEP. The different permits and licenses that are required for waterfront development are discussed below.

2.3.1 Municipal Regulations

The Boston Conservation Commission (BCC) is responsible for protecting and preserving open space as well as other natural resources in the city. This commission is comprised of seven commissioners, who are chosen by the mayor. The duty of the commissioners is to determine wetland boundaries and permit projects proposed in or near associated buffer zones. (*TBHA, 2007*)

Any proposed project that is within 100 feet of a flood plain or waterway is within the BCC's jurisdiction. A developer must obtain a Conservation Commission Wetlands Permit prior to applying for a Chapter 91 license.

2.3.2 State Regulation Chapter 91

All the areas that require Chapter 91 authorization include flowed and filled tidelands, great ponds within 250 feet of the mean high water line, and major non-tidal rivers and streams. Any structure that fits into one of the above categories falls under the Chapter 91 jurisdiction. Structures such as piers, wharves, dams and seawalls are regulated under this piece of legislation. Furthermore, any activity such as tideland filling or dredging must be authorized by the DEP. An example of a Chapter 91 license is shown in *Appendix B.* There are four basic types of authorization: a waterways license, a waterways permit, an amendment to a license or permit, and a Harbormaster Annual Permit.

In every application, the applicant must visually convey the locations of public access areas. (Lyman & Massachusetts Continuing Legal Education, Inc., 2000) These locations must be accessible to the public via pedestrian walkway, and should be obstacle free. (Lyman & Massachusetts Continuing Legal Education, Inc., 2000) Once the application is filed, the DEP

and the BRA confer to study the proposed project and determine if there will be any adverse affects to the environment.

The application process today has many steps and could be confusing for the normal citizen. First, the applicant is encouraged to meet with the DEP to determine if the site is located within Chapter 91 jurisdiction. Once water dependency has been determined, a public notice is sent out to the local government followed by a public hearing. Next, the DEP will send out a written determination to the applicant, either granting the license and listing the conditions that may apply or rejecting it altogether. The applicant has a right to an appeal if the license is rejected. The entire Chapter 91 license process is shown in *Figure 6*.

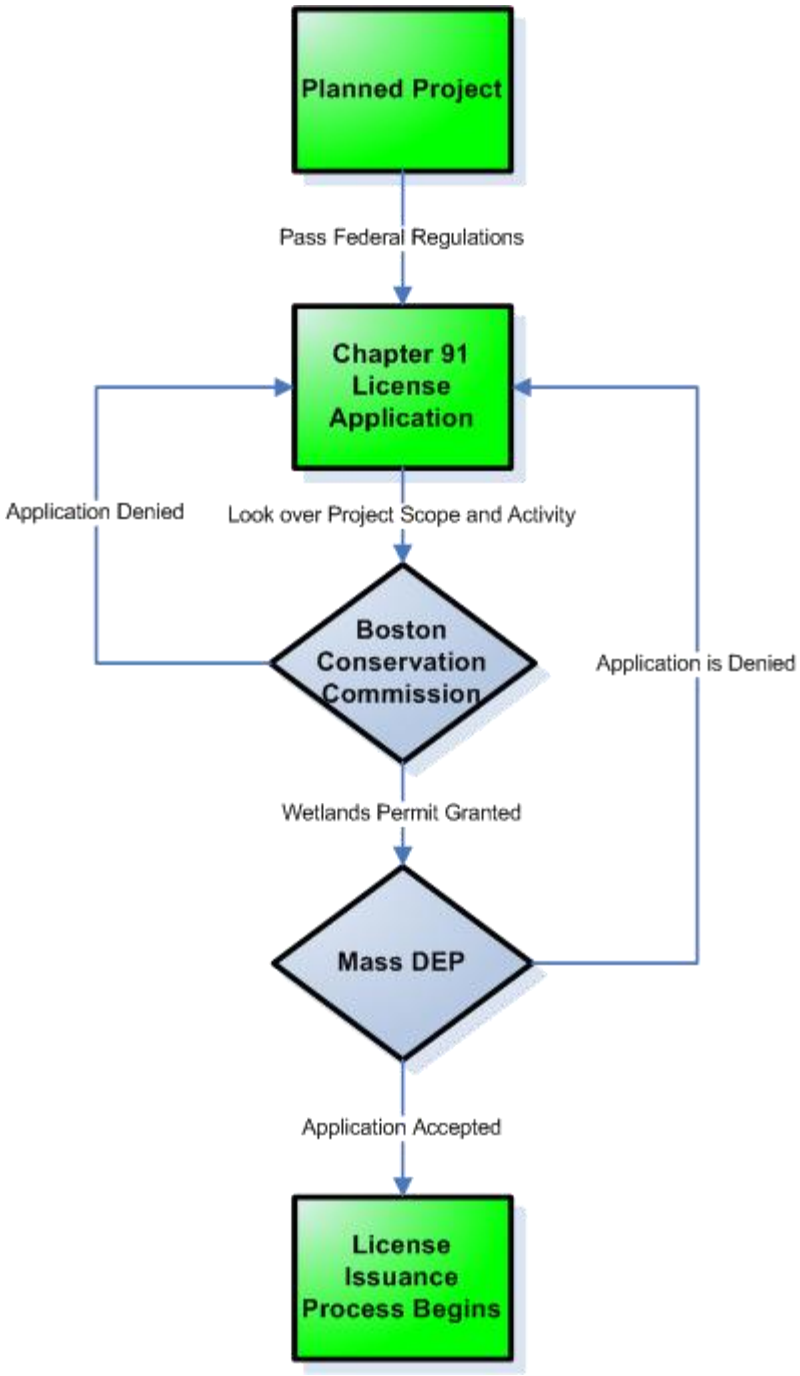


Figure 6 – Chapter 91 Application Process

When a Chapter 91 license is approved, there may be many special provisions that are issued to the specific project. These provisions include special public access points, public walkways, dredging sites and many other similar provisions that may be a factor on a given location.

Once the applicant has been granted a license and the appropriate fees have been paid, the licensee is required to submit the license to the local Registry of Deeds for recordation. Once this is completed, the project must then receive a Certificate of Compliance from the BRA according to the license's special conditions. Overall there are about 10-12 steps that must be completed by the applicant in order to obtain a Chapter 91 license successfully completed.

2.4 GIS: Background and Applications in Government Regulation

Although the license plans display drawings of the effected area, there still remains a level of ambiguity to the project's exact geographical location. However, the user can use a visual interface to locate the licenses using the software described below. For example, the area that is subject to Chapter 91 jurisdiction can be highlighted to give the user a visual representation.

GIS contains various applications that are utilized by government agencies, private businesses and researchers. A GIS map can be comprised of different layers. A layer can be in the form of a data point, line or polygon. A data point contains information that pertains to a specific location. An example of such a data point would be a sign. A line could represent public easements or any other municipal structure with a linear relationship, such as the Harborwalk.

A polygon contains information related to an area such as a parcel. These layers are shown as an example in *Figure 7.* A key layer for the City of Boston is the parcel layer. A parcel refers to the geographic area that the Assessing Department uses to determine property value. Each parcel has a Parcel ID assigned by the Assessing Department.

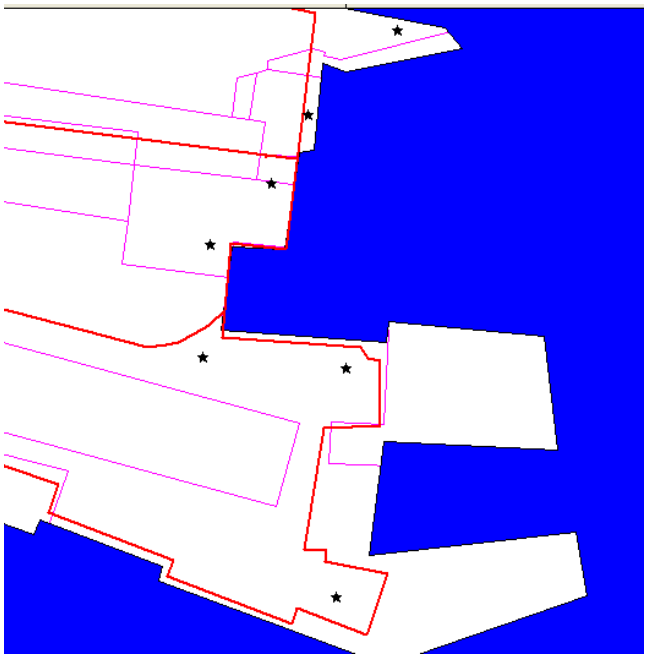


Figure 7 - Example GIS layers: Data point, Line and Polygon

Figure 8 displays the data layer that is related to the parcel ID. Several data layers can be directly uploaded into GIS by government agencies to enhance regulation by performing analysis. (Bracken, 1990)

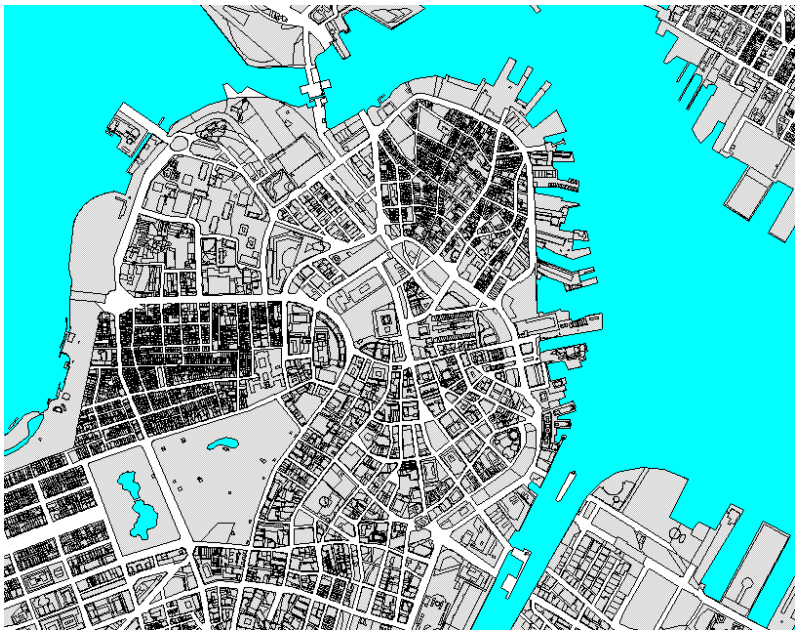


Figure 8 - Parcel data layer

This analysis is conducted by taking pertinent data layers and overlaying them onto a base map so that a conclusion can be drawn. This visual representation can also analyze changes over time within a region. (Bracken, 1990) Regulations are better enforced when government

agencies have the capability to display the various details in Chapter 91 licenses. *Figure 9* displays the data layers being sandwiched together to create a map.

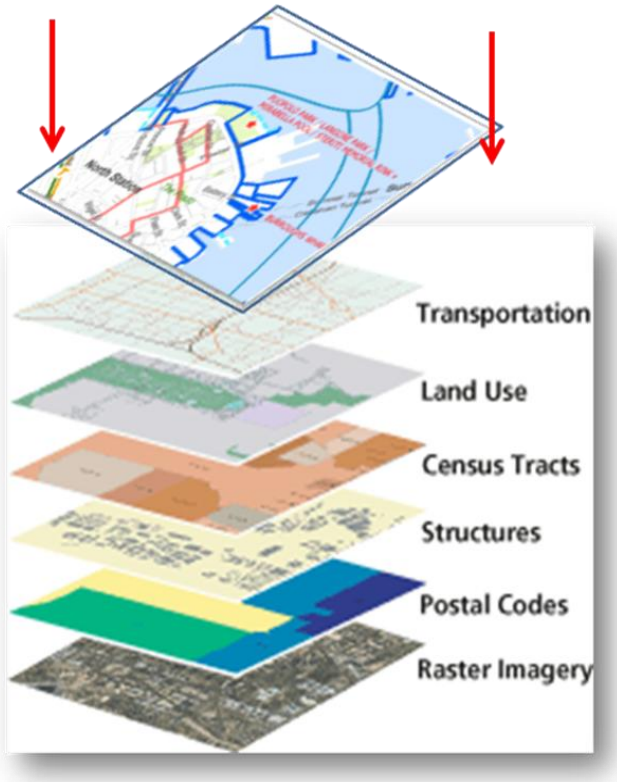


Figure 9 – GIS with added layers

2.5 Previous work

The following section describes a pair of projects that performed similar efforts in storing Chapter 91 license data. The parallels between the following projects and this project helped the team identify complications in license-related issues.

2.5.1 The Case of Chapter 91 in New Bedford, MA

In 1999, a team of University of Massachusetts-Boston professors started a pilot project in New Bedford, MA studying the potential of Geographic Information Systems (GIS) combined with Global Positioning System (GPS) in tracking Chapter 91 licenses. (Gelpke et al., 2002) They attempted to map all of the Chapter 91 licenses using GPS, since their locations in the license plans were not accurate. The professors then imported the locations of the licenses into GIS using the newly mapped coordinates.

The motivation for this project stemmed from the inaccurate mapping of licenses in the New Bedford area. The goal of their project was very much similar to our goal, which is to display Chapter 91 licenses in GIS. *Figure 10* is an example of a web-based map, displaying all the licenses in that area. The user can click on the red dots to open the scanned permits in a new window.

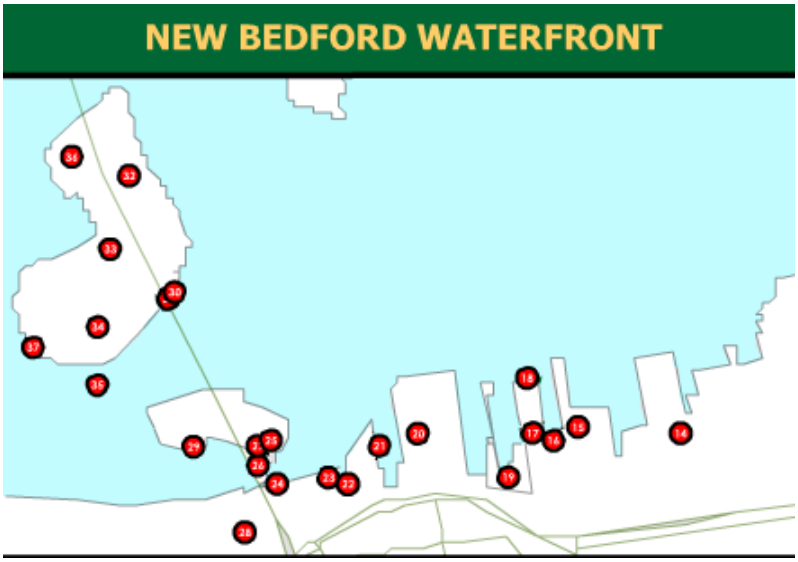


Figure 10 - Display of Chapter 91 licenses in New Bedford (*New Bedford Project, 2007)*

2.5.2 Mapping of Water Dependent Uses & Shoreline Conditions

In 1998, the Urban Harbors Institute in Boston mapped all water dependent uses and shoreline conditions along Boston Harbor as part of the Watersheet Plan. This plan, shown in *Figure 11*, contains useful information for government agencies and the general public. For example, the map displays all of the ferry routes throughout the harbor, as well as mooring and marina locations. This Watersheet Plan is updated every 10 years, so the next scheduled update will be in 2008. Our data addresses one of the four major tasks in this plan.

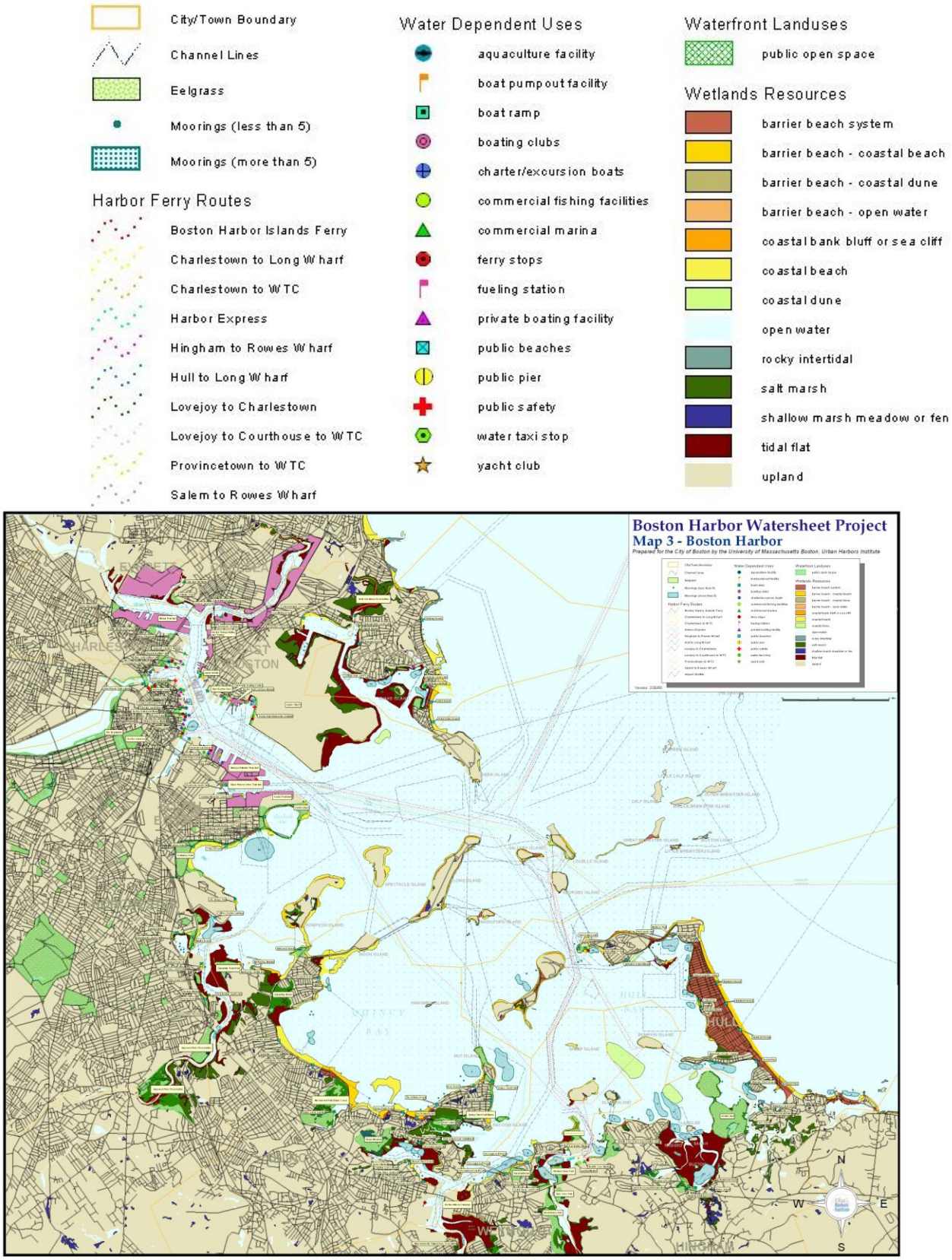


Figure 11 - 1998 Watersheet Plan

3 Methodology

Our project's goal was to improve public accessibility and waterfront regulation for Boston's Downtown waterfront by providing the Boston Redevelopment Authority (BRA) a database. This database contains state and municipal permitting information as well as public amenity information along the Downtown Harborwalk. In the long run, the BRA will use the database and analysis as tools to enhance waterfront regulation. These improvements will further enrich the waterfront experience shared by the citizens of Boston while sustaining a healthy commercial environment.

Our project's success was due to the accomplishment of the following individual objectives:

- Develop Database Design
- Map Public Amenities and Harborwalk Characteristics
- Convert Licenses into Electronic Form
- Evaluate Database with BRA to Finalize Structure
- Create Interface for Entering and Displaying Data

This Chapter will address each objective and discuss our team's methods of accomplishing our overall goal.

3.1 Develop Database Design

The accomplishment of our first objective was primarily contingent on information obtained from interviewing government officials and representatives from advocacy groups. Richard McGuinness, the Deputy Director of Waterfront Planning, provided our project team with many contacts in state and local agencies that would be interested in creating a Chapter 91 license database. A table of contacts interviewed and consulted throughout this project is located in *Appendix C*.

3.1.1 Interviews with Government Agencies

Our general approach for the many interviews we conducted with government agencies was to determine how licensing information contained in the database might be useful in their everyday work. The BRA and the DEP were the first agencies we interviewed, since they are the

ones who deal with Chapter 91 licenses on a frequent basis. Our research questions for these interviews were as follows:

- What is the role of the agency in waterfront regulation?
- How do they access licensing and permitting information?
- What data would be useful to access?
- How would their agency benefit from accessing information contained in the database?

Since government agencies predominantly focus on waterfront regulation, we focused more on database structure and information rather than mapping public amenities. However, we did ask GIS specialists from the BRA about public amenity mapping, along with GIS-related queries.

The main concern addressed during these interviews was the types of fields that should be included and excluded. A "field" is a place within the database where a particular type of information is stored. Furthermore, we discussed possible outcomes for our project and a timeline of implementation. We wanted to assure that each category was valid for every license, as it was very important to produce a sound framework.

3.1.2 Interviews with Non-Government Organizations

Since government agencies and NGO's have different agendas, they also have different information requirements. When our group interviewed representatives from NGO's such as Save the Harbor/Save the Bay and TBHA, we focused on these areas of discussion:

- What is your role in advocating public access along waterfront?
- Is the public fully aware of what the waterfront has to offer?
- How would the organization benefit from a map of public amenities along Harborwalk?
- How would this map be used by the organization?

Although we predominantly focused on public amenity mapping, we did touch on database topics with the TBHA. Since TBHA is proactive in issues with public accessibility, we asked them how they would utilize a database of permitting information. Overall, however, we wanted to hear how these advocacy groups would utilize a map of public amenities as well as their opinions on how the public would benefit from such a map.

3.1.3 Interviews with Management Information Systems Personnel

We also prepared a third set of topics for our meeting with Bob Tumposky and Andy Sharpe of the Management Information Systems (MIS) Department of Boston City Hall. These topics are more technical and specific to database structure rather than the larger social issues involved with our project:

- What database software would be best for creating and managing the database?
- How can we realize relationships between the different varieties of data in our database?
- How can we provide a user-friendly input interface that allows the user to enter the data?
- How can we design an output interface that displays a "fact sheet" of license information?
- Do you recommend any changes to our field types?

The primary goal of these meetings was to see if the MIS Department had any resources we would be able to utilize that would assist us in our database design process. Also, we wanted to explore possibilities in linking data structures, such as the Assessing Department's database of parcel information. Overall, we wanted to see if these technical experts could help us design a database that realized the Chapter 91 license data structure.

3.2 Mapping Public Amenities and Harborwalk Characteristics

Our second objective was to map the public amenities and significant Harborwalk characteristics along the Downtown harborfront. These amenities, such as benches, trash receptacles, binoculars and lampposts, were mapped using a Global Positioning System (GPS) device. In addition, we mapped all the Harborwalk signs along our area of focus and took pictures of every sign.

The GPS we used was Wide Area Augmentation System (WAAS) enabled, providing an accuracy of no worse than 7.6 meters in any direction. Most of the time WAAS enable receivers achieve accuracy within one meter. The locations of public amenities were mapped using this technology. This mapping process was conducted by a two person team. One person held the GPS and marked the location, while the other carried a notebook to write down the label for the waypoint and a description of the amenity. For example we would write down "WP0003" as the waypoint label and "single bench" for the amenity description.

In order to assure accuracy, we paused at each location for about 2 seconds. For some locations we recorded an average of points due to the inaccuracies inherent in GPS mapping. Over the course of a minute or so, the GPS device takes a location reading every second and then calculates a running average. *Figure 12* displays positional readings over a period of time. The final position clustered in the center is an average of all readings.

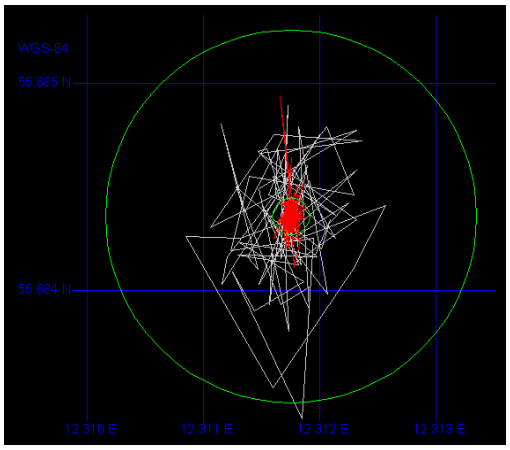


Figure 12 - GPS Positional Averaging

We used this method especially when the GPS signal was obstructed by buildings. This same technique was used throughout the entire pilot project conducted in New Bedford.

After the mapping was complete, all saved locations were downloaded to the computer and then loaded into a spreadsheet. The spreadsheet contains the waypoint number, coordinates, along with the date and time the waypoint was taken. We added a comment column as well to hold descriptors of waypoints. Some examples of descriptors include: *single bench, double bench, trash barrel, binoculars and sign*. We also took pictures of every Harborwalk sign in our area of study.

Whenever possible, we took pictures with the sun at our backs, thus achieving optimal lighting conditions. Furthermore, we stood about four to five feet behind the sign so we could also capture the surrounding environment. If a sign was double-sided, such as in *Figure 13*, then we took pictures from both sides. All pictures were taken in clear days to provide as much detail as possible. We also made sure that the date and time of the picture taken was displayed since this was requested by our sponsor. This data is important to track since signs and environments can change with time.

Similar to the mapped amenities, the waypoint number and picture number were written down on a spreadsheet for the signs.

Figure 13 – Harborwalk Sign from both sides

Finally, all the pictures of the signs were downloaded into the computer. Each sign was issued a waypoint name to preserve uniqueness. We documented our findings and imported the spreadsheets into the database, shown in *Figure 14*. This database allows the user to use GIS to display the amenity information along the Harborwalk. Conclusions can be drawn based on the visual representation of these amenities overlaid onto other layers.

	A	B	C	D	E	
1	Waypoint Nan	Time	lat	lon	Elevatio	Comment
2	WPT 00001	2007-03-22T15:20:30Z	42.360631	-71.05081	18	Double Bench
3	WPT 00002	2007-03-22T15:20:30Z	42.360676	-71.050806	18.4	Double Bench
4	WPT 00003	2007-03-22T15:20:30Z	42.360721	-71.050806	18.5	Double Bench
5	WPT 00004	2007-03-22T15:20:30Z	42.360736	-71.050808	18.200001	Trash Barrel
6	WPT 00005	2007-03-22T15:20:30Z	42.36094	-71.05081	14.6	Double Bench
7	WPT 00006	2007-03-22T15:20:30Z	42.360961	-71.050808	13.3	Trash Barrel
8	WPT 00007	2007-03-22T15:20:30Z	42.360976	-71.050813	12.4	Double Bench
9	WPT 00008	2007-03-22T15:20:30Z	42.361018	-71.050811	12.5	Double Bench
10	WPT 00009	2007-03-22T15:20:30Z	42.361305	-71.050816	11.3	Trash Barrel
11	WPT 00010	2007-03-22T15:20:30Z	42.361331	-71.050825	11.1	Double Bench
12	WPT 00011	2007-03-22T15:20:30Z	42.361368	-71.05083	10.9	Double Bench
13	WPT 00012	2007-03-22T15:20:30Z	42.36141	-71.050831	11	Double Bench
14	WPT 00013	2007-03-22T15:20:30Z	42.361451	-71.050835	11.6	Double Bench
15	WPT 00014	2007-03-22T15:20:30Z	42.361466	-71.050833	11.7	Trash Barrel
16	WPT 00015	2007-03-22T15:20:30Z	42.361716	-71.050858	12.7	Double Bench
17	WPT 00016	2007-03-22T15:20:30Z	42.361748	-71.05086	12.8	Double Bench

Figure 14 - Amenity spreadsheet with coordinates

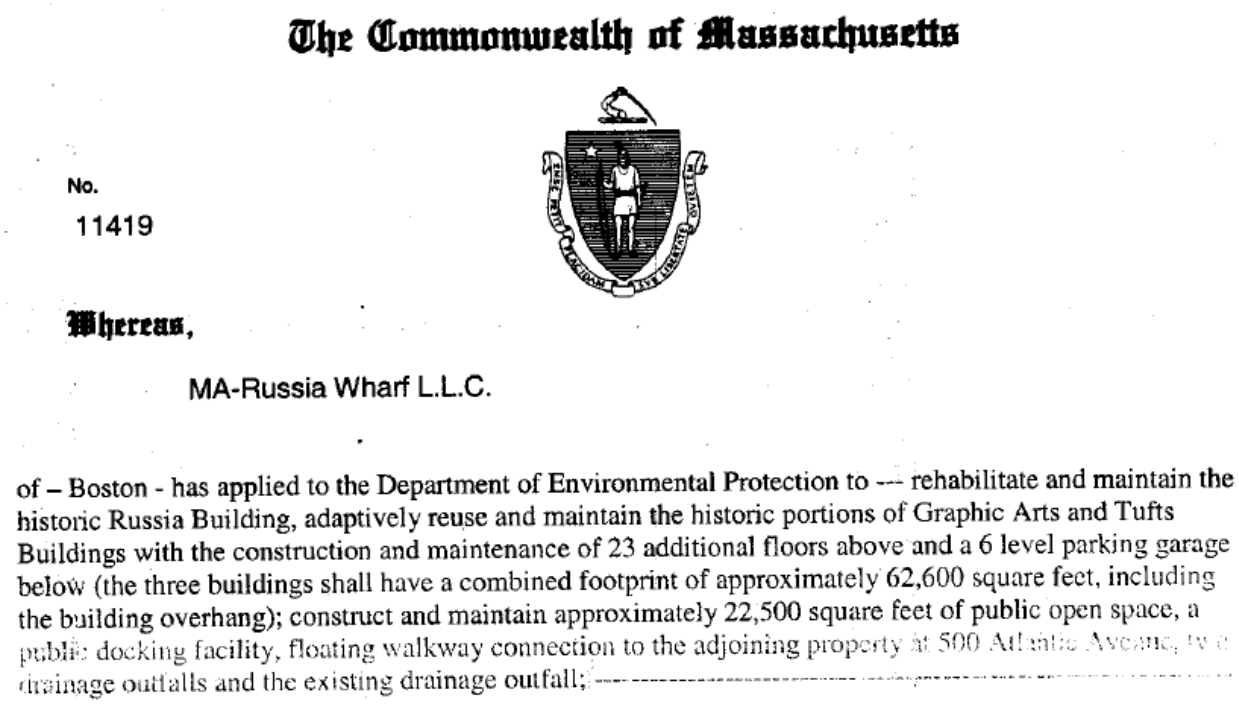
3.3 Converting Licenses into Electronic Form and Adding to Database

The process of converting licenses into electronic form is an important first step to increasing the availability of license data. First we had to obtain the licenses at the appropriate agencies. Then it was necessary that our project team convert these hardcopy licenses into an electronic format. Our team was not satisfied by just scanning these licenses into PDF format, however. We wanted to create a system that would allow one to store all relevant license information in a Microsoft Access database. This section of the Methodology Chapter illustrates the steps we completed to realize this goal.

3.3.1 Scanning Licenses into PDF Format

Adobe's Portable Document Format (PDF) presents a user-friendly interface without the extraneous editing functions contained in Microsoft Word. Our team's original ambition was to solely design a database, but this changed after talking to Richard McGuinness and Andrea Langhauser, Regional Planner for the DEP. After our interviews with the list of contacts shown in *Appendix C*, we concluded that it is necessary for Chapter 91 licenses to be scanned in PDF format. PDF is prevailingly used by our sponsor as well as other government agencies to file paper copies in electronic format.

Our first attempts in obtaining licenses in digital format took place at the Suffolk Registry of Deeds. Our team then resorted to collecting all the licenses between Burroughs and Rowes Wharfs from the DEP Archives at their regional headquarters in Boston. Furthermore, the DEP scanned the licenses into PDF format; *Figure 15* is a cover page of a license in PDF format.



