Massachusetts Coastal Infrastructure
Inventory and Assessment Project
Massachusetts Department of Conservation and Recreation
Office of Waterways

North Coastal

Salisbury
Newburyport
Newbury
Rowley
Ipswich
Essex

dcr

July 6, 2009

Prepared for:

Massachusetts Department of Conservation and Recreation
Hingham, Massachusetts

Presented by:
Bourne Consulting Engineering
Franklin, Massachusetts

In Association With:
Waterfront Engineers

BCE **Bourne Consulting Engineering**
Waterfront Engineers

North Coastal

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Section I

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Section I – Coastal Hazards Infrastructure and Assessment Program

INTRODUCTION

The Project and Client

The Commonwealth of Massachusetts has initiated a Coastal Hazards Commission (CHC) to identify the vulnerability of the state to coastal hazards. As one of five working groups working under the CHC, the 20-Yr Infrastructure Plan was to establish a prioritization for the repair of coastal structures. The focus areas of the Working Group include:

- Publicly owned infrastructure
- Infrastructure for which State is responsible
- Inventory of public hazards infrastructure
- Evaluation on conditions
- Development for a prioritization of work
- Estimation of capital and maintenance costs

The 20-Yr Infrastructure Working Group is led by Representative Frank Hynes with CZM as the lead State Agency overseeing the management of the project. The Massachusetts coastline has been broken up into 4 major regions consisting of the North Shore, Boston, South Coast, and the Cape and Islands. The South Shore (the Towns of Hull, Cohasset, Seekonk, Hingham, Plymouth, Kingston, Scituate and Duxbury) was previously evaluated by Bourne Consulting Engineering as a demonstration project in 2006.

Consultant Team

The consultant team that performed the demonstration project was led by Bourne Consulting Engineering (***BCE***) of Franklin, MA who was responsible for overall project management, specified areas of field assessments, and research. Assisting ***BCE*** was Applied Coastal Research and Engineering Inc.of Mashpee, MA, Childs Engineering Corporation, of Medfield, MA., and Waterfront Engineer LLC of Stratham, NH.

PURPOSE

Study Purpose

CZM seeks to identify the capacity of Massachusetts coastal structures to resist major coastal storms and prevent storm damage. In working toward this goal, CZM has initiated a program to perform an assessment of Commonwealth owned and/or maintained coastal structures. The first phase of this program was the performance of a demonstration project for coastal structures located on the South Shore. The demonstration project identified existing structures, their general conditions, ability to provide coastal protection and the probable cost for repairs. The information collected and developed has been incorporated into the MassGIS system to allow use for developing a 20 Year Coastal Infrastructure Plan.

The demonstration project served as a basis for the current statewide inventory assessment of all Commonwealth coastal structures and the needs for their maintenance and/or repair.

Goals of Study

The goals of the Massachusetts Coastal Infrastructure Inventory and Assessment Project include:

- To identify all the coastal structures the state either owns or has responsibility to maintain for the 4 regions included within the study
- Of the structures identified, determine the structure location and characteristics, the structure condition relative to providing coastal protection and the structure importance in relation to what it is protecting.
- To the degree possible, identify the structure elevation and the FIRM mapping flood elevation and category.
- To the degree possible, identify structure owner and available documents from local, state and federal agencies.
- To establish an estimated cost to rehabilitate the coastal structures to provide the level of project established in the structure's original design.
- Provide the information in a format compatible for incorporation into the MassGIS system

Limit of Study

Due to the time constraints and the amount of effort necessary to collect, process and compile the information, the following are identified as limitations of the information presented:

- All property ownership was taken as presumed. No legal investigation of ownership was performed during the project. Property ownership is based on town assessor maps. Where structures were located outshore of assessor map defined property lines, it was assumed to be Town land unless other information indicated otherwise. Where structures were located outshore of Mean Low Water, property is assumed to be State owned.

- The structure ownership was based on assessor maps and research at the local, state and federal levels. Where there was indication of public work on a structure on Town land or on private property, the structure was presumed to be Town owned. Where the structure was on state property, the structure was presumed to be state owned. Where ownership of the structure was not clear but was located on private property, the structure ownership was defined as unknown.

- The study included town and state owned structures as it was assumed that most town owned structures received state funding at some level for construction and/or maintenance.
    - Structures that were determined to be private were not included.
    - Undocumented structures considered to be on private land, but having the potential to have been publicly built and/or maintained, were identified as having an "unknown ownership".

- The prioritizing of structures was based primarily on risk to general infrastructure and density of housing. Infrastructure included was buildings. The study did not consider all infrastructure issues including:
    - No consideration on utility impacts – water, electrical, sewer, gas
    - No consideration of roadway and bridge protection
    - Evacuation routes were not considered within the investigation
    - Location of Emergency Shelters were not included in priority assessments

- Research was performed at the local, state and federal levels. The local research was limited to location and documenting available coastal structure contract drawings. Research at DCR was restricted to available historic construction plans for coastal structures at the MA-DCR Waterways office in Hingham, MA, and MA-DCR Division of Urban Parks and Recreation in

Boston, MA. No investigation of state archives was performed. Research at MA DEP Chapter 91 and USACE was limited to recorded permits and licenses found in their files. No investigation was performed at the Registry of Deeds.

DEVELOPMENT OF MassGIS DATABASE ATTRIBUTES

The specific attributes that would be incorporated into the MassGIS system were developed based on the scope of work and the goals to be achieved. The following was established to standardize the data collection and presentation and to allow total flexibility for sorting by attributes in the final GIS database. The attributes identified below were input into a MS Access database which was used to manage the data from all eight communities within a single file.

Database Attributes

- Attribute Descriptions/Definitions

Structure Number: A unique structure number was given to each coastal structure. The number was based on existing numbering systems that include the State Department of Environmental Protection community number followed by the local community assessor's parcel numbering system. The last three digits of the number represent the structure within the parcel. Where structures extend over several parcels, the structure is referenced to a parcel that is approximately in the center of the structure. Where Town assessor's references include letters, those are also included within the structure number. Some communities have block numbering within their numbering system and these are included. Communities without block numbering still have the block numbering included but these are illustrated as all zeros for that specific segment.

Structures that are on Town property, which would otherwise not have a parcel number, are referenced to a parcel that is in the immediate vicinity of the coastal structure.

On this basis, the following is the general numbering convention:

CCC-MMM-BBB-PPP-SSS

Where:	CCC	DEP Community Number
	MMM	Community Map Number
	BBB	Block Number (000 if no block numbering system)
	PPP	Community Parcel Number
	SSS	Structure Number

Property Ownership: All property ownership was on a "presumed" basis as no legal verification of ownership was performed. The ownership of the property was classified under four basic areas which were private ownership (Private), Town ownership (Local), Commonwealth of Massachusetts ownership (State), federal government ownership (Federal) or unknown. Property ownership was based on Town assessor's maps. Where the location was located above Mean Low Water, and not within a defined parcel, the property ownership was presumed to be the Town unless documentation was found to indicate otherwise. Where a structure was located offshore of Mean Low Water, the property ownership was presumed to be federal.

Structure Ownership: The ownership of all structures is presumed as no verification of ownership was performed. Ownership of the structure was determined by research into historic state and federal

permits and the entity indicated on the permits as the applicant. Where no other information was found, the following was utilized:

- Structures located on private land but appearing to be significant structures were identified as owned by the Town or as "Unknown". Unknown was used were there was a question of local or private ownership.
- Structures on Town property were assumed to be owned by the Town
- Structures that were located off-shore were presumed to be federally owned
- Structures that were identified as being privately owned were eliminated from the database

Basis of Ownership: The basis of structure ownership was provided to give rationale to the structure ownership and identified the research resource that identified the ownership or the methodology otherwise used. The responses utilized were limited to the following:

- DPW – DPW Employee Interview
- DCR - Contract Drawings
- DEP – Ch 91 License
- USACE – Permits
- Property Ownership
- Offshore Structure

Structure Owner's Name: Ownerships names reflect the presumed owner of publicly owned structures. As this was for public structures only, the ownership was restricted to the community name, the state agency or the federal agency.

Earliest Structure Record: The year of the oldest document located for the structure. The information is determined from the document research performed on the structure from local, state and federal agencies. If no documents could be found than this entry is denoted as 'Unknown". Where documentation of the structure could be found, the date from the oldest document was utilized.

Primary Structure / Secondary Structure: Many of the coastal structures consisted of combined structures which were rated separately. It was typically found that one structure was significantly more predominant (Ex. Bulkhead/Seawall) and was therefore identified as the Primary Structure while a smaller structure might exist in front (ex. Revetment) of it. The type, height and material of each structure are identified separately. The condition of each structure was based on the Primary Structure. Where there was no secondary structure, the fields were left blank.

Structure Type: The structure type was categorized into five basic coastal structure categories which were Bulkhead/Seawall, Revetment, Coastal Beach, Coastal Dune, and Jetty/Groin.

Structure Material: The identification of the coastal structure's material of construction was performed and represents the primary material. Stone structures consisted of both mortared and non-mortared conditions.

Structure Height: Each type of structure was categorized by its visible height in feet which was broken into four specific ranges which are:

< 5 feet 5 to 10 feet 10 to 15 feet >15 feet

Structure Condition: A preliminary assessment of the condition for each structure was performed by the field teams. This was by visual observation only and no detailed investigation was performed. The condition assessments were based on a predefined five level rating system that ranged from Rating A for Excellent Condition to Rating F for Critical Condition. A detailed listing of the conditions and their definitions can be seen in Exhibit A.

Priority Rating: In order to account for the need for protection at any one site, a five level priority rating system was established. This allowed for consideration of public infrastructure protection, density of residential housing for development of structure overall importance for coastal protection. The ratings range from Level 1 for no infrastructure or residence protection to Level 5 for critical inshore infrastructure protection and/or high density residential. The detailed listing and definitions for the priority categories can be seen in Exhibit B.

Structure Repair / Reconstruction Cost: A preliminary estimation of construction costs to maintain or repair structures was made based on the preliminary field assessment of the structures. A Repair Cost Matrix was developed based on structure type, condition, height and material and can be seen in Exhibit C. Once each structure's type, height, and material classifications were determined, the cost per foot for the structure was determine from the Repair Cost Matrix and multiplied by the length of the structure to obtain the estimated repair/restoration cost. The cost matrix repair costs include a 20 percent construction cost contingency as well as 10 percent costs for engineering and permitting.

Structure Length: The length of each structure is provided and utilized in the development of the repair/reconstruction costs. The lengths are given to the nearest foot and taken as the linear distance along the structure, as determined by the GPS location, which takes into account structure angles and curvature.

Structure Elevation: The elevation of structures was determined in feet from existing information where available. The datum used is NAVD 88 and elevations are to the nearest foot. From a previous study much of the south shore coastal structures had elevations defined based on LIDAR mapping data. Where available structure documentation with elevations was found, in areas with no LIDAR data, the information was included within the structure information. Where there was no LIDAR information or existing documentation, the item has been left blank.

> LIDAR (Light Detection and Ranging) is technology that is currently being used for high-resolution topographic mapping by mounting a LIDAR sensor, integrated with Global Positioning System (GPS) and inertial measurement unit (IMU) technology, to the bottom of aircraft and measuring the pulse return rate to determine surface elevations.

FEMA Zone and Elevation: For each structure the FEMA Flood Insurance Rate Maps (FIRM) were researched for their Flood Zone designation and their Base Flood Elevation from the most recent FIRM maps for the specific Town. The elevations are provided in feet on the same datum as the FIRM maps (NGVD) with no adjustments or conversions.

Structure Comments: The engineering team provided a brief description and comment on the structure at the time of the field assessments which is provided in support of the condition rating that was given for the structure.

Pictures: At the time of the field assessments, digital photographs were taken to provide a general overview of the structure. The number of pictures was limited to a maximum of six. The first photograph for each structure is shown on the Structure Assessment Form. The list of all photographs is provided on the form.

Town Documents: Town documents represent the structure information that could be found in the Town's DPW/Engineering Department records. Where particular records could be found, a table of document information was developed and included within the database with limited descriptions.

MA - DCR Documents: MA-DCR documents represent the structure information that could be found within DCR – Waterways office in Hingham Where particular records could be found, a table of document information was developed and included within the database with limited descriptions.

MA - DEP Chp. 91 Licenses: MA-DEP Chapter 91 license documents represent the structure information that could be found within MA-DEP Chp 91 records in Boston. Where particular records could be found, they were scanned as pdf files and attached to the structure through the GIS database information. In addition, a table of license document information was developed and included within the database with limited descriptions

USACE Permits: USACE Permits represent the structure information that could be found within the Army Corp of Engineers regulatory office in Concord, MA. Where particular records could be found, they were scanned as pdf files and attached to the structure through the GIS database information. In addition, a table of license document information was developed and included within the database with limited descriptions.

DEVELOPMENT OF REPAIR / RECONSTRUCTION COSTS

A matrix to be used within the database has been developed to assess likely rehabilitation/repair costs to restore the coastal structures to their original design condition. No attempt was made to assess the level of exposure and associated level of protection that might be required to meet current design standards for these structures. These costs are only an estimation to bring these structures back to their original design intent based on 2006 construction costs.

The development of the cost matrix is based on the following:

Structure Condition Ratings – The condition of the coastal structures was determined in the field by the survey crew which was led by an engineer with waterfront structure assessment and design experience. The definitions of the rating criteria utilized for the assessments are presented elsewhere.

The cost implications for each rating condition are as follows:

- A Rating Structures not requiring any maintenance, repair or rehabilitation cost and would not be expected to experience damage if subject to a major coastal storm event
- B Rating Structures requiring limited or no repair and would be expected to experience only minor damage if subject to a major coastal storm event. The value of these maintenance costs is assumed to be 10 percent of the construction cost.
- C Rating Structures requiring moderate to significant level of repair or reconstruction and would be expected to experience significant damage if subject to a major coastal storm event. The structure is presumed to be effective under a major storm event. The value of the repair costs is assumed to be 50 percent of the construction cost.
- D Rating Structures requiring significant level of rehabilitation or total reconstruction and would be expected to experience significant damage or possibly fail if subject to a major coastal storm event. The value of the repair costs is assumed to be 100 percent of the construction cost.

- F Rating Structures requiring complete reconstruction and would expect to provide little or no protection from a major coastal storm event. The value of the repair costs is assumed to be 100 percent of the construction cost plus a cost for removal/disposal of the original structure.

Height of Structure – Height of a structure is a major factor in the structure cost and therefore was identified as a significant factor is assessing rehabilitation/repair construction costs. The structures were broken down into four major categories which were:

< 5'	Structures that were less than five feet in height
5'-10'	Structures five to 10 feet in height
10'-15'	Structures over 10 feet to 15 feet in height
> 15'	Structures greater than 15 feet in height – assumed 20 feet typical

Length of Structure – Length is based on field GPS location with measurements rounded to the nearest foot.

Bulkhead / Seawall Structures – These structures are assumed to be constructed out of concrete, steel, stone or wood with each having its own criteria for establishing costs. For each structure type the following was assumed:

- Concrete Seawalls – These walls were assumed to be gravity structures with the volume of concrete used based on the bottom width being one-half of the structure height. Costs of construction were based on a per cubic yard estimate that varied from $350 to $630 per cubic yard depending on the structure height. Values for excavation and demolition of existing structure were also included.
- Stone Seawalls - These walls were treated the same as concrete seawalls and assumed to be gravity structures with the volume of the structure based on the bottom width being one-half of the structure height. Costs of construction were based on a per cubic yard estimate that varied from $350 to $630 per cubic yard depending on the structure height. Values for excavation and demolition of existing structure were also included.
- Steel Bulkheads – Steel bulkheads were presumed to be constructed with steel sheet piling. Tie back systems were presumed for structures 10 feet or greater in height. Shorter walls were assumed to have a cantilever design. The total depth of sheeting was presumed to be two times the exposed height. The cost for construction varied from $40 per square foot to $60 per square foot plus the cost of excavation and demolition.
- Timber Bulkheads – Timber bulkheads were presumed to be constructed with timber piles at eight foot on center, horizontal wales and vertical four inch sheathing. The unit costs for installed materials used were $1,500 per pile and $7.50 per bfm.

Revetment Structures – Revetment structures were presumed to be constructed of dry placed (no concrete) stone with a two on one slope and a horizontal toe and crown equal to the thickness layer established for each height condition. The total thickness of the revetment layers varied from six to ten feet with the cost of armor and under-layer stone assumed to be $50 per ton and the crushed stone base to be $15 per ton.

Groins and Jetties – Groins and jetties were assumed to be the same materials and construction as the revetment structures but would have two sides and therefore double the quantities.

Coastal Beaches – Costs for restoration of Coastal beaches presumed the placement of beach renourishment sands at a 1-on-20 slope over the existing beach conditions. The cost for deposition of sand assumed relatively close source of material and utilized $20 per cubic yard for the material installed.

Coastal Dunes – Restoration of coastal dunes assumed a cross section of renourished sand with a one-on-four slope on one side of a 25 foot width at the defined dune height. The cost for deposition of sand assumed relatively close source of material and utilized $20 per cubic yard for the material installed.

Contingency – A contingency of 20 percent was added to all costs to reflect the unknowns associated with this level of rehabilitation/repair estimating.

Engineering and Regulatory Approvals – A ten percent increase to the cost matrix prices was assessed to represent the engineering design and regulatory approval requirements for the restoration of these structures.