The Commonwealth of Massachusetts

No.
11419

Whereas,

MA-Russia Wharf L.L.C.

of – Boston - has applied to the Department of Environmental Protection to --- rehabilitate and maintain the historic Russia Building, adaptively reuse and maintain the historic portions of Graphic Arts and Tufts Buildings with the construction and maintenance of 23 additional floors above and a 6 level parking garage below (the three buildings shall have a combined footprint of approximately 62,600 square feet, including the building overhang); construct and maintain approximately 22,500 square feet of public open space, a public docking facility, floating walkway connection to the adjoining property at 500 Atlantic Avenue, two drainage outfalls and the existing drainage outfall;

Figure 15 – License in PDF Format

The licenses are saved in the PDF document as a graphic. In other words, the text is not searchable or editable, like a word document. In order for the text in the licenses to be searchable by keyword, we had to run all the pages through "Optical Character Recognition" (OCR) software. The copiers at the BRA have such software built in, so we were able to scan the pages and the copier saved them directly as an editable text file. OCR is not 100% accurate, however, especially when the scanned text is not very legible or not formatted well. If this is the case, then the final document will contain many errors, including misspelled words. For instance, a search query for the word *Harborwalk* in one license would fail to find a single occurrence because the OCR function stored to word as *Harbonwalk*. Formatting is also a challenge for OCR software sometimes. Therefore we had to proofread each licenses as best as we could. Each license was scanned in its entirety and stored on a network drive. The license number was used as a file name.

3.3.2 Importing License Data into Database

This step was crucial in our hopes of delivering a well-structured, sustainable database of Chapter 91 license data to the BRA. In order to import the license data into our database while minimizing input error, we completed this task in two phases:

- Input license data using Microsoft Access datasheet
- Input license data using developed input interface

The first phase was undertaken as soon as licenses were collected from the DEP.

Within this view, we were able to input the data with relative ease since we designed the database. Each of the license attributes were placed in the fields, and the special conditions were placed in the sub-datasheet, as shown in the *Figure 16*. The datasheet view was used to import data for about half of the licenses within our scope. However, this view is not useful as a permanent method of inputting data, since it does not provide an easy-to-follow layout for the user.

Project ID	License Number	License Type	Date Issued	Date of Recordation	Private Tidelands	Commonwealth Tidelands
1	11419	License	8/7/2006	9/8/2006	☑	☑
2	3865	License	10/27/1994	10/28/1994	☐	☑
3	3864	License	1/25/1996	1/31/1996	☐	☐

Conditions ID	Conditions
23	Special Condition 1
24	Special Condition 2: Term
26	Special Condition 3: Completion of Construction Activities
27	Special Condition 4: DEP Compliance Access
28	Special Condition 5: Modification to Licenses
29	Special Condition 6: Certificates of Compliance
30	Special Condition 7: Future Maintenance Responsibilities
31	Special Condition 8: Public Review
32	Special Condition 9: Maintenance of Pedestrian and Vehicular Access
33	Special Condition 10: Water Quality
34	Special Condition 11: Utilities
35	Special Condition 12: Open Space Restoration
36	Special Condition 13: Removal of Temporary Structures
(AutoNumber)	

0						

Figure 16 – Screenshot of Datasheet Input

The second phase of importing licenses was undertaken after Andy Sharpe and Bob Tumposky of the MIS Department at the BRA developed an input interface for our database. The description of this interface is located later in this Chapter.

3.4 Creating an Interface for Entering Data

Once we conducted our field analysis and obtained our raw data, we needed a way to display and input the data using a user-friendly interface. For this reason, an interface involves two aspects, an input method and an output method. Our focus in developing the input method was to prevent the user from having direct interaction with the datasheets. Rather, the user would use an input form to enter in license data in a standardized manner. This is not only more

visually appealing, but it also protects the existing data from corruption and user error. While we focused on developing one input interface, we worked on two different ways to output the information contained in the database. The database interface is one of the most important aspects of our project, since a database that expects too much from the user will be considerably underutilized.

3.4.1 Input

In order to import the data from the remaining licenses, a specific interface was developed. The most important design principle used by the team was ease of use, as well as consistency. It is essential that the data is entered into the database accurately. If the input form is not entirely conclusive, the database will be prone to blank fields or incorrectly entered data. The development of the input form included the following steps:

- Determine which data fields to display on form
- Organize fields on input form
- Assign input methods for each field
- Setup links to sub-datasheets and other databases

The first step in this process was the easiest to complete, since the relevant fields could be easily determined. In fact, all fields except for indexes and repetitive data were included in the form. Organizing the fields required more design analysis, since we wanted the layout of the form to be user-friendly.

The next step required a particular input method (i.e. checkbox) that minimized user error with regards to importing data. Dropdown menus or simple check boxes were implemented wherever possible to keep the database uniform. If the user writes in "private Tidelands" for example as opposed to just check a box, it could be misspelled, which will make it hard to organize the data. The development of the input interface was outsourced to the MIS Department at the BRA, but our project group still had complete oversight over its appearance and contents.

3.4.2 Output

Once all the Chapter 91 license data was imported successfully into the database, a method of displaying this information in a meaningful way was developed. We came up with a list of criteria for two equally effective outputs: the Chapter 91 fact sheet and the GIS map.

One way we envisioned displaying data was through a Microsoft Access interface that provided multifaceted user interaction. For instance, a user could list all Chapter 91 licenses that have a Harborwalk stipulation in them. In addition, this interface would provide an option allowing the user to print out a "fact sheet" about each license. This "fact sheet" would display all the important information about a license in an organized list.

From the preliminary planning stages of this project, one of our team's major focuses was to create Chapter 91 informational layers on a GIS map. The positional information for each license is stored in the database, so we referenced this data to display license information in a GIS-compatible format. To perform this function, we used a software converter.

Since we needed to display license information in concert with other map layers, such as parcels, streets, water, and building footprints, we met with Rolf Goetze, a MapInfo expert for the BRA. He provided us with all of the base layers that we needed for our map. We were able to manipulate these base layers to create a visual layer of the area of focus for this project. After completing the base layer, we consulted Rolf Goetze and Carolyn Bennett to determine the process for linking this database with GIS.

While working on the Chapter 91 layer for this detailed map, we also created a layer in GIS that displayed the Harborwalk. Rolf Goetze also provided us with a layer that displays all the T stations that are in close proximity to the water's edge. Overall, the GIS and Microsoft Access interfaces were planned for separate uses but to work in harmony so that all needs are met for the different prospective users.

3.5 Evaluate Database with BRA to Finalize Structure

After completing previous objectives successfully, we began to evaluate our database design with representatives from the BRA. This included Richard McGuinness and Brad Washburn from Waterfront Planning as well as Bob Tumposky and Andy Sharpe from MIS. *Figure 17* displays the flowchart that represents our general approach to completing this objective.

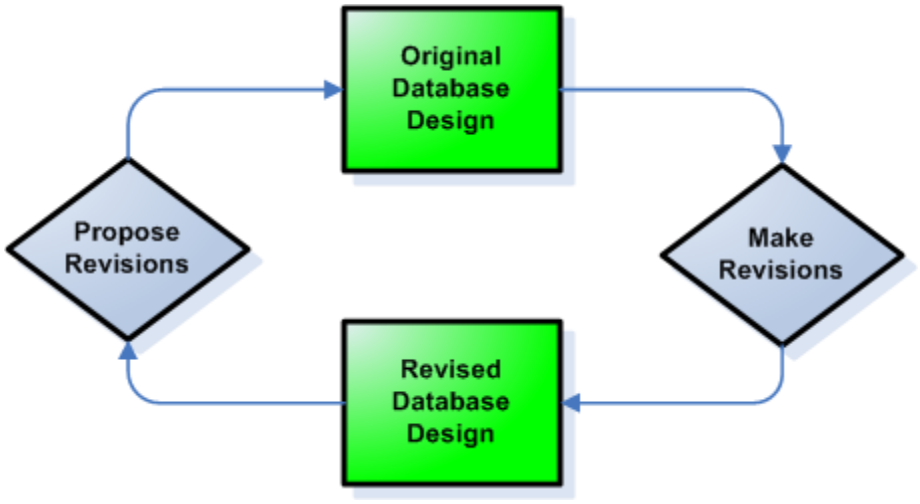


Figure 17 – Evaluation Flowchart

First, we proposed our original database design to the parties previously mentioned. We discussed design, data, and interfacing. Once we received feedback from both parties, we made revisions to database attributes. We were then able to show the revised database to the BRA to gather final suggestions. These final suggestions were subsequently implemented to finalize our database design, data, and interfacing.

4 Results and Analysis

Contained in the following sections are all of the results that the team recovered from conducting many interviews, executing field work, and performing archival research. Once these results were gathered and documented, our project team was able to analyze the current state of obtaining Chapter 91 licenses, the considerations of the database design, creating a database structure for Chapter 91 licenses, and displaying all relevant information using GIS.

4.1 Challenges locating Chapter 91 Licenses

The process of obtaining Chapter 91 licenses for our pilot area clarified how inaccessible this information is to the general public. Up to that point we had sufficient knowledge about Chapter 91 from our interviews with government officials. Despite this "knowledge," it was still difficult for us to obtain licenses.

Since 1979 all issued licenses are required to be recorded at the local Registry of Deeds by the licensee after it has been granted by the DEP. The Registry of Deeds' purpose is to maintain a public record of every legal document issued in the Commonwealth. A copy of every Chapter 91 license is also filed at the DEP. Both agencies are open to the public, but not accessible in the same way. While the Suffolk Registry of Deeds maintains daily hours of 8:30 AM to 4:45 PM for research, the DEP has public visiting hours only once a week, usually for half a day on Wednesdays. Andrea Langhauser, of the DEP, allowed our project team to visit the DEP's archives outside of the public hours.

Both agencies do not maintain the same method of recording nor do they possess the same volume of records. The Registry of Deeds has a far lower number of licenses than were actually issued. Between 1979 and 2007, only 27 Chapter 91 licenses were found to be recorded in the database for Boston. The Registry of Deeds contains more licenses but they are categorized incorrectly, making them extremely difficult to locate.

The Registry of Deeds maintains two ways in storing licenses, in paper format as well as a scanned digital copy. The Registry of Deeds has its database available through its webpage http://www.masslandrecords.com as well as on site. The user can search for land records using a variety of methods, such as by property owner, but the search function is very limited. First, the user must choose which type of search and then enter the property owner's last name. The user

can refine the search if there are too many results, such as limiting the results by town and document type, see *Figure 18***.**

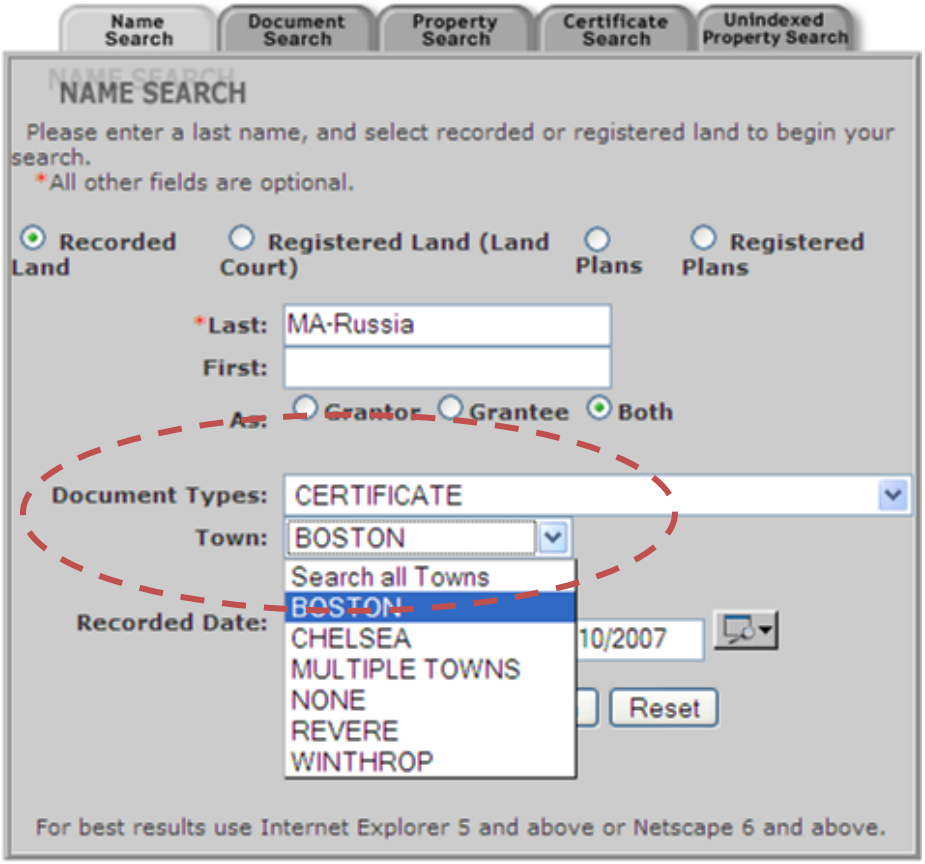


Figure 18 – Registry of Deeds Document Search Form

For our purposes, however, this search method did not seem sufficient. In addition to their limited number of licenses, we noticed that their search function has its own limitations. For example, we knew that Russia Wharf was in our project scope so we searched for it by typing in "Russia Wharf LLC." We soon noticed that this did not yield a single result. After further investigation, we noticed that the license was filed under the licensee "MA-RUSSIA WHARF LLC."

In conclusion, the search options at the Registry of Deeds are limited, which in turn limits the usefulness of the database. The user can only search for certain parameters, such as last name, street name, or document. One cannot even search by Chapter 91 license number.

The DEP, on the other hand, has all licenses ever issued in Massachusetts filed by license number. All licenses are stored on shelves in an organized fashion. Each binder contains a range of licenses whose numbers are listed on the binding. However there is no comprehensive

index of these licenses of any sort, either in print or electronic. The only dependable index is located on a map of Boston Harbor with licenses numbers listed along the waterfront. These license numbers indicate the approximate location of where the license exists, but often these numbers are illegible.

Furthermore, the DEP only possesses electronic copies of licenses from the year 2000 to the present. These electronic licenses are unsigned, exclude plans, and are unavailable to the public. Therefore, our project team determined that licenses in their paper form are the only way to verify integrity. Once we made this determination, we obtained all the licenses in our area of focus from the DEP in scanned PDF documents. Overall, we obtained 25 licenses that applied to our project.

4.2 Chapter 91 Details

After we finished collecting licenses from the DEP in PDF format, we conducted some preliminary analysis on license details. One of the things we noticed was the relationship between parcels and licenses. A parcel can be subject to more than one license, and one license may span over several parcels. This creates a complex relationship, see *Figure 19*:

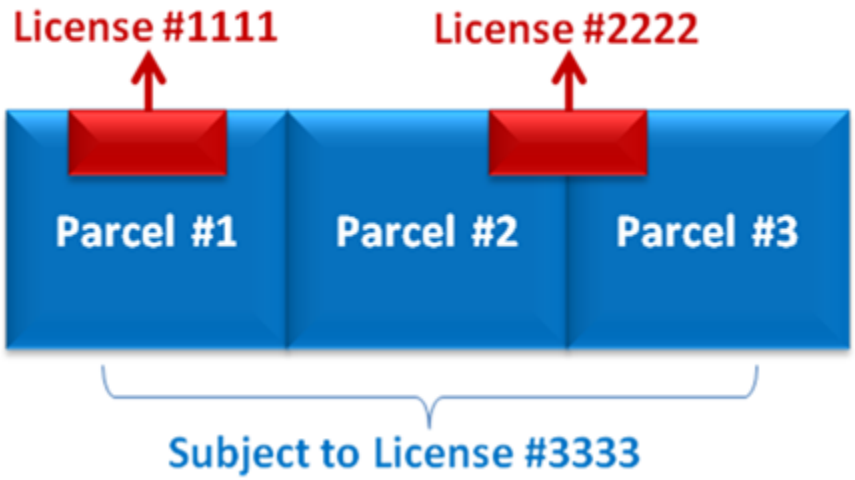


Figure 19 – City Parcel to license(s) relations

We examined the licenses further to determine the characteristics they have in common. For instance, every license is issued to a licensee, has a license term and a date of issuance. Every license contains plans to show the project locus or area of concern. Moreover, each license has special conditions specifying more detailed conditions for the property owner, such as Harborwalk width and maintenance information. These special conditions vary from site to

site, such as Harborwalk characteristics. The expression for Harborwalk in licenses also varies between pedestrian walkway, public easement, and public throughway. Licenses from different time periods contain different amounts of information. It is extremely difficult to design a database that is comprehensive but still compatible with older licensees. For instance, some licenses have Standard Waterways License Conditions and some do not. In addition, only licenses in close proximity to the shoreline have Harborwalk stipulations.

4.3 Database Design Development

Currently there are about 11,000 Chapter 91 licenses issued in the state of Massachusetts. The number of entries in a database is an important design consideration. A different database would be used if the number of Chapter 91 licenses was above 100,000. Given the limited amount of data in our scope, we designed the database in Microsoft Access. Although there are many other database programs available, Access was chosen due to its versatility and its wide range of applications.

Figure 20 shows the Access 2003 database design and how the data is structured within. Each entry in the database starts with a project name. A project name is the most distinctive title assigned to a property, for example New England Aquarium or Commercial Wharf. Then each parcel is tied to one or more Chapter 91 licenses, which in turn can have special conditions and a link to the project's Boston Conservation Commission wetlands permit. All this information is contained in the database we created for the BRA. Furthermore each parcel ID can be linked to the assessing online database of the City of Boston, such as seen in *Figure 20*.

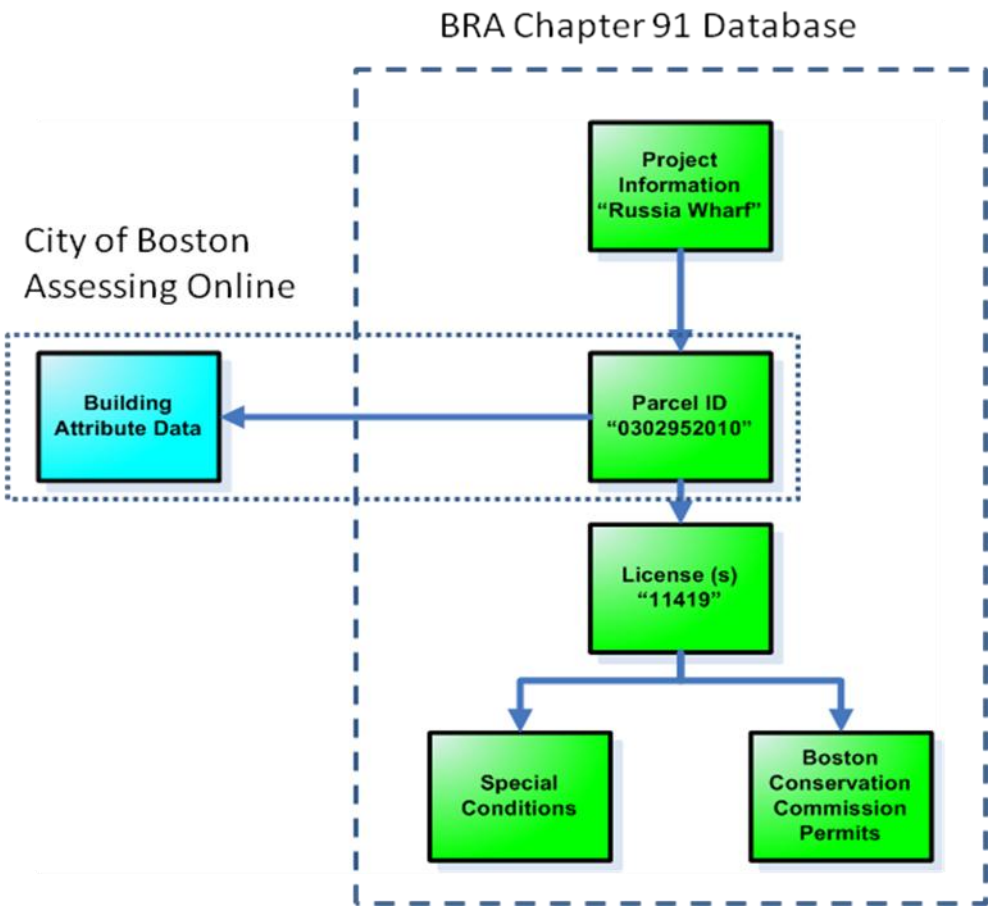


Figure 20 - BRA Chapter 91 Database Internal Structure

Figure 21 shows a screen shot of an overview of information provided by the assessing department, such as property value, address and owner information.

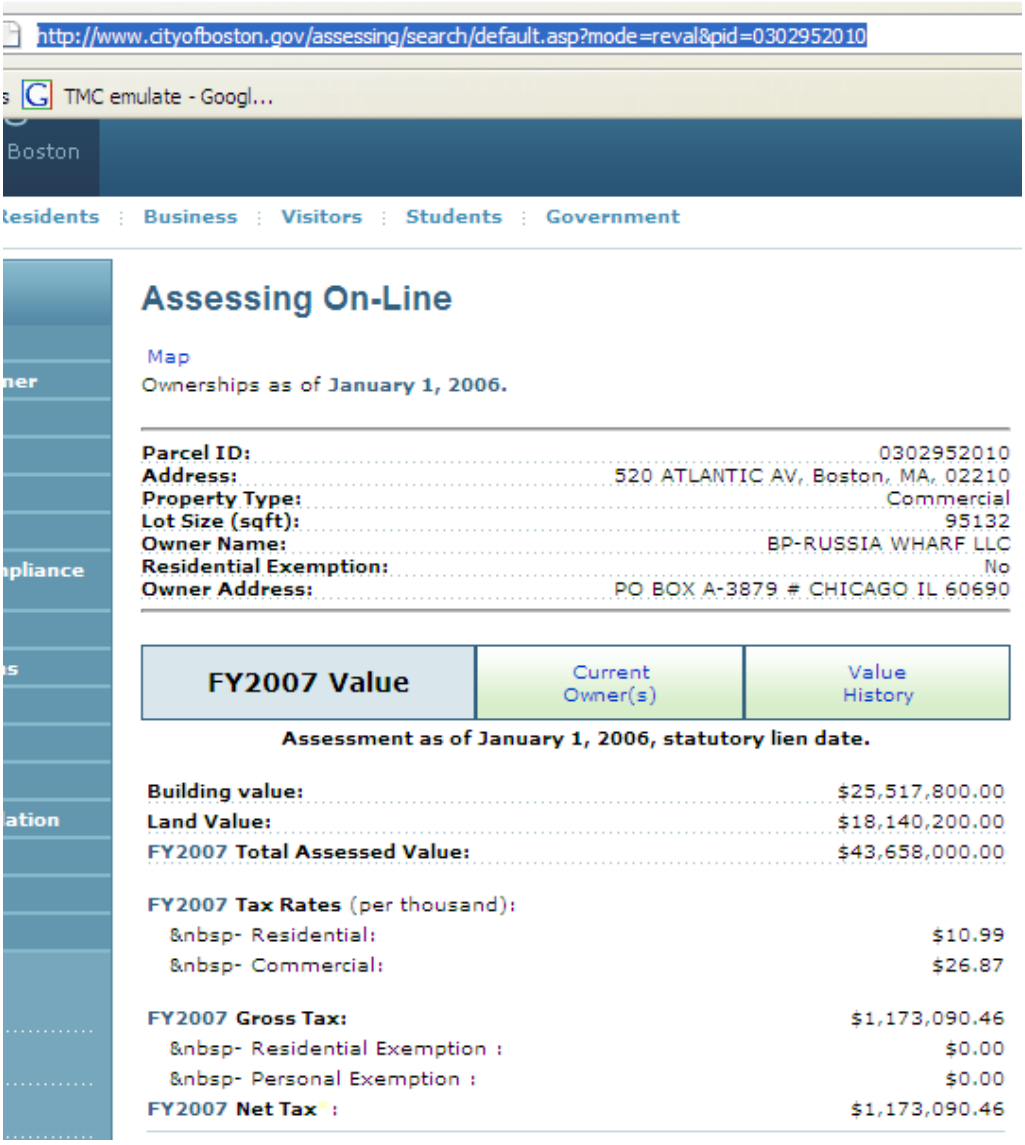


Figure 21 - Screenshot of Assessing online showing property information

Professor Fabio Carrera, Adjunct Assistant Professor at WPI, advised our group that it is not good practice to leave a data field empty or use zeros to represent lack of data. On the same token, he said that an empty field could have many different interpretations to the user and should therefore be avoided whenever possible.

Through our analysis of several licenses, we determined the following fields to be common enough in all licenses to put into our database, shown in *Figure 22*.

Field Name	Data Type	Description
License Number	Number	Number Issued By DEP
License Type	Text	Indicates Whether the Record is a License, Amendment, or Permit
Date Issued	Date/Time	Date License was Approved By DEP
Date of Recordation	Date/Time	Date of License was Recorded At Registry of Deeds
Private Tidelands	Yes/No	Specifies whether the Activity/Project is on Private Tidelands
Commonwealth Tidelands	Yes/No	Specifies whether the Activity/Project is on Commonwealth Tidelands
Name of Waterway	Text	Specifies Name of Waterway Property is Adjacent to
Water Activity	Text	Describes the Scope of Activity in License
Municipal Harbor Plan	Hyperlink	Specifies Which Municipal Harbor Plan is in Effect for Each License
Water Dependent	Yes/No	Specifies whether the License is Water-Dependent or Non-Water Dependent
License Term	Text	Years of License Activity
Harborwalk	Yes/No	Specifies Whether the Harborwalk is Defined in License
Harborwalk Minimum Width	Number	Minimum Width of Harborwalk (Feet)
Tidewater Displaced	Number	Amount in Cubic Yards of Tidewater Displaced By Construction
Monetary Contributions	Currency	Lists the Monetary Contributions from Licensee to Programs and Projects for Public Interest
Government Funding	Text	Either Federal, State, Municipal, or None, Describing Subsidies Used to Fund Project
Licensee Full Name	Text	Name of Organization or Individual Issued License
Licensee Address	Text	Address of Organization or Individual Issued License
Licensee City	Text	City of Organization or Individual Issued License
Licensee State	Text	State of Organization or Individual Issued License
Licensee Zip Code	Text	Zip Code of Organization or Individual Issued License
Licensee Phone Number	Text	Phone Number of Organization or Individual Issued License
Licensee Email Address	Hyperlink	Email Address of Organization or Individual Issued License
License Full-Text	Hyperlink	Link to Full-Text License in PDF Format, Including Plans

Figure 22 – Details of Fields in Database

When users search for a particular license, they can search by any field that is in the database, such as by zip code, project name and owner. Users will also be able to display licenses that fulfill one category, such as those that contain the Harborwalk. If the user searches for "Russia Wharf" for example he will see all the information that is currently in the database. He will also see how many licenses have been assigned to the Russia Wharf project area. Furthermore, if a user searches by parcel number, he will see the project names and the licenses that are associated with it. Currently our database contains all licenses in our projects scope, a total of 25 licenses. For each parcel there are many older, expired licenses that the new licenses may refer to in the text.

4.3 Database Limitations

Although our team worked to deliver a comprehensive and functional database of Chapter 91 licenses to the BRA, some problems still remain in our design. For instance, one license may have a project name that has no geographical significance, but represents the name of the construction project. This is especially true for tunnels and structures that are below the surface. Given the complex nature of licenses, this database will be difficult to use for people with limited knowledge of license details. Older licenses, for example, do not have special conditions, per se. Some do not explicitly state the date of recordation in the Suffolk Registry of Deeds.

A reasonable understanding of the license process is required, especially for data entry. A detailed description of each input field is either on the input form or in the glossary. Notwithstanding, decisions must still be made about data input. For instance, a user may have to determine whether a license is for water dependent or non-water dependent uses, since it is not explicitly stated in the license.

Another considerable limitation is that the database is "static." Although the team hoped to create a dynamic database linked to other relevant data, it was not feasible to achieve this during the project's short timeframe. We believe that this is negligible drawback, however, since upkeep of this database is not a daunting task. Moreover, given that approximately three new licenses are issued per year for Suffolk County. Nevertheless, our database sets the stage for future licenses under the current DEP regulations. *Appendix D* shows a few screenshots of our current database structure.

4.4 Mapping License Information and Public Benefits along the Harbor

There are many capabilities that accompany the use of Geographic Information System (GIS). The most important trait of GIS is the ability to copy and alter layers to display information of interest. As part of our analysis, we located all the parcels that fell under Chapter 91 jurisdiction. *Figure 23* displays the parcels that require Chapter 91 licenses. Along with the Chapter 91 parcels, our team has created other layers that display the locations of public amenities.

Figure 23 - Chapter 91 Parcels in Yellow

As mentioned in the methodology chapter, the locations of these points of interest are mapped using GPS and are imported into a spreadsheet. That data can then be subsequently imported into a MapInfo layer as long as each data point has positional characteristics. Different symbols can be assigned for the different amenities to distinguish between each type, such as  for a bench. Despite our efforts to record the locations as accurately as possible, it was very obvious with some waypoints that the recorded location was off-target.

In spite of this obstacle, it was very easy to manually relocate the points to where they should be in MapInfo. We first plotted all the points on the map as they were recorded by the GPS, overlaying an orthographic picture. The picture has such great detail that the locations of benches and trash barrels were seen with relative ease. Therefore, we double-checked the location of each waypoint and moved them if necessary to the correct locations.

With the proper display of the data, a public access analysis could be undertaken. For example, *Figure 24* displays the locations of all Harborwalk signs that are located from Burroughs to Long Wharf. By studying *Figure 24***,** we concluded that the majority of the Harborwalk signs are located on the new Harborwalk and less so on the vintage Harborwalk,

which is the Harborwalk path constructed before 1995. *Figure 24* agrees with the comments that TBHA made in their Grading the Harborwalk Study, one example of this would be when the report states "the only major missing segment is in the North End Harborwalk at the U.S. Coast Guard Station."

Once all the signs have been catalogued, the map will provide the BRA a complete inventory of all Harborwalk signs. Should a sign be misplaced by a storm or vandalism, the BRA will have a record of the sign's appearance and its location. The second major use of the sign inventory is to reinforce Chapter 91 license stipulations. The BRA can look on the map and see how many signs are placed on any particular property. Based on that information they can give detailed provisions of new signs that need to be erected. On the same note, TBHA will be able to utilize the map when they conduct their *Grading the Harborwalk* survey.

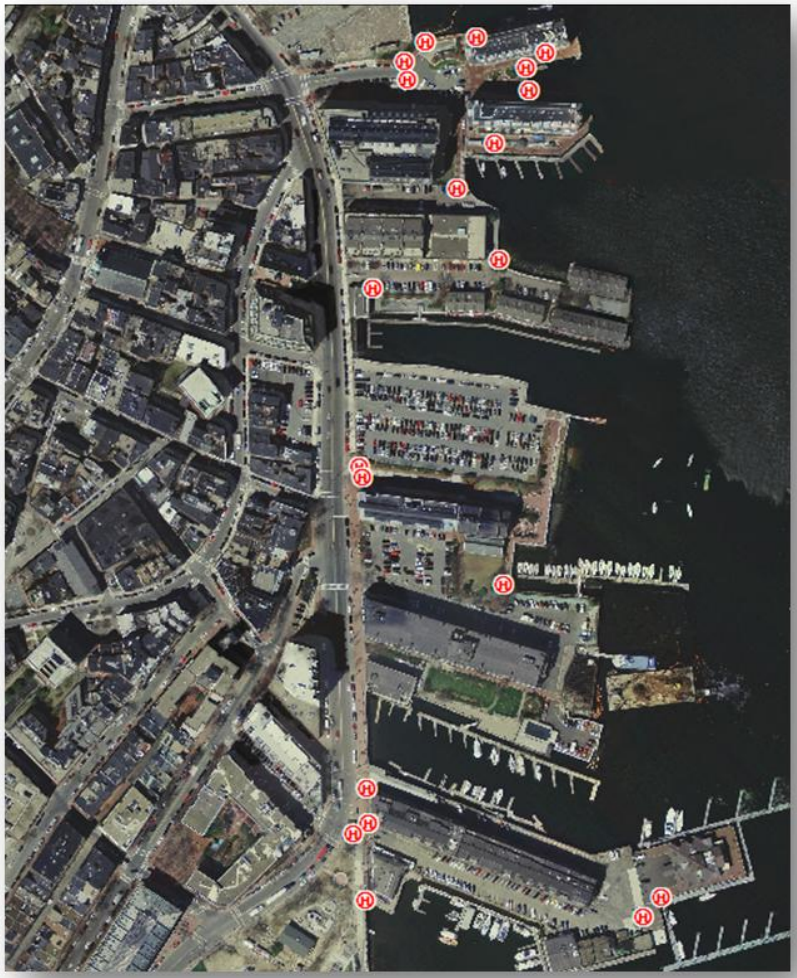


Figure 24 - Harborwalk Signs

GIS has the capability to display detailed information about each data point. A data point can be a single sign, or it could be a Chapter 91 layer. If the user clicks on a data point, the information contained for that point is displayed. *Figure 25* displays the details about a Harborwalk sign.