EXHIBIT A

Structure Condition Table – 5 Level Rating System

Preliminary Condition Assessment		Definition Based Upon Perceived Immediacy of Action and Potential to Cause Damage if Not Corrected	Level of Action Required
A	Excellent	Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm	None
B	Good	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure	Minor
C	Fair	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide additional material for full protection and extended life	Moderate
D	Poor	Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.	Major
F	Critical	Conditions of structure/landform may warrant emergency stabilization as failure may result in potential loss of property and/or life. Landform eroded, loss of integrity Structure exhibits critical levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure provides little or no protection from a major coastal storm. Actions taken to totally reconstruct structure to regain full capacity. Landform stability is severely compromised, rate of erosion/material loss may be increasing, and landform does not provide adequate protection from a major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.	Immediate

EXHIBIT B

Priority Rating System - 5 Level Rating System

Preliminary Priority Level Assessment		Level Based Upon Perceived Immediacy of Action and Presence of Potential Risk to Inshore Structures if Not Corrected	Level of Action Required
I	None	No Inshore Structures or Residential Dwelling Units Present	Long Term Planning Considerations
II	Low Priority	Inshore Structures Present with Limited potential for Significant Infrastructure Damage	Future Project Consideration
III	Moderate Priority	Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)	Consider for Active Project Improvement Listing
IV	High Priority	High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)	Consider for Next Project Construction Listing
V	Immediate / Highest Priority	Critical Inshore Structures Present with Potential for Infrastructure Damage and/or High Density Residential Dwellings Conditions of structure may warrant emergency stabilization as failure may result in potential loss of property and/or life. (>10 dwellings impacted / 100 feet of shoreline)	Consider For Immediate Action Due to Public Safety and Welfare Issues

CZM SOUTH SHORE COASTAL INFRASTRUCTURE INVENTORY AND ASSESMENT PROJECT

EXHIBIT C

September 14, 2006

REPAIR / REHABILITATION COSTING DATA

Cost per linear foot of structure

STRUCTURE TYPE	STRUCTURE MATERIALS	STRUCTURE HEIGHT	STRUCTURE CONDITION RATING A	B	C	D	F
BULKHEAD/ SEAWALL	CONCRETE	Under 5 Feet	$0	$84	$425	$850	$983
		5 To 10 Feet	$0	$152	$759	$1,518	$1,782
		10 To 15 Feet	$0	$251	$1,254	$2,508	$2,970
		Over 15 Feet	$0	$396	$1,980	$3,960	$4,752
	STEEL	Under 5 Feet	$0	$54	$273	$546	$680
		5 To 10 Feet	$0	$165	$825	$1,650	$1,848
		10 To 15 Feet	$0	$251	$1,254	$2,508	$2,772
		Over 15 Feet	$0	$343	$1,716	$3,432	$3,795
	STONE	Under 5 Feet	$0	$84	$425	$850	$983
		5 To 10 Feet	$0	$152	$759	$1,518	$1,782
		10 To 15 Feet	$0	$251	$1,254	$2,508	$2,970
		Over 15 Feet	$0	$396	$1,980	$3,960	$4,752
	WOOD	Under 5 Feet	$0	$86	$431	$862	$994
		5 To 10 Feet	$0	$127	$632	$1,265	$1,463
		10 To 15 Feet	$0	$161	$804	$1,608	$1,872
		Over 15 Feet	$0	$202	$1,008	$2,017	$2,380
COASTAL BEACH	SAND	Under 5 Feet	$0	$26	$132	$264	$264
		5 To 10 Feet	$0	$127	$634	$1,267	$1,267
		10 To 15 Feet	$0	$224	$1,122	$2,244	$2,244
		Over 15 Feet	$0	$396	$1,980	$3,960	$3,960
COASTAL DUNE	SAND	Under 5 Feet	$0	$18	$93	$186	$186
		5 To 10 Feet	$0	$48	$238	$476	$476
		10 To 15 Feet	$0	$79	$395	$790	$790
		Over 15 Feet	$0	$132	$660	$1,320	$1,320
REVETMENT	STONE	Under 5 Feet	$0	$66	$333	$664	$730
		5 To 10 Feet	$0	$120	$601	$1,201	$1,300
		10 To 15 Feet	$0	$157	$781	$1,564	$1,696
		Over 15 Feet	$0	$247	$1,234	$2,468	$2,666
GROIN	STONE	Under 5 Feet	$0	$132	$664	$1,328	$1,460
		5 To 10 Feet	$0	$240	$1,201	$2,402	$2,600
		10 To 15 Feet	$0	$314	$1,564	$3,128	$3,392
		Over 15 Feet	$0	$494	$2,468	$4,937	$5,333

NOTE: Repair / Rehabilitation Costs include 10% for engineering and regulatory approvals and 20 % construction contingency.

Section II

Salisbury

Section II – Community Findings – Town of Salisbury

COMMUNITY DESCRIPTION

The Town of Salisbury consists of a land area of 15.43 square miles out of a total area of 17.84 square miles and had a population of 7,827 in the 2000 census. The Town is located on the North Shore of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline that is directly exposed to open ocean waves is 4 miles with the remaining shoreline semi-protected by offshore structures or landforms. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Salisbury, there were 12 structures which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen in Sheets 1 through Sheet 4 in Section II-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

STRUCTURE TYPE AND QUANTITY - Town of Salisbury

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Length
Bulkhead / Seawall	2		2				2315
Revetment	2		2				735
Breakwater							
Groin / Jetty	3		2	1			210
Coastal Dune	3		1	1	1		2145
Coastal Beach	2	2					165
	12	2	7	2	1		5570

Within the above table, the total length of each type of structure is also provided. The structures are listed by the type which is providing the primary coastal protection. Many sites have multiple structure types at the same location (i.e. revetment in front of seawall). These secondary structures, although not identified within these tables, are included in the development of repair/rehabilitation costs.

The development of repair costs has been included by structure type and by condition. In the Town of Salisbury's case there are a total of 10 structures which would require approximately $ 1.8 million to bring all the coastal structures to "A" Rating. Most critical will be the structures in the "D" and "F" classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event. To reconstruct these structures, identified in the preliminary survey as being in poor condition, an estimated $ 561, 680 would be required to upgrade the Town's coastal protection.

STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Salisbury

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Bulkhead / Seawall	2		$ 661,135				$ 661,135
Revetment	2		$ 96,234				$ 96,234
Breakwater							$ -
Groin / Jetty	3		$ 29,360	$ 320,892			$ 350,252
Coastal Dune	3		$ 45,030	$ 94,010	$ 561,680		$ 700,720
Coastal Beach	2						$ -
	12	$ -	$ 831,759	$ 414,902	$ 561,680	$ -	$ 1,808,341

Based on the limited research within the scope of this project research, the presumed ownership of the structures was established on an initial basis and would be subject to more intense review in future tasks. Structures identified as being owned privately were excluded from further consideration. Although ownership of the land on which the structure was located was a factor, the structure ownership was treated as a separate issue from land ownership. For the Town of Salisbury the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Salisbury

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Town Owned	1		$ 100,980				$ 100,980
Commonwealth of Massachusetts	11		$ 730,779	$ 414,902	$ 561,680		$ 1,707,361
Federal Government Owned							$ -
Unknown Ownership							$ -
	12	$ -	$ 831,759	$ 414,902	$ 561,680	$ -	$ 1,808,341

The identification of presumed ownership was not based on the investigation of legal documents but relied on property ownership and from construction and regulatory documents that were found. A more detailed investigation of legal documents and agreements would be required where structure ownership is disputed. A more detailed identification of structure type, length, condition and location can be found in Section II-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

The enclosed reports and associated documents reflects the Town of Salisbury's coastal structure information that will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

This database will also provide relatively quick access to identify available documentation for these structures as well as the ability to be updated as coastal structure improvements are made.

Section II - Salisbury

Part B

Structure Assessment Reports

COASTAL STRUCTURE LOCATION PLAN

TOWN OF SALISBURY
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

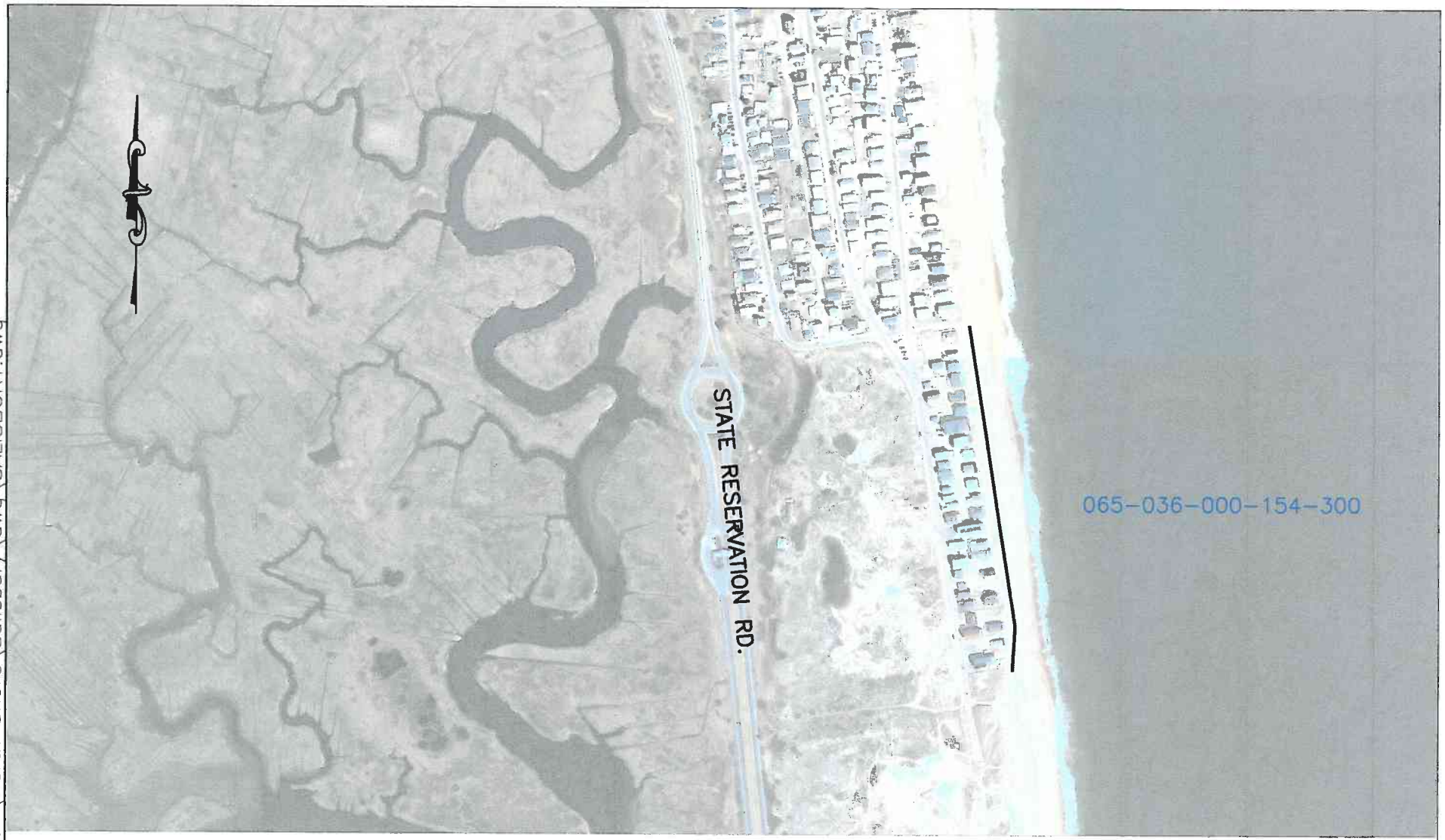
0 150

SCALE: 1" = 150'

BCE Bourne Consulting Engineering
3 Bond Street
Franklin, MA 02038
TEL. (508) 533-4888 FAX. (508) 533-4889

SHEET 1

File: X:\27652-\27667\North Shore\Salisbury\dwg\SALISBURY.dwg



COASTAL STRUCTURE LOCATION PLAN

TOWN OF SALISBURY
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150

SCALE: 1" = 150'

BCE Bourne Consulting Engineering
3 Pond Street
Franklin, MA 02038
TEL. (508) 633-6080 FAX. (508) 633-6029

SHEET 2

File: X:\27652-\27667\North Shore\Salisbury\dwg\SALISBURY.dwg

COASTAL STRUCTURE LOCATION PLAN

TOWN OF SALISBURY
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150

SCALE: 1" = 150'

BCE Bourne Consulting Engineering
3 Bank Street
Franklin, MA 02038
TEL. (508) 533-8600 FAX. (508) 533-8616

SHEET 3

File: X:\27652-\27667\North Shore\Salisbury\dwg\SALISBURY.dwg

COASTAL STRUCTURE LOCATION PLAN

TOWN OF SALISBURY
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'

BCE Bourne Consulting Engineering
3 Bank Street
Franklin, MA 02038
TEL. (508) 553-0000 FAX. (508) 553-0000

SHEET 4

File: X:\27652-\27667\North Shore\Salisbury\dwg\SALISBURY.dwg

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-007-000-010-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	First Street	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Salisbury	1948	$100,980.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
255 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Stone	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A mortared granite block seawall in generally good condition, though the top of the wall cantilevers out beyond toe of wall.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

- 065-007-000-010-100-PHO1A.JPG
- 065-007-000-010-100-PHO1B.JPG
- 065-007-000-010-100-PHO1C.JPG
- 065-007-000-010-100-PHO1D.JPG

Structure Documents:

USACE	April 2001	Permit Plan - Town	065-007-000-010-100-COE1A
MA-DCR	March 2002	Town Pier Facility	065-007-000-010-100-DCR1A
DEP	October 26,	Plan Accompanying	065-007-000-010-100-LIC1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-007-000-015-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Gillis Bridge	3/13/2009

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MHD	Unkown	$33,772.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
215 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	10 to 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Placed stone revetment in front of the bridge abutment. No visable scour, some stone rotation. Stones are 3 feet by 2 feet by 2 feet. Creast is one stone width. Slope is 1 on 1.

Condition Rating	B Good
Level of Action	Minor
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority Rating	IV High Priority
Action	Consider for Next Project Construction Listing
Description	High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

065-007-000-015-100-PHO1A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-007-000-015-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Gillis Bridge	3/13/2009

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MHD	Unknown	$19,760.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
40 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Groin/ Jetty	Stone	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Placed stone groin with stone that are approximately 3 feet by 3 feet by 3 feet. Slope is approximately one on one. Minor unreveling at the head of the groin. The creast is one stone wide. There appears to be one layer of armor stone.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

065-007-000-015-200-PHO2A.JPG

065-007-000-015-200-PHO2B.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-030-000-001-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Merrimac River	9/25/2007

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	1974	$62,462.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
520 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A stone revetment at a boat ramp in satifactory condition. The geotextile is exposed between stones.

Condition Rating	B Good
Level of Action	Minor
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority Rating	II Low Priority
Action	Future Project Consideration
Description	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

065-030-000-001-100-PHO1A.JPG

Structure Documents:

USACE	April 1974	Proposed Access	065-030-000-001-100-COE1A
MA-DCR	March 1974	Proposed Access	065-030-000-001-100-DCR1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-030-000-001-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	State Park	9/25/2007

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	Unkown	$320,892.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
130 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Groin/ Jetty	Stone	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A stone groin unravelling inshore at the west side and at the offshore end. Both sides and crest underlayer stone are exposed but in fair condition.

Condition Rating	C
	Fair
Level of Action	Moderate
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority Rating	I
	None
Action	Long Term Planning Considerations
Description	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

065-030-000-001-200-PHO2A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-030-000-001-300

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	State Park	9/25/2007

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	1952	$560,155.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
2060 Feet	11 Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Concrete	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:
Revetment	Stone	5 to 10 Feet

Structure Summary :

A precast concrete wave return face seawall set on top of stone revetment. Generally in satisfactory condition, except there is 300 linear feet of damaged revetment and loss of wall backfill along centered portion of wall. There are trees, shrubs and dune behind wall, and a campground roadway set back.

Condition Rating	B Good
Level of Action	Minor
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority Rating	I None
Action	Long Term Planning Considerations
Description	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

065-030-000-001-300-PHO3A.JPG

Structure Documents:

MA-DCR	April 1952	Proposed Shore	065-030-000-001-300-DCR3A
MA-DCR	March 2001	Seawall	065-030-000-001-300-DCR3B
MA-DCR	May 2002	Emergency Seawall	065-030-000-001-300-DCR3C

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-030-000-001-400

Key: community-map-block-parcel-structure

Property Owner: State

Location: State Park

Date: 9/25/2007

Presumed Structure Owner: State

Based On Comment:

Owner Name: MA-DCR

Earliest Structure Record: Unkown

Estimated Reconstruction/Repair Cost: $9,600.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
40 Feet	11 Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Groin/ Jetty	Stone	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A mortared stone groin with minor mortar loss. The stones at the offshore end have shifted approximately 3 inches offshore, causing open joints. Generally satisfactory condition.

Condition Rating	B Good
Level of Action	Minor
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority Rating	I None
Action	Long Term Planning Considerations
Description	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

065-030-000-001-400-PHO4A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-030-000-001-500

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Salsbury Beach South Dune	3/19/2009

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	Unkown	$94,010.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
395 Feet	Feet NAVD 88	V2	16 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Dune	Sand	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Sand dune at the southern most part of Salisbury Beach. Behind is parking lot, in front is a sandy beach. Dune is well covered withi dune grass but has signs of minor erosion.

Condition Rating	C Fair	*Priority Rating*	I None
Level of Action	Moderate	*Action*	Long Term Planning Considerations
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.	*Description*	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

065-030-000-001-500-PHO5A.JPG

065-030-000-001-500-PHO5B.JPG

065-030-000-001-500-PHO5C.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-032-000-104-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Broadway	9/25/2007

Presumed Structure Owner:	Based On Comment:
State	Tax Map

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	Unkown	$0.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
110 Feet	15 Feet NAVD 88	V2	15 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Beach	Sand	Under 5 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A beach nourishment area per the Harbor Master, good condition. Some nearby buildings elevated on piles.

Condition Rating	A Excellent
Level of Action	None
Description	Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm.

Priority Rating	I None
Action	Long Term Planning Considerations
Description	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

065-032-000-104-100-PHO1A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-036-000-154-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Salisbury Beach	9/25/2007

Presumed Structure Owner:	Based On Comment:
State	Tax Map

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	2000	$45,030.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
570 Feet	15 Feet NAVD 88	V2	16 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Dune	Sand	10 to 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A dune with sand fence and some dune grass at the crest. There is some recently dumped sand and some ocean side erosion. There is street parking behind the dune.

Condition Rating	B Good
Level of Action	Minor
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority Rating	II Low Priority
Action	Future Project Consideration
Description	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

065-036-000-154-100-PHO1A.JPG

Structure Documents:

MA-DCR	Jan 2000	Proposed Dune	065-036-000-154-100-DCR1A
MA-DCR	May 2000	Proposed Dune	065-036-000-154-100-DCR1B

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-036-000-154-200

Key: community-map-block-parcel-structure

Property Owner: State

Location: Driftway Street

Date: 9/25/2007

Presumed Structure Owner: State

Based On Comment: Tax Map

Owner Name: MA-DCR

Earliest Structure Record: Unkown

Estimated Reconstruction/Repair Cost: $0.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
55 Feet	15 Feet NAVD 88	V2	15 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Beach	Sand	Under 5 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A beach nourishment area, per the Harbor Master, that is in good condition.

Condition Rating	A Excellent
Level of Action	None
Description	Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm.

Priority Rating	I None
Action	Long Term Planning Considerations
Description	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

065-036-000-154-200-PHO2A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Salisbury

Structure ID: 065-036-000-154-300

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Salisbury Beach Dune	3/19/2008

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	Unkown	$561,680.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
1180 Feet	16 Feet NAVD 88	V2	16 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Dune	Sand	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Dune fronting small houses. Many areas of low spots and voids. Not a consistant shape. Slope is eroded throughout. In front of it is a sandy beach.