Figure 25 - Harborwalk sign details

In addition to the creation of public amenity layers along the harborfront, we created a layer classifying parcels under Chapter 91 jurisdiction. In these Chapter 91-regulated parcels, an "information dot" is displayed called a Parcel ID (PID) dot. When the PID dot is clicked, a popup displaying all the information contained in the database for that parcel will appear. *Figure 26* displays the parcels and "information dots" that are located on the map. This image is zoomed in to the New England Aquarium:

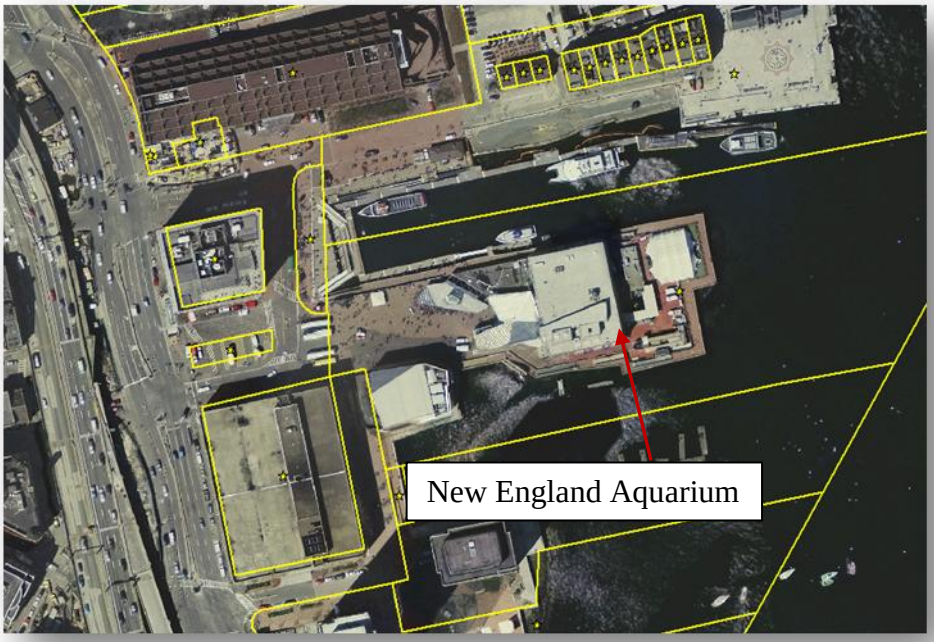


Figure 26 - Chapter 91 related layers

Using a different tool for information, the user can obtain different data about that parcel. Shown in *Figure 27*, the user can see a list of licenses related to that parcel.

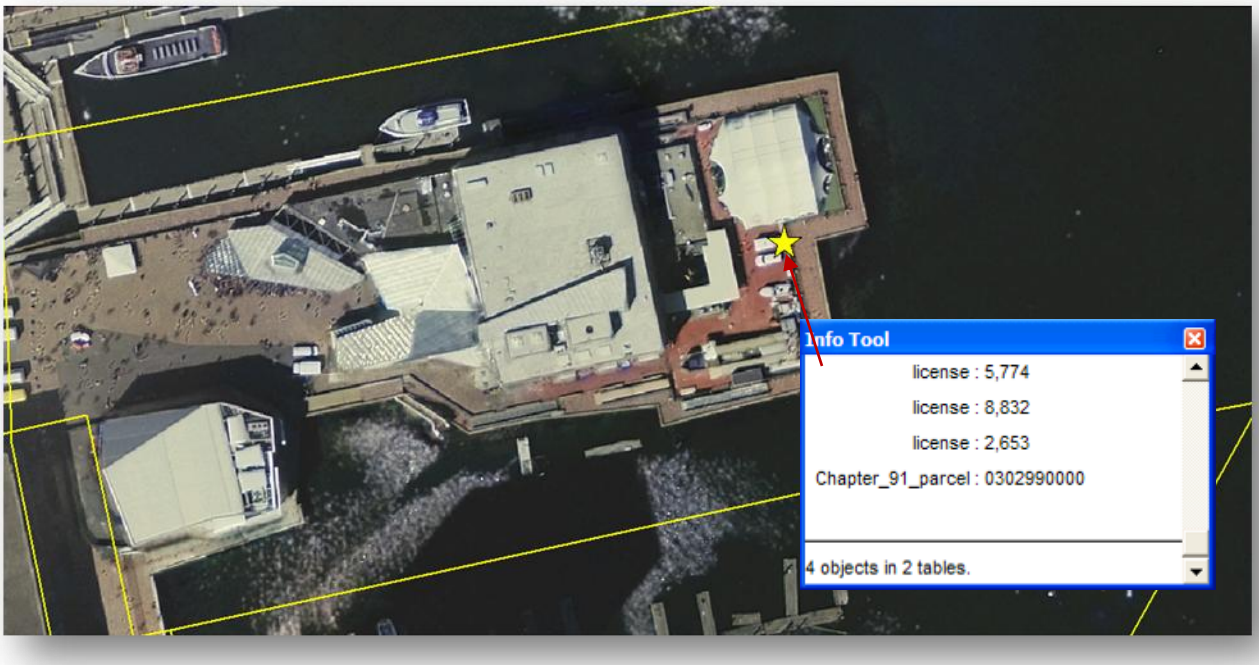


Figure 27 - List of Chapter 91 Licenses

By clicking on one of the license numbers, a new window is opened, displaying all the information in the database for that license. For example, if a user wants to find license details about license number 5774, all they would have to do is click on license number 5774 and that license will be opened. *Figure 28* displays the GIS output of the information that is located in the data points.

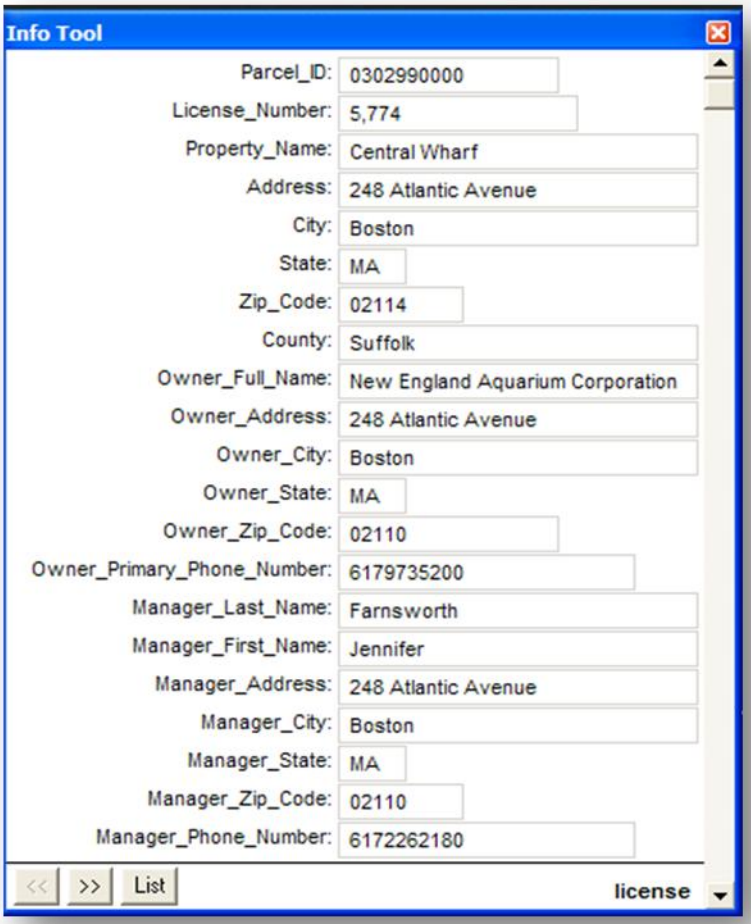


Figure 28 - Information from License 5774

With this system, the BRA or any user would be able to quickly search for basic license information related to the site should a problem arise.

4.5 Analyzing Public Access

Collecting all of this raw data is very valuable for the BRA, but there is a limit to the degree raw data can be utilized. By importing all of these data points into a database and GIS, any user can perform operations or create thematic maps. One of the analyses that our project

team executed was to locate all of the parcels that have Harborwalk signs on their property. As shown in *Figure 29***,** one can see that there are a variety of parcels that have Harborwalk signs, all of them shown in green.

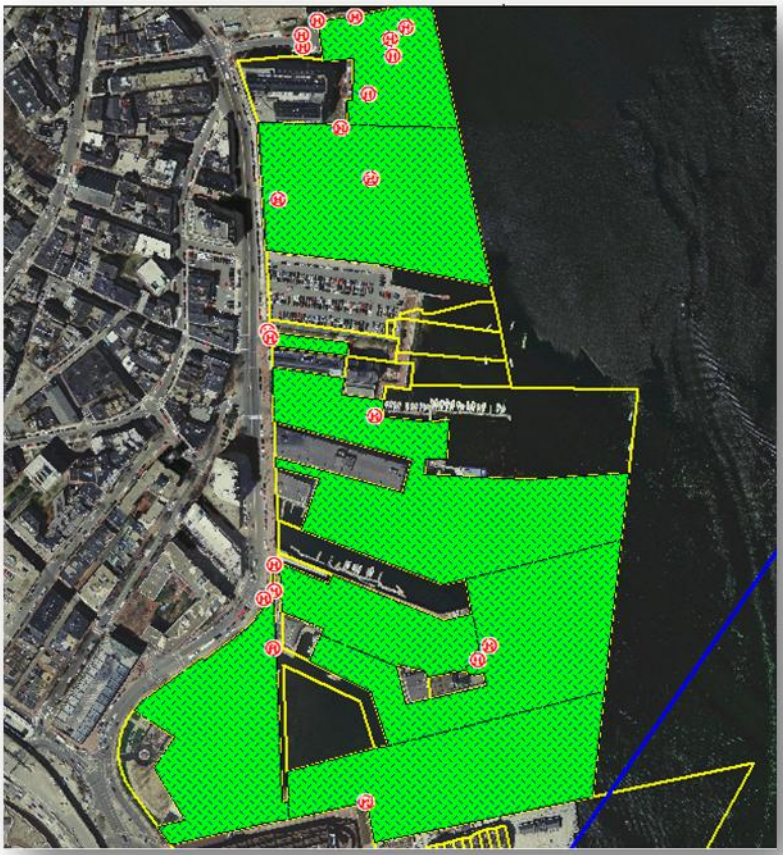


Figure 29 - Parcels with Harborwalk signs

A user can also find all of the parcels that have benches located on them. This search could be used for the public to locate places to go and relax during times of leisure. *Figure 30* displays the parcels that have benches located on their property. The graphic display of such simple information will allow the BRA to quickly determine where more benches might needed or where more Harborwalk signs should be posted. Ultimately this increased accessibility to information will help reduce the confusion of the Harborwalk path along the waterfront.

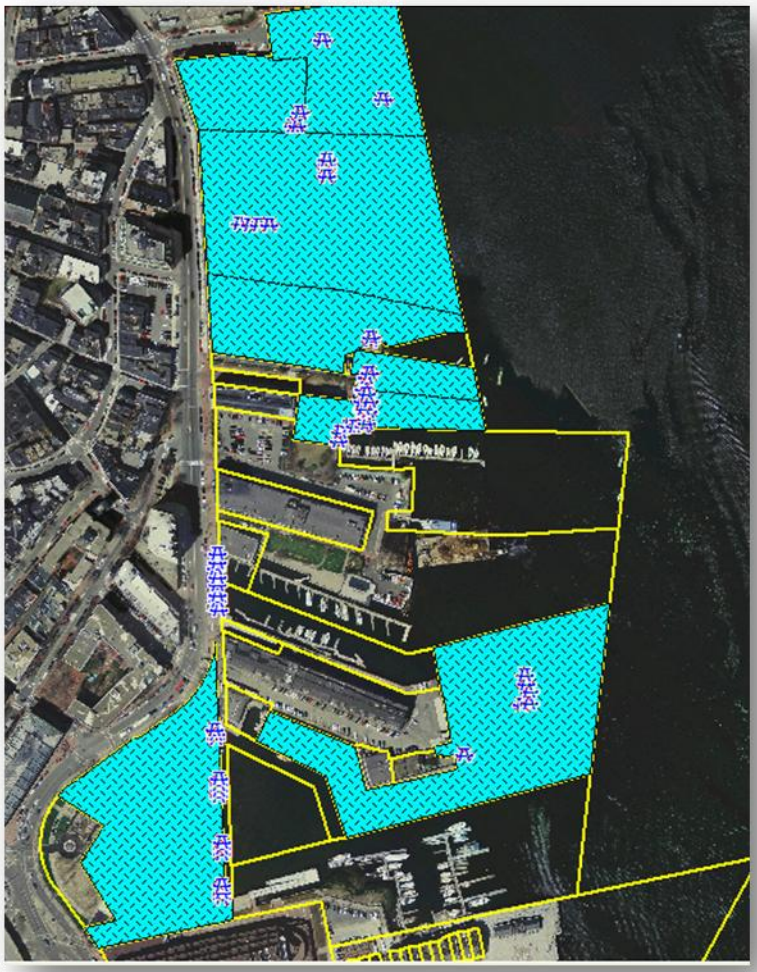


Figure 30 - Parcels with Benches

5 Conclusions and Recommendations

After studying the Chapter 91 legislation and waterfront regulation from Burroughs Wharf to Rowes Wharf, we have come to several conclusions. The team concluded that it was extremely difficult to find Chapter 91 licenses without a keen understanding of the license details and ways of obtaining them. The main reason that it is so difficult to obtain these licenses is because there are three different collections of Chapter 91 licenses: Historic Landmarks Commission, Department of Public Works, and DEP. In effect, there can be three different locations throughout Massachusetts that will have the same Chapter 91 license numbers, but in different collections. The main deduction we have taken from our observations and studies is that the procedure for issuing a license is quite inefficient.

The project team concluded that the best way to assign the licenses was by the name of the project. The project name would then be linked to the related parcel's ID number. This allows a many-to-many relationship to exist in the database, which means that several parcels can be linked to one license and several licenses can be associated with one parcel. The project team was able to construct a sound database structure to populate with Chapter 91 license information by drawing from these conclusions.

In addition, the team discovered that in-depth analysis on public accessibility along the waterfront was insufficient since there were no direct violations of the Chapter 91 law. Without Chapter 91 direct law violations to use as reinforcement, it is extremely difficult for advocacy organizations to ensure public accessibility along the harborfront. For example, MIT interns conducted a summer-long study on Harborwalk signage and public accessibility to the waterfront and recommended measures to improve both. Their suggestions have yet to be implemented, however, since they lack concrete regulatory support in Chapter 91 licenses. Therefore, concrete data and tools, such as a GPS unit, for collecting data must be utilized if definitive action is to be taken to improve public access to the waterfront. The ability to manipulate raw data gives the BRA a chance to visually display the information and allows them to conduct a variety of analyses. The product of these analyses will be a more informed view of public access to the Downtown waterfront. This will undoubtedly enhance waterfront regulation and public access enforcement.

6.1 Implementation of Chapter 91 Database

Studying the conclusions that the team has drawn up, we recommend that the Boston Redevelopment Authority adopt, expand, and fully populate the database with all current Chapter 91 licenses (post 1990). We believe that the BRA should focus on the licenses that were granted after 1990 because the newest Chapter 91 regulations were instated during that year. Once the BRA has fully imported all of the current Chapter 91 licenses, we recommend that they start to add historical licenses for reference. We ask that the caretaker of this database to refer to our user manual located in *Appendix E*. This user manual describes procedures needed to ensure proper database upkeep.

6.2 Linking Database to GIS

Granted that the BRA populates the Chapter 91 database, the next logical step in this process is to program a link that would automatically update the GIS map whenever newly-imported licenses are added to the database. This can be done first by inputting the licenses into the database, then closing the database, and finally opening the GIS map (more detailed instructions are located in *Appendix F*). By completing those two steps the GIS information will be constantly updated. We recommend the BRA performs these steps every time a Chapter 91 license has been entered into the database.

6.3 Creation of online map

If the database proves to be as useful as planned, we recommend the BRA update our GIS layers, which include public amenities and Chapter 91 data. We also ask the TBHA to complete the mapping of all amenities that are located along the Harborwalk. In addition, we also recommend that the TBHA map and locate more amenities along the Harborwalk, such as restrooms, informational landmarks and parks (see *Appendix G* for instructions for documenting amenities using GPS). Once this is completed, the TBHA should send all of this data to the BRA so that they may update the layers we have created. Next, we recommend that the BRA explore the possibility of uploading this information on a public web site. This web site would be accessible for all citizens and would increase awareness of public accessibility along the Harborwalk.

The BRA could add the layers to the Boston Atlas or have them attached to the Harborwalk's website. *Figure 31* displays the current interface of the Boston Atlas. The Boston Atlas allows the public display five layers of data. If the Chapter 91 and public amenity layers were added to this web site, the user would be able to select one or both of these layers. The Boston Atlas is maintained by the BRA and can be found under this address: http://www.mapjunction.com/bra/.

Figure 31 - The Boston Atlas

6.4 Long Term Recommendations

Figure 32 shows an organization chart of how we envision our project fitting in to the overall picture of waterfront regulation. The different colors represent the different level of data that would be located in our recommended central database. The yellow represents the federal permits that need to be obtained, the blue represents our database and the state permits and the green represents the municipal permits and data that would be included.

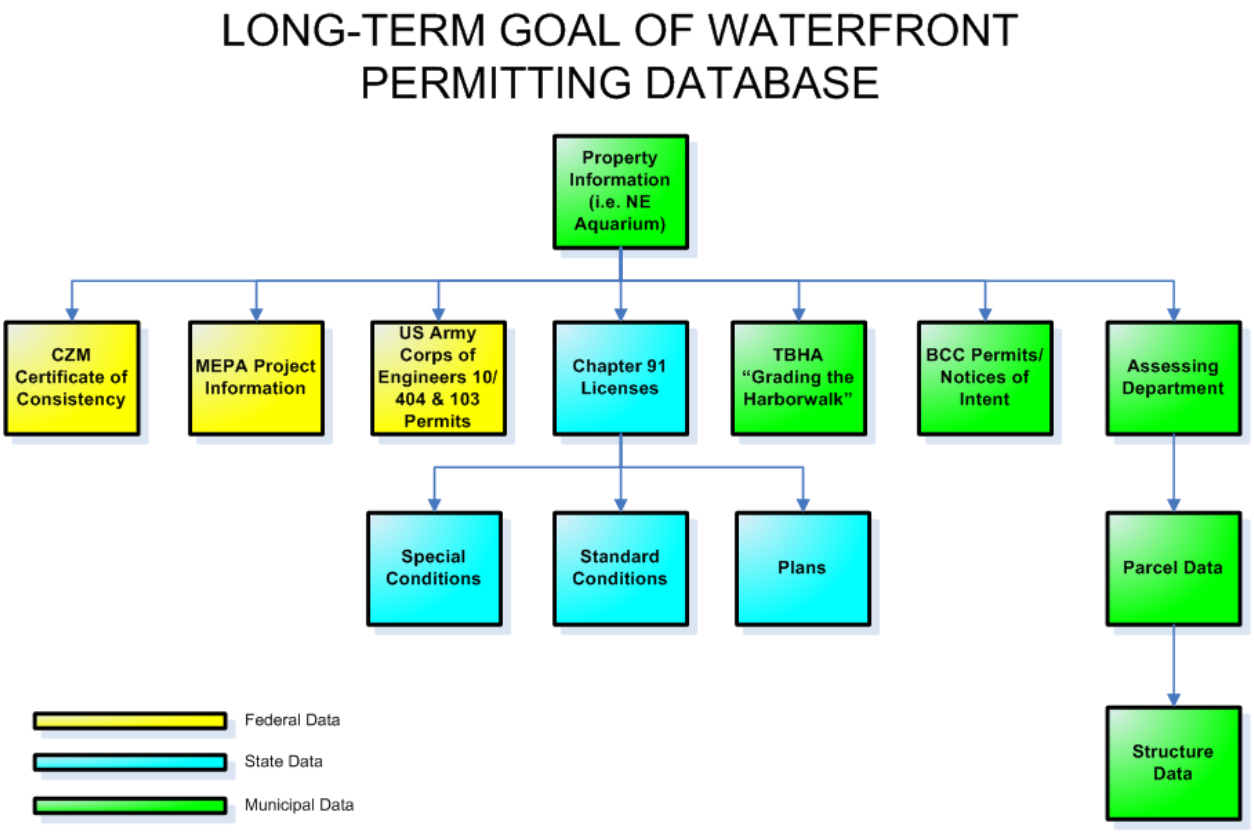


Figure 32 – Future database permitting structure

We recommend that the BRA confer with other agencies to begin the process of creating a single database for waterfront permits. This includes federal data, such as the US Army Corps of Engineers permits and the MEPA permits, as well as the Municipal permits such as the Boston Conservation Commission Wetlands Permits. Grouping this data into a central location will increase accessibility of information to government officials as well as allowing concerned citizens to analyze the process.

On the same note, we recommend that GIS have a more central role and waterfront permitting applications. For instance, a map could be available when an applicant applies for a Chapter 91 license. The applicant could proceed to click on the area of interest and all pertinent spatial information would be auto-filled in the application. This includes coordinates, adjacent waterway, city, state, zip code, type of tideland, and parcel data. This will immensely expedite the licensing process by minimizing licensee error.

Finally, we recommend that the DEP convert all of their licenses into electronic form. This would include importing all older license information into a centralized, state and city controlled database and converting each license page into PDF format. Although this would

require a few of months to complete, the ends would certainly justify the means. Once all licenses are digitized, the DEP can begin using the database to extract information to complete written determinations and, finally, the actual license. By following this procedure, the DEP would ensure that the database is kept up to date and that all licenses are available for the public to download at their leisure.

Our sponsor, the BRA, has a major role in this movement to increase accessibility of permitting information. The BRA provides a link between the government regulation of the waterfront and the vigilant advocacy groups. Our efforts will help enable them to continue this movement of change so that the law can be a living document and not one sitting in a binder on the shelf for referential purposes.

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Save the Harbor. http://www.savetheharbor.org/

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Appendix A: Boston Redevelopment Authority

The Boston Redevelopment Authority (BRA) is a legislative agency of the City of Boston that was created in 1957 to broaden the city's management to both private and public housing. By 1960, the organization was given the capacity to seize property through eminent domain and the rights to buy and sell commercial and residential property in the city. In addition to its administrative powers, the branch advises other parts of the city government, including the zoning commission on zoning relief. Furthermore, the BRA has the ability to acquire parcels throughout Boston and can sell them to spur development in accordance to its interests. Like other government agencies, the BRA has to closely work together with other branches of the government, as well as nonprofit organizations like the Boston Harbor Association (TBHA), on public interest projects such as the Harborwalk. The BRA is responsible for many aspects of the city's development, all of which support its mission to aid in the economic and building development in Boston.

The BRA is divided into sub-organizations that individually contribute to perform the agency's mission. The subdivisions include: Administration and Finance, Economic Development, Jobs and Community Services, Planning, and Research. Our liaison's subdivision is the Planning board, whose purpose is to "coordinate all planning and zoning activities in neighborhoods throughout the city, including coordination of community planning, involvement in planning and project review, and development of master plans and zoning." Richard McGuiness, our project liaison, is the Deputy Director of the Waterfront Planning Board within the Planning subdivision. Much of the board's work pertains to Municipal Harbor Plans (MHP) which set site-specific provisions and regulations for Boston's waterfront districts. There are a number of different Municipal Harbor Plans drafted.

Overall, the BRA leads the drive in developing the city for its citizens while providing local zoning enforcement, falling under the scope stipulated in the Massachusetts General Laws. More specifically, the organization has a major role in regulating Boston's waterfront.

Appendix B: Chapter 91 License

This appendix contains the entire Chapter 91 license for Russia Wharf, as one can see it is very confusing to try and determine the important information contained within the license.

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Page: 1 of 13 09/08/2006 02:59 PM

13

The Commonwealth of Massachusetts

No.
11419

Whereas,

MA-Russia Wharf L.L.C.

of – Boston - has applied to the Department of Environmental Protection to --- rehabilitate and maintain the historic Russia Building, adaptively reuse and maintain the historic portions of Graphic Arts and Tufts Buildings with the construction and maintenance of 23 additional floors above and a 6 level parking garage below (the three buildings shall have a combined footprint of approximately 62,600 square feet, including the building overhang); construct and maintain approximately 22,500 square feet of public open space, a public docking facility, floating walkway connection to the adjoining property at 500 Atlantic Avenue, two drainage outfalls and the existing drainage outfall; ----------

and has submitted plans of the same; and whereas due notice of said application, and of the time and place fixed for a hearing thereon, has been given, as required by law, to the – Mayor and City Council -- of the – City -- of -- Boston. ----------

NOW, said Department, having heard all parties desiring to be heard, and having fully considered said application, hereby, subject to the approval of the Governor, authorizes and licenses the said ----------

MA-Russia Wharf L.L.C. ---, subject to the provisions of the ninety-first chapter of the General Laws, and of all laws which are or may be in force applicable thereto, to --- rehabilitate and maintain the historic Russia Building, adaptively reuse and maintain the historic portions of Graphic Arts and Tufts Buildings with the construction and maintenance of 23 additional floors above and a 6 level parking garage below (the three buildings shall have a combined footprint of approximately 62,600 square feet, including the building overhang); construct and maintain approximately 22,500 square feet of public open space, a public docking facility, floating walkway connection to the adjoining property at 500 Atlantic Avenue, two drainage outfalls and the existing drainage outfall; ----------

in and over filled and flowed tidelands of – Fort Point Channel -- in the – City -- of – Boston -- and in accordance with the locations shown and details indicated on the accompanying DEP License Plan No. 11419 dated May 10, 2006 (17 sheets).

Attested hereto
Francis M. Roache
Francis M. Roache
Register of Deeds

Plan
Book 2006 Page 824

Return to:
Katharine Bachman
Wilmer Hale
60 State Street
Boston, MA 02109

Property Recorded - Suffolk County Registry of Deeds
Book 21991 Page 310

(30 Pages)

PRINTED ON RECYCLED PAPER

530 Atlantic Avenue, 270-286 Congress Street, Boston, MA

The structures authorized hereby shall be limited to approximately 861,000 square feet of floor area devoted to the following interior uses: office (approximately 500,000 square feet), residential (approximately 330,000 square feet for a maximum of 240 residential units that may include residential condominium units, residential rental units, or loft-style units), retail, restaurant, performance, civic and cultural (in the aggregate approximately 31,000 square feet), associated parking (up to 650 spaces). The exterior uses authorized shall be limited to: public use and enjoyment of the waterfront plaza and walkways, dockage for commercial waterborne passenger vessels and recreational boats.

Fill and structures on site were authorized by the following authorizations: HL 1908 (dated 1896), HL 1909 (1896), HL 2422 (1900), DEP 5065 (1996), DEP 7735 (1999), DEP 7732 (2000), Chapter 564 of the Acts of 1979 as amended by Chapter 457 of the Acts of 1982, and Chapter 367 of the Acts of 1992. The State Harbor Line (Ch. 170/1880) and US Pierhead Line (1889) define the southeast property line.

This License will be valid for a term of ninety-nine (99) years from the date of issuance.

This License is subject to the following Special Conditions and Standard Conditions.

Italicized terms used, but not defined, herein shall have the meanings assigned to such terms in the Waterways Regulations, generally at 310 CMR 9.02. All building measurements hereunder are defined in accordance with the Boston Zoning Code or as otherwise noted on the License Plans.

Special Condition #1 Applicability of License to Lots; Responsibility for Fulfillment of License Conditions: This license will apply to all existing and future lots, condominiums or other ownership structures that may be created for all or portions of the Russia Wharf Redevelopment Project. All payments, management, maintenance, and enforcement of commitments contained in this license shall be the responsibility of the unit within the condominium, or other ownership structure, that includes the office component ("Office Owner"), provided that the Office Owner may share the cost of all such responsibilities with other units in the condominium/other ownership structure or other lots included in the Project.

Special Condition #2, Height Offset: As shown on the License Plan Sheet 16 of 17, the elevation of the existing Tufts Buildings roof (approximately 91 feet) shall be maintained for a horizontal distance of 15 feet landward of the existing seaward edge of the building (coincident with the line of *Mean High Water*); and building heights shall not increase beyond that point at a rate greater than 4.5 vertical feet for each additional foot landward of *Mean High Water*. The height of the new structure above the Tufts and Graphic Arts Building shall not exceed 395 feet measured to the top of the roof of the highest occupied floor. The height of the Russia Building is not proposed or authorized to change from the existing height of approximately 103 feet.

Special Condition #3 Open Space Components: The Licensee shall construct and maintain in good repair a network of public open space of not less than 22,500 square feet with no obstacles for safe, free and universally accessible public passage. All open space shall be accessible 24 hours a day with no gates or other barriers installed to impede pedestrian circulation. The open space shall include the following components as further described on the License Plans Sheets 7 of 17.

a) Construct a Waterfront Plaza and maintain the existing Harborwalk with a minimum width of fifteen feet (15') along the entire 185 linear foot project shoreline, together comprising at least 0.35 acre in size.

b) Create an approximate ten-foot (10') setback for pedestrian access along the new northern wall of the Graphic Arts and Tufts Buildings (8 feet at the northeasterly entrance to the Tufts Building) using consistent grade elevations and compatible surface materials with the Massachusetts Highway Accessway on the adjacent 500 Atlantic Avenue site.

c) Reestablish a courtyard along the entire length of Nelson Court that connects the Congress Street sidewalk to the Mass. Highway Accessway[1]. The open-air section of the courtyard (that is not covered by the overhang created by the upper floors of the Graphic Arts Building and the office building entrance) may have a varying width but at no point shall it be less than three feet (3') wide.

d) Reconstruct the city-owned sidewalks and install streetscape improvements along Congress Street and Atlantic Avenue with necessary approvals from the City of Boston. Expand the Congress Street sidewalk to an average width of eighteen feet (18') and install appropriate sensory aids, to be approved by the City of Boston Transportation Department, at the parking garage ramp to alert pedestrians of approaching vehicles.

e) The public open space shall include, but not be limited to, the following pedestrian amenities: benches, lighting, a "Mutt Mitt" Station, trash receptacles, public art, landscaping that complements but does not obstruct public access, and way-finding signage. The Licensee also shall create and install interpretative signage and exhibits at various locations within the Waterfront Plaza. The interpretative signage and exhibits shall document the history of Russia Wharf, be consistent with the Boston Historic Piers Network Plan and be valued at no less than one hundred and fifty thousand dollars ($150,000).

f) The public open space shall be completed and available for safe pedestrian use by the date the Certificate of Occupancy is issued for the Graphic Arts and Tufts Buildings except for landscaping and other matters awaiting seasonal opportunity that shall be completed within six months after the issuance of such Certificate of Occupancy.

g) The Office Owner shall be responsible for maintaining and programming events in the public open space in accordance with the approved Management Plan and Annual Work Plans described in Special Condition #10 and #11 below.

Special Condition #4 Open Space Final Design and Programming: The final design of the open space shall reflect the textures and character of the historic waterfront while maintaining the flexibility and connectivity with the adjacent public spaces and complying with accessibility requirements. The final landscape design shall not include features that significantly diminish the amount of public open space suitable for direct pedestrian use, nor have the effect of privatizing or otherwise discouraging public use of such open space. The Waterfront Plaza shall be designed and programmed to enhance the destination value of the Fort Point Channel for public use and enjoyment as envisioned in the approved Phase 2 MHP and the Fort Point Channel Watersheet Activation Plan dated May 2002 as may be amended. The Plaza shall include a zone of flexible use as delineated on the License Plan Sheet 9 of 17 that allows for a wide variety of outdoor public events and activities without obstructing informal pedestrian connection between Congress Street and the water transportation terminal at 500 Atlantic Avenue. Moveable tables and chairs shall be available to the general public for dining and music performances adjacent to the Restaurant/Café/Performance Venue, provided however that a limited area may be reserved for restaurant patrons as delineated on the License Plan Sheet 8 of 17.

[1] Only the section of the courtyard that is fully open to the sky was included in the open space calculation.