Condition Rating	D Poor
Level of Action	Major
Description	Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority Rating	III Moderate Priority
Action	Consider for Active Project Improvement Listing
Description	Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

065-036-000-154-300-PHO3A.JPG

065-036-000-154-300-PHO3B.JPG

065-036-000-154-300-PHO3C.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

Section II - Salisbury

Part C

Structure Photographs

TOWN: SALISBURY
SOURCE: WFE - FIELD PHOTOGRAPHS
LOCATION: Bourne Consulting Engineering
DATE OF RESEARCH: AUGUST 2007

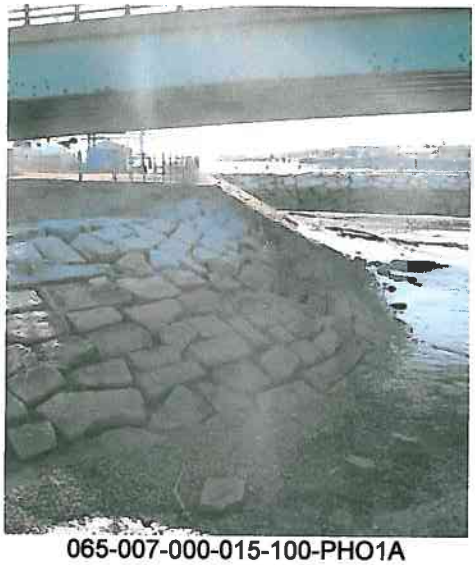
BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
065-007-000-010-100	065-007-000-010-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-007-000-010-100	065-007-000-010-100-PHO1B.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-007-000-010-100	065-007-000-010-100-PHO1C.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-007-000-010-100	065-007-000-010-100-PHO1D.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-007-000-015-100	065-007-000-015-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-007-000-015-200	065-007-000-015-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-007-000-015-200	065-007-000-015-200-PHO2B.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-030-000-001-100	065-030-000-001-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-030-000-001-200	065-030-000-001-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-030-000-001-300	065-030-000-001-300-PHO3A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-030-000-001-400	065-030-000-001-400-PHO4A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-030-000-001-500	065-030-000-001-500-PHO5A.JPG		Bourne Consulting Engineering		Mar-09	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-030-000-001-500	065-030-000-001-500-PHO5B.JPG		Bourne Consulting Engineering		Mar-09	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-030-000-001-500	065-030-000-001-500-PHO5C.JPG		Bourne Consulting Engineering		Mar-09	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-032-000-104-100	065-032-000-104-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-036-000-154-100	065-036-000-154-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-036-000-154-200	065-036-000-154-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-036-000-154-300	065-036-000-154-300-PHO3A.JPG		Bourne Consulting Engineering		Mar-09	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-036-000-154-300	065-036-000-154-300-PHO3B.JPG		Bourne Consulting Engineering		Mar-09	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
065-036-000-154-300	065-036-000-154-300-PHO3C.JPG		Bourne Consulting Engineering		Mar-09	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey


065-007-000-010-100-PHO1A


065-007-000-010-100-PHO1B


065-007-000-010-100-PHO1C


065-007-000-010-100-PHO1D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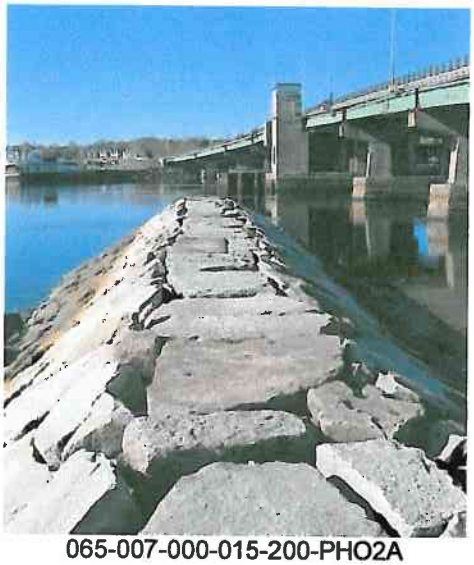
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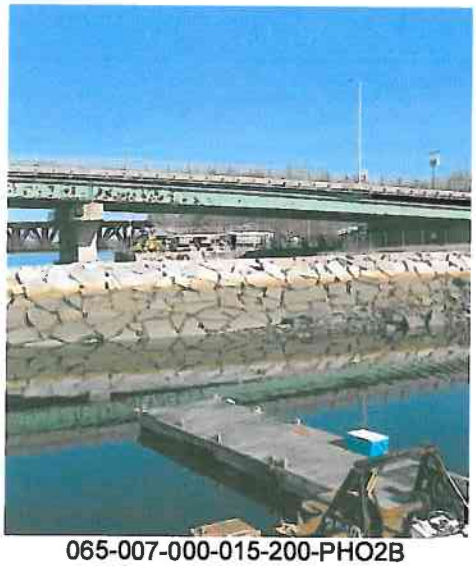
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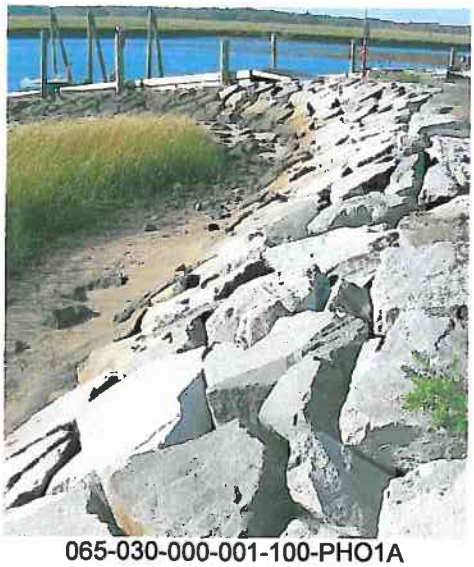
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065-030-000-001-400-PHO4A


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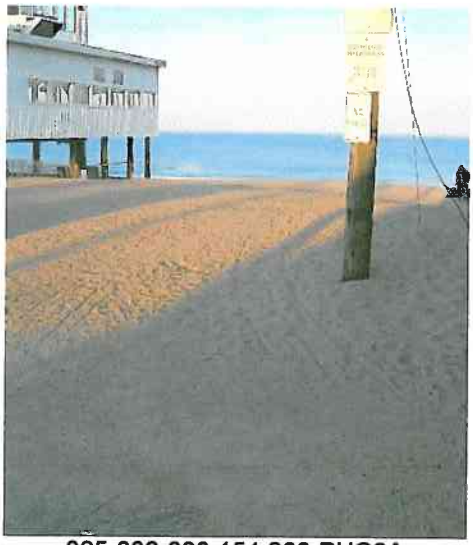
065-036-000-154-100-PHO1A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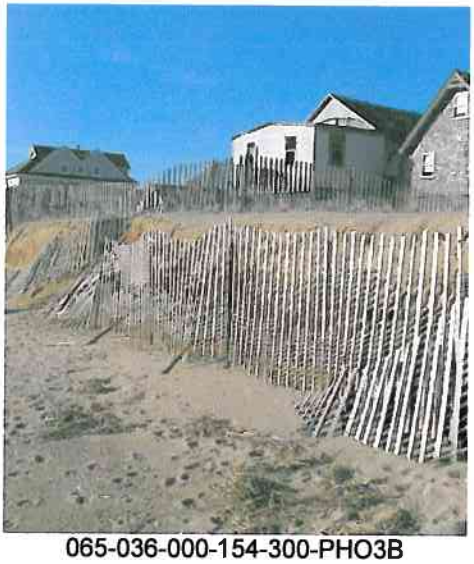


065-036-000-154-300-PHO3B

065-036-000-154-300-PHO3C

Section II - Salisbury

Part D

Structure Documents

TOWN DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents

TOWN: SALISBURY
SOURCE: Town of Salisbury
LOCATION: TOWN
DATE OF RESEARCH: JULY 2007

No Town Documents for the Town of Salisbury

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

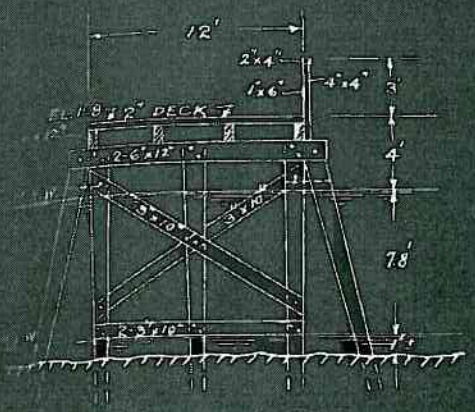
TOWN: SALISBURY
SOURCE: MA-DCR
LOCATION: MA-DCR BOSTON and HINGHAM, MA
DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
065-007-000-010-100	065-007-000-010-100-DCR1A	02-11	MA-DCR	Salisbury	March 2002	Town Pier Facility Rehabilitation - Town of Salisbury	12	First and Secon Street	Bulkhead
065-030-000-001-100	065-030-000-001-100-DCR1A	4984	MA-DCR	Salisbury	March 1974	Proposed Access Ramp and Facilities - Black Rock Creek at Merrimack River - Salisbury	3	Black Rock Creek at Merrimack River	Ramp
065-030-000-001-300	065-030-000-001-300-DCR3A	1211	MA-DCR	Salisbury	April 1952	Proposed Shore Protection - Salisbury Beach Reservation - Salisbury - Prepared for the DPW of Massachusetts - Division of Waterways	2	Salisbury Beach Reservation	Stone Mound and Precast Wall
065-030-000-001-300	065-030-000-001-300-DCR3B	3444	MA-DCR	Salisbury	March 2001	Seawall Rehabilitation - Salisbury Beach State Reservation	1	East of Parking Lot	Seawall and Riprap
065-030-000-001-300	065-030-000-001-300-DCR3C	3479	MA-DCR	Salisbury	May 2002	Emergency Seawall Rehabilitation - Salisbury Beach State Reservation	1	East of Parking Lot	Revetment and Seawall
065-036-000-154-100	065-036-000-154-100-DCR1A	3411	MA-DCR	Salisbury	January 2000	Proposed Dune Construction - 9 Ocean Fron Street 4016 North End Boulevard - Salisbury	2	Ocean Front Street and North End Boulevard	Dune
065-036-000-154-100	065-036-000-154-100-DCR1B	N/A	MA-DCR	Salisbury	May 2000	Proposed Dune Construction - 9 Ocean Front South	1	9 Ocean Front South	Dune Construction

TOWN: SALISBURY
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
065-007-000-010-100	065-007-000-010-100-LIC1A	3095	DEP	Salisbury	October 26, 1948	Plan Accompanying Petition of Town of Salisbury to Build a Solid fill And Pile and Timber Pier in Merrimack River Salisbury 1948	1	Merrimack River	Bulkhead Seawall

065-007-000-010-100



SECTION A-A
SCALE-FEET 10
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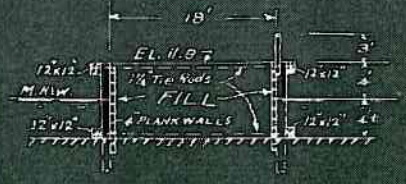

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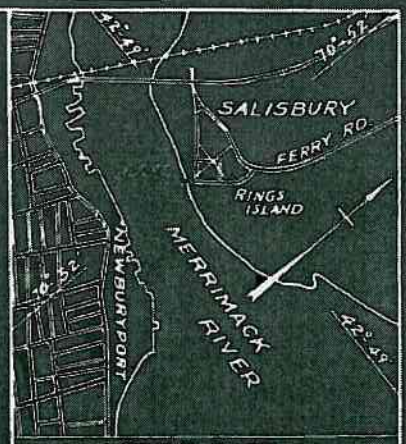
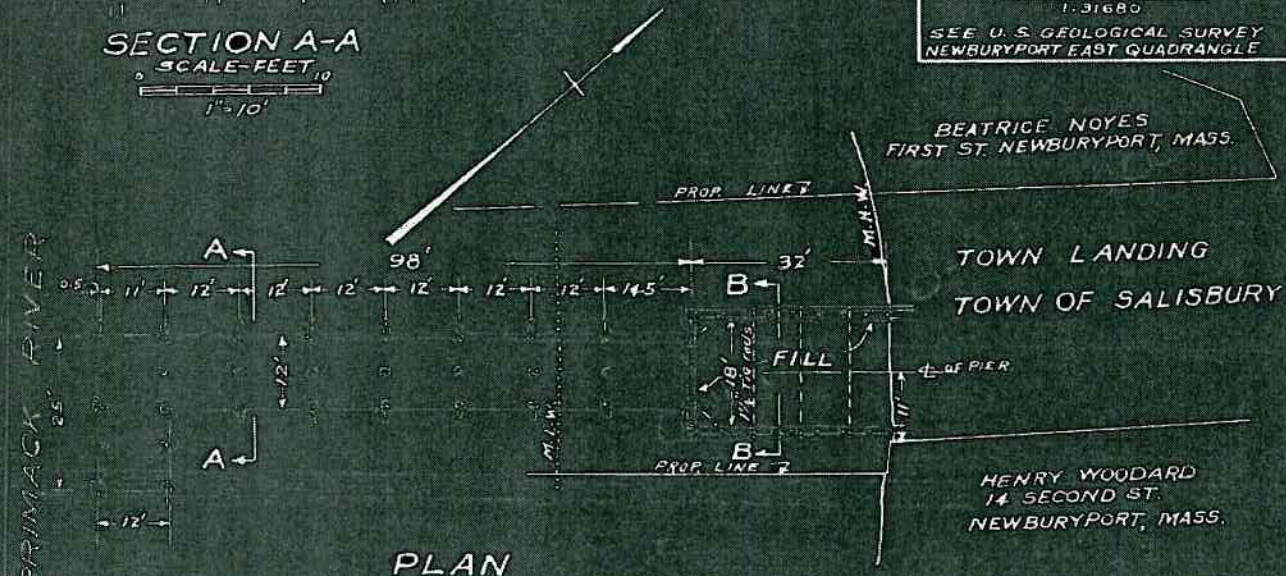
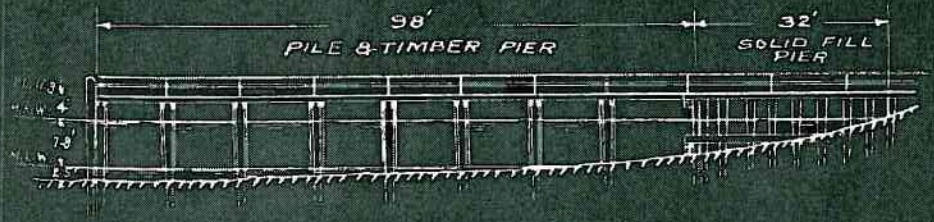


SEE U.S. GEOLOGICAL SURVEY
NEWBURYPORT EAST QUADRANGLE



PLAN
SCALE-FEET 30
1"=30'



ELEVATION
SCALE-FEET 30
1"=30'

PLAN ACCOMPANYING PETITION OF
TOWN OF SALISBURY
TO BUILD A SOLID FILL AND PILE AND TIMBER PIER IN
MERRIMACK RIVER
SALISBURY
1948

NO 3095
APPROVED BY DEPARTMENT OF PUBLIC WORKS
OCTOBER 26, 1948

COMMISSIONER OF PUBLIC WORKS

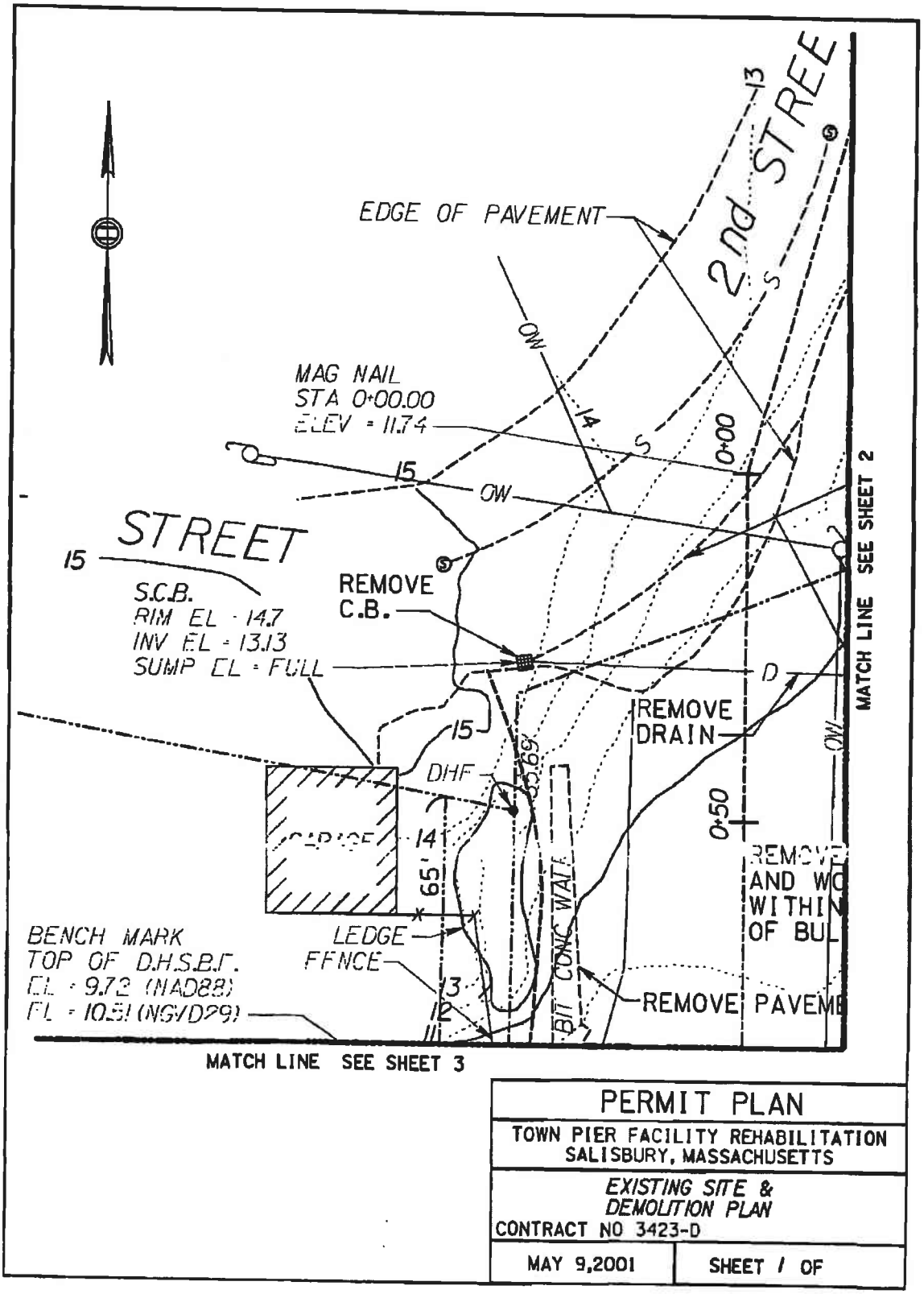
ASSOCIATE COMMISSIONERS

DIRECTOR - DIVISION OF WATERWAYS

TOWN: SALISBURY
SOURCE: US ACOE
LOCATION: CONCORD, MA
DATE OF RESEARCH: AUGUST 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
065-007-000-010-100	065-007-000-010-100-COE1A	200101026	USACE	Salisbury	April 2001	Permit Plan - Town Pier Facility Rehabilitation - Salisbury, Massachusetts	35	Town Pier	Bulkhead
065-030-000-001-100	065-030-000-001-100-COE1A	74-218	USACE	Salisbury	April 1974	Proposed Access Ramp and Facilities - Black Rock Creek at Merrimack River - Salisbury, Massachusetts - Application by DPW of Massachusetts - Division of Waterways	1	Black Rock Creek	Revetment