Special Condition #5 Dock and Floating Walkway: The Licensee shall construct and maintain a small boat docking facility and cause to be installed and maintain a floating walkway connection to the Water Transportation Terminal at 500 Atlantic Avenue for public use and access as shown on the License Plans Sheets 8 through12 of 17 and in accordance with the Fort Point Channel Watersheet Activation Plan dated May 2002 (see page 41).

a) The small boat docking facility shall provide nine slips dedicated to the following uses – a water taxi pick up and drop off; a public landing for transient recreational vessels; transient tie up area for dinghies; and berthing for up to six recreational vessels, charter boats or craft associated with special events, displays or celebrations. The northernmost slip shall be used as the water taxi landing since it is closest to the Water Transportation Terminal. The slip closest to Congress Street may be used for short-term dinghy tie up. How the slips are used shall be described in a Management Plan approved and periodically updated in accordance with Special Condition #11.

b) Three slips shall remain available for the transient public use for the term of the license. For purposes of the license, *transient* shall be defined at the water taxi as "touch and go", at the public landing as no longer than thirty (30) minutes, and at the dinghy tie up as no longer than four (4) hours unless otherwise modified by an approved Management Plan.

c) Leases to any slip shall be for a maximum of one year subject to annual renewal. Overnight berthing agreements for water taxis, charter boats, or recreational vessels may not exceed one year. Overnight berthing agreements for special events displays or celebrations may not exceed two weeks.

d) The water taxi docking and public landing shall be provided free of charge. The dinghy dock may include a courtesy fee to limit extended use and encourage turnover. Net income generated through this fee will be donated to a non-profit organization supporting public use of the Fort Point Channel.

e) The small boat docking facility shall be completed by the date the first Certificate of Occupancy is issued for the Graphic Arts and Tufts Buildings. The Licensee shall install, or cause to be installed by a public agency, the floating walkway connection to the Water Transportation Terminal at 500 Atlantic Avenue at the same time the Water Transportation Terminal is constructed.

f) The Licensee shall be responsible for ensuring that this commitment is fulfilled.

Special Condition #6 Interior Public Facilities: The Licensee shall construct and the Office Owner shall cause to be maintained the following *Facilities of Public Accommodation* within the ground floor of the Graphic Arts and Tufts Building. Approximately 31,000 square feet shall be devoted to the following uses as described on the License Plan Sheet 7 of 17. No more than 14,320 square feet (25%) of the combined ground floor area of the three buildings shall be devoted to *Upper Floor Accessory Services*.

a) A Town Square, a sky-lit civic gathering and function space, shall be located in approximately 6,300 square feet of the atrium area of the Graphic Arts and Tufts Buildings. This enclosed gathering area shall provide a shelter during inclement weather for water transportation users and a setting for planned and spontaneous performances that complement the planned programming for other public facilities on site in accordance with Special Condition #9, below. The northeast entrance to the Town Square shall be oriented to direct pedestrians towards the water transportation terminal at 500 Atlantic Avenue. Town Square may include a limited area (no more than 300 square feet) for moveable tables and chairs that are available primarily to the general public and which include expansion seating for customers of the Restaurant/Café/Performance Venue as long as the expansion seating does not provide wait service and is not roped off or otherwise reserved for patrons only.

b) A Multi-Media Presentation Area of approximately 3,800 square feet, including the appropriate multi-media equipment and other infrastructure, shall be dedicated to performances, lectures, screenings, demonstrations, and other forms of presentations to the public at large on a wide variety of topics including, but not limited to, Boston's history, culture, diversity and future.

c) A Cultural/Civic space shall be used for a Channel Concierge service as well as during the day for an office space for a nonprofit advocacy group of the Fort Point Channel and during the evening for community meetings. Such space shall total approximately 700 square feet and have entrances off Town Square and Congress Street, unless Mass. Historic Commission determines the later is inconsistent with the historic reconstruction. The Channel Concierge shall be an individual that serves as a free source of information, maps, and ticket sales to orient the public toward current events and activities for public enjoyment along the waterfront as well as the point of contact for the art display described in item e, below. The Channel Concierge may be included with a Children's Concierge service developed in cooperation with the Children's Museum or other nonprofit institution; if so, a small area (no more than 50 square feet) may be devoted to retail sales that complement and support the Children's Concierge. The Licensee shall allow community groups to use this space rent-free for meetings during the evening hours that do not conflict with the Concierge service.

d) A Restaurant/Café /Performance Venue occupying approximately 6,200 square feet shall be located along the waterside of the Tufts Building as envisioned by the Restaurant Row concept in the Fort Point Channel Watersheet Activation Plan. Performances in the Café/Performance Venue shall be scheduled and staged periodically throughout the year in an independent fashion or as the indoor complement to planned performances on the Waterfront Plaza.

e) An art display of work of Boston artists, with priority given to those from the Fort Point District, shall be installed regularly and on a rotating basis on or along the walls of the Town Square and Civic/Cultural space that houses the Channel Concierge.

f) Fully accessible public restrooms occupying approximately 360 square feet shall be available within the Town Square (and the area occupied shall be included as part of the overall size of the Town Square). A sign shall be posted noting the hours and availability of the public restrooms that is clearly visible from the Waterfront Plaza.

g) Approximately 13,900 square feet devoted to retail space shall activate the facade of the Russia Building along Atlantic Avenue and of the Graphic Arts Building along Congress Street.

h) The underground parking garage shall include 62 spaces available commercially (to the general public for a fee).

i) The *Facilities of Public Accommodation* shall be ready to be occupied upon receipt of the first Certificate of Occupancy issued for the building in which the FPA is housed. These facilities shall be available at least during extended business hours, generally 8:00 a.m. to 10:00 p.m. seven days a week with the exception of Town Square and the associated public restrooms that may be available for longer hours up to 24 hours a day as determined by an approved Management Plan described in Special Condition #11.

j) The Office Owner shall be responsible for ensuring that this commitment is fulfilled in accordance with the approved Management Plan and, for the *Special Public Destination Facilities*, the Annual Work Plans described in Special Condition # 10 and 11 below.

k) Any use specifically listed in the *Facility of Public Accommodation* definition at 310 CMR 9.02 shall be presumed to meet the above requirements for such facilities with the exception of those facilities identified in *items a, b. and c* which have been determined to be a *Special Public Destination Facility*. Conversely, any use proposed as a *Facility of Public Accommodation* that is not specifically listed in the regulatory definition shall require prior review and approval of the Department.

Special Condition #7 Rent-Free Office Space: The Licensee shall contribute the space described in Special Condition 6c, above, on a rent-free basis to the Friends of Fort Point Channel as support for its operations to activate the watersheet and area along its edge. The initial lease shall commence upon issuance of the Certificate of Occupancy for the Graphic Arts and Tufts Buildings and have a 10-year term with possibilities for renewals in 5-year increments for the term of the license. No rent may be charged for the full term of the license. Should the Friends of Fort Point Channel decline the use of the space the Licensee shall offer the lease, with prior input from the Fort Point Channel Operations Board and approval of the Department, to a non-profit organization with a complementary mission. The Office Owner shall be responsible for ensuring that this commitment is fulfilled.

Special Condition #8 Monetary Contributions: The Licensee shall make monetary contributions in the amounts set forth below to a fund or escrow account designated by the BRA for the purpose of planning, programming, designing, constructing, and maintaining activities described below to activate the waters and the edge of Fort Point Channel. The Office Owner shall have all responsibilities for payment of monetary contributions associated with offsets and amplifications, provided that the Office Owner may share the cost of all such responsibilities with other units in the condominium or other ownership structure or lots included in the project.

a) Bridge Lighting – Four hundred thousand dollars ($400,000) for the lighting, design, purchase, and installation of new architectural lighting fixtures that will enhance the restoration of the Congress Street Bridge lighting. The Office Owner will be responsible for the replacement of light bulbs for the duration of the license.

b) Children's Wharf Park - Five hundred thousand dollars ($500,000) to be used for the development or long-term maintenance of a new park across the Fort Point Channel near the Children's Museum authorized by License #7732 (to the MBTA) and the license to be issued pursuant to waterways application W05-1502N for the Children's Museum.

c) Watersheet Activation - Five hundred thousand dollars ($500,000) for a variety of public programming and events or capital improvements to help implement the Fort Point Channel Watersheet Activation Plan.

d) Water Transportation - Five hundred thousand dollars ($500,000) to support water transit service operations from 500 Atlantic Avenue.

e) The full monetary contribution shall be provided upon issuance of any Certificate of Occupancy for the site.

f) The Fort Point Channel Operations Board shall oversee and approve all financial withdrawals from the dedicated fund or escrow account. Adequate accounting of the deposits and payments for each designated purpose shall be provided to the Department within 30 days of each transaction. The Department has received suitable documentation that $35,352.75 dollars has been spent for design of the bridge lighting described in item (a) above.

Special Condition #9 Special Public Destination Facility: The Office Owner shall ensure that the interior spaces described in Special Condition 6(a)-(c), above, are reserved exclusively as a *Special Public Destination Facility* (*SPDF*). This area (known as the Town Square, Multi-Media Presentation Area, and Civic/Cultural Space) shall occupy approximately 10,800 square feet in the locations shown on the License Plan Sheet 7 of 17. The SPDF shall provide an extensive, year-round program of entertainment, artistic, civic, and cultural activities to the public at large, in a manner that enhances the destination value of the waterfront in accordance with the Secretary's approval Decision on the Fort Point Downtown Waterfront Phase 2 MHP Decision (issued March 8, 2004). As stipulated in said Approval Decision, at footnote 16 on page 22, such destination value must be enhanced "by serving significant community needs, attracting a broad range of people or providing innovative amenities for public use", provided further that "special consideration shall be given to: those (facilities) which encourage diversity in the pattern of uses and population of users at the waterfront, (with) special efforts (to be) made in this regard to solicit creative use concepts from the planning and advocacy community at large ... and to public or non-profit organizations that otherwise would be unable to afford market rates for waterfront space ...". Pursuant to this basic standard, the SPFD activity program shall comply with the following additional criteria.

a) SPDF activities in the Town Square shall be available to the public free of charge. SPDF activities in the Multi Media Presentation Area, whether operated by a third party or by the Licensee, shall be made available in accordance with an affordable pricing schedule deemed appropriate by the Fort Point Channel Operations Board in accordance with Special Condition 10 herein.
b) The SPDF may be utilized on a limited basis for private functions or other events restricted to a specified group of patrons. Such private functions or events shall be limited to weekdays or weeknights at an average frequency of twice a month as approved in advance by the Operations Board through the Annual Work Plan. Town Square may include a limited area (no more than 300 square feet) for moveable tables and chairs that are available primarily to the general public and may include expansion seating for customers of the Restaurant/Café/Performance Venue as long as the expansion seating does not provide wait service and is not roped off or otherwise reserved for patrons only.
c) The respective spaces comprising the SPDF shall be programmed and managed on an integrated basis and in coordination with the Waterfront Plaza, and Restaurant/Café/Performance Venue that are described in Special Conditions 3 and 6, respectively.
d) In developing the program of SPDF activities, the Office Owner shall consult with and be guided by the recommendations of the Fort Point Channel Operations Board and the Russia Wharf Program Advisory Committee, in accordance with Special Condition 10 –12 herein. Except as otherwise provided herein, the frequency, breadth, and quality of the program shall be at least comparable to the SPDF Plan presented as Attachment A of the waterways application.

Special Condition #10 Fort Point Channel Operations Board: To ensure effective public input and oversight in the implementation of the *SPDF* programming described in Special Condition #9, above, the Office Owner shall convene regular meetings of the Fort Point Channel Operations Board (the "Operations Board") - an appointed board established by the City of Boston pursuant to the Approval Decision on Phase 2 MHP. This Operations Board has two primary responsibilities. The Operations Board shall oversee operations and expenditures from the legally established fund or escrow account created with contributions through the Fort Point Downtown Municipal Harbor Plan managed by the BRA including those described in Special Condition #8. The funds shall be made available for planning, programming, designing, constructing, and maintaining open space and watersheet activation elements identified in the Fort Point Channel Watersheet Activation Plan. As an additional responsibility, the Operations Board, with input from the Russia Wharf Program Advisory Committee, shall provide ongoing input in and oversight of the occupancy and the regularly scheduled programming for the *Special Public Destination Facility*, Waterfront Plaza and Restaurant/café/Performance Venue in accordance with the following provisions.

a) Membership: The Operations Board shall consist of 3 appointed members - a designee of the BRA from Mayor's Office of Arts, Tourism and Special Events or similar City agency, a designee of the Secretary of Environmental Affairs, and a representative of the Fort Point Channel Abutters Group.

b) Meeting Frequency: The Operations Board shall convene at least one meeting prior to licensing to discuss the organizational structure and appropriate procedures necessary to implement its mission. Afterwards, the Operations Board should meet as frequently as necessary but no less than twice annually with all meetings open and advertised to the public.

c) Annual Plan Review Process: The Office Owner shall prepare an Annual Work Plan on the programming, operation and associated estimated costs for the *SPDF* that also describes the performances in the Restaurant/Café/Performance Venue and the Waterfront Plaza. The Annual Work Plan shall be submitted no later than November 1 of each year for the following calendar year, commencing upon issuance of a Certificate of Occupancy for that portion of the Project that includes the first floor of the Graphic Arts and Tufts Building. The Office Owner shall submit the Annual Work Plan first to the Advisory Committee for its review and then shall submit the plan to the Operations Board for approval. The Operations Board shall review the Annual Work Plan and the recommendations of the Advisory Committee and either approve or modify the proposed programming to ensure the *SPDF* will be programmed and operated by the Office Owner in accordance with the provisions of Special Condition #9, above. On behalf of the Operations Board, the Office Owner shall prepare annual reports to submit to DEP regarding its oversight activities. The Office Owner shall carry out the approved Annual Work Plan in satisfaction of the requirement to provide a *SPDF* in accordance with this License. Nothing in this condition is intended to supersede the authority of DEP to monitor compliance and enforce conditions of this license.

d) A Russia Wharf Program Advisory Committee shall report to the Operations Board and shall consist of a representative appointed by the Operations Board from each of the following organizations: the BRA; the Friends of Fort Point Channel; other area non-profit groups including, but not limited to, The Boston Harbor Association, Save The Harbor/Save The Bay, and the Greenway Conservancy; the *SPDF* tenant operators, if any; at least one non-governmental organization with expertise in civic/cultural programming; and the Office Owner. Through periodic meetings generally held every three months during the first five years of operation and at least semiannually thereafter that are open and advertised to the public, this advisory committee shall review the annual *SPDF* plan and provide ongoing input to the Office Owner and Operations Board as to the programming and operation of the *SPDF* in coordination with public events and other activities occurring at other Facilities of Public Accommodation on the project site including but not limited to the Waterfront Plaza and the Restaurant/Café/Performance Venue.

Special Condition #11 Management Plan: The Licensee shall prepare a Management Plan in accordance with 310 CMR 9.35(5) for all interior *Facilities of Public Accommodation* and exterior publicly accessible spaces on the project site.

a) Purpose: The objectives of the Plan are, over the short-term, to advertise over a broad geographic area and to diverse user groups the availability of the public facilities; and, over the long-term, to achieve effective public use and enjoyment of all publicly accessible facilities while minimizing conflicts with other legitimate interests including the protection of private property and natural resources. The Office Owner shall use best efforts to coordinate with the other public activities and operations on and along the waters edge as envisioned in the Fort Point Channel Watersheet Activation Plan (May 2002, or as amended by the City) as well as the annual programming for the *Special Public Destination Facility* at the project site.

b) Content: The Annual Work Plan prepared for the programming, operation, and associated estimated costs of the *Special Public Destination Facility* is one element of the overall Management Plan. At a minimum, the Management Plan shall address long-term programming, management, maintenance and marketing methods that will be employed for all interior and exterior *Facilities of Public Accommodation* on the project site. Secondly, the Licensee shall describe methods to actively market the use of the water taxi landing to commercial operators and potential customers living at, near, or using the community facilities on the project site. Thirdly, Persons responsible for carrying out the duties of the Management Plan and their contact information shall be provided. Lastly, the Licensee may adopt reasonable rules, subject to prior review and written approval by the Department, as are necessary for the protection of public health and safety and private property, and to ensure public use and enjoyment by minimizing conflicts between user groups.

c) Draft Plan: A draft Management Plan shall be submitted for Department review and approval within 30 days of the completion of the BRA final design review. Coincident with the Department's receipt of the Draft Plan, the Licensee shall provide a copy of the draft plan to those on the distribution list of this Written Determination for a 30-day comment period. The Draft Plan shall include the plans and operational details for any restaurant use of limited portions of the Waterfront Plaza adjacent to indoor restaurant spaces; contact information for the property manager; draft marketing plans for the SPDF; and be otherwise consistent with item (b) above and other conditions of this Written Determination.

d) Periodic Review: The Management Plan shall be periodically reviewed and revised as necessary based on changes in the operation and management of any interior and exterior public facilities. Whenever the Management Plan is updated, it shall be submitted to the Department for review and approval in accordance with Special Condition #12, below.

Special Condition #12 Periodic Review Thru Management Plan Compliance: The Management Plan shall be periodically reviewed and revised as necessary based on changes in the operation and management of any interior and exterior public facilities. At a minimum, a Final Management Plan shall be submitted to the Department for its review, approval or modification prior to the issuance of the first Certificate of Occupancy for the Graphic Arts and Tufts Building and updated every five years, beginning on or before the fifth anniversary date of the issuance this license. The Management Plan updates shall include an evaluation of the extent to which the *Facilities of Public Accommodation* have served to make the project site an effective destination for public use and enjoyment of the waterfront and be accompanied by adequate documentation that it was circulated coincidently for a 30-day comment period to those on the distribution list of this Written Determination.

An updated Management Plan shall include a comprehensive description and evaluation of how the *Special Public Destination Facility*, the Waterfront Plaza, the public small boat docking facility, and all other interior and exterior *Facilities of Public Accommodation* on the project site are functioning in compliance with the Special Conditions of this License relative to the following factors: the use & programming, construction & maintenance, operating costs & funding, and organizational & management arrangements. The report shall be prepared in consultation with the Fort Point Channel Operations Board and the Russia Wharf Program Advisory Committee, and shall contain such supplemental material or independent statements as said parties deem appropriate to identify such aspects as may be in need of improvement. The Licensee shall append to the plan (a) the results of annual compliance inspection reports detailing the Licensee's compliance with the Special and Standard Conditions of the License and (b) copies of the Annual Work Plans approved by the Operations Board during the previous 5 year period. In the event the Department or Licensee determines the updated Management Plan identifies items not consistent with the Written Determination, the Licensee shall submit appropriate revisions or otherwise seek Department review pursuant to 310 CMR 9.22 or 9.24, as applicable.

Special Condition #13 Final Design Review: The final plans and specifications (i.e. contract documents) for all portions of the project shall be subject to review and approval by the Boston Redevelopment Authority in accordance with its Development Review Procedures and all terms and conditions of this License; of special note, but not limited to Special Condition #4 (open space programming and design). The Licensee shall submit suitable documentation, for Department review and approval, that the final design plan set including the landscape design plans, are consistent with this license. Said documentation shall be submitted along with the *draft* Management Plan described in Special Condition #11 within 30 days of completion of the BRA review and prior to the commencement of any construction. In the event the Department determines the final design plans are not consistent with the Written Determination, the Licensee shall submit appropriate revisions or otherwise seek Department review pursuant to 310 CMR 9.22 or 9.24, as applicable.

Special Condition #14 Submission of Final Permits: Prior to license issuance the Licensee shall provide to the Department written documentation pursuant to 310 CMR 9.14(5) that all major federal, state and local approvals or authorizations have been received provided, however, that such approvals as are typically deferred until the start of construction (e.g. building permit, garage/flammable storage permit, Public Improvement Commission approvals) and the BRA final design approval, a final Sewer Extension or Connection Permit and NPDES permit may be provided to the Department after licensing but prior to the start of construction.

Special Condition #15 Disclosure to the Residents: The Licensee shall fully disclose in the sales and ownership documents for each of the components of the project, including the residential and office uses, of the commitment to public accessibility, active programming and four season, day and evening events throughout the indoor and outdoor public spaces, and the noise and activity levels associated with them.

Special Condition #16 Minor Modifications: Given the complexity and scope of the project and as a result of the various requisite reviews, the Licensee may undertake minor project modifications upon written notice to, and approval by, the Department pursuant to 310 CMR 9.22.

Special Condition #17 Limited Liability: The use by the public of the publicly accessible areas at the project site shall be considered a permitted use to which the limited liability provisions of M.G.L. Chapter 21, § 17c shall apply.

Special Condition #18 Certificate of Occupancy: The Licensee shall provide to the Department, within thirty (30) days of receipt, a copy of any Certificate of Occupancy issued at the site.

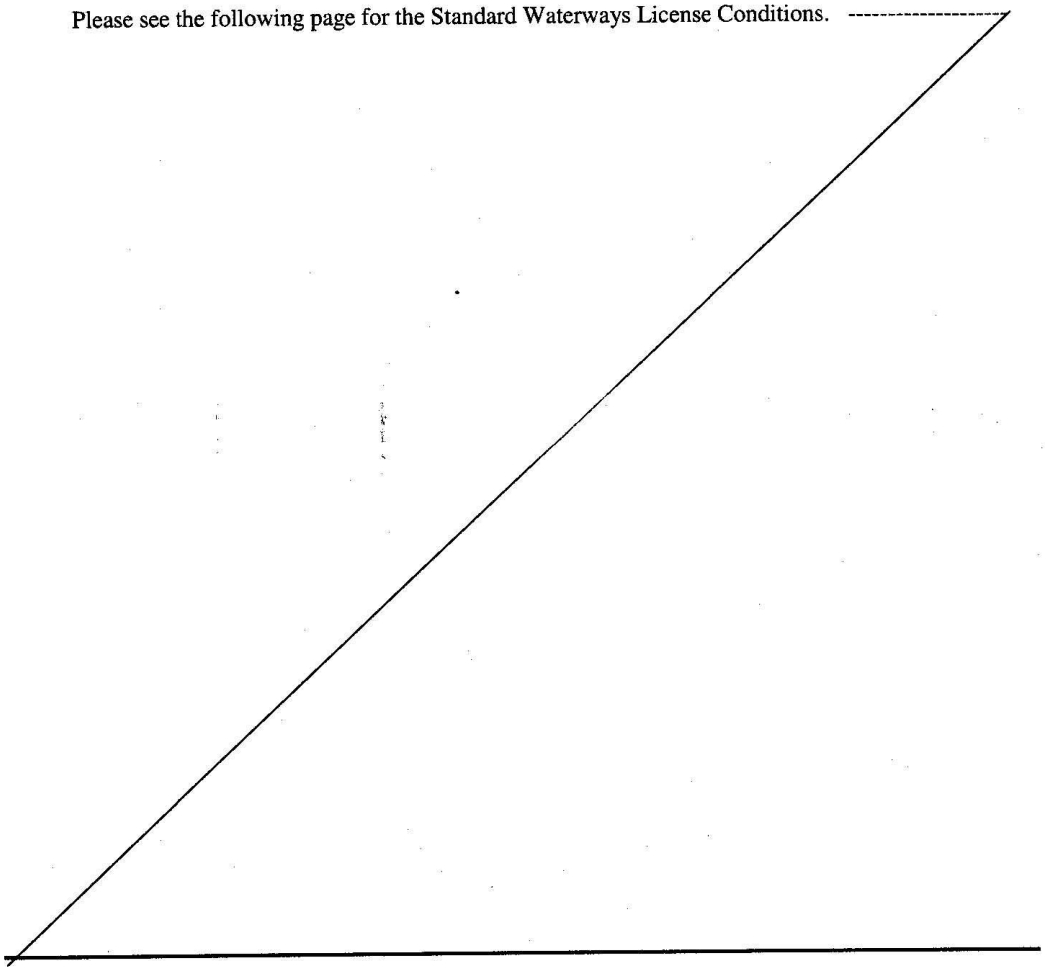
Special Condition #19 Construction Term: All work authorized herein shall be completed within eight (8) years of the date of License issuance. Said construction period may be extended by the Department for one or more one year periods without public notice, provided that the Applicant submits to the Department no later than thirty (30) days prior to the expiration of said construction period a written request to extend the period and provides an adequate justification for said extension.

Special Condition #20 Annual Compliance Fee: The Licensee shall be subject to an annual compliance fee for nonwater-dependent uses pursuant to 310 CMR 4.00.

Special Condition #21 Department Compliance Access: The Licensee shall allow agents of the Department to enter the project site to verify compliance with the conditions of the Chapter 91 License prior to completion of this portion of the project.

Special Condition #22 Certificates of Compliance: The Licensee shall request in writing that the Department issue a Certificate of Compliance in accordance with 310 CMR 9.19. The request shall be accompanied by a certification by a registered professional engineer licensed to do business in the Commonwealth that the project was completed in accordance with the License.

Please see the following page for the Standard Waterways License Conditions. ----------



Duplicate of said plan, number 11419 is on file in the office of said Department, and original of said plan accompanies this License pursuant hereto, and is to be referred to as a part hereof.

STANDARD WATERWAYS LICENSE CONDITIONS

1. Acceptance of this Waterways License shall constitute an agreement by the Licensee to conform with all terms and conditions stated herein.

2. This License is granted upon the express condition that any and all other applicable authorizations necessitated due to the provisions hereof shall be secured by the Licensee prior to the commencement of any activity or use authorized pursuant to this License.

3. Any change in use or any substantial structural alteration of any structure or fill authorized herein shall require the issuance by the Department of a new Waterways License in accordance with the provisions and procedures established in Chapter 91 of the Massachusetts General Laws. Any unauthorized substantial change in use or unauthorized substantial structural alteration of any structure or fill authorized herein shall render this Waterways License void.

4. This Waterways License shall be revocable by the Department for noncompliance with the terms and conditions set forth herein. This License may be revoked after the Department has given written notice of the alleged noncompliance to the Licensee and those persons who have filed a written request for such notice with the Department and afforded them a reasonable opportunity to correct said noncompliance. Failure to correct said noncompliance after the issuance of a written notice by the Department shall render this Waterways License void and the Commonwealth may proceed to remove or cause removal of any structure or fill authorized herein at the expense of the Licensee, its successors and assigns as an unauthorized and unlawful structure and/or fill.

5. The structures and/or fill authorized herein shall be maintained in good repair and in accordance with the terms and conditions stated herein and the details indicated on the accompanying license plans.

6. Nothing in this Waterways License shall be construed as authorizing encroachment in, on or over property not owned or controlled by the Licensee, except with the written consent of the owner or owners thereof.

7. This Waterways License is granted subject to all applicable Federal, State, County, and Municipal laws, ordinances and regulations including but not limited to a valid final Order of Conditions issued pursuant to the Wetlands Protection Act, G.L. Chapter 131, s.40.

8. This Waterways License is granted upon the express condition that the use of the structures and/or fill authorized hereby shall be in strict conformance with all applicable requirements and authorizations of the DEP.

This License authorizes structure(s) and/or fill on:

_X Private Tidelands. In accordance with the public easement that exists by law on private tidelands, the Licensee shall allow the public to use and to pass freely upon the area of the subject property lying between the high and low water marks, for the purposes of fishing, fowling, navigation, and the natural derivatives thereof.

_X Commonwealth Tidelands. The Licensee shall not restrict the public's right to use and to pass freely, for any lawful purpose, upon lands lying seaward of the low water mark. Said lands are held in trust by the Commonwealth for the benefit of the public.

___ a Great Pond of the Commonwealth. The Licensee shall not restrict the public's right to use and to pass freely upon lands lying seaward of the high water mark for any lawful purpose

No restriction on the exercise of these public rights shall be imposed unless otherwise expressly provided in this License.

Unless otherwise expressly provided by this License, the Licensee shall not limit the hours of availability of any areas of the subject property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.

License # 11419

The amount of tidewater displaced by the work hereby authorized has been ascertained by said Department, and compensation thereof has been made by the said -- MA-Russia Wharf L.L.C. -- by paying into the treasury of the Commonwealth -- two dollars and zero cents ($2.00) -- for each cubic yard so displaced, being the amount hereby assessed by said Department. [9 c.y. = $18.00]

Nothing in this License shall be so construed as to impair the legal rights of any person.

This License shall be void unless the same and the accompanying plan are recorded within sixty (60) days from the date hereof, in the Suffolk County Registry of Deeds.

IN WITNESS WHEREAS, said Department of Environmental Protection have hereunto set their hands this 7th day of August in the year two thousand six.

Program Chief

Program Director

Commissioner

Department of Environmental Protection

THE COMMONWEALTH OF MASSACHUSETTS

This license is approved in consideration of the payment into the treasury of the Commonwealth by the said -- MA-Russia Wharf L.L.C. ---------- of the further ---------

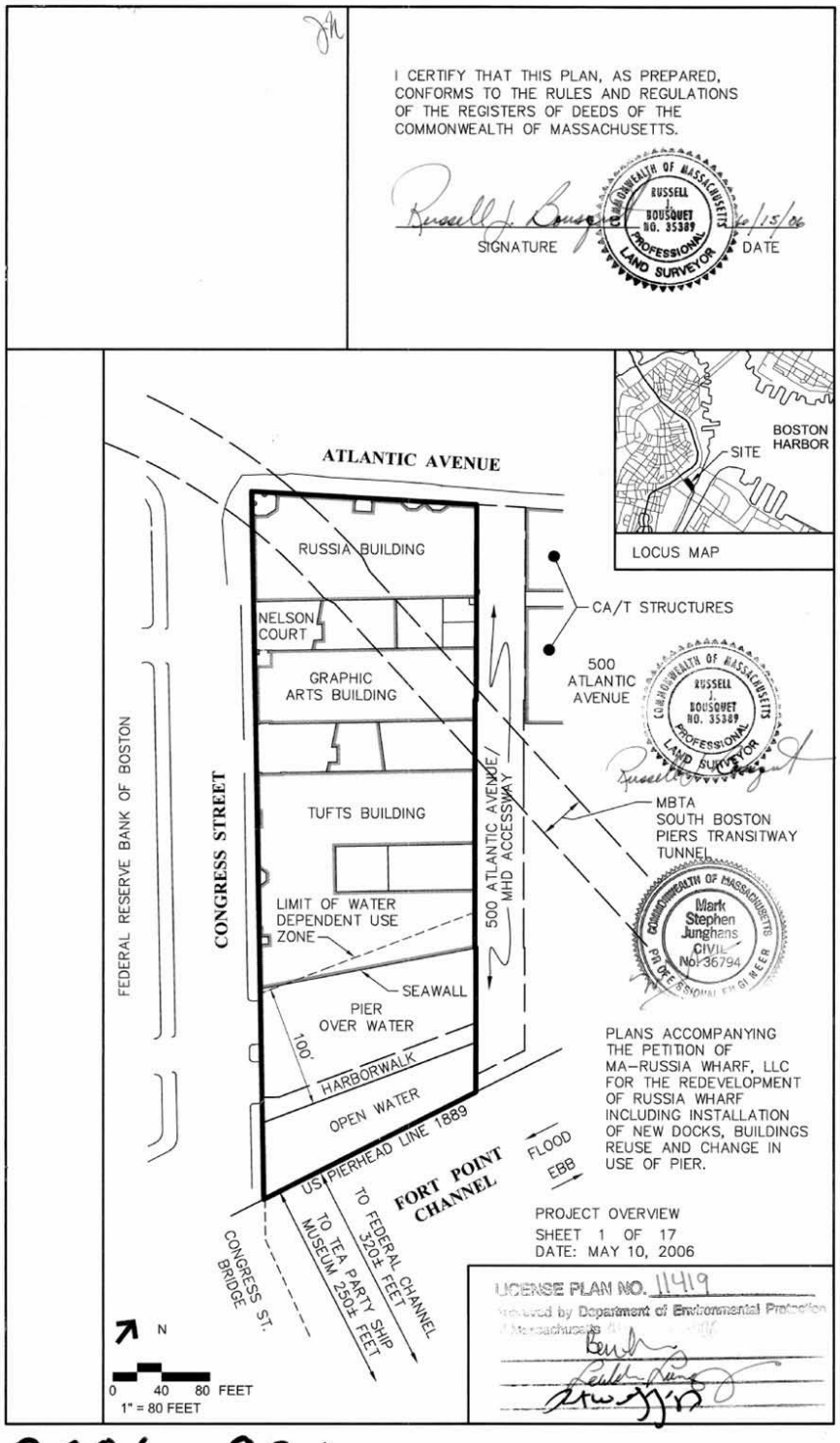
sum of -- (twenty eight thousand three hundred and thirty two dollars ($28,332.00)) ----------

the amount determined by the Governor as a just and equitable charge for rights and privileges hereby granted in the land of the Commonwealth.

BOSTON

Approved by the Governor.