065-007-000-010-100



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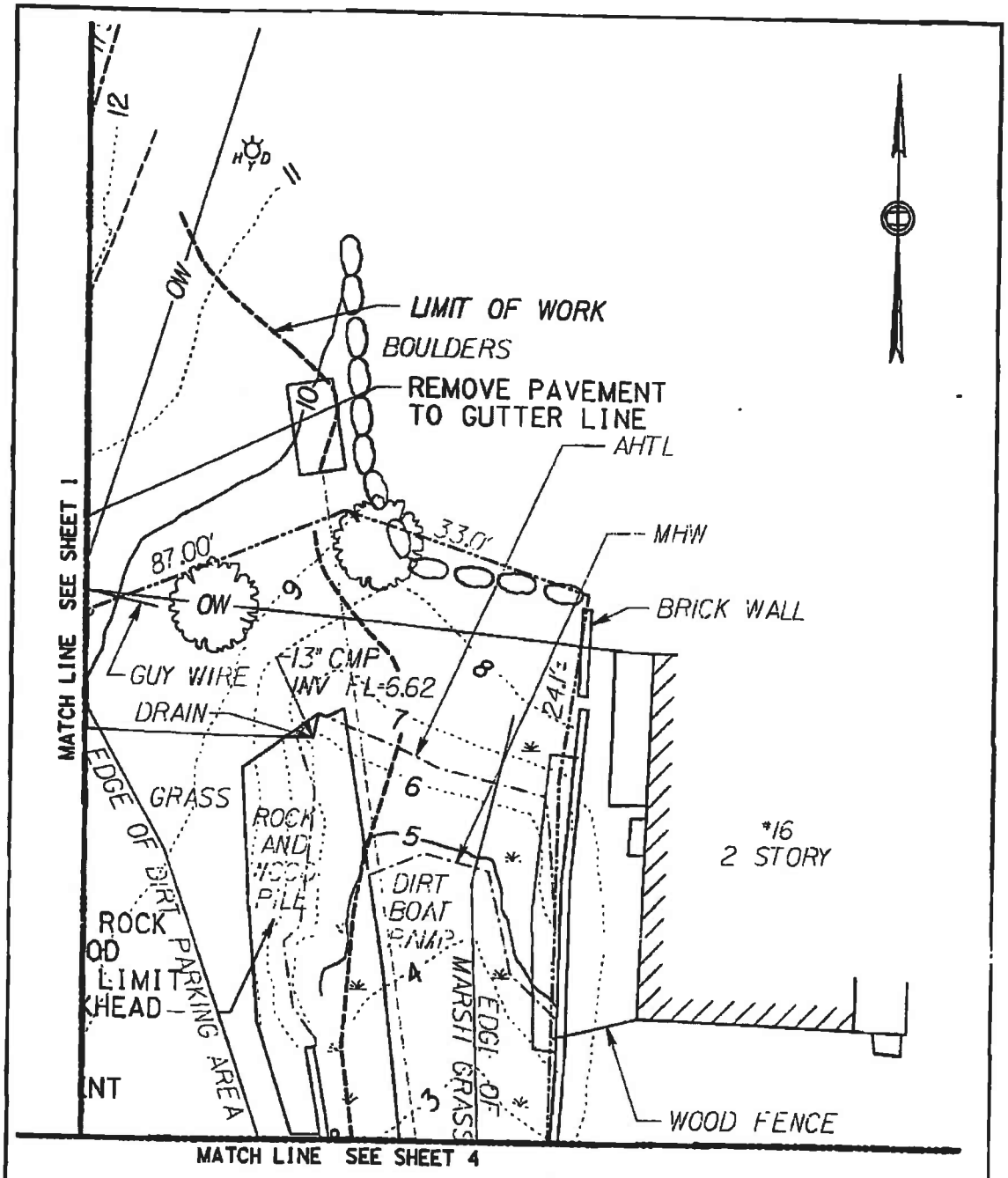
DATE: 10-May-01 15:46

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
EXISTING SITE & *DEMOLITION PLAN* CONTRACT NO 3423-D	
MAY 9,2001	SHEET 1 OF

065-007-000-010-100



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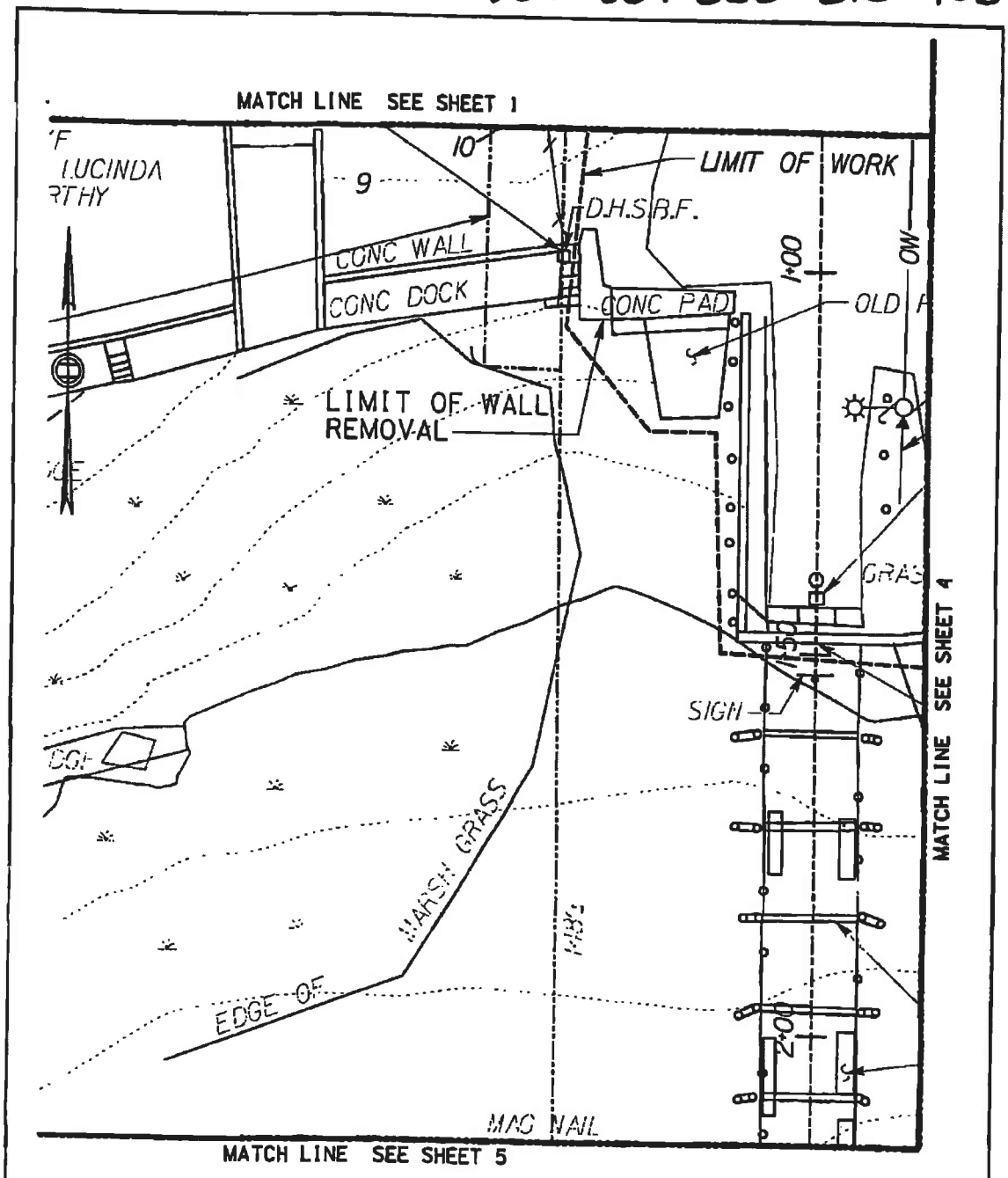
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
EXISTING SITE & DEMOLITION PLAN	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 2 OF

065-007-000-010-100



PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
EXISTING SITE & DEMOLITION PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 3 OF

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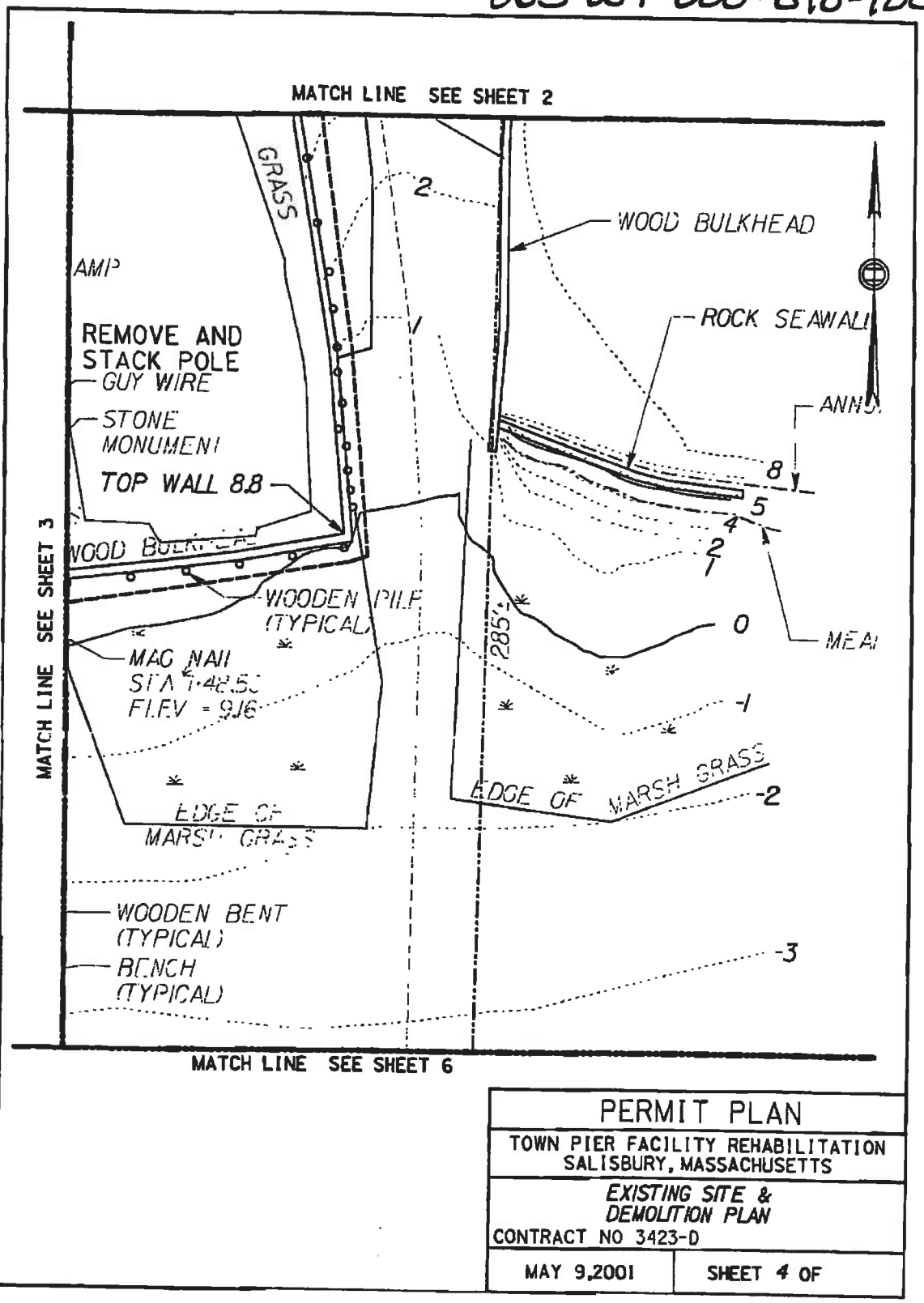
065-007-000-010-100



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TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
EXISTING SITE & *DEMOLITION PLAN*	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 4 OF

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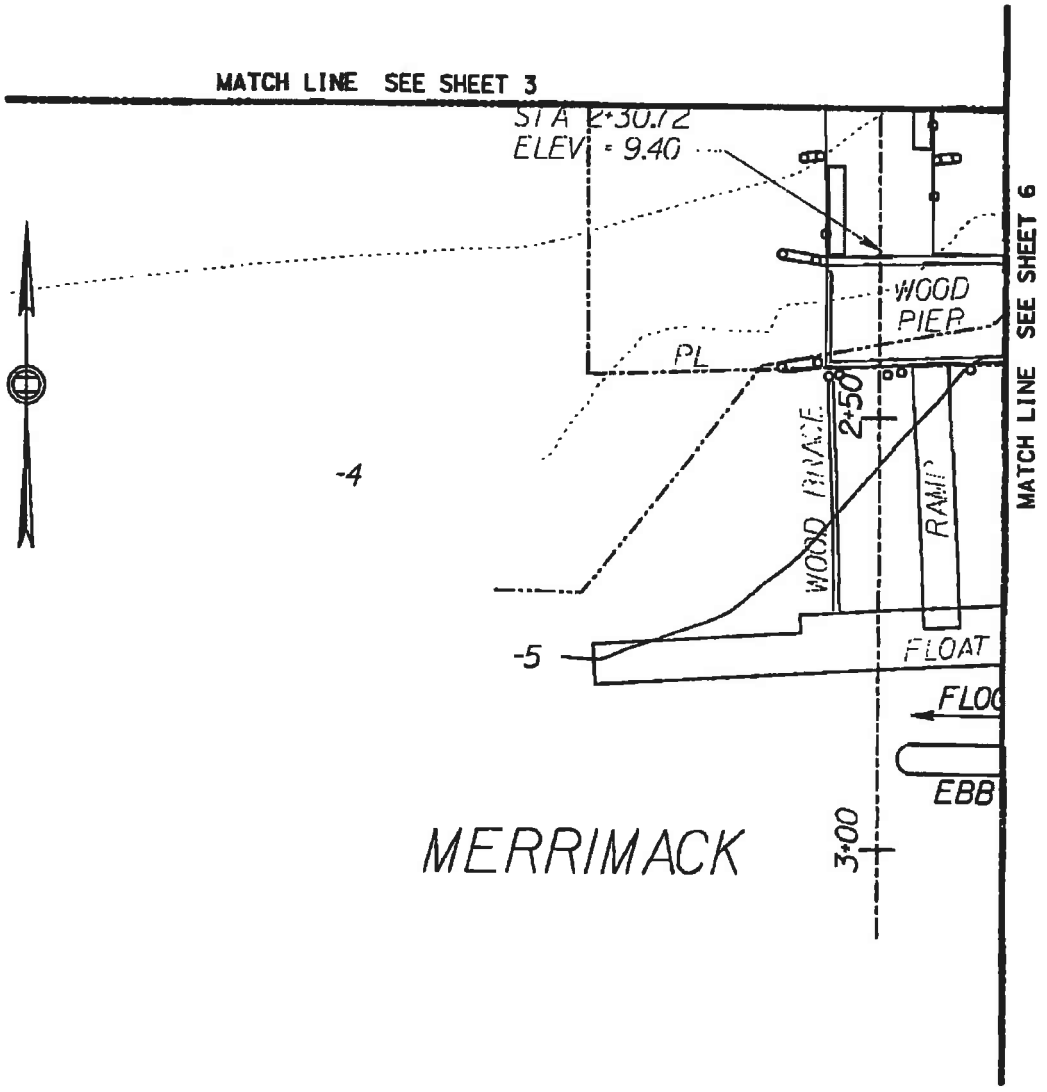
065-007-000-010-100



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EXISTING SITE & DEMOLITION PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 5 OF

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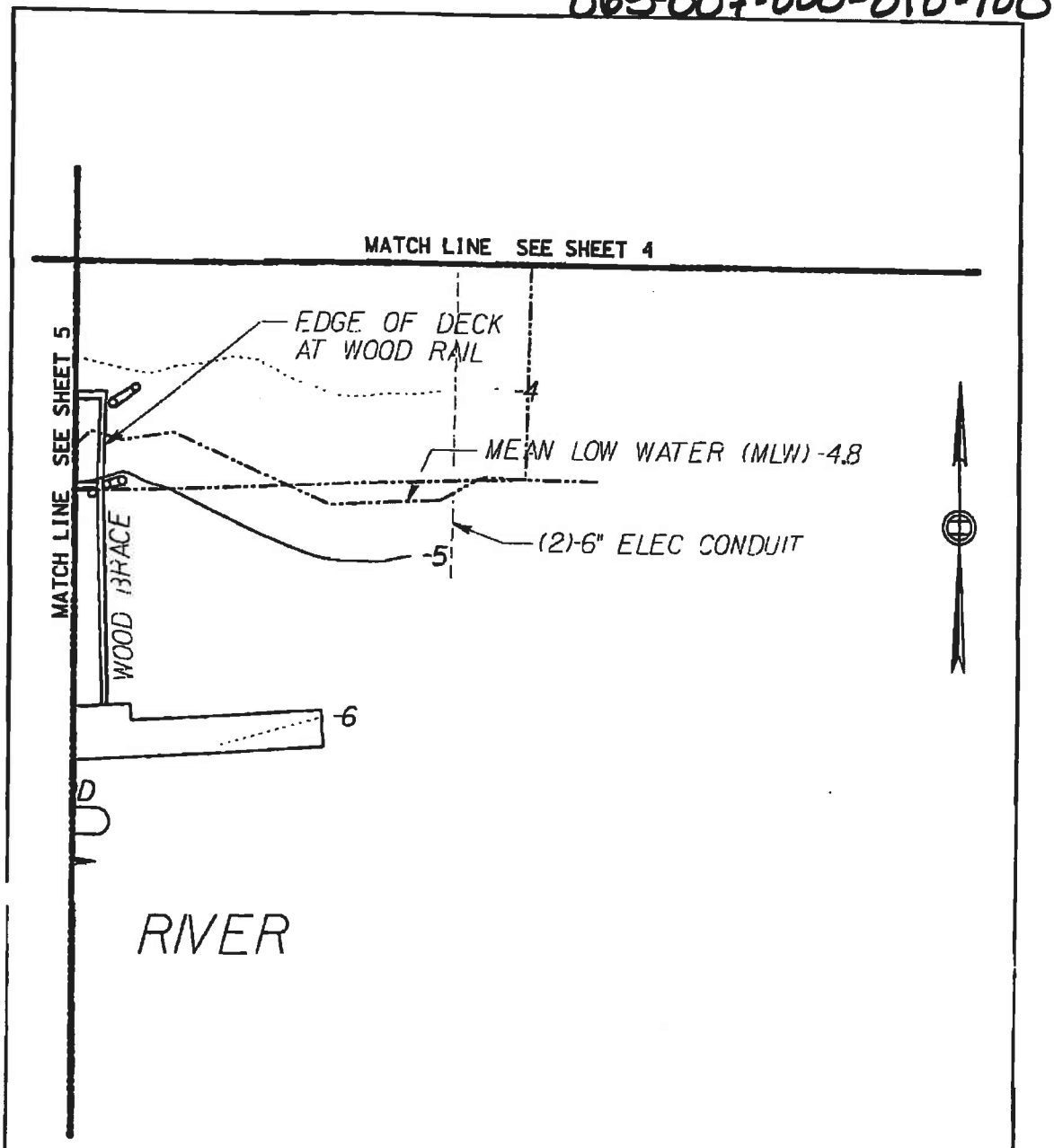