Governor



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2006-824

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

SIGNATURE 4/15/06 DATE

COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
PROFESSIONAL LAND SURVEYOR

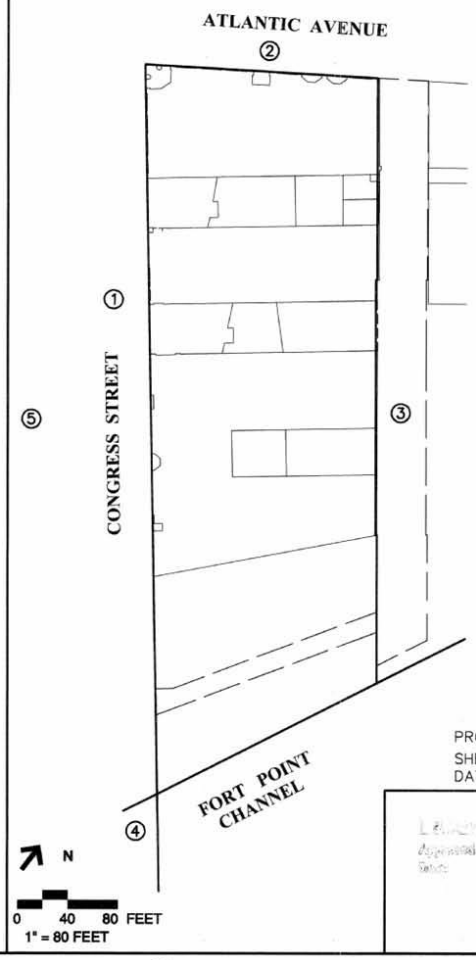
ABUTTERS LIST

①② CITY OF BOSTON
BOSTON CITY HALL
ONE CITY HALL PLAZA
BOSTON, MA 02201

③ EXTEL BOSTON HARBOR LLC
ONE INTERNATIONAL PLACE,
14th FLOOR
BOSTON, MA 02110

④ MASS HIGHWAY DEPARTMENT
10 PARK PLAZA
BOSTON, MA

⑤ FEDERAL RESERVE
BANK OF BOSTON
600 ATLANTIC AVENUE
BOSTON, MA 02210



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COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
PROFESSIONAL LAND SURVEYOR

PROJECT ABUTTERS
SHEET 2 OF 17
DATE: MAY 10, 2006

LAND VEST PLAN NO. 11419
Approval by Department of Environmental Protection
date

2006-824

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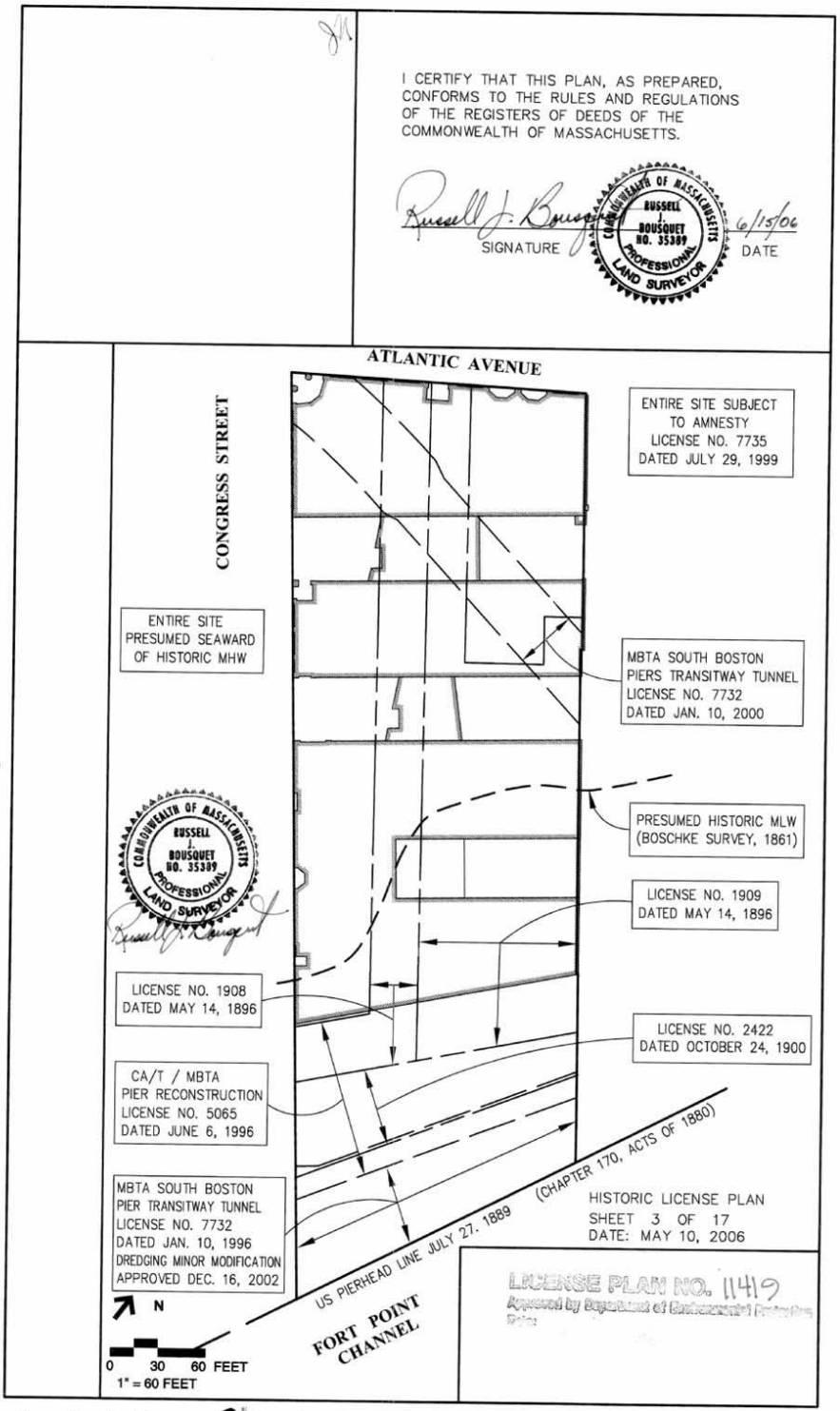
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.
SIGNATURE
6/15/06
DATE
COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET NO. 35389
PROFESSIONAL LAND SURVEYOR
ATLANTIC AVENUE
CONGRESS STREET
ENTIRE SITE SUBJECT TO AMNESTY LICENSE NO. 7735 DATED JULY 29, 1999
ENTIRE SITE PRESUMED SEAWARD OF HISTORIC MHW
MBTA SOUTH BOSTON PIERS TRANSITWAY TUNNEL LICENSE NO. 7732 DATED JAN. 10, 2000
PRESUMED HISTORIC MLW (BOSCHKE SURVEY, 1861)
LICENSE NO. 1909 DATED MAY 14, 1896
LICENSE NO. 1908 DATED MAY 14, 1896
LICENSE NO. 2422 DATED OCTOBER 24, 1900
CA/T / MBTA PIER RECONSTRUCTION LICENSE NO. 5065 DATED JUNE 6, 1996
MBTA SOUTH BOSTON PIER TRANSITWAY TUNNEL LICENSE NO. 7732 DATED JAN. 10, 1996 DREDGING MINOR MODIFICATION APPROVED DEC. 16, 2002
US PIERHEAD LINE JULY 27. 1889 (CHAPTER 170, ACTS OF 1880)
FORT POINT CHANNEL
N
0 30 60 FEET
1" = 60 FEET
HISTORIC LICENSE PLAN
SHEET 3 OF 17
DATE: MAY 10, 2006
LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
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2006-824
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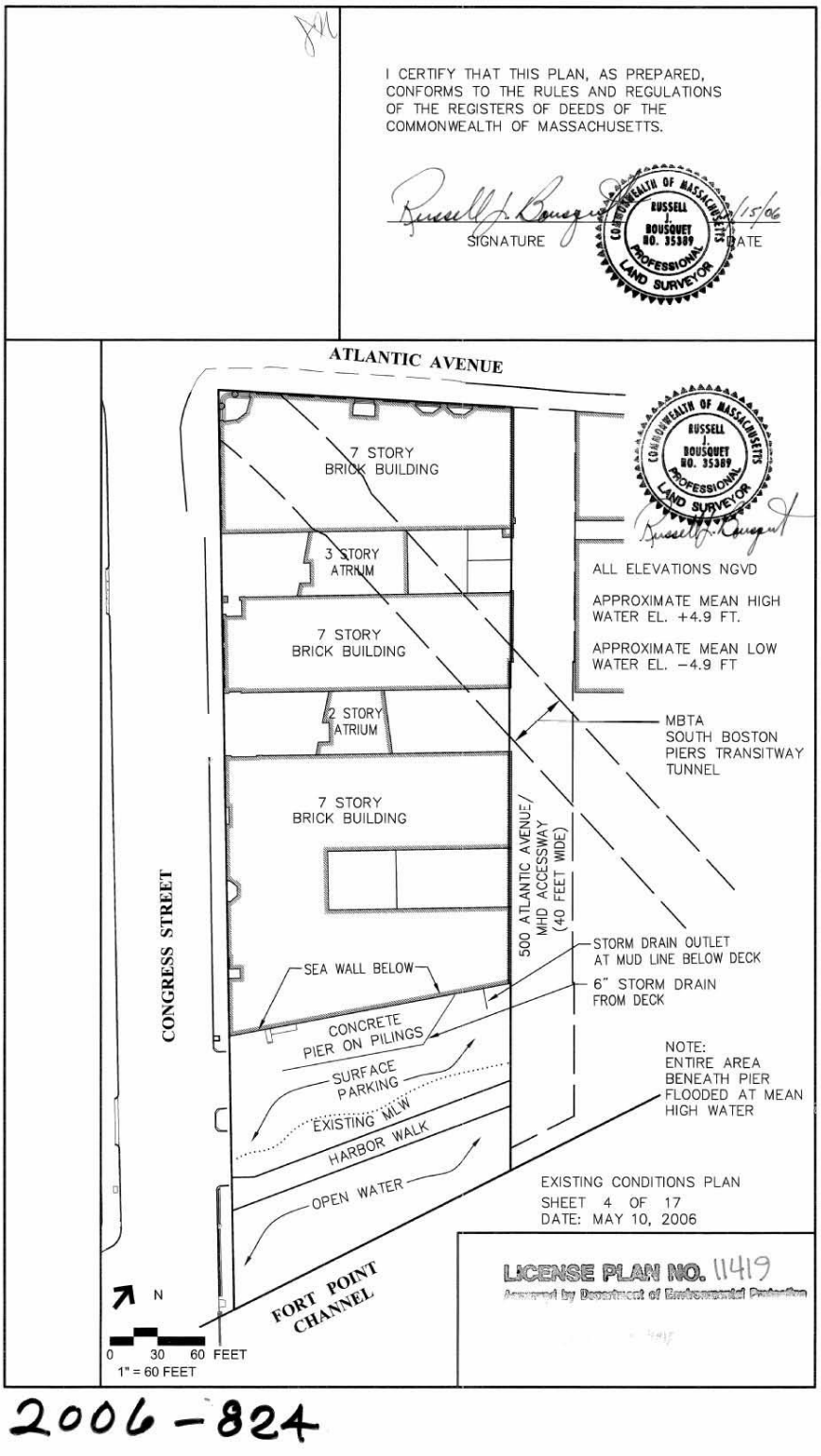
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.
SIGNATURE
DATE
COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR
ATLANTIC AVENUE
7 STORY BRICK BUILDING
3 STORY ATRIUM
7 STORY BRICK BUILDING
2 STORY ATRIUM
7 STORY BRICK BUILDING
CONGRESS STREET
500 ATLANTIC AVENUE/ MHD ACCESSWAY (40 FEET WIDE)
SEA WALL BELOW
CONCRETE PIER ON PILINGS
SURFACE PARKING
EXISTING MLW
HARBOR WALK
OPEN WATER
FORT POINT CHANNEL
ALL ELEVATIONS NGVD
APPROXIMATE MEAN HIGH WATER EL. +4.9 FT.
APPROXIMATE MEAN LOW WATER EL. -4.9 FT
MBTA SOUTH BOSTON PIERS TRANSITWAY TUNNEL
STORM DRAIN OUTLET AT MUD LINE BELOW DECK
6" STORM DRAIN FROM DECK
NOTE: ENTIRE AREA BENEATH PIER FLOODED AT MEAN HIGH WATER
EXISTING CONDITIONS PLAN
SHEET 4 OF 17
DATE: MAY 10, 2006
LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
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1" = 60 FEET
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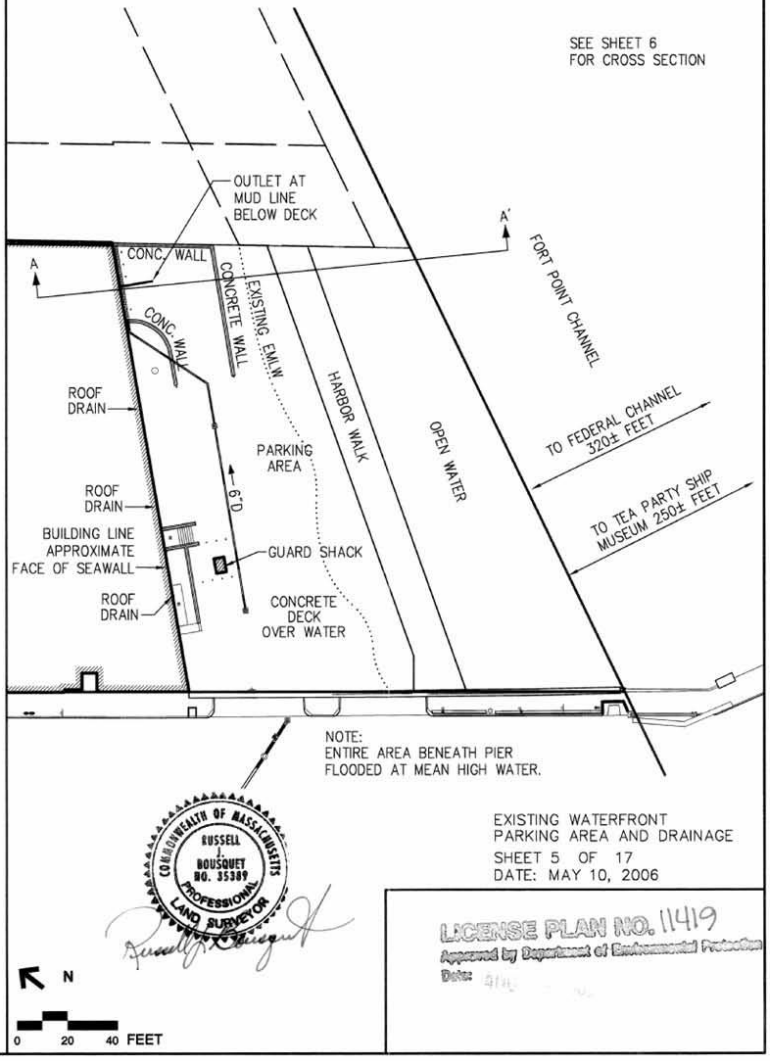
2006-824

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

SIGNATURE

COMMONWEALTH OF MASSACHUSETTS RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR

10/15/06
DATE



EXISTING WATERFRONT
PARKING AREA AND DRAINAGE
SHEET 5 OF 17
DATE: MAY 10, 2006

COMMONWEALTH OF MASSACHUSETTS RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR

LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
Date: 5/16

17

2006-824

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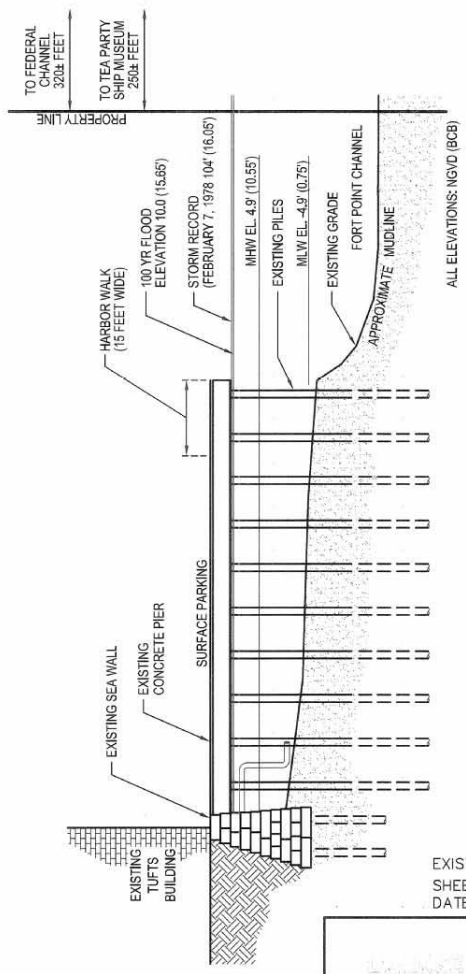
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

SIGNATURE

COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
PROFESSIONAL LAND SURVEYOR

6/15/06
DATE



EXISTING CROSS SECTION A–A
SHEET 6 OF 17
DATE: MAY 10, 2006

11419

0 10 20 FEET
1" = 20 FEET HORIZ. & VERT.

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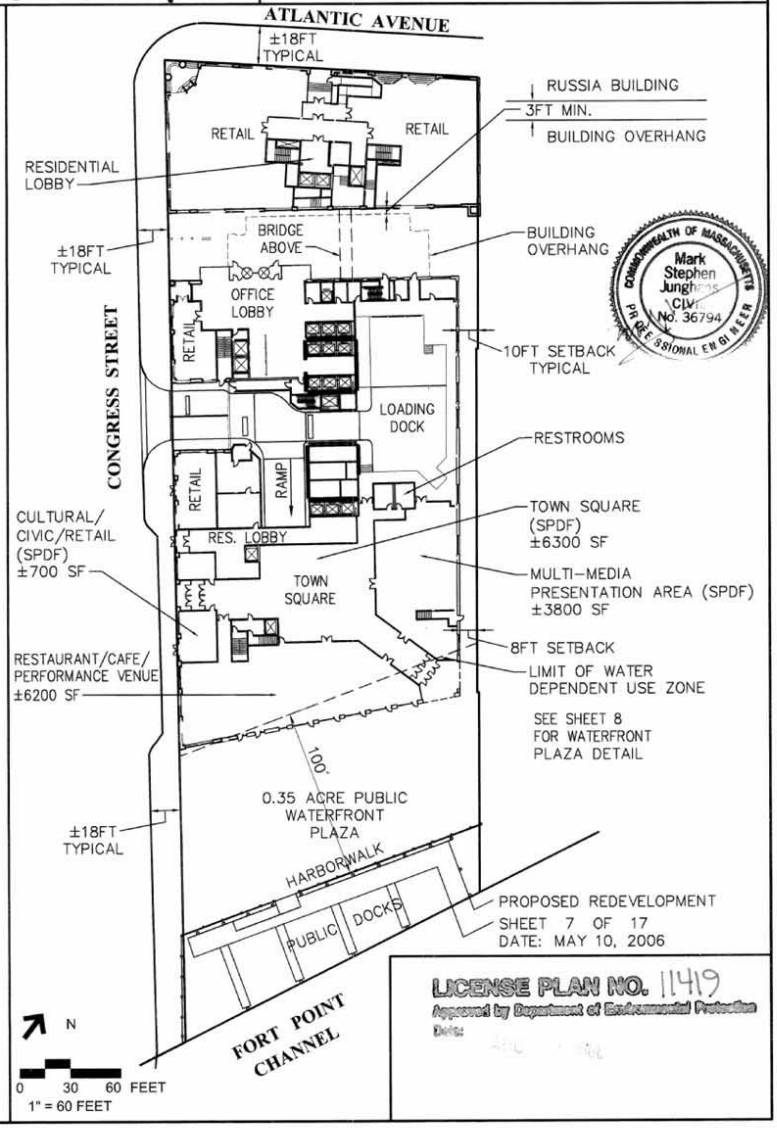
Doc: PLAN 09/08/2006 02:50 PM

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

SIGNATURE — COMMONWEALTH OF MASSACHUSETTS — RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR — 6/15/06 DATE

2006-824

17



COMMONWEALTH OF MASSACHUSETTS — Mark Stephen Jung — CIVIL — No. 36794 — PROFESSIONAL ENGINEER

LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
Date:

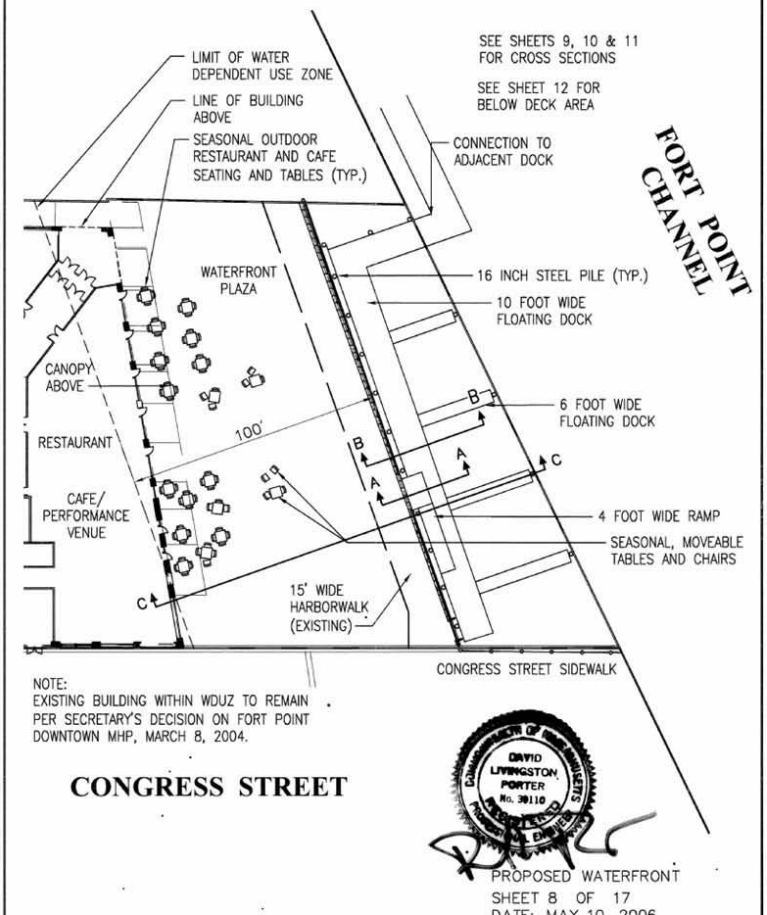
2006-824

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

SIGNATURE — COMMONWEALTH OF MASSACHUSETTS — RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR — 6/15/06 DATE

2006-824

17



NOTE:
EXISTING BUILDING WITHIN WDUZ TO REMAIN PER SECRETARY'S DECISION ON FORT POINT DOWNTOWN MHP, MARCH 8, 2004.

CONGRESS STREET

DAVID LIVINGSTON PORTER No. 30110 REGISTERED ENGINEER

PROPOSED WATERFRONT
SHEET 8 OF 17
DATE: MAY 10, 2006

LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
Date:

N

0 20 40 FEET
1" = 40 FEET

2006-824

L:\0824008\cad\ev\planset\Chapter91\08428-C91_Prop-Waterfront.dwg

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

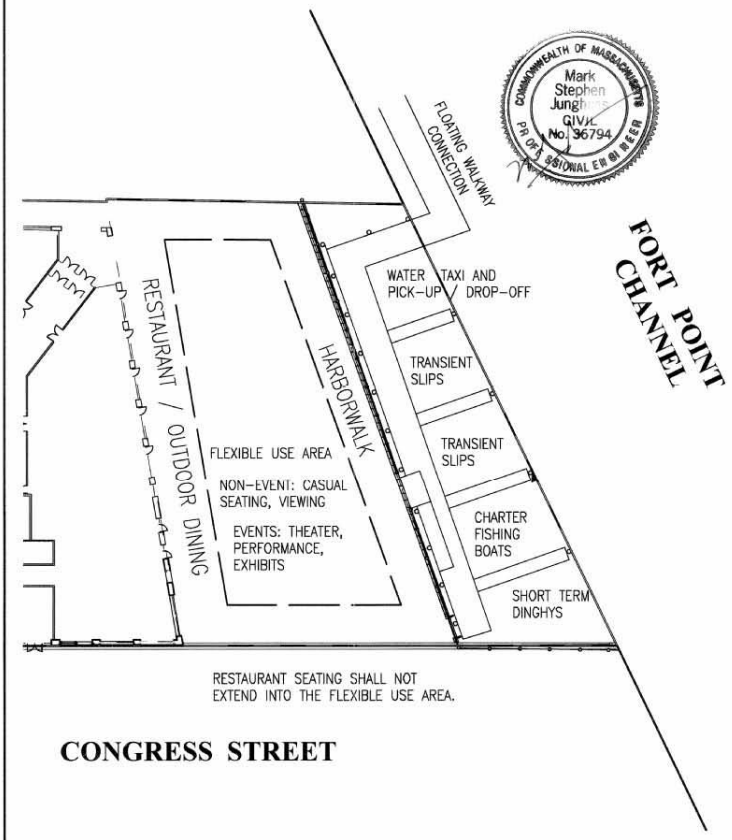
SIGNATURE

COMMONWEALTH OF MASSACHUSETTS RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR

6/15/06
DATE

2006-824

17



PROPOSED WATERFRONT USES
SHEET 9 OF 17
DATE: MAY 10, 2006

LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
Date:

N

0 20 40 FEET
1" = 40 FEET

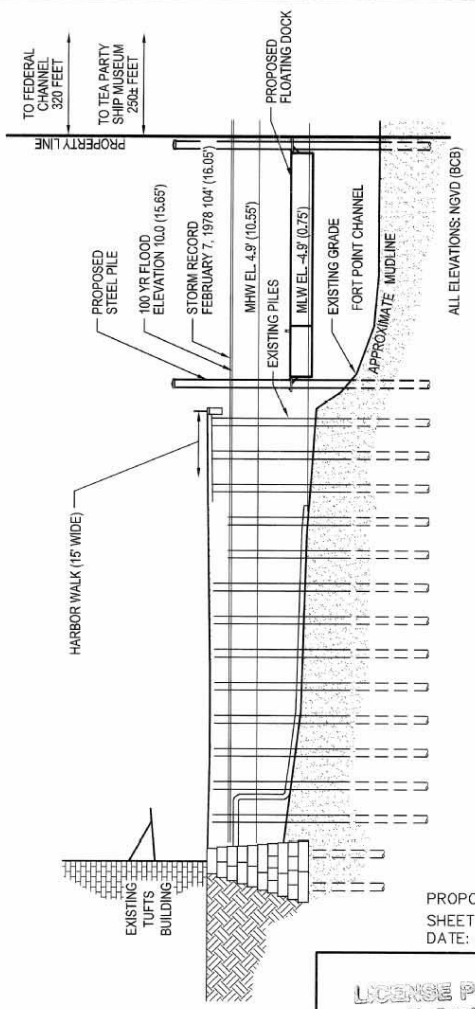
2006-824

L:\0824008\cad\ev\planset\Chapter91\08428-C91_Prop-Waterfront-Uses.dwg

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

Russell J. Bousquet 1/15/06
SIGNATURE DATE

COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35369
PROFESSIONAL LAND SURVEYOR



COMMONWEALTH OF MASSACHUSETTS
DAVID LIVINGSTON PORTER
No. 39110
REGISTERED PROFESSIONAL ENGINEER

PROPOSED CROSS SECTION C-C
SHEET 10 OF 17
DATE: MAY 10, 2006

LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
Date:

17

2006-824

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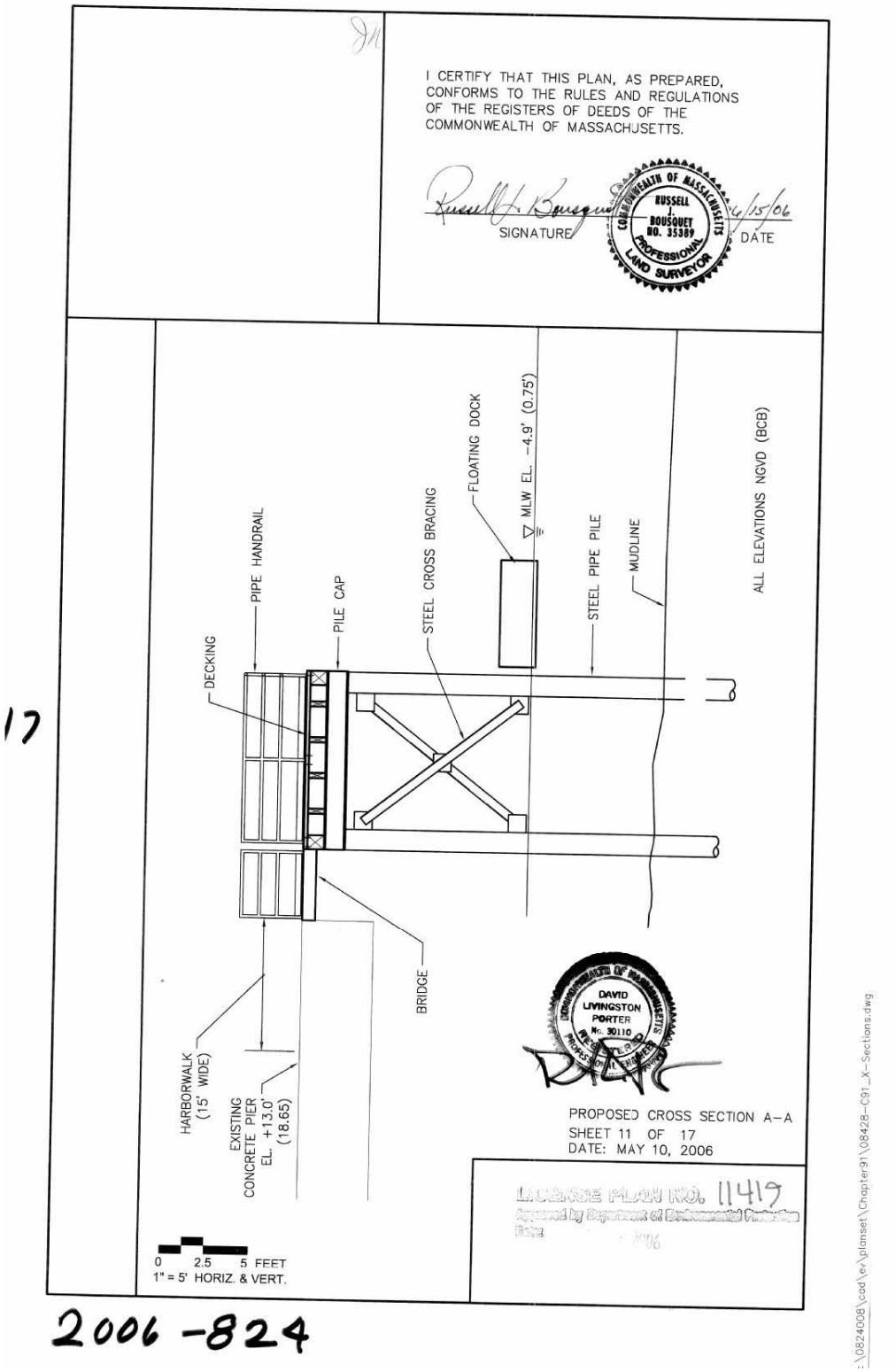
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.
SIGNATURE
DATE
RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR
17
DECKING
PIPE HANDRAIL
PILE CAP
STEEL CROSS BRACING
FLOATING DOCK
MLW EL. -4.9' (0.75')
STEEL PIPE PILE
MUDLINE
ALL ELEVATIONS NGVD (BCB)
BRIDGE
HARBORWALK (15' WIDE)
EXISTING CONCRETE PIER EL. +13.0' (18.65)
0 2.5 5 FEET
1" = 5' HORIZ. & VERT.
DAVID LIVINGSTON PORTER No. 30110
PROFESSIONAL ENGINEER
PROPOSED CROSS SECTION A-A
SHEET 11 OF 17
DATE: MAY 10, 2006
LICENSE PLAN NO. 11419
2006-824
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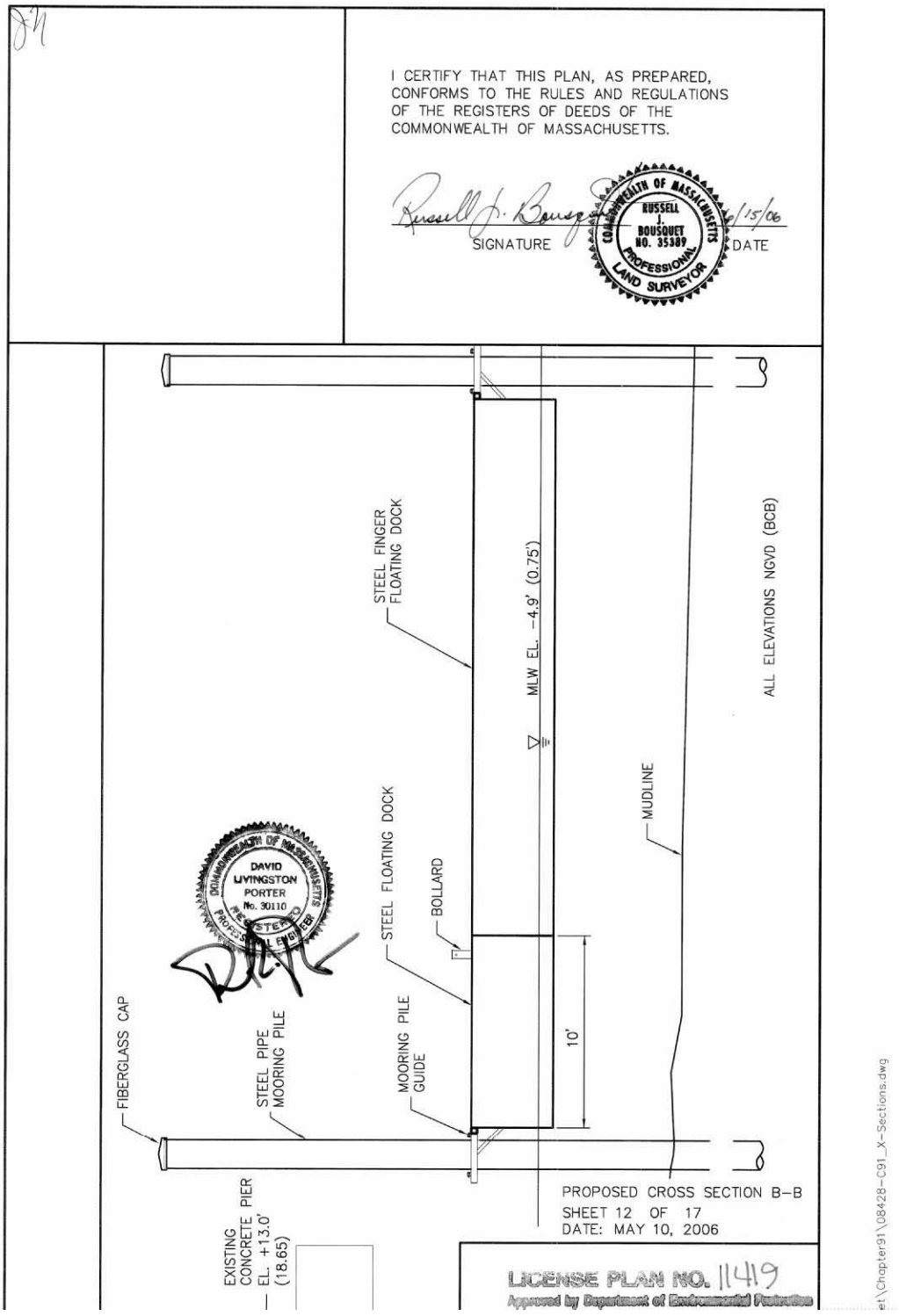
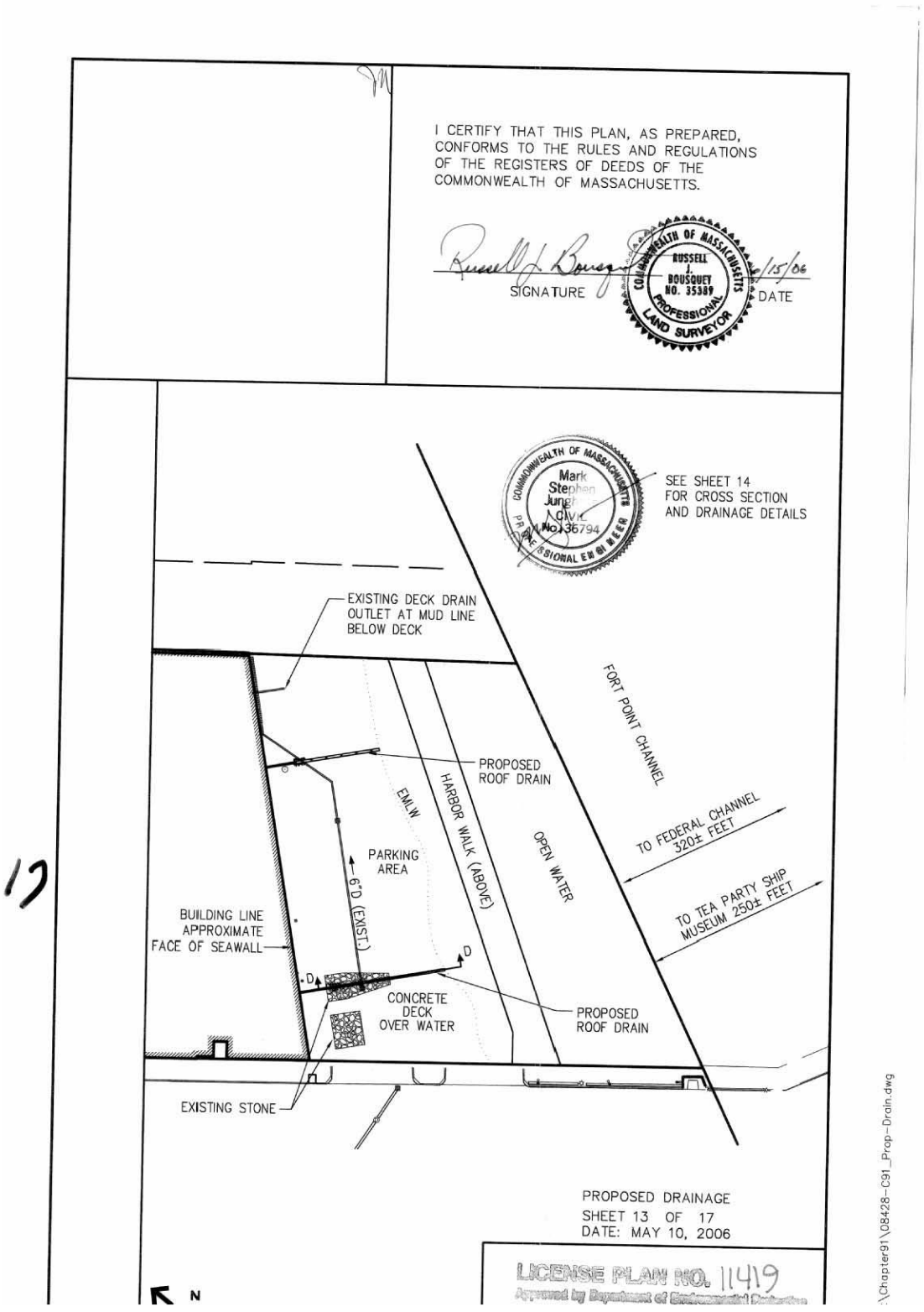

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.
SIGNATURE
DATE
COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR
DAVID LIVINGSTON PORTER No. 30110 REGISTERED PROFESSIONAL ENGINEER
STEEL FINGER FLOATING DOCK
MLW EL. -4.9' (0.75')
ALL ELEVATIONS NGVD (BCB)
STEEL FLOATING DOCK
BOLLARD
MUDLINE
FIBERGLASS CAP
STEEL PIPE MOORING PILE
MOORING PILE GUIDE
10'
EXISTING CONCRETE PIER EL. +13.0' (18.65)
PROPOSED CROSS SECTION B-B
SHEET 12 OF 17
DATE: MAY 10, 2006
LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection
et\Chapter91\08428-C91_X-Sections.dwg


I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.
SIGNATURE
DATE
COMMONWEALTH OF MASSACHUSETTS
RUSSELL J BOUSQUET NO. 35389 PROFESSIONAL LAND SURVEYOR
COMMONWEALTH OF MASSACHUSETTS
Mark Stephen Jung
No. 36794
REGISTERED PROFESSIONAL ENGINEER
SEE SHEET 14 FOR CROSS SECTION AND DRAINAGE DETAILS
EXISTING DECK DRAIN OUTLET AT MUD LINE BELOW DECK
PROPOSED ROOF DRAIN
EMLW
HARBOR WALK (ABOVE)
OPEN WATER
FORT POINT CHANNEL
TO FEDERAL CHANNEL 320± FEET
TO TEA PARTY SHIP MUSEUM 250± FEET
PARKING AREA
6"D (EXIST.)
BUILDING LINE APPROXIMATE FACE OF SEAWALL
CONCRETE DECK OVER WATER
PROPOSED ROOF DRAIN
EXISTING STONE
PROPOSED DRAINAGE
SHEET 13 OF 17
DATE: MAY 10, 2006
LICENSE PLAN NO. 11419
N
\Chapter91\08428-C91_Prop-Drain.dwg

13

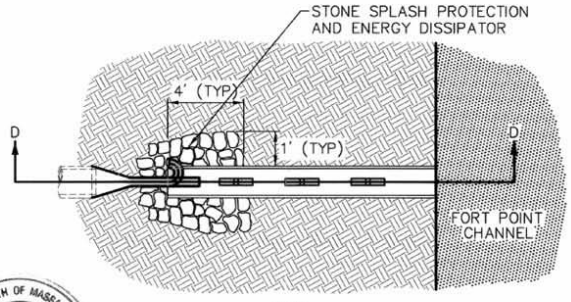
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

SIGNATURE

1/13/06
DATE

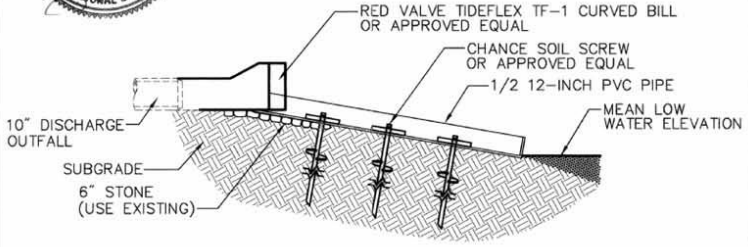
COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
PROFESSIONAL LAND SURVEYOR

17



PLAN

COMMONWEALTH OF MASSACHUSETTS
Mark Stephen Junghans
NO. 36794
PROFESSIONAL ENGINEER



SECTION D-D

SEE DRAWING #13

NOTE:
EXISTING BUILDING WITHIN WDUZ TO REMAIN PER SECRETARY'S DECISION ON FORT POINT DOWNTOWN MHP, MARCH 8, 2004.

NOT TO SCALE

PROPOSED DRAINAGE DISCHARGE OUTFALL
SHEET 14 OF 17
DATE: MAY 10, 2006

LICENSE PLAN NO. 11419
Approved by Department of Environmental Protection

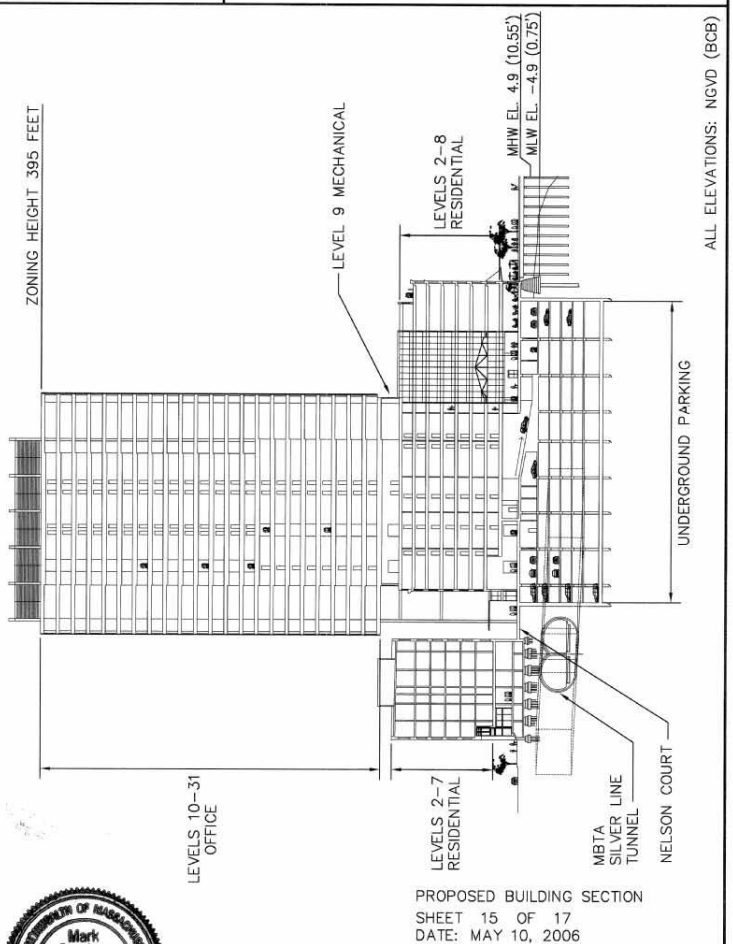
2006-824

..\0824008\cad\ev\planset\Chapter91\08428-C91_Drain-Outfall.dwg

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

Russell J. Bousquet 5/5/06

COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
PROFESSIONAL LAND SURVEYOR



PROPOSED BUILDING SECTION
SHEET 15 OF 17
DATE: MAY 10, 2006

COMMONWEALTH OF MASSACHUSETTS
Mark Stephen Jung
No. 36794
PROFESSIONAL ENGINEER

LICENSEE PLAN NO. 11419
Approved by Department of Environmental Protection
Date:

NOT TO SCALE

12

2006-824

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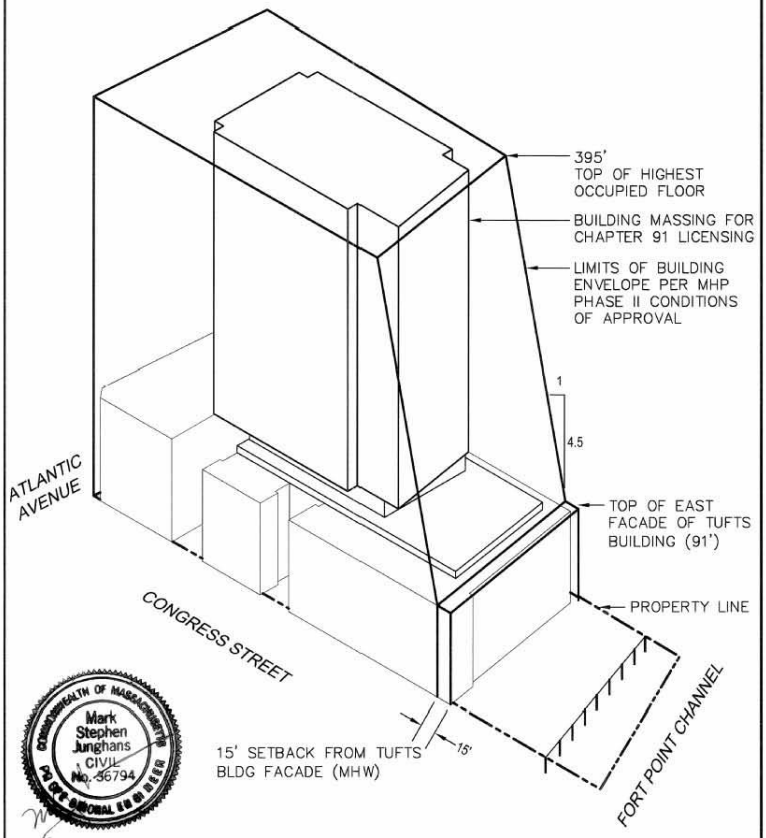
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

Russell J. Bouquet 10/15/06

COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
PROFESSIONAL LAND SURVEYOR



COMMONWEALTH OF MASSACHUSETTS
Mark Stephen Junghans
CIVIL
No. 36794

PROPOSED MASSING AND MODIFIED BUILDING SETBACK
SHEET 16 OF 17
DATE: MAY 10, 2006

NOTE:
MASSING AS APPROVED BY SECRETARY'S DECISION ON FORT POINT DOWNTOWN MHP, MARCH 8, 2004.

LICENSE PLAN NO. 11419

NOT TO SCALE

12

2006-824

...\0824008\cad\ev\planset\Chapter91\08428-C91_Mass-Setback.dwg

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

Russell J. Bousquet 4/5/06
SIGNATURE DATE

COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
PROFESSIONAL LAND SURVEYOR

INTERIOR FACILITIES OF PUBLIC ACCOMODATION	
RETAIL AND INTERIOR FPA ENTRANCES	14,000
RESTAURANT/CAFÉ/PERFORMANCE VENUE	6,200
SUBTOTAL INTERIOR FPA	**20,200**
SPECIAL PUBLIC DESTINATION FACILITY	
TOWN SQUARE	6,300
MULTI-MEDIA PRESENTATION AREA	3,800
CULTURAL / CIVIC	700
SUBTOTAL SPDF	**10,800**
TOTAL INTERIOR FPA	**31,000**
EXTERIOR FPA SPACE AT GROUND FLOOR	**1,330**
UPPER FLOOR ACCESSORY	
OFFICE AND RESIDENTIAL LOBBIES, STAIRS, ELEVATORS, UTILITY CORES, BUILDING SECURITY, LIFESAFETY AND BUILDING MANAGEMENT.	**14,691**
OTHER / SHARED SPACE	
LOADING DOCK, LOADING DOCK OFFICES, PARKING RAMP, ETC.	**11,742**
RUSSIA, GRAPHIC ARTS AND TUFTS FOOTPRINT	58,765
OFFICE BUILDING OVERHANG FOOTPRINT	3,835
TOTAL BUILDING FOOTPRINT	**62,600**
CHAPTER 91 OPEN SPACE	
NELSON COURT, WATERFRONT PLAZA, N. PROPERTY LINE	22,135
SITE DRIVE	1,306
SE CORNER OF RUSSIS BUILDING	48
SUBTOTAL OPEN SPACE	**23,489**

1. AS REQUIRED BY SECRETARY'S DECISION ON FORT POINT DOWNTOWN MHP, FINAL DESIGN SHALL PROVIDE A MINIMUM OF 21,000 SF OF OPEN SPACE.

ADDITIONAL PUBLIC SPACE (LISTED ABOVE)	
NELSON COURT BENEATH BUILDING OVERHANG	3,835

COMMONWEALTH OF MASSACHUSETTS
Mark Stephen Jurghans
CIVIL
No. 36794
REGISTERED ENGINEER

PROPOSED GROUND FLOOR USES
SHEET 17 OF 17
DATE: MAY 10, 2006

LICENSE PLAN NO. 11419

17

2006-824

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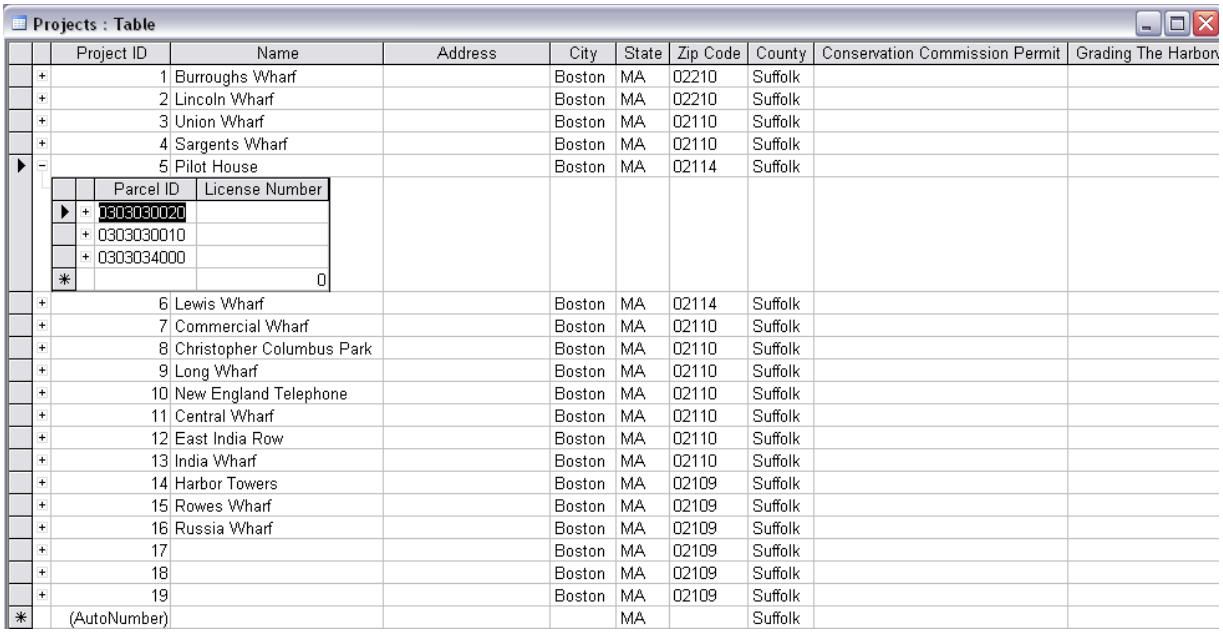
Appendix C: Contacts

Contact	*Agency/Organization*	*Position*
Jack Wiggin	Urban Harbors Institute	Interim Director
Ben Lynch	Dept. of Environmental Protection	Chief of Waterways Program
Andrea Langhauser	Dept. of Environmental Protection	Watershed Team Leader
Stephen Mague	Office of Coastal Zone Mgmt	Regional Technical Assistant
Robert Tumposky	Boston City Hall	MIS Director
Andy Sharpe	Boston City Hall	MIS Access Specialist
David Carlson	Boston Redevelopment Authority	Senior Urban Architect
Bradford Washburn	Boston Redevelopment Authority	Senior Waterfront Planer
Rolf Goetze	Boston Redevelopment Authority	Senior GIS Analyst/Research
Carolynn Bennett	Boston Redevelopment Authority	GIS Analyst/Research
Richard McGuinness	Boston Redevelopment Authority	Director of Waterfront Planning
Matt Wolfe	Save the Harbor/Save the Bay	Vice President
Vivien Li	The Boston Harbor Association	Executive Director

Appendix D: Database Structure

This appendix includes many more screen shots of the layout of the database.



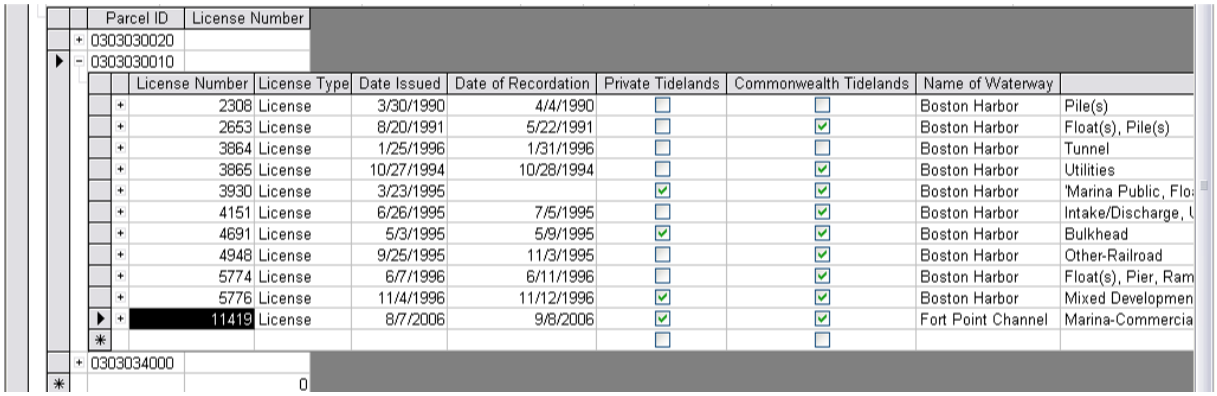
Projects : Table

Project ID	Name	Address	City	State	Zip Code	County	Conservation Commission Permit	Grading The Harbor
1	Burroughs Wharf		Boston	MA	02210	Suffolk		
2	Lincoln Wharf		Boston	MA	02210	Suffolk		
3	Union Wharf		Boston	MA	02110	Suffolk		
4	Sargents Wharf		Boston	MA	02110	Suffolk		
5	Pilot House		Boston	MA	02114	Suffolk		
6	Lewis Wharf		Boston	MA	02114	Suffolk		
7	Commercial Wharf		Boston	MA	02110	Suffolk		
8	Christopher Columbus Park		Boston	MA	02110	Suffolk		
9	Long Wharf		Boston	MA	02110	Suffolk		
10	New England Telephone		Boston	MA	02110	Suffolk		
11	Central Wharf		Boston	MA	02110	Suffolk		
12	East India Row		Boston	MA	02110	Suffolk		
13	India Wharf		Boston	MA	02110	Suffolk		
14	Harbor Towers		Boston	MA	02109	Suffolk		
15	Rowes Wharf		Boston	MA	02109	Suffolk		
16	Russia Wharf		Boston	MA	02109	Suffolk		
17			Boston	MA	02109	Suffolk		
18			Boston	MA	02109	Suffolk		
19			Boston	MA	02109	Suffolk		
(AutoNumber)				MA		Suffolk		

Project 5 – Pilot House

Parcel ID	License Number
0303030020	
0303030010	
0303034000	
	0

Figure 33 – User Clicks on Project to View Parcels

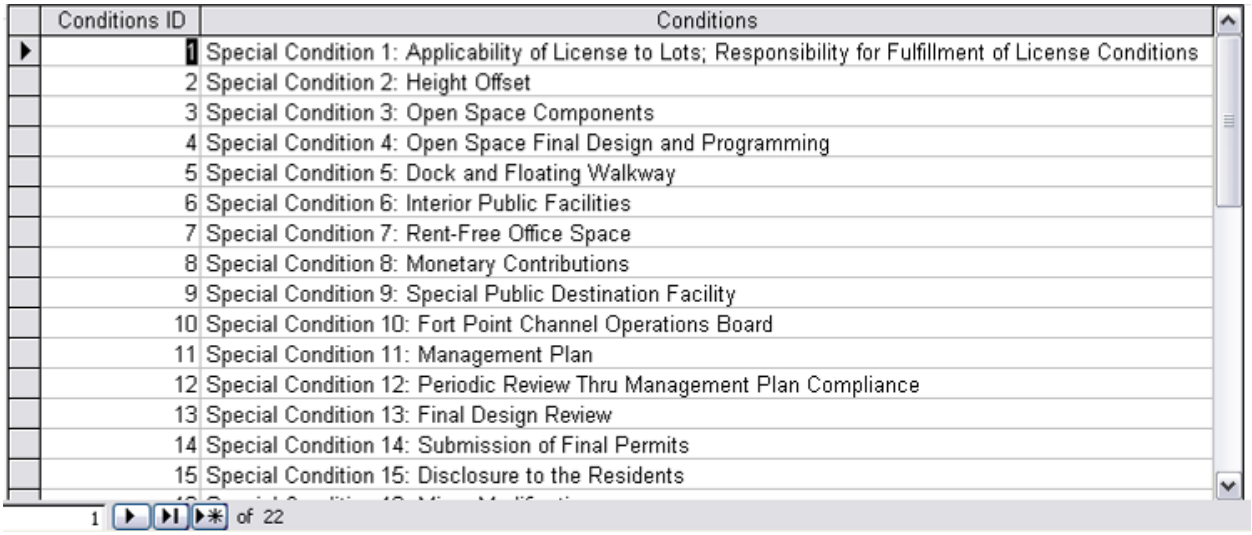


Parcel ID	License Number
0303030020	
0303030010	
0303034000	
	0

Parcel 0303030010 – Licenses

License Number	License Type	Date Issued	Date of Recordation	Private Tidelands	Commonwealth Tidelands	Name of Waterway	
2308	License	3/30/1990	4/4/1990	☐	☐	Boston Harbor	Pile(s)
2653	License	8/20/1991	5/22/1991	☐	☑	Boston Harbor	Float(s), Pile(s)
3864	License	1/25/1996	1/31/1996	☐	☐	Boston Harbor	Tunnel
3865	License	10/27/1994	10/28/1994	☐	☑	Boston Harbor	Utilities
3930	License	3/23/1995		☑	☑	Boston Harbor	'Marina Public, Flo
4151	License	6/26/1995	7/5/1995	☐	☑	Boston Harbor	Intake/Discharge,
4691	License	5/3/1995	5/9/1995	☑	☑	Boston Harbor	Bulkhead
4948	License	9/25/1995	11/3/1995	☐	☑	Boston Harbor	Other-Railroad
5774	License	6/7/1996	6/11/1996	☐	☑	Boston Harbor	Float(s), Pier, Ram
5776	License	11/4/1996	11/12/1996	☑	☑	Boston Harbor	Mixed Developmen
11419	License	8/7/2006	9/8/2006	☑	☑	Fort Point Channel	Marina-Commercia

Figure 34 – User Clicks on Parcel to view Licenses



Conditions ID	Conditions
1	Special Condition 1: Applicability of License to Lots; Responsibility for Fulfillment of License Conditions
2	Special Condition 2: Height Offset
3	Special Condition 3: Open Space Components
4	Special Condition 4: Open Space Final Design and Programming
5	Special Condition 5: Dock and Floating Walkway
6	Special Condition 6: Interior Public Facilities
7	Special Condition 7: Rent-Free Office Space
8	Special Condition 8: Monetary Contributions
9	Special Condition 9: Special Public Destination Facility
10	Special Condition 10: Fort Point Channel Operations Board
11	Special Condition 11: Management Plan
12	Special Condition 12: Periodic Review Thru Management Plan Compliance
13	Special Condition 13: Final Design Review
14	Special Condition 14: Submission of Final Permits
15	Special Condition 15: Disclosure to the Residents

1 of 22

Figure 35 – User Clicks on License to View Special Conditions

Appendix E: Database User Manual

Introduction

The following manual illustrates ways in which authorized users can modify the Chapter 91 license database created by the 2007 WPI Interactive Qualifying Project (IQP) group. The manual contains screenshots and graphics that explain the database structure and how it can be manipulated.

First, the reader is introduced to the design of the database to ensure comprehension prior to manipulation. Second, the reader will find procedures describing the necessary steps in order to update the database contents.

Structure

The prospective users of this database are expected to withhold a prior understanding of the Chapter 91 licensing process, as well as a basic understanding of waterfront-related regulations in the City of Boston. Still, the users must understand the design of this database and how the various components are related to one another.

The highest level in the database hierarchy is the project information. A project is simply the most common reference to a piece of waterfront property. For example, the project name would be New England Aquarium instead of Central Wharf because New England Aquarium is the most recognized title for that property. In addition, every project has at least one license associated with it.

The bottom portion of the hierarchy contains the data associated with each license. The most complicated relationship exists between parcels in licenses. For instance, there may be several licenses associated with one parcel and a group of parcels related to one license. The relationship in this case is called a many-to-many relationship, which is described in *Figure 36*:

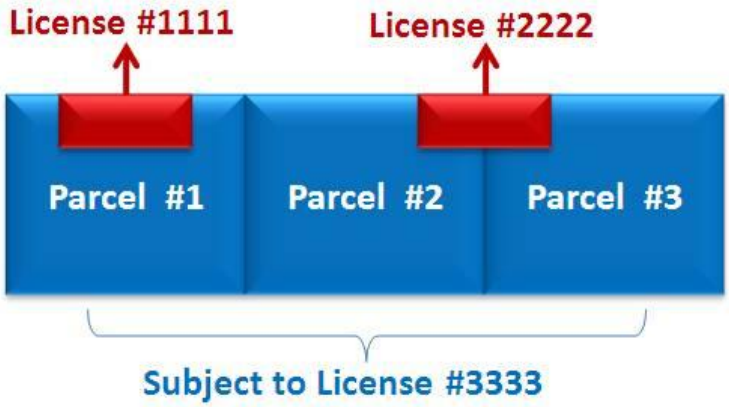


Figure 36 – Many-to-Many Relationship Between Parcels and Licenses

Therefore, the user may see repeated license entries in cases where there are multiple parcels in the project scope.