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
EXISTING SITE & DEMOLITION PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 6 OF

FILE: J:\35402\PERMIT\SHEET6.DGN
DATE: 11-May-01 08:08

065-007-000-010-100

SUGGESTED METHOD OF DEMOLITION OF PIER

- FLOAT, GANGWAY RAMP AND WOOD BRACES TO BE REMOVED BY OTHERS
- REMOVE RAIL, BENCHES AND DECK (BY TOWN)
- REMOVE ALL PILES IN THEIR ENTIRETY (FOR BID PURPOSES ASSUME 53 PILES AT PIER AND 26 AT BULKHEAD)
- REMOVE ALL EXISTING CUT OFF PILES (FOR BID PURPOSES ASSUME 18 EACH)

SUGGESTED METHOD OF DEMOLITION OF BULKHEAD

- INSTALL STEEL SHEETING FOR PERMANENT SCOUR PROTECTION INSIDE EXISTING WOOD SOLDIER PILE & LAGGING
- CONSTRUCT STONE BULKHEAD (SEE DRAWING 6)
- REMOVE EXISTING WOOD SOLDIER PILES & LAGGING
- CUT STEEL SHEETING OFF APPROXIMATELY 0.5 FT BELOW MUD LINE. (SEE TABLE I ON DRAWING 6)

NOTES:

- ELEVATIONS REFER TO NGVD OF 1929. THE BENCH MARK BEING THE TOP OF A STONE BOUND EL - 10.51'.
- TOPOGRAPHIC DATA TAKEN FROM PLAN: GENERAL CONDITION SURVEY TOWN PIER MERRIMAC RIVER SALISBURY TOPOGRAPHIC PLAN OF TOWN PIER FOR THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT BY RYAN ENGINEERING CORP. NAHANT, MA. DATED JULY 31, 1998. PLAN SHOWING EXISTING TOPOGRAPHY AT 30 FIRST ST. BY MILLENNIUM ENGINEERING, INC. SALISBURY, MA. DATED MARCH 11, 1998.
- PROPERTY LINE DATA TAKEN FROM PLAN OF LAND SURVEYED FOR TOWN OF SALISBURY MAY 1963 BY CARROLL H. KNOWLES.
- LAND OWNER TOWN OF SALIBURY, MA. BK 5210 PG 172, BK 4296 PG 215

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
EXISTING SITE & DEMOLITION PLAN CONTRACT NO 3423-D	
MAY 9, 2001	SHEET 7 OF

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DATE: 11-May-01 08:21

065-007-000-010-100

GENERAL NOTES

1. THE CONTRACTOR SHALL VISIT THE SITE AND BE KNOWLEDGEABLE OF CONDITIONS THEREON. THE CONTRACTOR SHALL INVESTIGATE, VERIFY, AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT AND SHALL NOTIFY THE ENGINEER OF ANY CONDITION REQUIRING MODIFICATIONS BEFORE PROCEEDING WITH THE WORK.
2. CONTRACTOR SHALL VERIFY ALL PROPOSED AND EXISTING CONDITIONS, INCLUDING THEIR LOCATIONS, DIMENSIONS AND ELEVATIONS IN THE FIELD AND SHALL TAKE ALL NECESSARY FIELD MEASUREMENTS. STATIONS AND OFFSETS SHOWN ON DRAWINGS ARE APPROXIMATE. NOTIFY THE ENGINEER OF ANY LAYOUT CONDITION THAT IS NOT CONSISTENT WITH THE DRAWINGS OR THAT WILL IMPAIR LAYOUTS OR ATTACHMENTS OF FINISHES PRIOR TO PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.
3. THE UTILITIES SHOWN HAVE BEEN COMPILED FROM INFORMATION FURNISHED BY FIELD SURVEY AND VARIOUS UTILITY COMPANIES. ACCURACY AND COMPLETENESS ARE NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL MAKE FIELD INVESTIGATIONS AND OBTAIN INFORMATION FROM UTILITY COMPANIES TO CONFIRM THE LOCATION AND ELEVATION OF ALL SURFACE UTILITIES. IF ANY CONFLICTS ARISE THE CONTRACTOR SHALL REPORT TO THE ENGINEER IMMEDIATELY.
4. THE CONTRACTOR IS TO COORDINATE ALL SUBCONTRACTORS' WORK BEFORE THE WORK IS INSTALLED. REMOVAL AND RECONSTRUCTION OF WORK DUE TO LACK OF COORDINATION SHALL BE DONE AT NO EXPENSE TO THE OWNER.
5. CONSTRUCTION SHALL BE MADE FROM APPROVED SHOP DRAWINGS ONLY.
6. CONTRACTOR SHALL LAYOUT ALL SITE IMPROVEMENTS FOR ENGINEER'S APPROVAL PRIOR TO STARTING WORK.
7. FINISH GRADES OF PAVEMENTS AND SITE IMPROVEMENTS SHALL BE STAKED FOR APPROVAL BY ENGINEER PRIOR TO STARTING WORK.
8. NEW PAVEMENTS ARE TO BE FLUSH WHERE THEY MEET EXISTING. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY GRADE DISCREPANCIES PRIOR TO WORK.
9. BEFORE EXCAVATING, INSTALLING, BACKFILLING, GRADING AND PAVING, ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THE DRAWINGS. CALL "DIG SAFE" 1-800-322-4844 PRIOR TO THE WORK.
10. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL STRUCTURES, WALKS, STREETS, PAVEMENTS, TREES, SUBSURFACE ELEMENTS, OVERHEAD WIRES, AND PLANTINGS, ON OR OFF THE PREMISES, AND SHALL REPAIR AND REPLACE OR OTHERWISE MAKE GOOD AS DIRECTED BY THE ENGINEER ANY SUCH OR OTHER DAMAGE SO CAUSED.
11. REMOVAL OF SITE ELEMENTS SHALL INCLUDE THE REMOVAL OF FOUNDATIONS TO FULL DEPTH UNLESS INDICATED OTHERWISE.
12. THE CONTRACTOR SHALL REMOVE FROM THE PROJECT SITE ALL STUMPS, RUBBISH, AND DEBRIS FOUND THEREON. STORAGE OF SUCH MATERIALS ON THE PROJECT SITE WILL NOT BE PERMITTED. THE CONTRACTOR SHALL LEAVE THE SITE IN SAFE, CLEAN, AND LEVEL CONDITION UPON COMPLETION OF EACH DAYS' WORK.
13. REMOVE AND DISPOSE OF ALL STRUCTURES, PAVEMENT AND OTHER MATERIALS INDICATED FOR DEMOLITION ON PLANS AND ELEVATIONS.
14. MATERIALS DESIGNATED FOR REMOVAL SHALL BE DISPOSED OF IN A LEGAL MANNER, AT NO ADDITIONAL COST TO THE OWNER.
15. SURFACES TO REMAIN IN THE AREA OF DEMOLITION ARE TO BE REPAIRED AND PATCHED TO MATCH SURROUNDING WORK.
16. FOR SLAB AND WALL DEMOLITION, MAKE SAWCUTS ALONG EDGES. DO NOT OVER CUT THE SPECIFIED PORTION.
17. BEFORE STARTING THE DRAINAGE WORK, THE CONTRACTOR SHALL FIELD VERIFY EXISTING DRAINAGE CONDITIONS SHOWN ON THE DRAWINGS, AS WELL AS THE PROPOSED LOCATIONS AND ELEVATIONS. ANY DISREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
18. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING STORM DRAINAGE AT ALL TIMES.
19. ALL EXISTING SIGNS SHALL BE REMOVED AND STOCKED, UNLESS OTHERWISE NOTED ON PLANS.
20. ALL TREES WITHIN THE PROJECT LIMITS SHALL REMAIN, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
EXISTING SITE & DEMOLITION PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 8 OF

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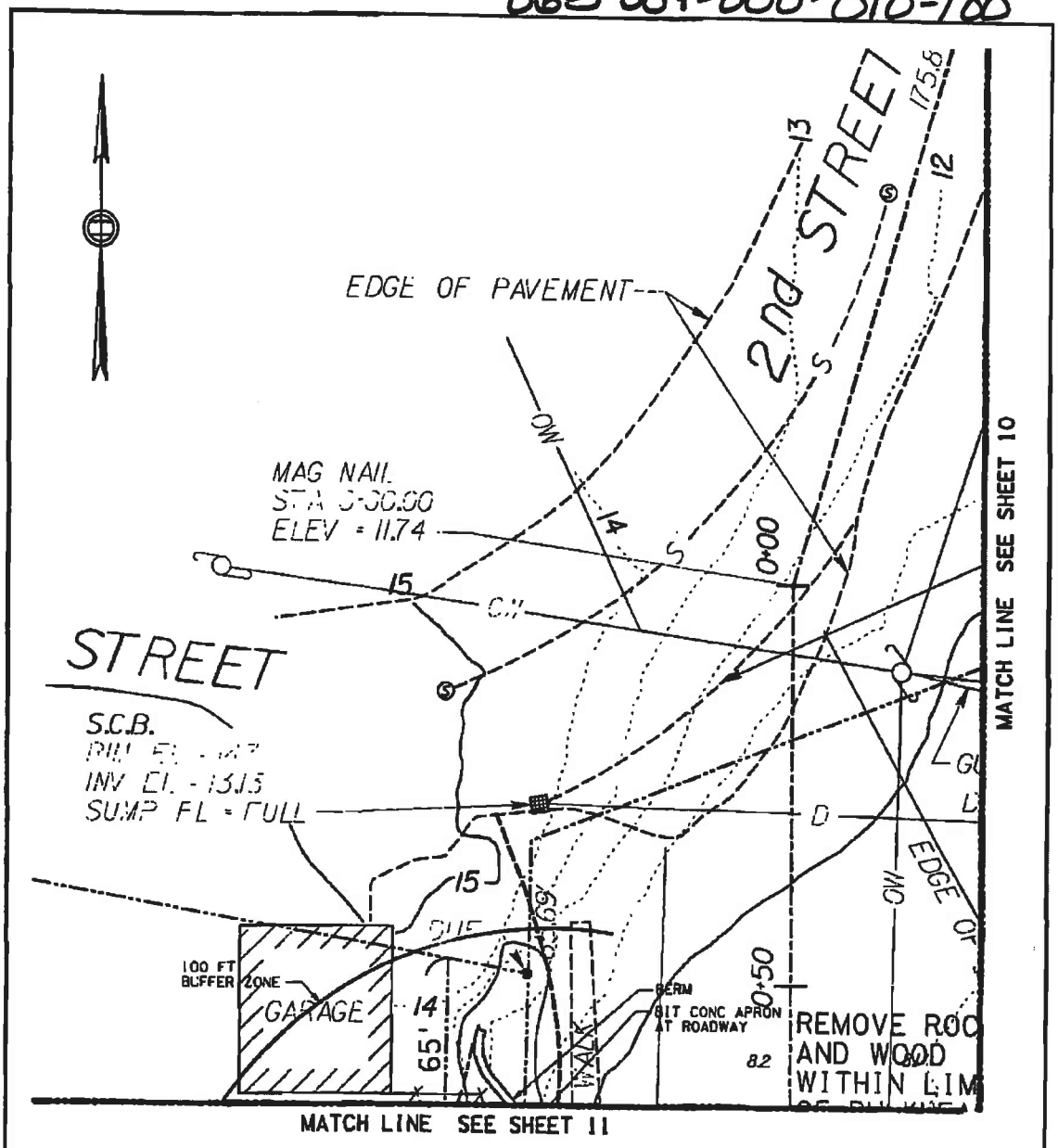
065-007-000-010-100



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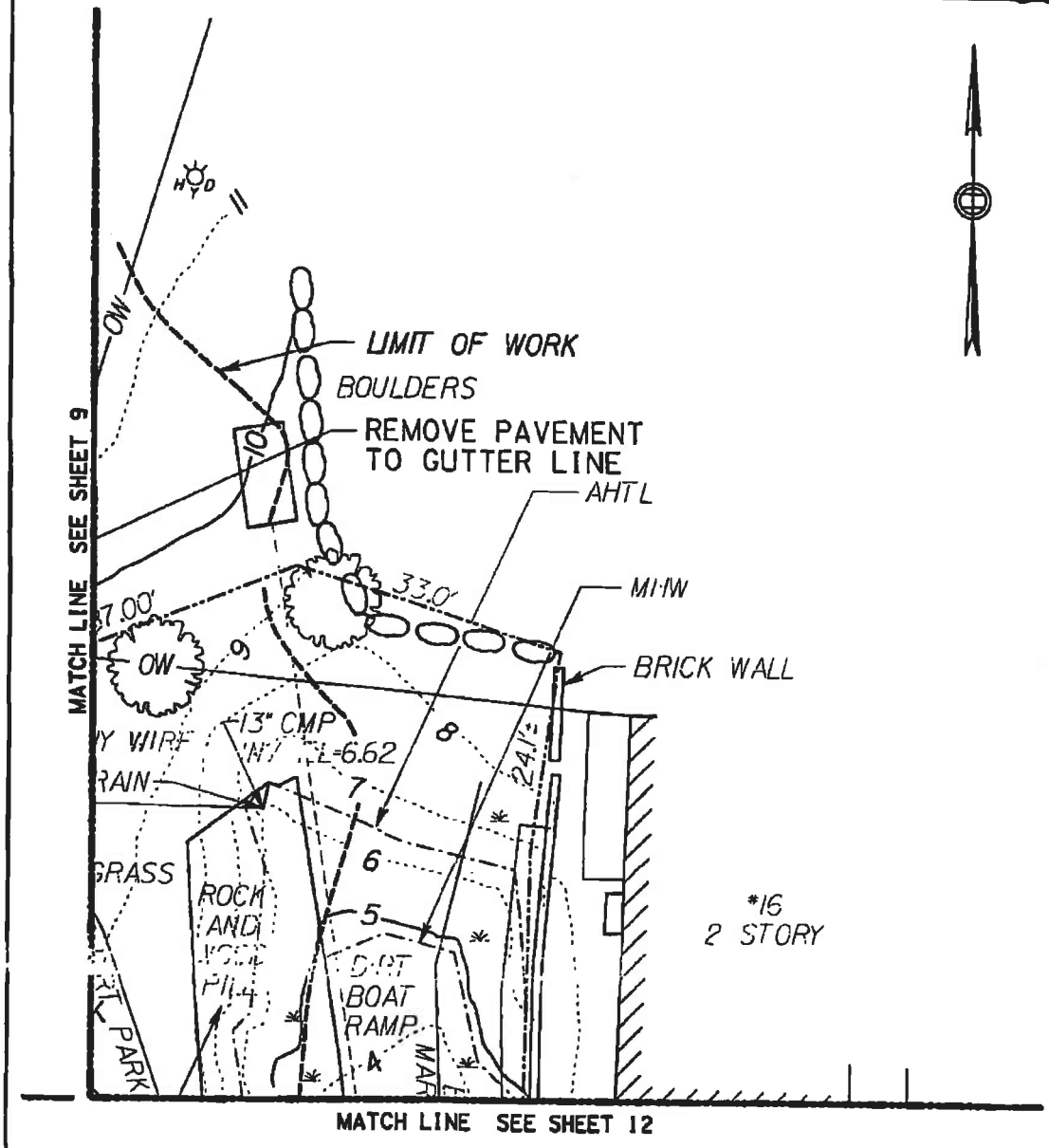
PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
PERMIT PLAN	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 9 OF

065-007-000-010-100



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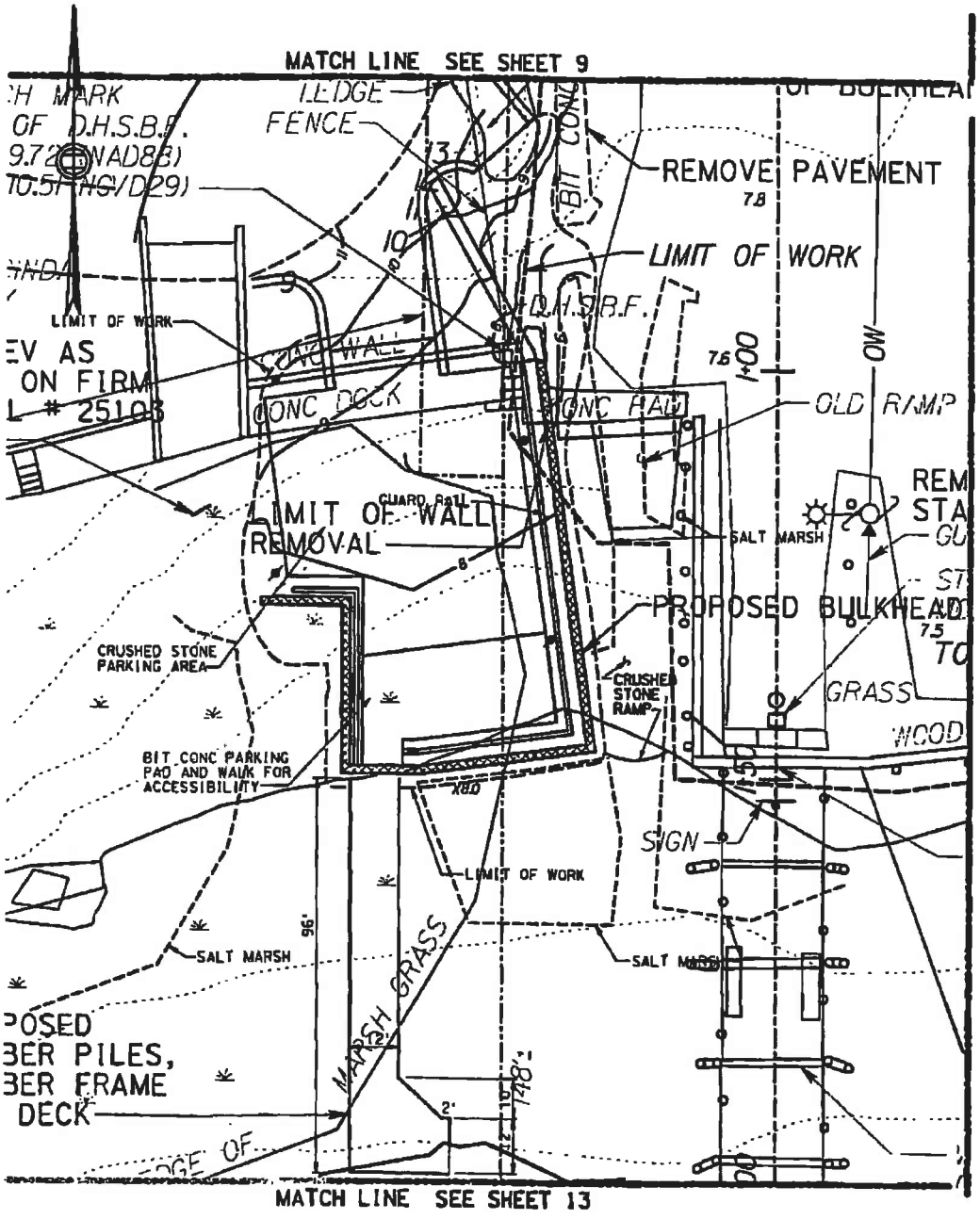
PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
PERMIT PLAN	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 10 OF