Lastly, the special conditions are associated with each individual license. The documents represent the full-text licenses in PDF format, which are also associated with each project. *Figure 37* shows the database hierarchy graphically:

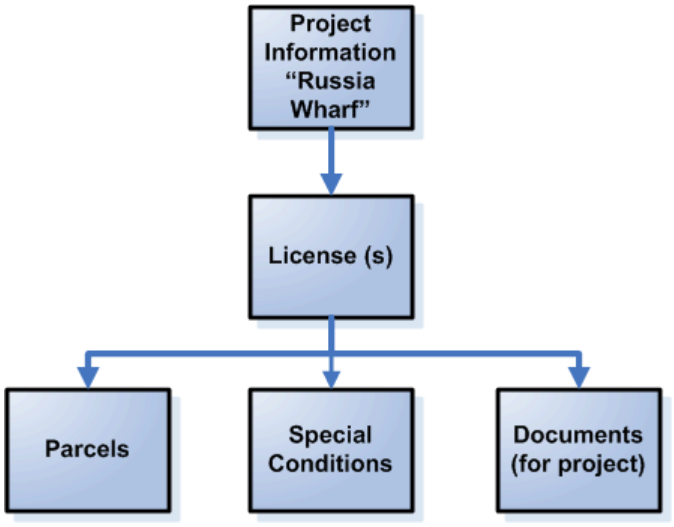


Figure 37 – Database Hierarchy

Walkthrough

The explanation of the database hierarchy is followed with a virtual walkthrough of the database to verify the reader's comprehension. The walkthrough starts with the project input form, shown in *Figure 38*:

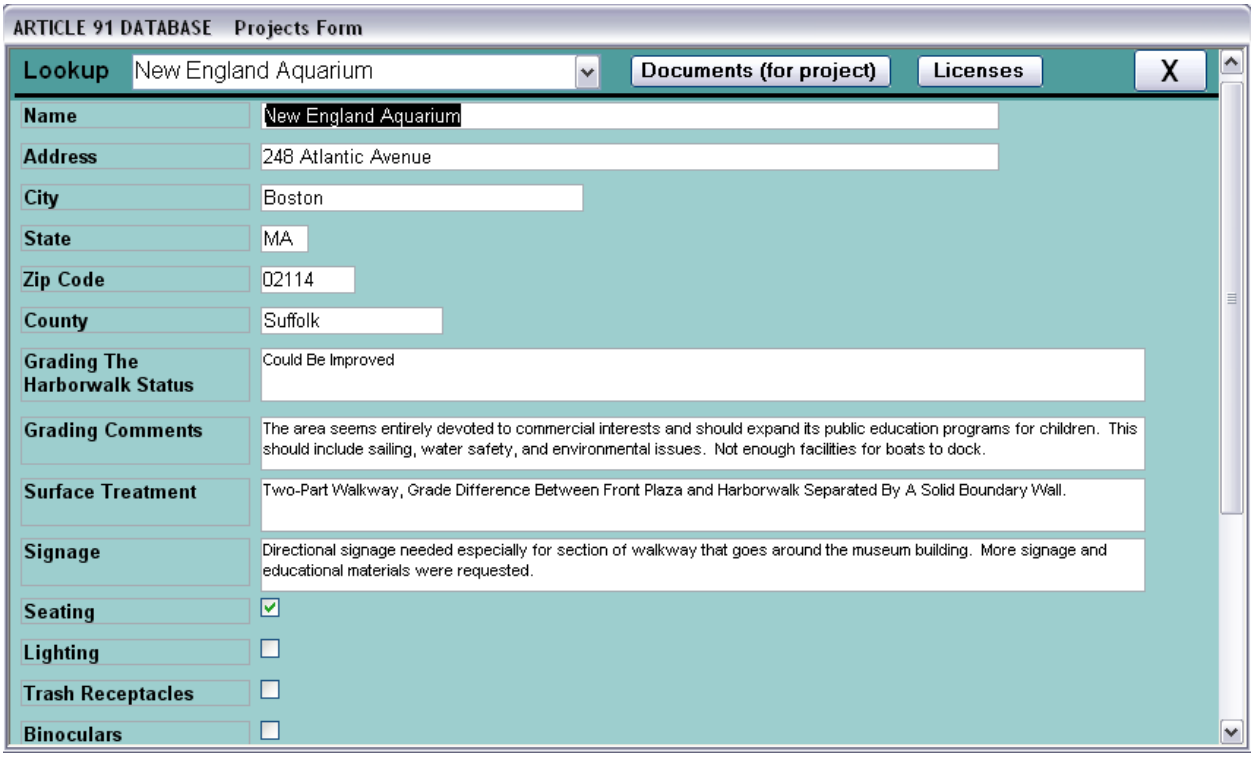


Figure 38 – Project Input Form

From this point, the user may perform one of three actions. First, the user may click on the *Lookup* dropdown menu and select a different project. This can be completed by either clicking the dropdown arrow to the right and selecting a new project, or by clicking on the project name inside the lookup field and typing in a new project name. Second, the user may select the *Documents (for project)* button. This action opens a new window with all files associated with the current project, shown in *Figure 39*:

Figure 39 – Project Folder with Chapter 91 Licenses

The user will find this button in the Licenses and Special Conditions Forms as well. Lastly, the user may click on the *Licenses* button. This button opens up a new input form shown in *Figure 40*:

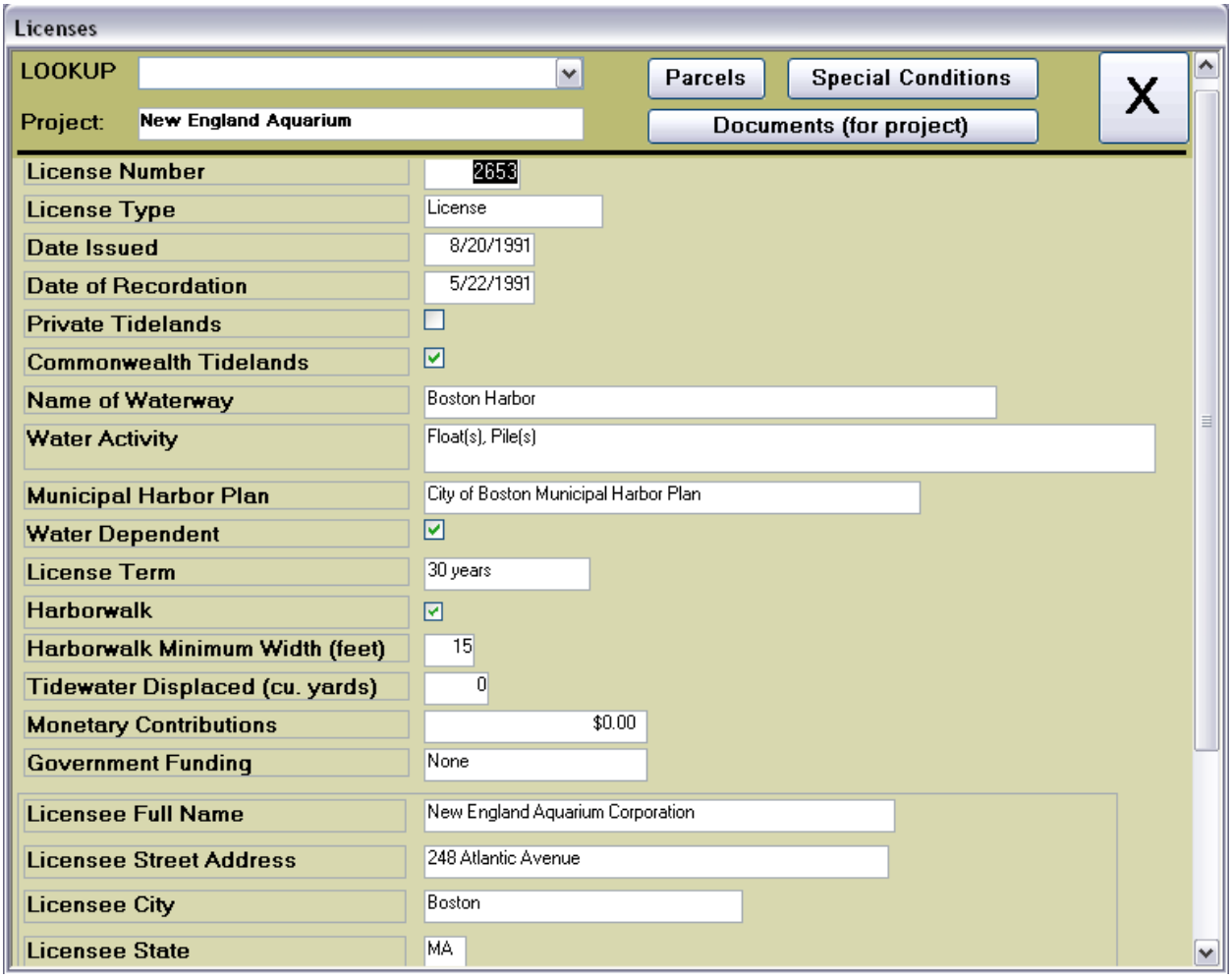


Figure 40 – License Input Form

The license form automatically displays details related to the license with the lowest license number assigned to a particular project. If database users wished to see all of the licenses issued for the current project, they would select the *LOOKUP* dropdown menu. The process in selecting a different license is identical to that of selecting a different project on the project form.

The buttons in the upper-right corner of the form open various windows of information specific to each license (with the exception of the *Documents (for project)* window). The *Parcels* button opens up a window containing all of the parcels within the license plan area. An example of a Parcels For Licenses Window is shown in *Figure 41*:

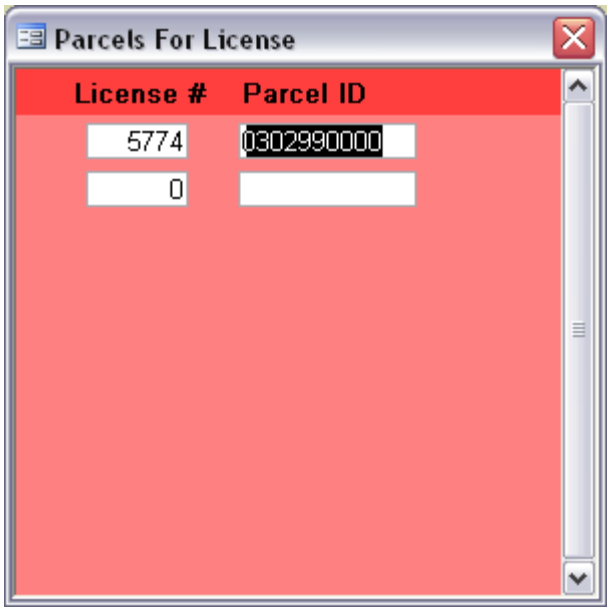


Figure 41 – Parcels For Licenses Window

The last possible option entails the user clicking on the *Special Conditions* button. This will prompt the opening of the Special Conditions For Licenses window, which contains all of the special conditions associated with the current license. An example is shown in *Figure 42*:

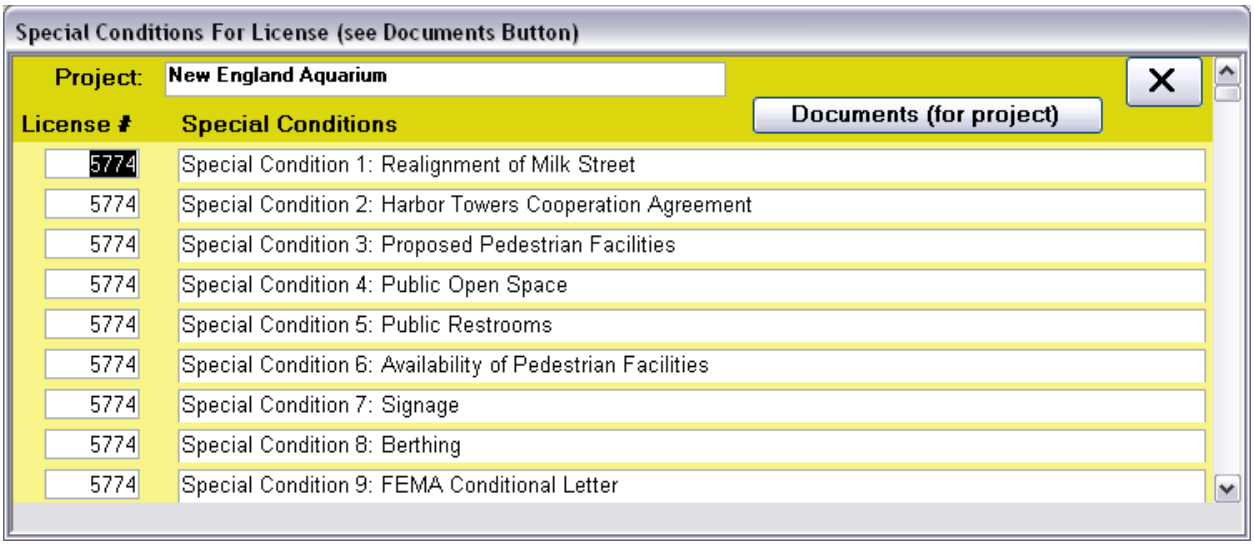


Figure 42 – Special Conditions For Licenses Window

Input Procedures

The following input procedures were developed without the functionality of adding or deleting entries. However, they provide a basis of how the data should be entered once this functionality becomes available:

Adding New Project

1. Open up the windows folder where the database is stored (i.e. C:\Article91)

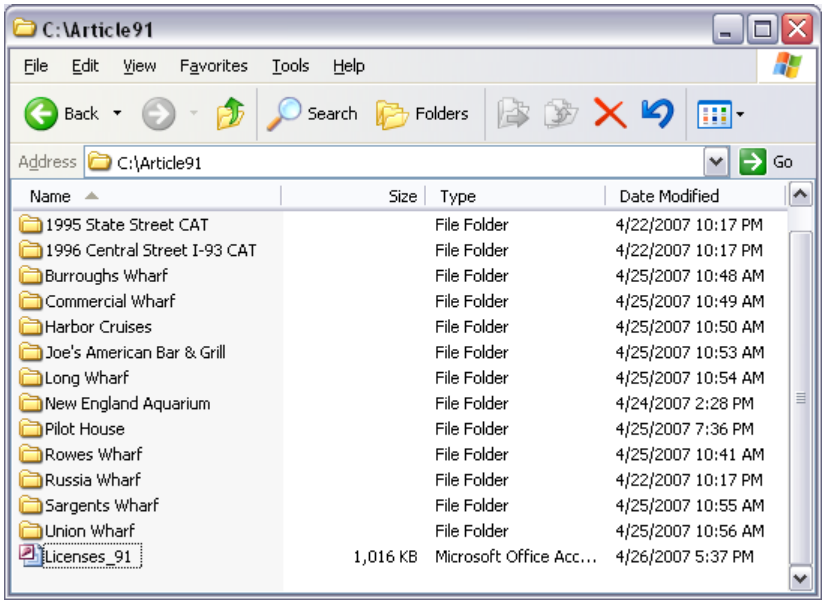
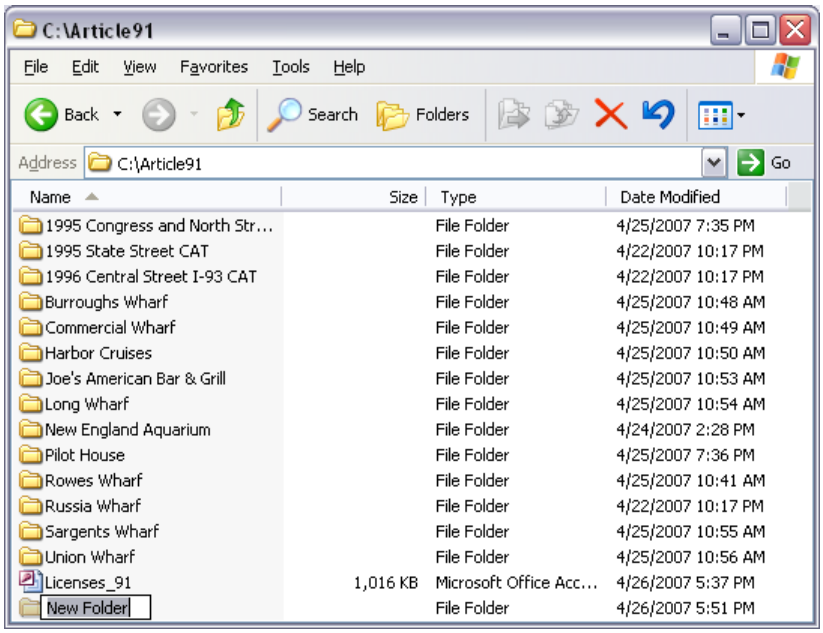


Figure 43 – Database Directory

2. Go to the window menu at the top and select *File→New→Folder*. This will produce a new folder:



3. Enter the desired project name to rename folder (i.e. Christopher Columbus Park):

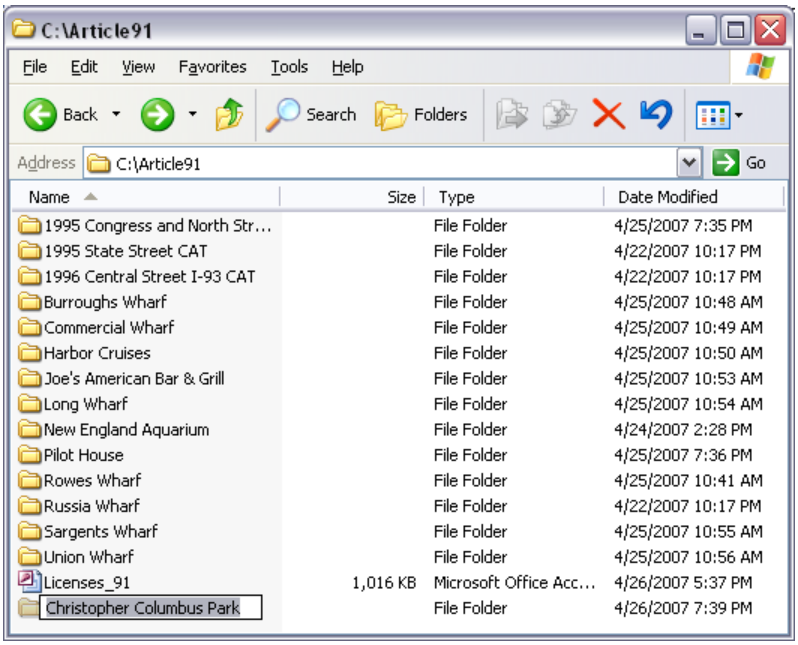


Figure 44 – Renaming Folder

4. Copy and paste license files associated with newly created project. Make sure that the word “license” and the license number are in the file name:

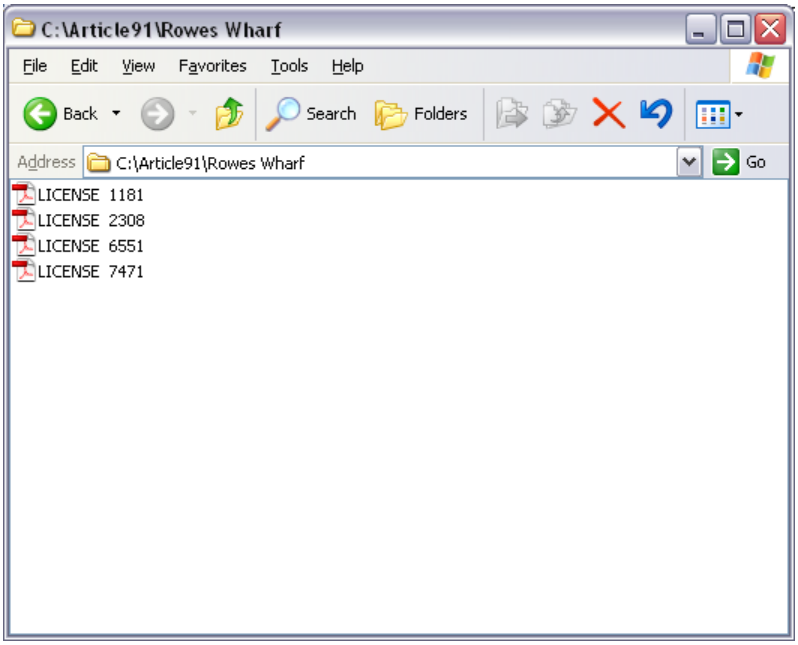


Figure 45 – License Files

5. Now open the database in Microsoft Access. The project form should automatically appear.
6. Click on the *add record* button.
7. Type in the project information, including project name, address, city, state, zip code, and county.
8. Insert "Grading the Harborwalk" information for the project, if the project has been evaluated by the Boston Harbor Association (TBHA).
    a. The *Grading the Harborwalk Status* is usually graded as *very good*, *good*, or *could be improved*.
    b. The *Grading Comments* should consist of TBHA's general thoughts regarding the current state of the Harborwalk as well as the possibilities for improvement.
    c. The *Surface Treatment* field should describe the Harborwalk composition, such as *paved walkway*, *wooden planks*, or *stone dust*.
    d. The *Signage* should describe the TBHA's comments on the Harborwalk signage, particularly the locations of the signage, the conditions of the signage, and the quantity of the signage. In addition, suggested signage-related improvements should be listed here.

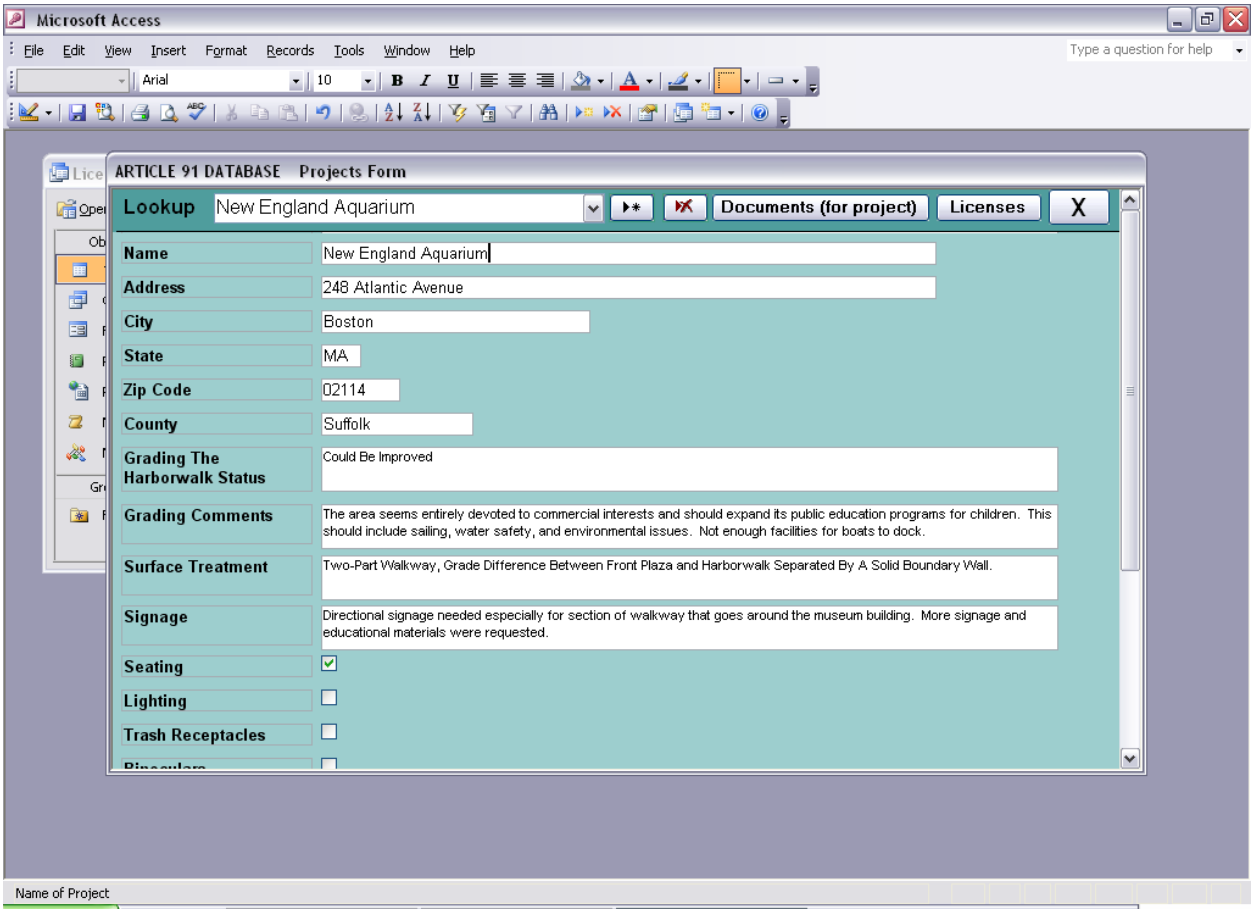


Figure 46 – Project Information

9. Amenity information, such as *Seating*, *Lighting*, *Trash Receptacles*, and *Binoculars* can be obtained through one of several databases.
    a. The TBHA has comments on amenities in their grading of the Harborwalk. For more information, contact Vivien Li at the TBHA.
    b. The user may look at the BRA's GIS layer of public amenities. For more information, contact Richard McGuinness at the BRA.

    Simply check the amenities that exist on the project site. If amenities exist that do not fall under one of the four checkboxes, please list them under *Other Amenities*.

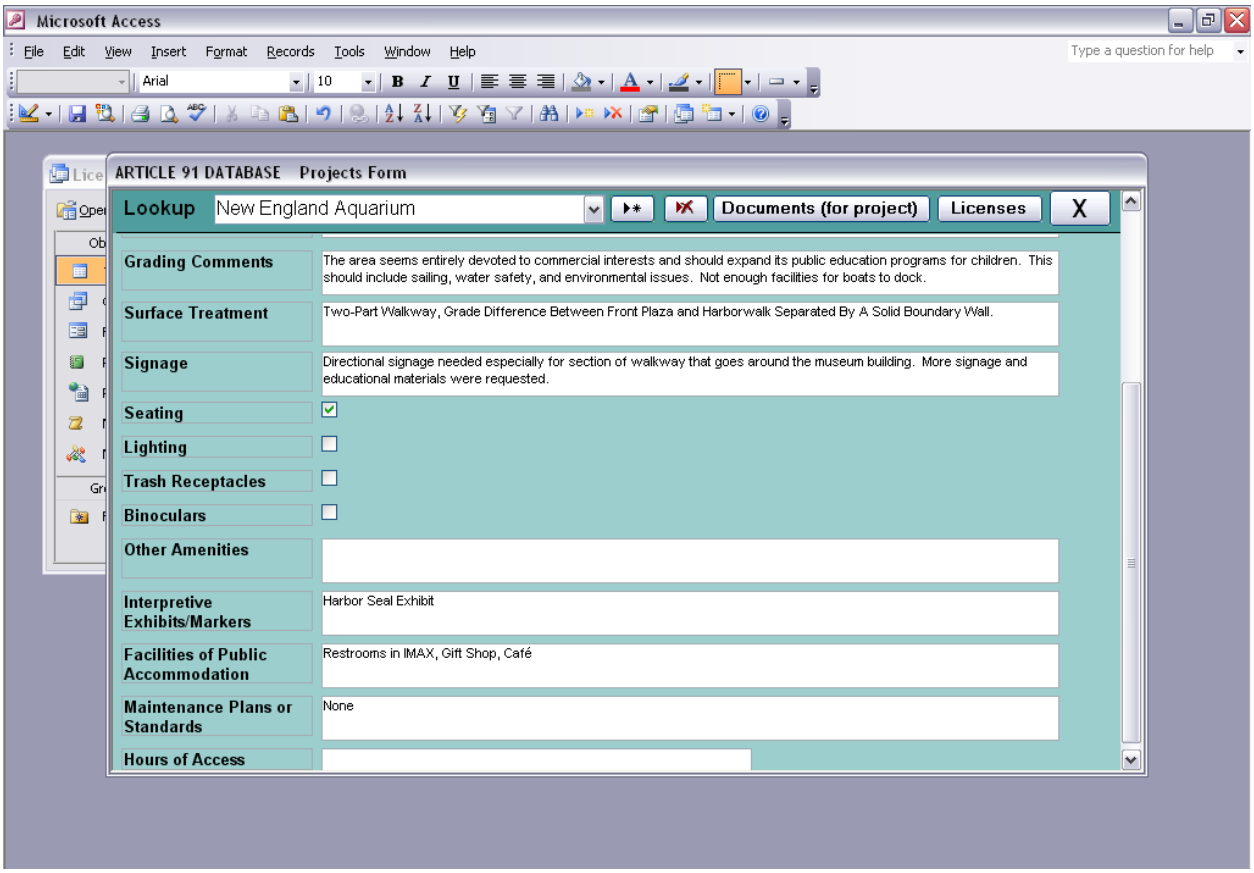


Figure 47 – Amenity/Public Access Information

10. Enter in interpretive exhibits or markers, such as the *Harbor Seal Exhibit* at the New England Aquarium, or Boston area information markers.
11. Describe the various Facilities of Public Accommodation (FPA), such as restrooms, restaurants, gift shops, indoor seating areas, and all facilities that would fall under the Chapter 91 definition for FPA's.
12. Type in either the current plans for Harborwalk renovation or current maintenance of the Harborwalk for the project. Examples: *Poor Maintenance of Harborwalk, several areas of concern* or *Proposed 15-foot wide Harborwalk – Closed to Public during Construction*.
13. Finally, enter in the Hours of Access, such as *24 Hours a Day* or *Dawn to Dusk*. Also, specific hours can be entered if available.

Adding a License

1. Providing that the project information is accurate, Go to the *Licenses* window for a particular project and click *Add License*.

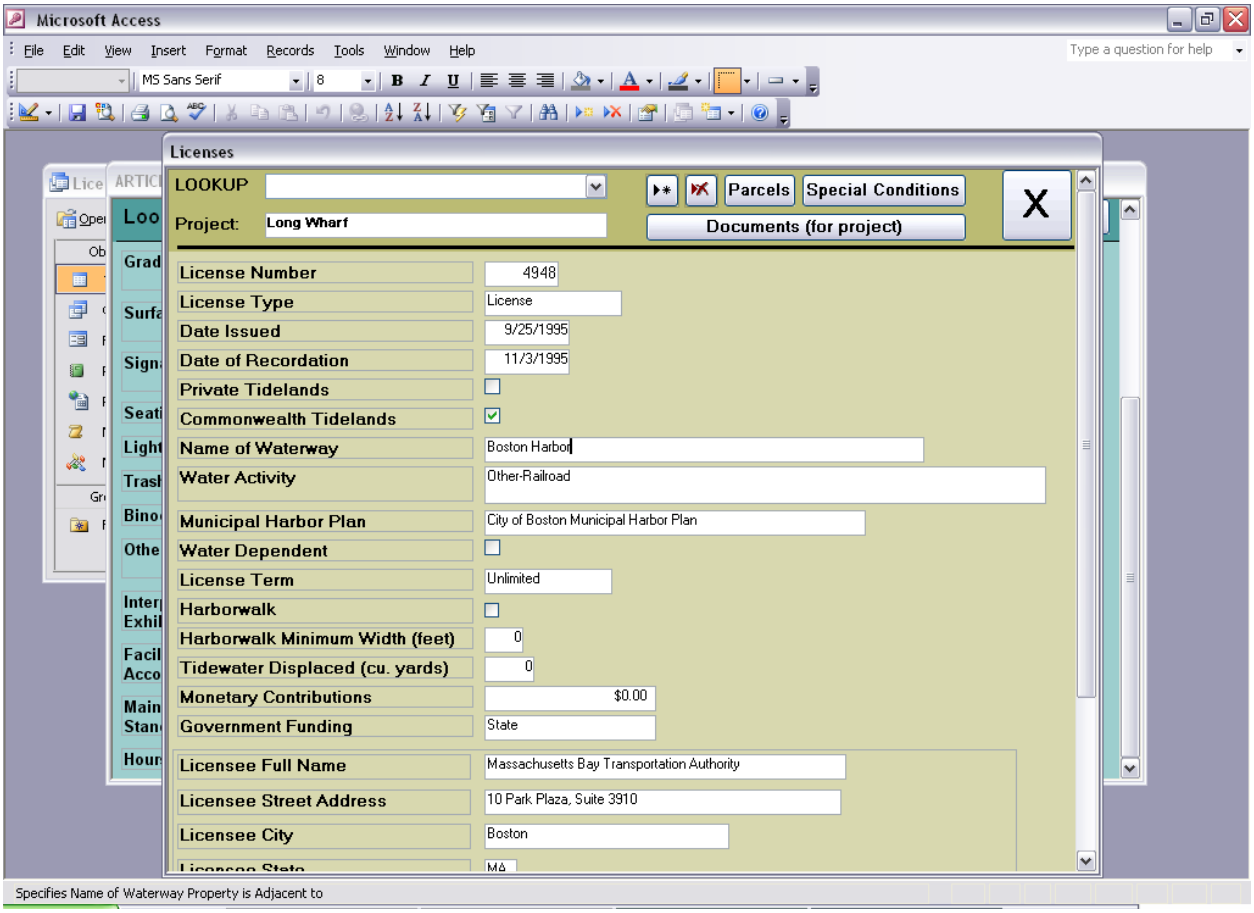


Figure 48 – License Form

2. Enter in the License Number, located on the first page of the license.
3. Enter in the License Type: *License*, *Permit*, or *Amendment*. Amendments will specify the original license, and permits are issued numbers separate from their license counterparts.
4. Enter in the *Date Issued*, which is located on the page containing signatures of validation (preceding Plans).
5. Enter in the *Date of Recordation*. This is the date when the license was recorded at the local Registry of Deeds. Contact Andrea Langhauser or Michael Garvin at the Department of Environmental Protection for this information.
6. Next, determine whether the license is authorized on *Private Tidelands*, *Commonwealth Tidelands*, or both. This information is located at the bottom of the page named *Standard Waterways License Conditions*.
7. Enter in the name of the adjacent waterway (i.e. Boston Harbor).
8. Enter in the *Water Activity*, which will entail classifications made by the DEP. Please contact the DEP for this information.
9. Type in the name of the municipal harbor plan (MHP) associated with the license. Examples: *City of Boston Municipal Harbor Plan*, *Fort Point Channel Municipal Harbor Plan*.
10. Determine water dependency of the license. Contact the DEP for such information.