0165-007-000-010-106



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DATE: 11-May-01 09:09

PERMIT PLAN

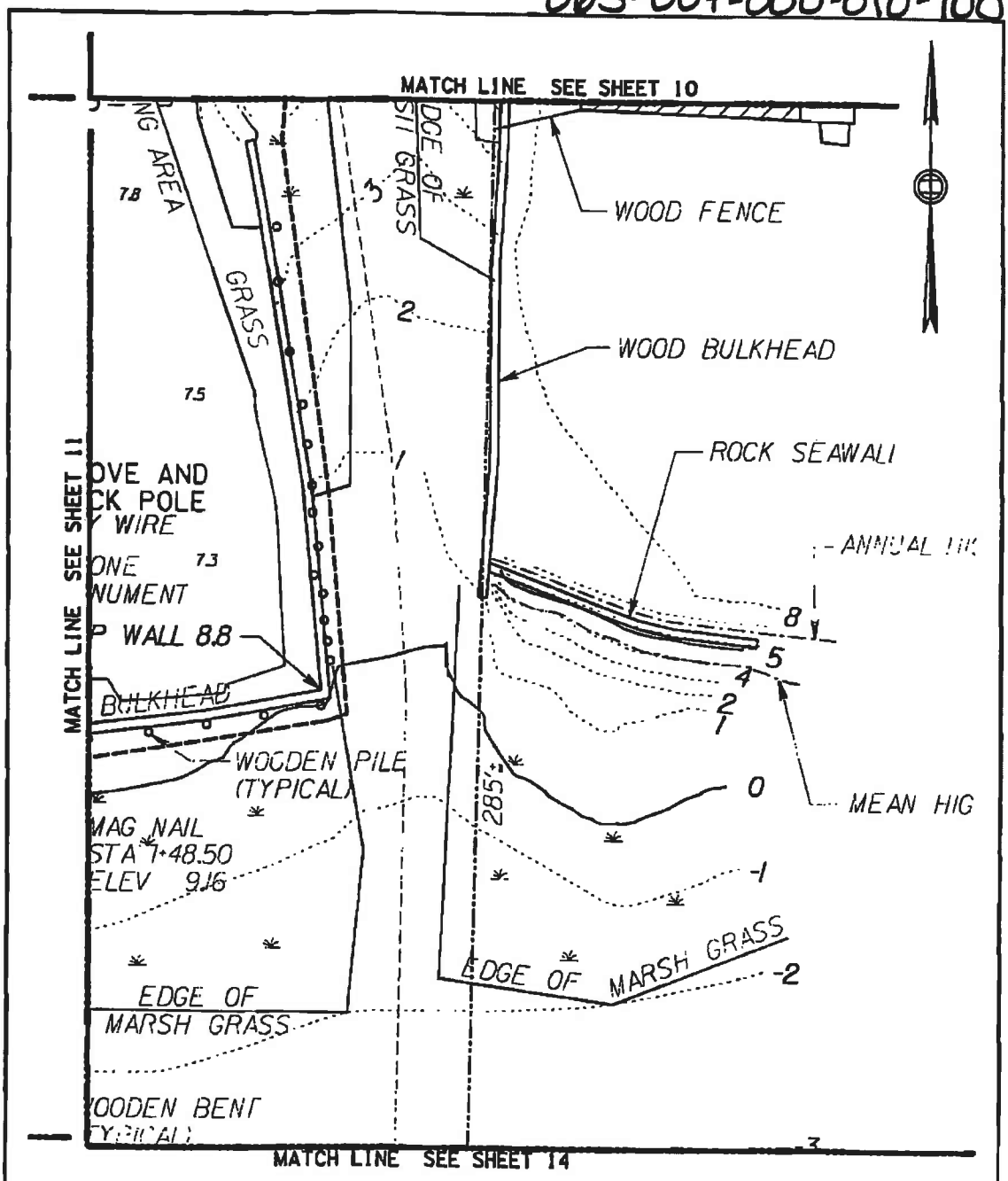
TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

PERMIT PLAN

CONTRACT NO 3423-D

MAY 9,2001	SHEET 11 OF

065-007-000-010-100



PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
PERMIT PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 12 OF

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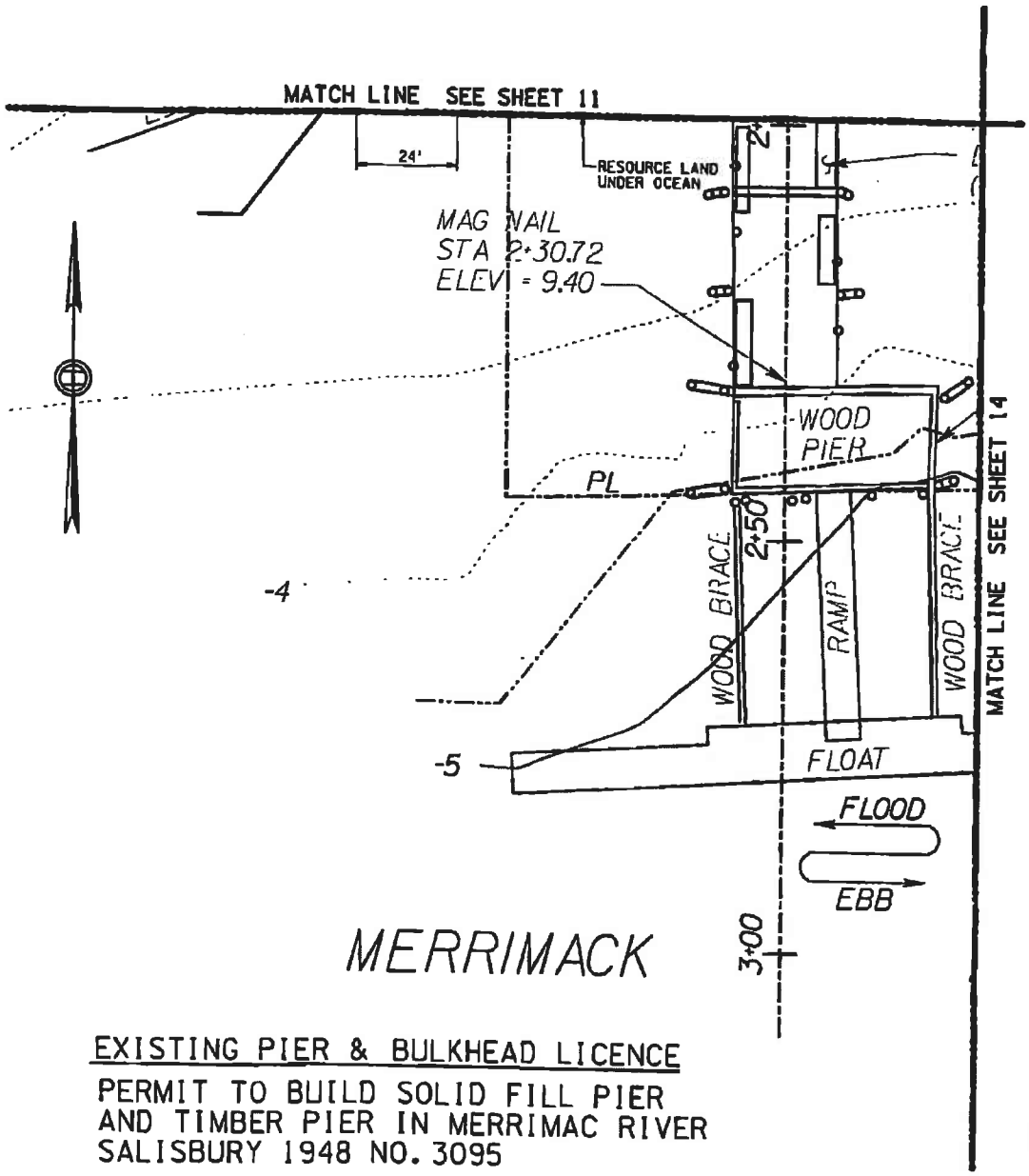

EXISTING PIER & BULKHEAD LICENCE

PERMIT TO BUILD SOLID FILL PIER
AND TIMBER PIER IN MERRIMAC RIVER
SALISBURY 1948 NO. 3095

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
PERMIT PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET *13* OF

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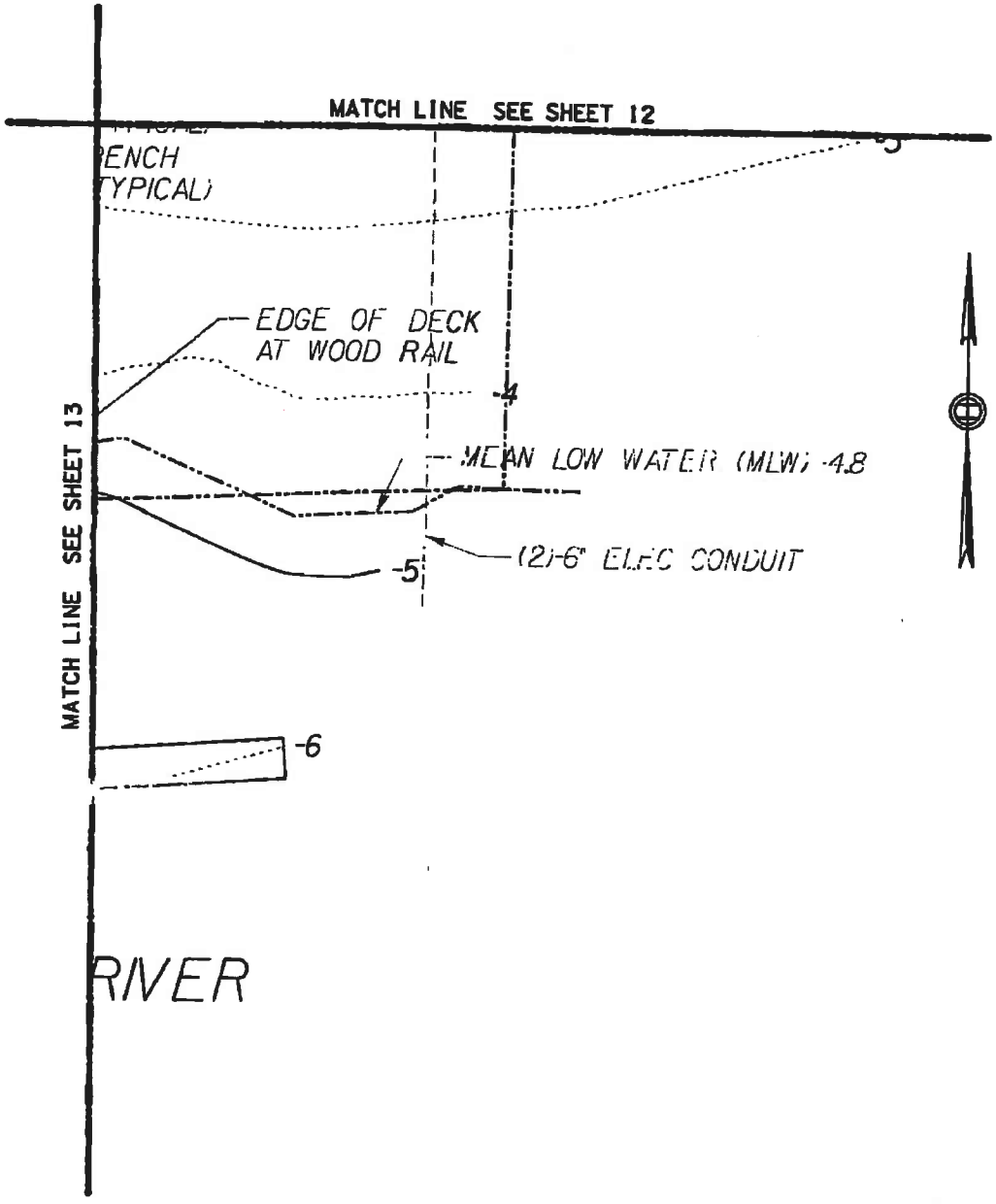

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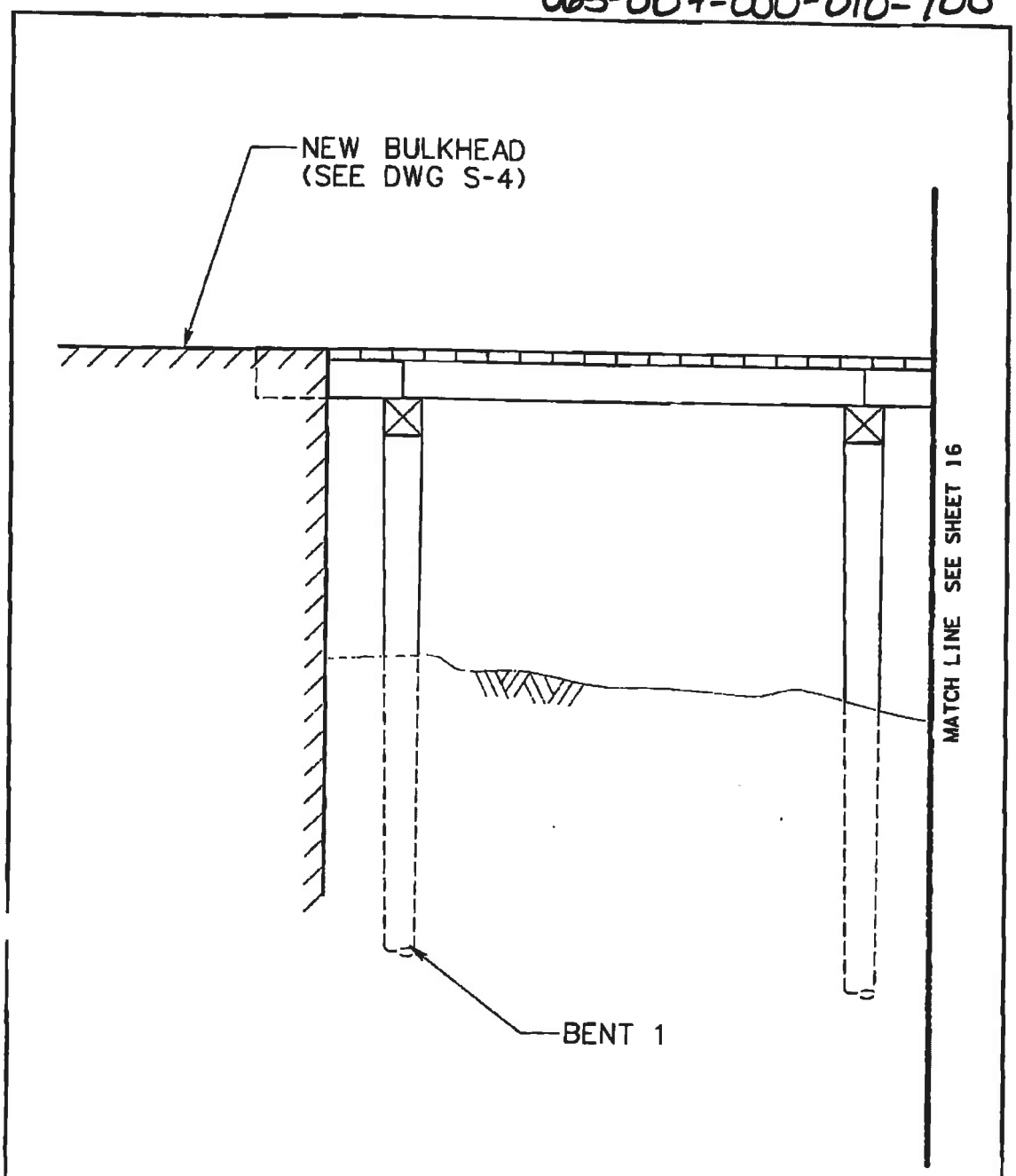
PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
PERMIT PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 14 OF

065-007-000-010-100



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PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
REPLACEMENT PIER ELEVATIONS	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 15 OF

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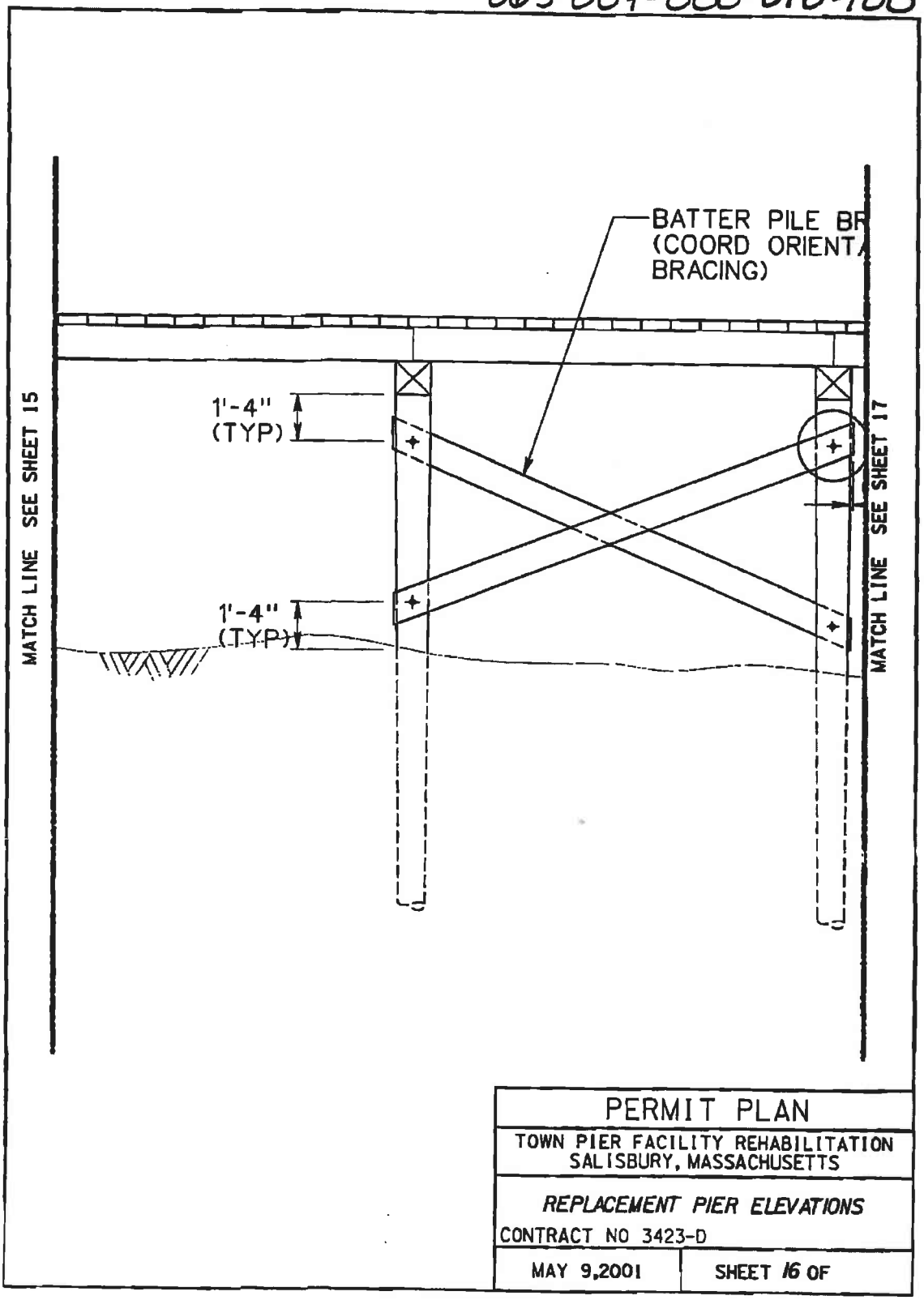

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
REPLACEMENT PIER ELEVATIONS	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET *16* OF

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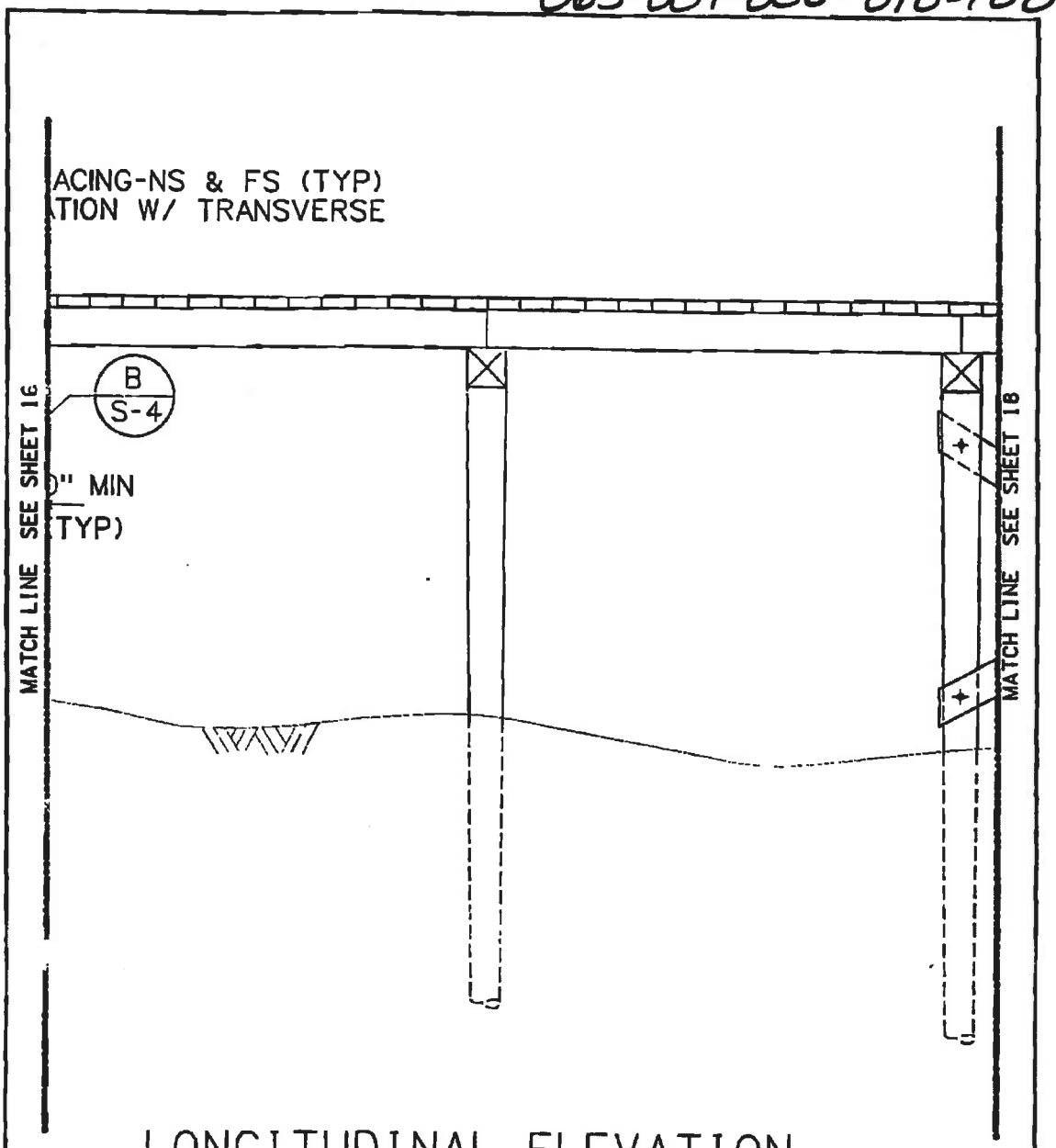

LONGITUDINAL ELEVATION

1/4"=1'-0"

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
REPLACEMENT PIER ELEVATIONS CONTRACT NO 3423-D	
MAY 9,2001	SHEET 17 OF

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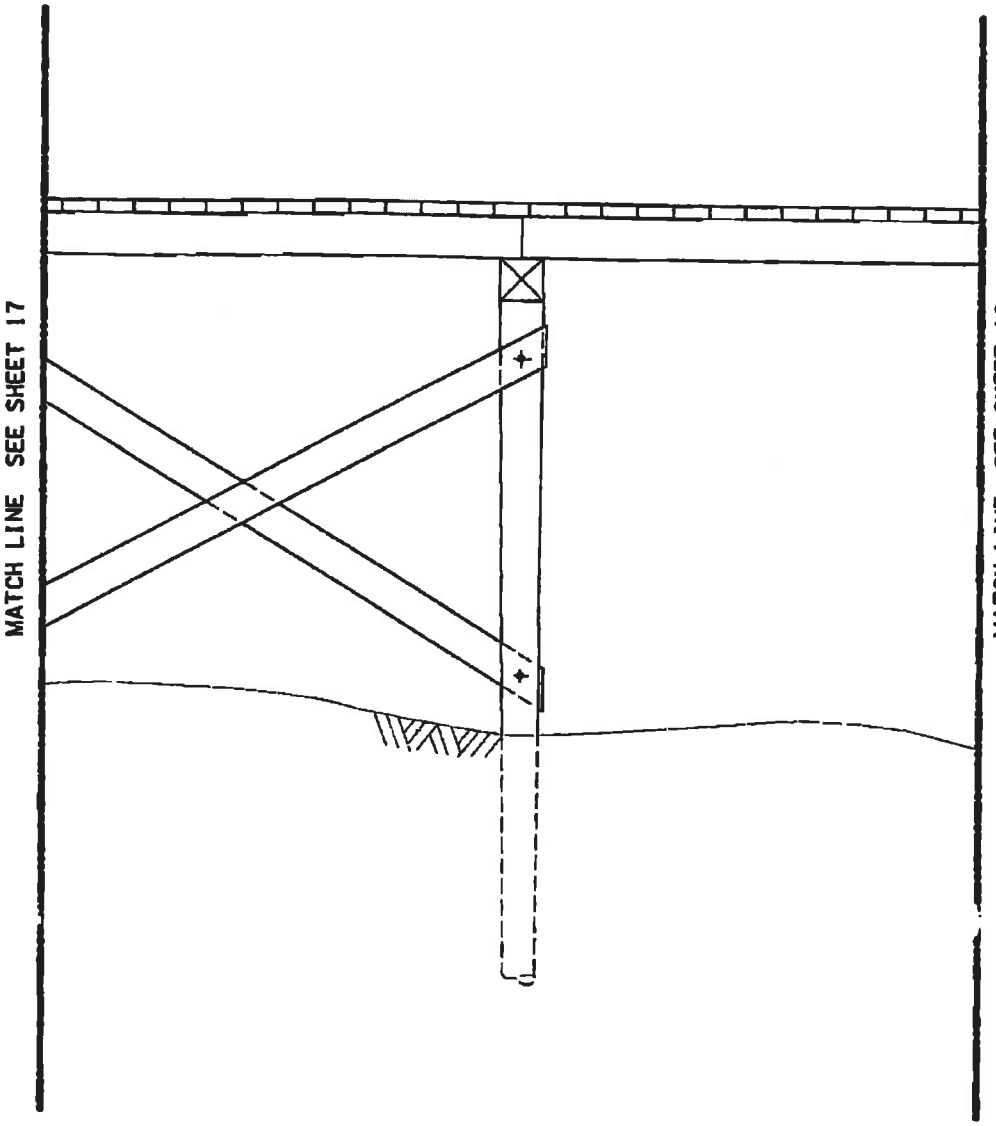

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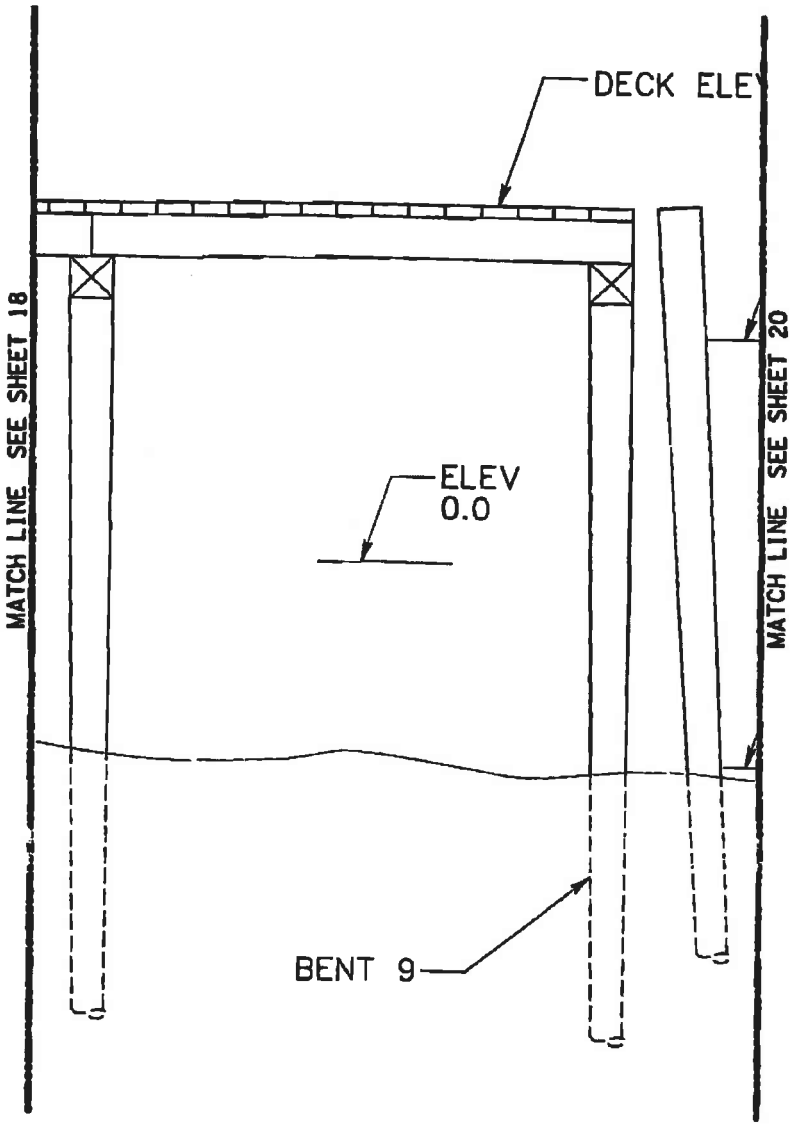
REPLACEMENT PIER ELEVATIONS	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET *18* OF

065-007-000-010-100



PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
REPLACEMENT PIER ELEVATIONS	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 19 OF

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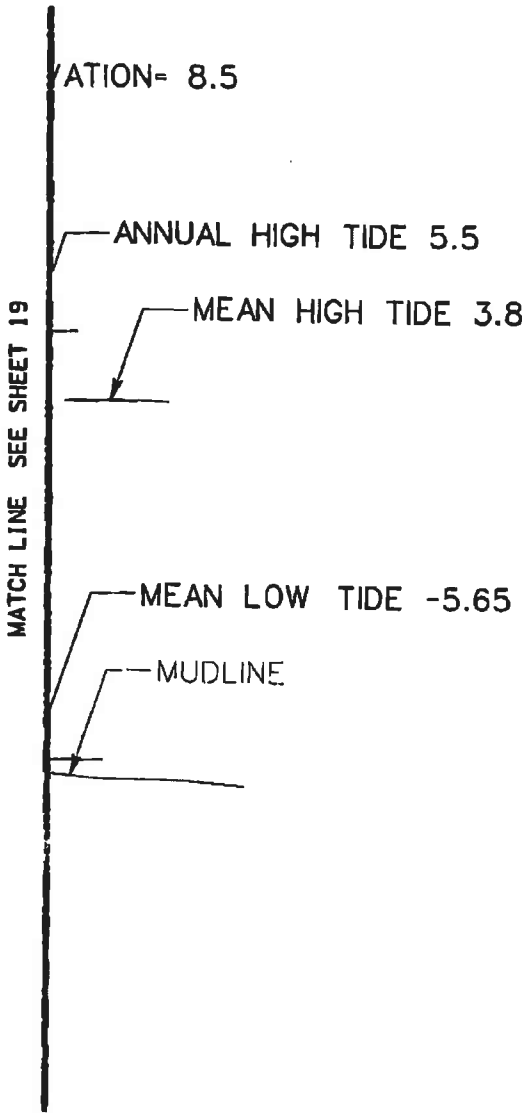

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
REPLACEMENT PIER ELEVATIONS	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 20 OF

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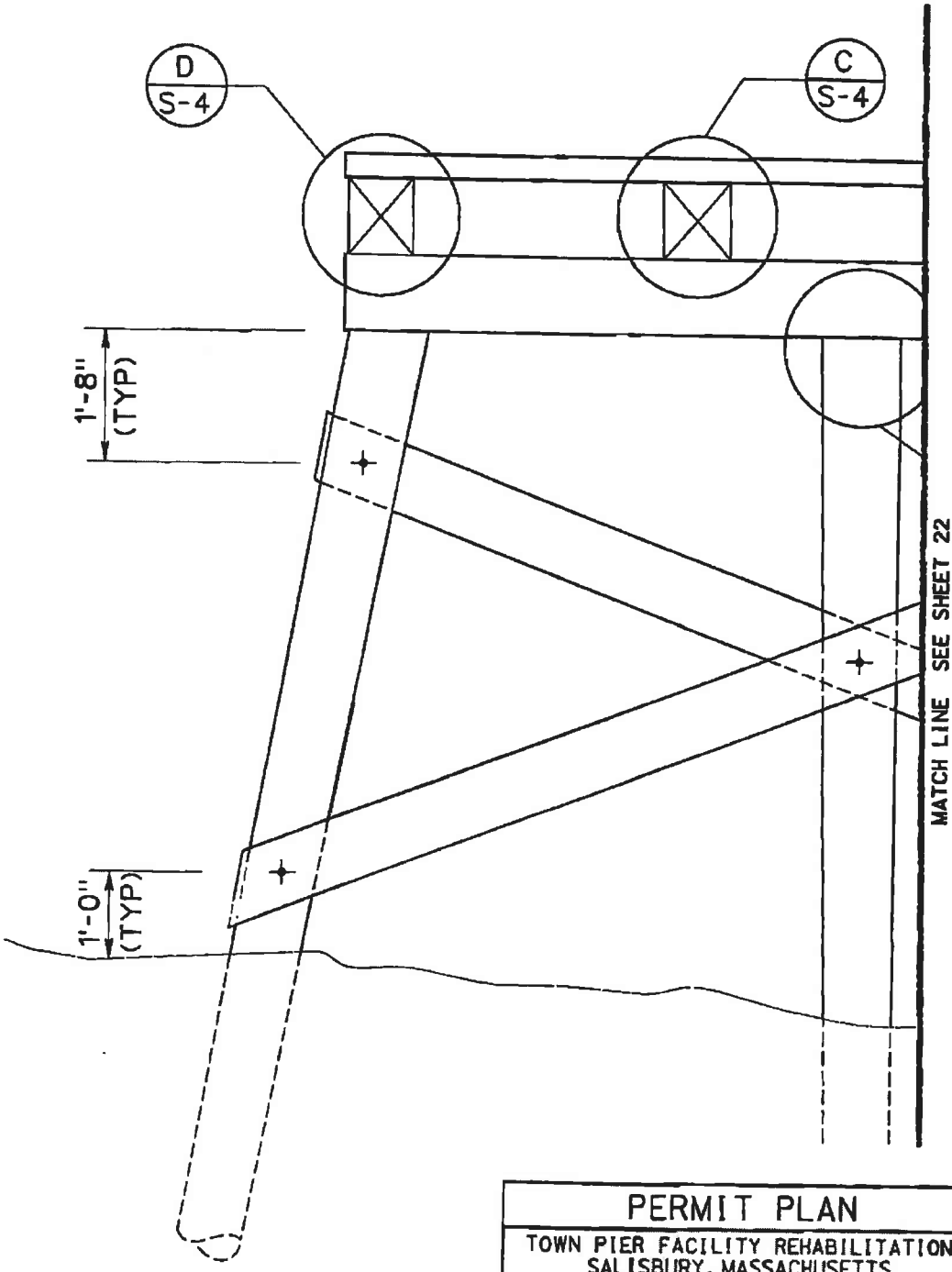