11. Enter in the term of the license. This can be found on the first page, in the special conditions, or on the last page of the license.
12. Select the checkbox next to *Harborwalk* if there is a stipulation regarding the Harborwalk This can be stated in the license as a *pedestrian walkway*, *pedestrian thruway*, or *public easement*.
13. Enter in the *Harborwalk Minimum Width*. This is usually located in the same part of the license as the Harborwalk stipulation.
14. Enter in *Tidewater Displaced*, which is located on the last page of the document.
15. Enter in the total amount of contributions made by the licensee for public benefits. This is listed in the special conditions if listed at all.
16. Enter in the *Government Funding* for the activity detailed in the license. The possible entries are *Federal*, *State*, *Municipal*, or *None*.
17. Enter in the licensee's contact information, including name, address, city, state, zip code, phone number, and email address. The phone number and email address will be related to an individual representing the licensee in most cases.

Adding Parcel Information

1. Assuming all license information is entered in correctly, click the *Parcels* button to open the *Parcels for Licenses* window:

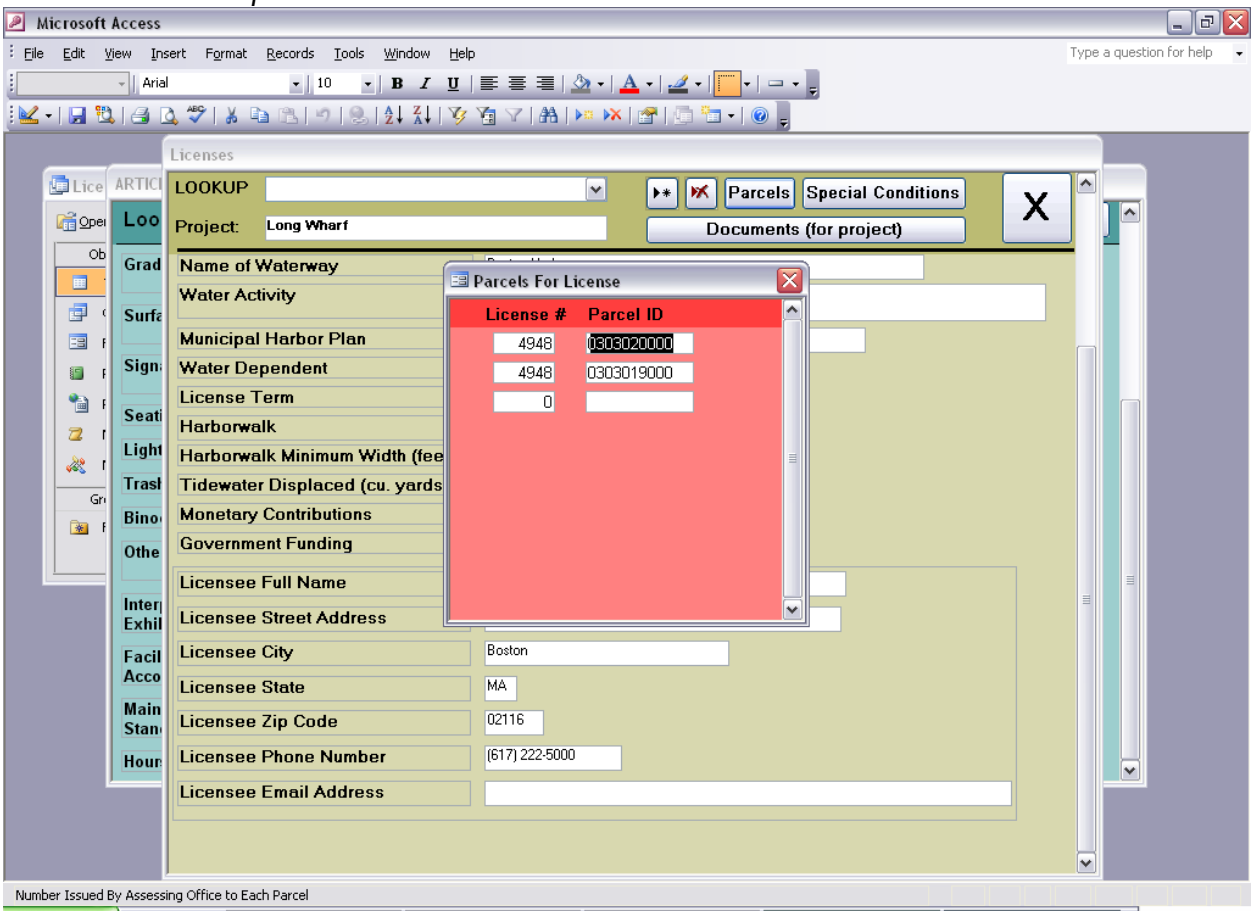


Figure 49 – Parcel Form

2. Click the *Add Parcel* button. The appropriate license number should automatically appear in the *License #* column.
3. Type in the Parcel ID number for the parcel. The number should be 10 digits long and can be found by accessing the Assessing Department's database.
4. Repeat steps 2 and 3 for each relevant parcel.

Adding Special Conditions

1. Assuming all license information is entered correctly, click on the *Special Conditions* button to open to *Special Conditions for License* window:

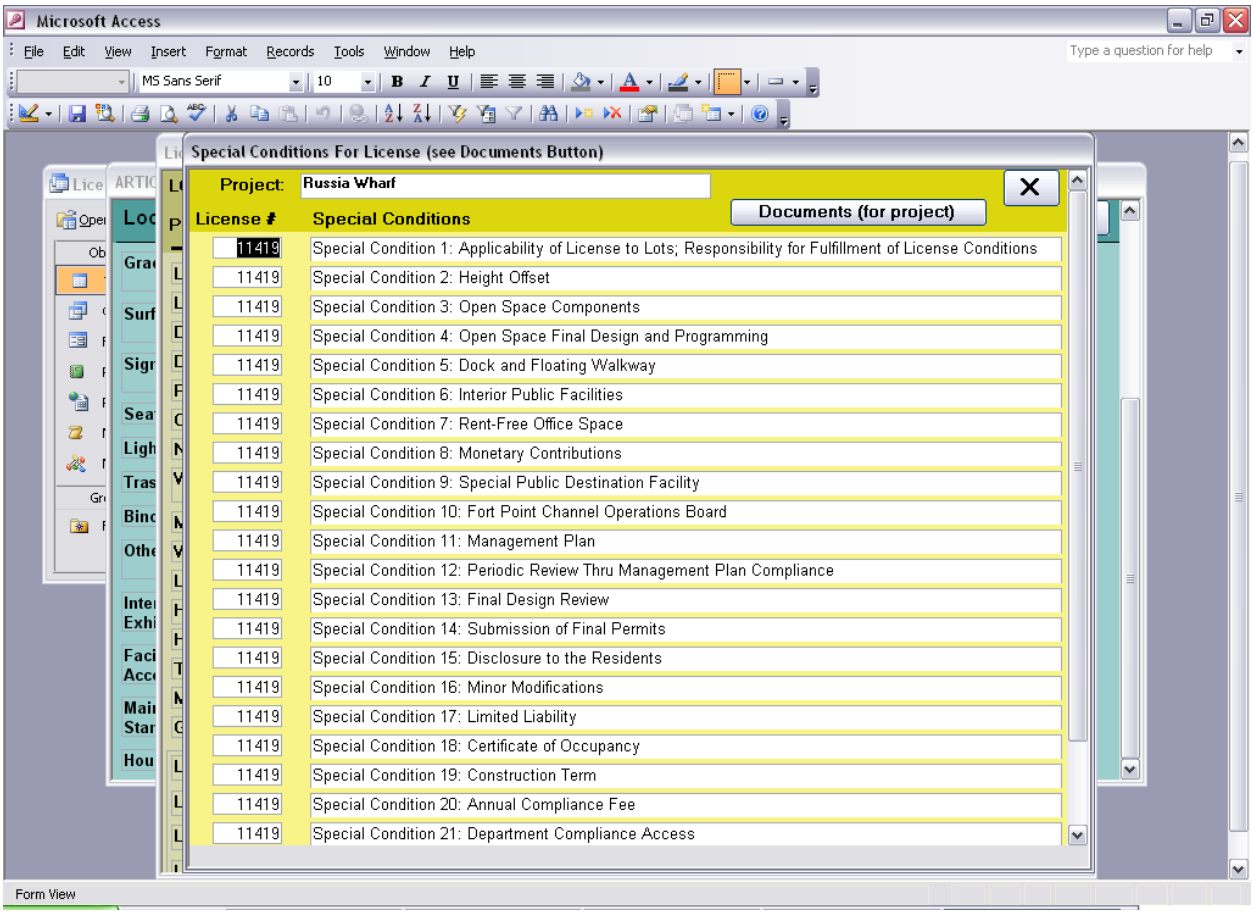


Figure 50 – Special Conditions Form

2. Select the *Add Condition* button. The appropriate license number should automatically appear in the *License #* column.
3. Enter in the special condition number and a descriptor. This descriptor is given for newer licenses. The user must create an informative descriptor for special conditions in older licenses.
4. Repeat steps 2 and 3 until all special conditions are added.

Self-Check

1. Bring the Projects form up onto the screen.
2. For a newly added project, click the *Lookup* dropdown menu and verify that the project is in the list.
3. Select the *Documents (for project)* button and verify that the appropriate project folder appears on the screen.
4. Select the *Licenses* button.
5. Select the *LOOKUP* dropdown menu, and verify that all relevant licenses are listed for the project.
6. Select the *Parcels* button and verify that all associated parcels are listed.
7. Select the *Special Conditions* button and verify that all associated special conditions are listed

Appendix F: MapInfo User Manual

This following Document will guide the user through a set by step process to display the GIS Layers that relate to this project.

Step 1: Opening MapInfo

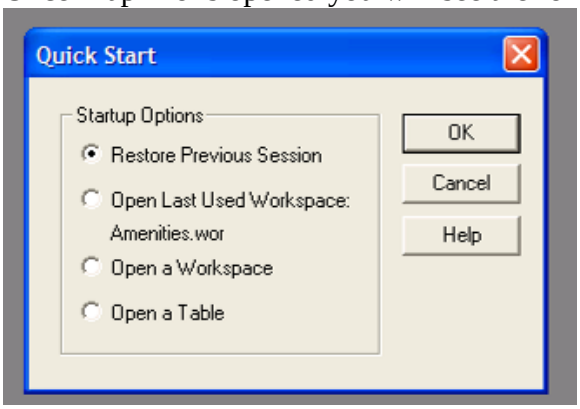
To open the program locate the following figure located on your desktop 

If there is no icon located on the desktop you can locate the same program by following the provided steps.

1. Click the START button
2. Click on ALL PROGRAMS
3. Locate MAPINFO
4. Click on the MAPINFO Button

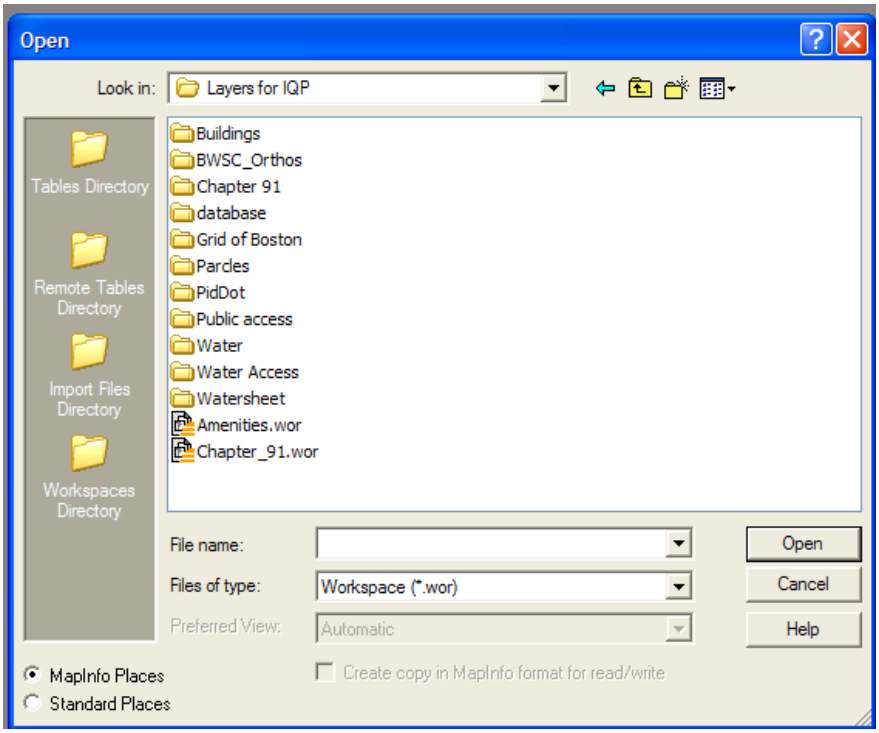
Step 2: Beginning Program

Once MapInfo is opened you will see the following screen:

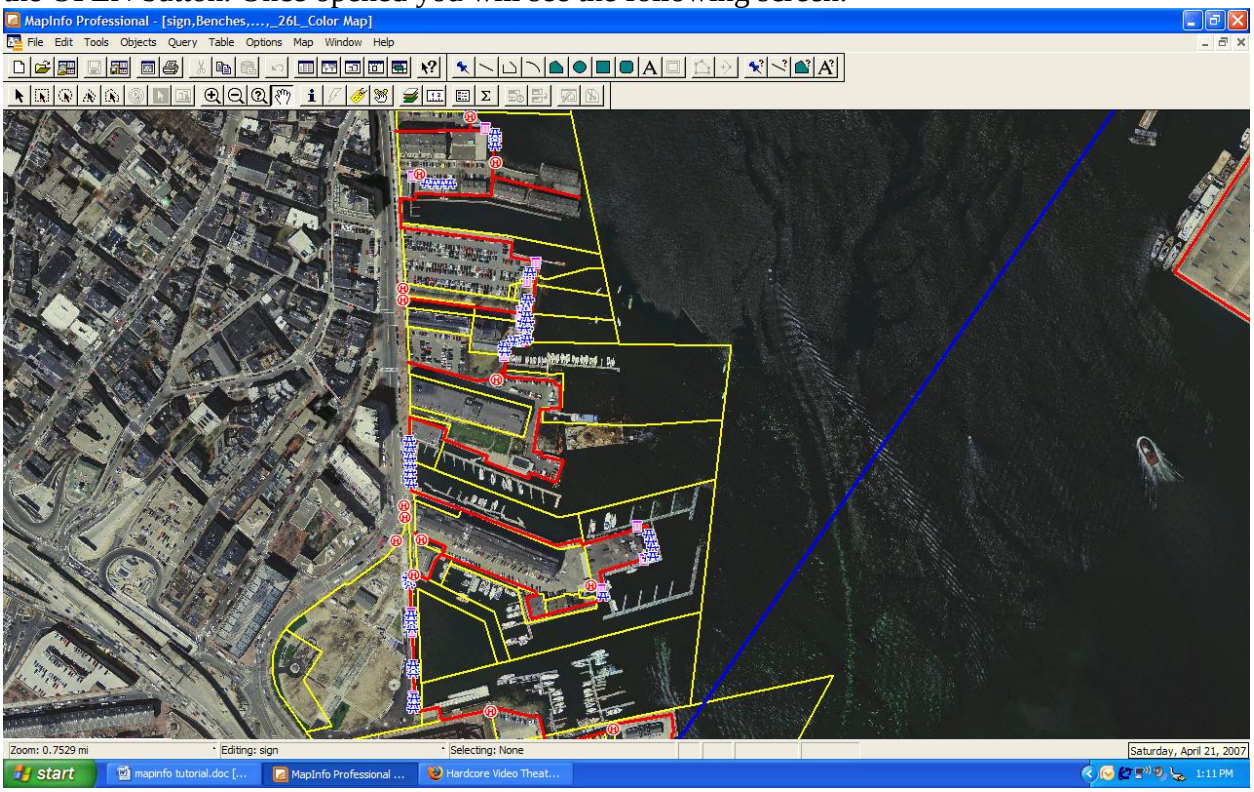


This table allows you to decide if you want to restore what you last worked on, open a workspace(a map with all of the layers you used) or a table(a single layer)

To access the Chapter 91 or public amenity workspaces simply click on the “Open a workspace” and then the OK button. The next screen you will see is the following:



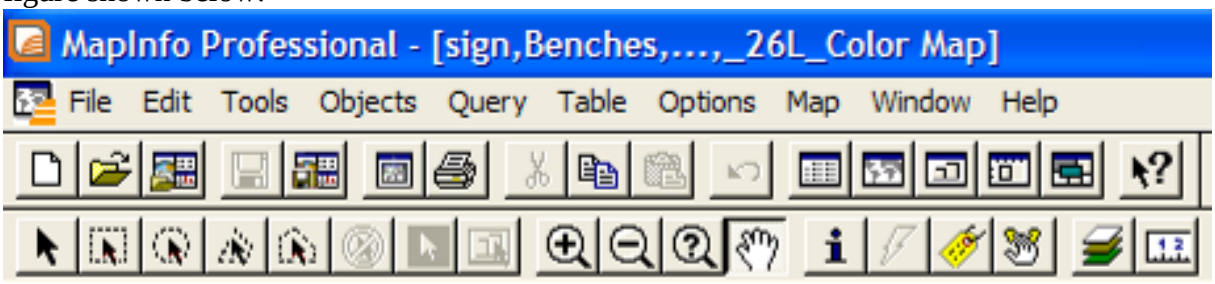
For this example we will select the amenities as the workspace. Click on the amenities and then the OPEN button. Once opened you will see the following screen:



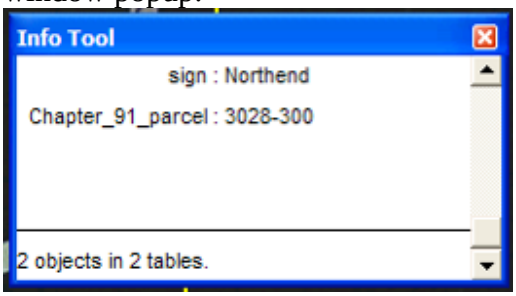
This screen is the map of the all the public amenities that were mapped, included in this map are benches, Harborwalk signs, trash receptacles and local T stations.

Step 3: Viewing the Information in the Data points

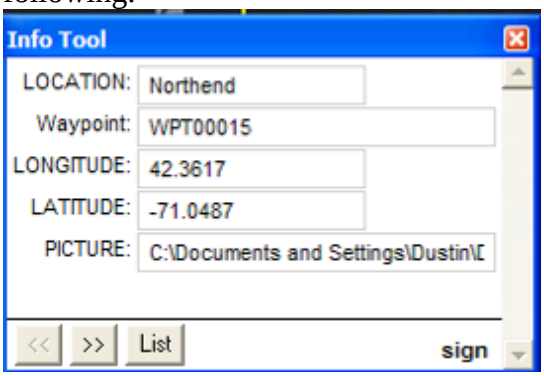
To view all of the data that is located in the data points. Simply click the *i* button located in the figure shown below:



Once you click the button you will be able to click on and parcel, data dot or Harborwalk line. For example, if you click on the Harborwalk sign on Commercial Wharf. You will have this window popup:



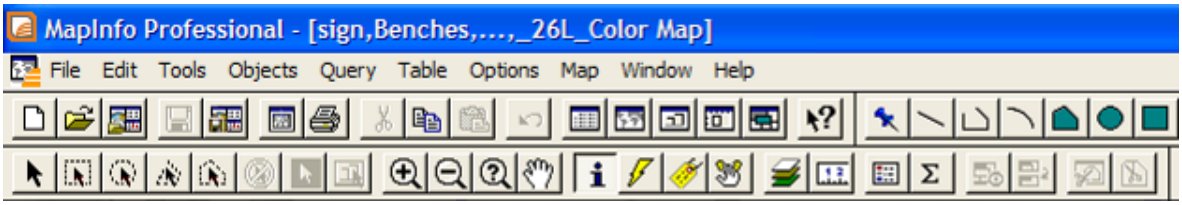
You can then click on the word sign and you will be lead to another window that looks like the following:



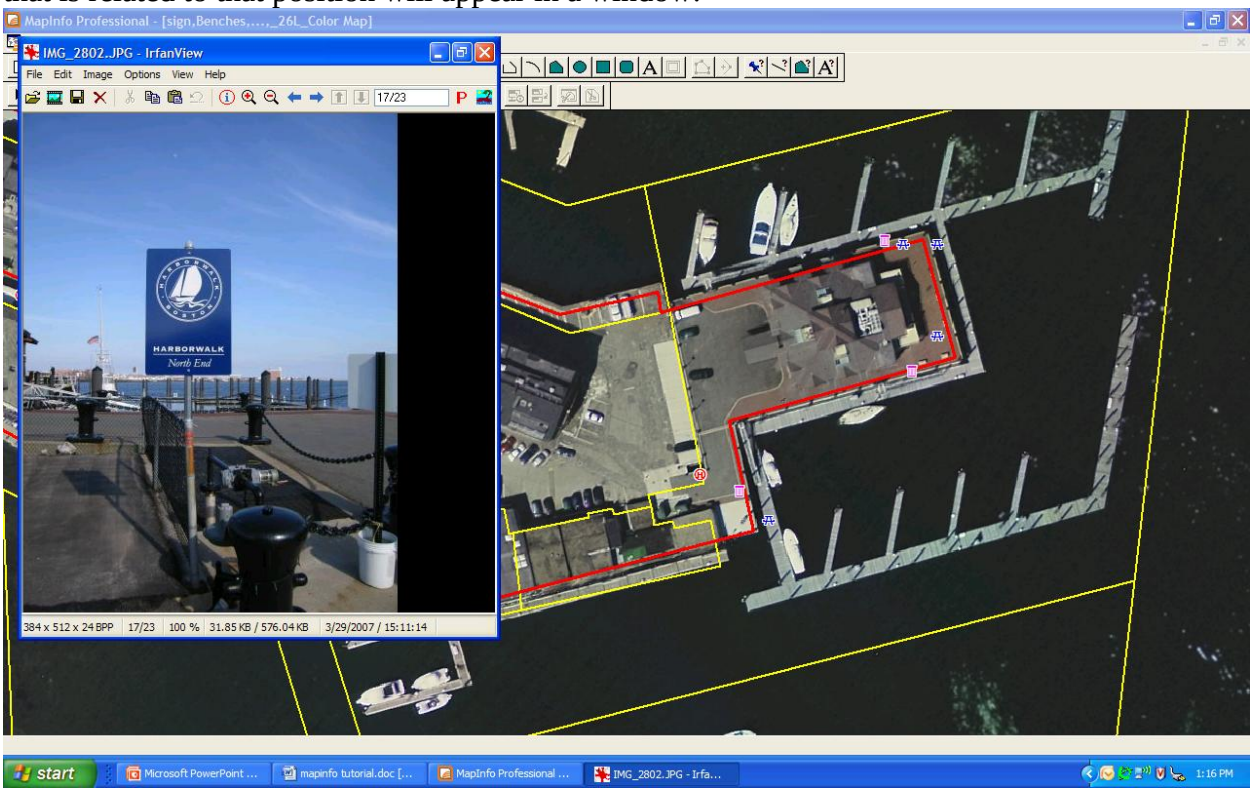
This table contains all of the location data that was taken when using a GPS unit.

Step 4: Viewing Harbor Walk Pictures

If you want to see a picture of the sign then you need to click on the lightning bolt that is located next to the *i* button:



Once you click this yellow lightning bolt just simply click on any of the red  and the picture that is related to that position will appear in a window:



For more step by step instructions to use MapInfo please go to the following website:
http://ece.wpi.edu/CityLab/UIS/Mapinfo/Mapinfo_podcasts.html

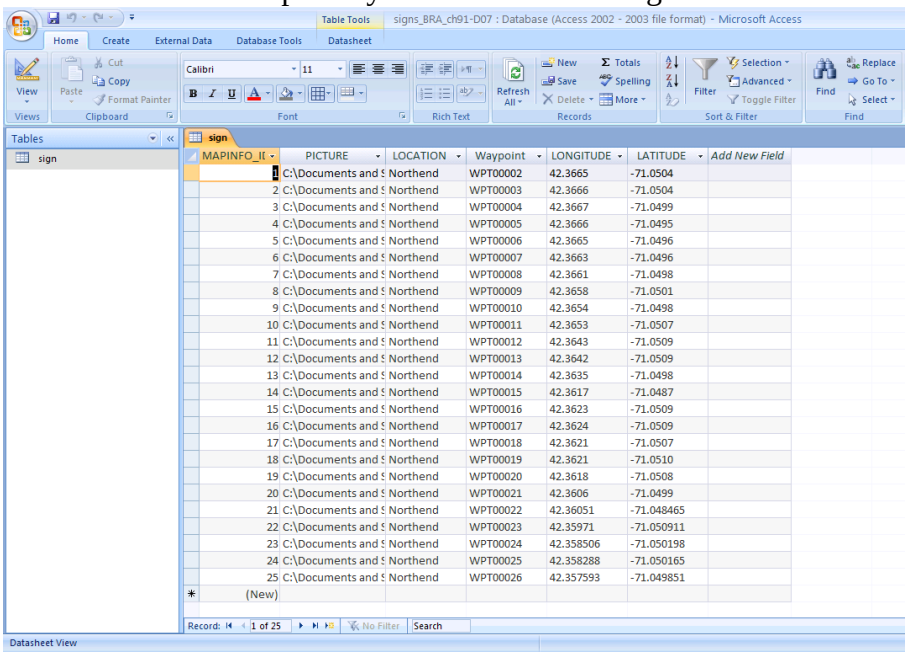
Importing Data points into GIS

Step 1: Open up spread sheet of GPS data

To open these files locate it on the hard drive or by opening Microsoft Excel and finding the Folder.
Once you open the file the spread sheet should look something like this:

	A	B	C	D	E	F
1	Time	latitude	longitude	elevation	waypoint	comment
2	3/27/2007 17:52	42.364091	-71.049513	8.1	WPT 00063	Single Bench
3	3/27/2007 17:52	42.36409	-71.049483	8.8	WPT 00064	Stool Bench
4	3/27/2007 17:52	42.364071	-71.049403	9.3	WPT 00065	Free Double Eye Scope
5	3/27/2007 17:52	42.364123	-71.049421	12.3	WPT 00066	Light Post
6	3/27/2007 17:52	42.364106	-71.04946	10.3	WPT 00067	Trash Barrel
7	3/27/2007 17:52	42.364146	-71.049448	8.5	WPT 00068	Double Bench: one broken
8	3/27/2007 17:52	42.364171	-71.04946	7.6	WPT 00069	Single Bench: metal frame broken
9	3/27/2007 17:52	42.364206	-71.049428	7.4	WPT 00070	Light Post
10	3/27/2007 17:52	42.364245	-71.049423	7.2	WPT 00071	Trash Barrel and light Post
11	3/27/2007 17:52	42.364348	-71.049406	7.8	WPT 00072	Free Single Eye Scope

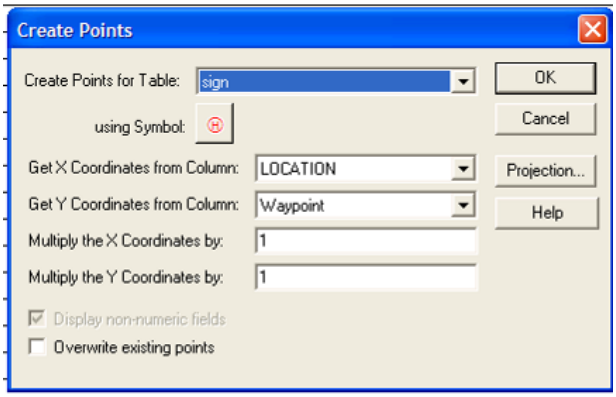
Once you see a spreadsheet similar to the once that is above simple open the database that is related to the amenity that was mapped on that trip. For example if you mapped all of the signs in South Boston, you would simply open the database that was named signs.
One this database is opened you will see something like this:



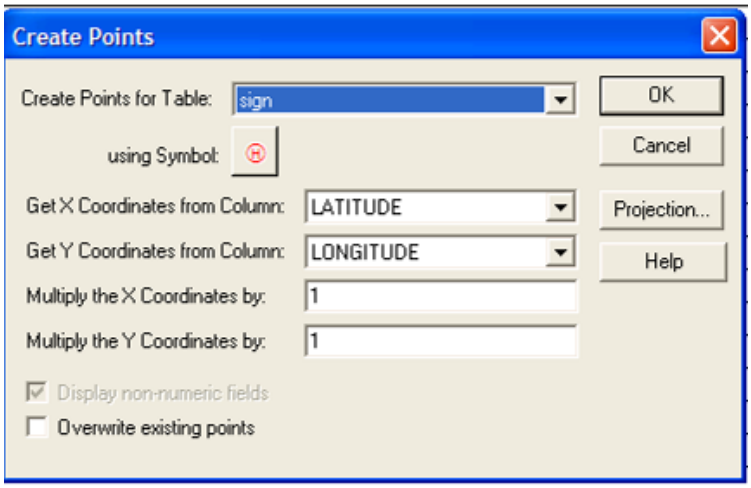
Now the next step would be to copy and paste all of the new locations into the empty cells. Once this is completed click SAVE and close the database.

Step 2: Updating Points

Now open MapInfo following the steps above.
Once opened Click on WINDOW, located on the top toolbar, once this is clicked you then click on NEW BROWSER WINDOW. When this is clicked a window will popup asking which table to open select SIGNS or the amenity that you mapped.
Once this is clicked a table will popup that is very similar to the one located in the database. The next step would be to clock on TABLE→CREATE POINTS
When this button is clicked you will see the following popup:



Simply select the amenity that you have mapped and the symbol that is associated with the amenity. Then you would select the LATITUDE as the X COORDINATE and the LONGITUDE as the Y COORDINATE. Once it looks like the following you can click ok.



Once this is clicked that map will be automatically updated with the new data points.

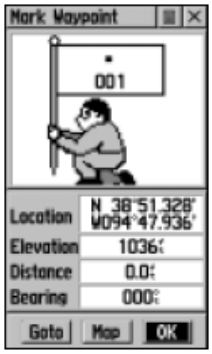
Appendix G: GPS User Manual

The following guide will outline how to map locations using the Garmin eTrex Venture. For detailed instructions please reference the owner's manual. A copy can be downloaded here: http://www8.garmin.com/manuals/eTrexVenture_OwnersManual.pdf

a) Make sure device is turned on and satellites are acquired. For accuracy please wait a couple seconds at each point for the position to be refined. In denser populated areas where the sky is blocked by buildings take special care that the signal quality is sufficient.

b) In the main menu click on 

. This will open the Mark Waypoint Page. Follow the instructions below on how to mark a waypoint.



To mark your current location as a waypoint:

1. Press in and hold the **THUMB STICK** until the Mark Waypoint Page appears. You can also access this page by highlighting the Mark Icon on the Main Menu Page and then pressing in on the **THUMB STICK.** It automatically is assigned a 3-digit number.
2. To change the name of the waypoint, use the **THUMB STICK** to highlight the waypoint name field and press it in to choose the appropriate letters or numbers one at a time.
3. To assign an identifying symbol to a waypoint, use the **THUMB STICK** to highlight the symbol block just above the waypoint name. Press the **THUMB STICK** and choose the symbol of your choice from the available list.
4. To save the waypoint, highlight 'OK' and press in on the **THUMB STICK**.
5. If you do not want to save it as a new waypoint, press the **PAGE** button before pressing any other to cancel.

c) Write down the waypoint number with a comment, such as "Harborwalk sign." We recommend using the following format:

Waypoint number	Picture number(s)	Comment
WP0004	IMG_4371,IMG_4372	North End Harborwalk Sign

d) Take pictures of the amenities in a standard fashion so that comparison is easy. For Harborwalk signs, stand a couple feet back so that the surroundings can be seen. If possible take photograph with sun in back for best results. Make sure date and time is enabled in the camera so it can be easily seen when the picture was taken. See figure below as a sample.

e) 

f) When mapping is complete, download all the collected waypoints to the computer using MapSource Software. Once the waypoints have been imported, please export them from

the Mapsource program. Next open excel and import the file into there. Please refer to the MapSource instruction manual on how to connect the GPS to the computer.
A copy of the manual can be found here:
http://www8.garmin.com/manuals/MapSource_MapSourceUsersGuide.pdf