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PERMIT PLAN

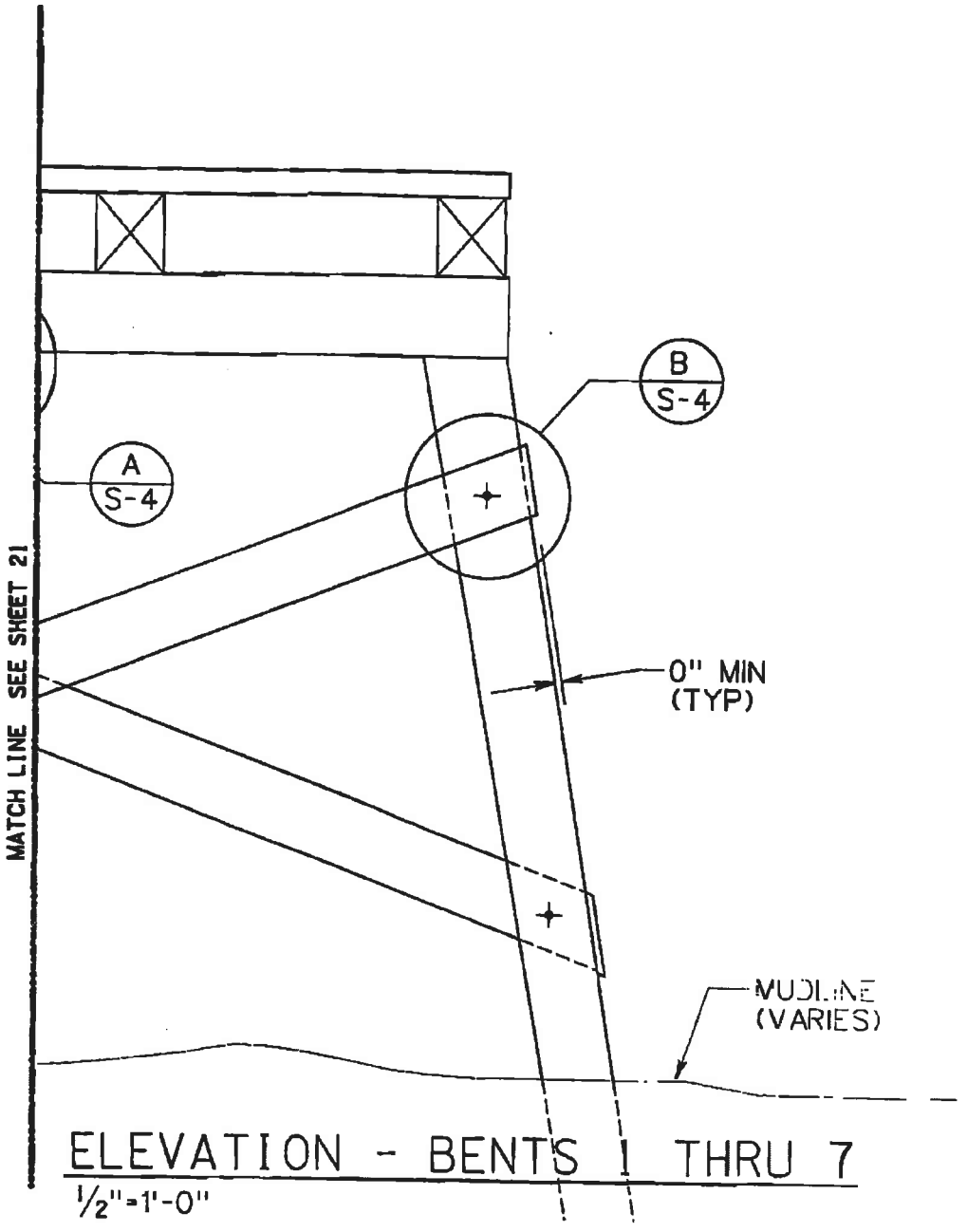
TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

REPLACEMENT PIER ELEVATIONS

CONTRACT NO 3423-D

MAY 9,2001 | SHEET *21* OF

0105-007-000-010-100



ELEVATION - BENTS 1 THRU 7

1/2"=1'-0"

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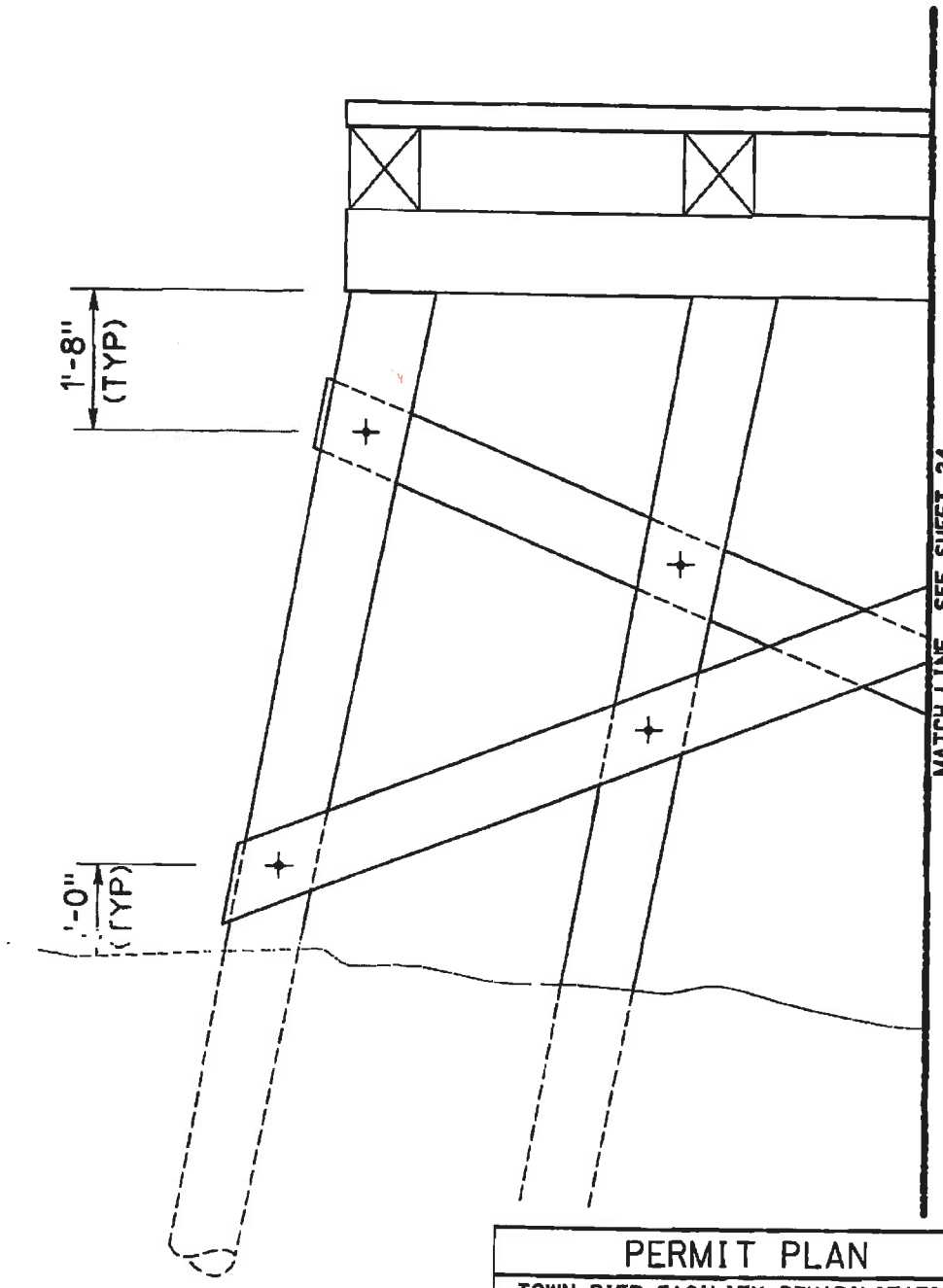
DATE: 11-May-01 11:34

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
REPLACEMENT PIER ELEVATIONS CONTRACT NO 3423-D	
MAY 9,2001	SHEET 22 OF

065-007-000-010-106



PERMIT PLAN

TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

REPLACEMENT PIER ELEVATIONS

CONTRACT NO 3423-D

MAY 9,2001 | SHEET 23 OF

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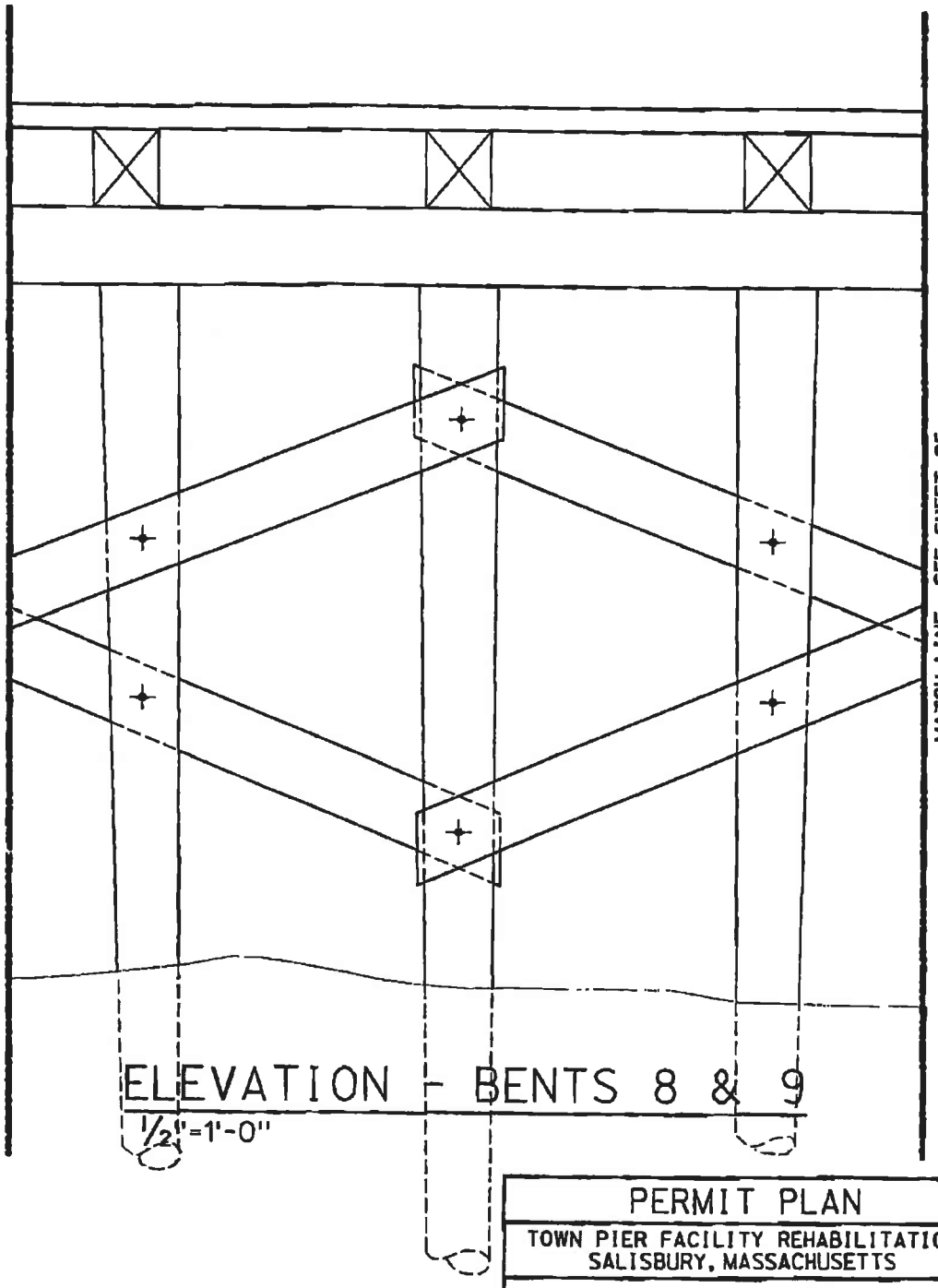

ELEVATION - BENTS 8 & 9

1/2"=1'-0"

PERMIT PLAN

TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

REPLACEMENT PIER ELEVATIONS

CONTRACT NO 3423-D

MAY 9,2001 | SHEET 24 OF

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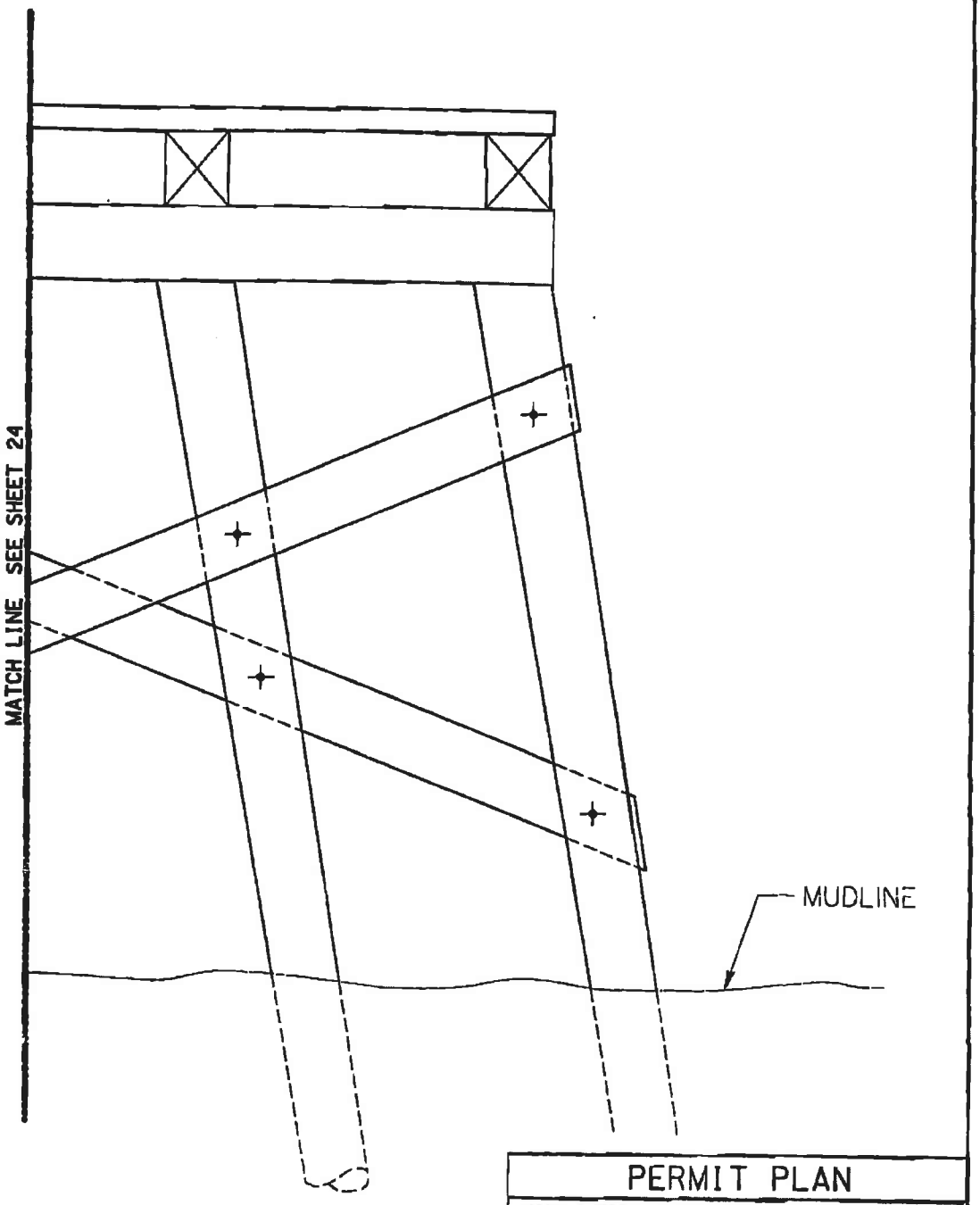

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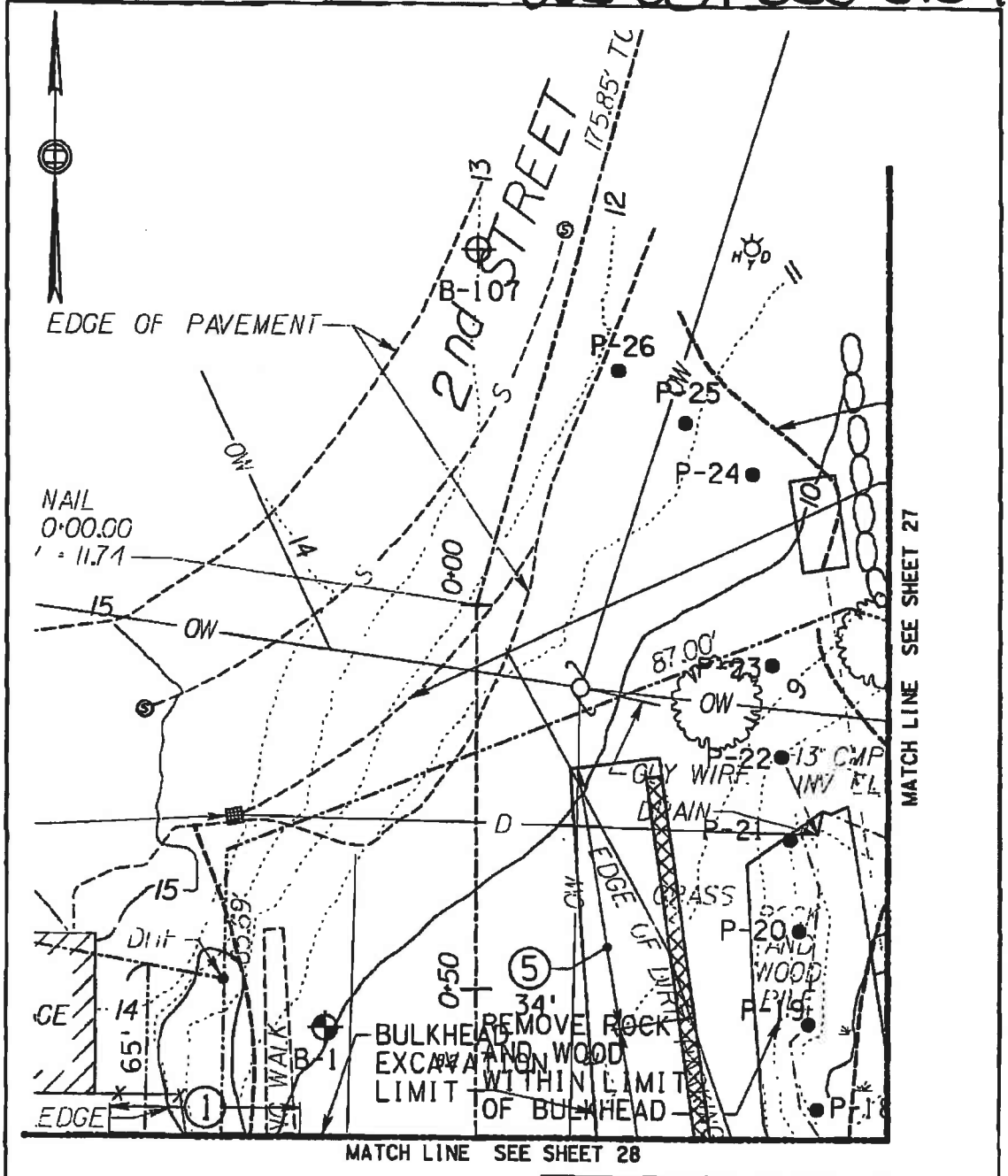
PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
REPLACEMENT PIER ELEVATIONS	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 25 OF

065-007-000-010-100



PERMIT PLAN

TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

BORING LOCATION PLAN

CONTRACT NO 3423-D

MAY 9,2001 | SHEET 26 OF

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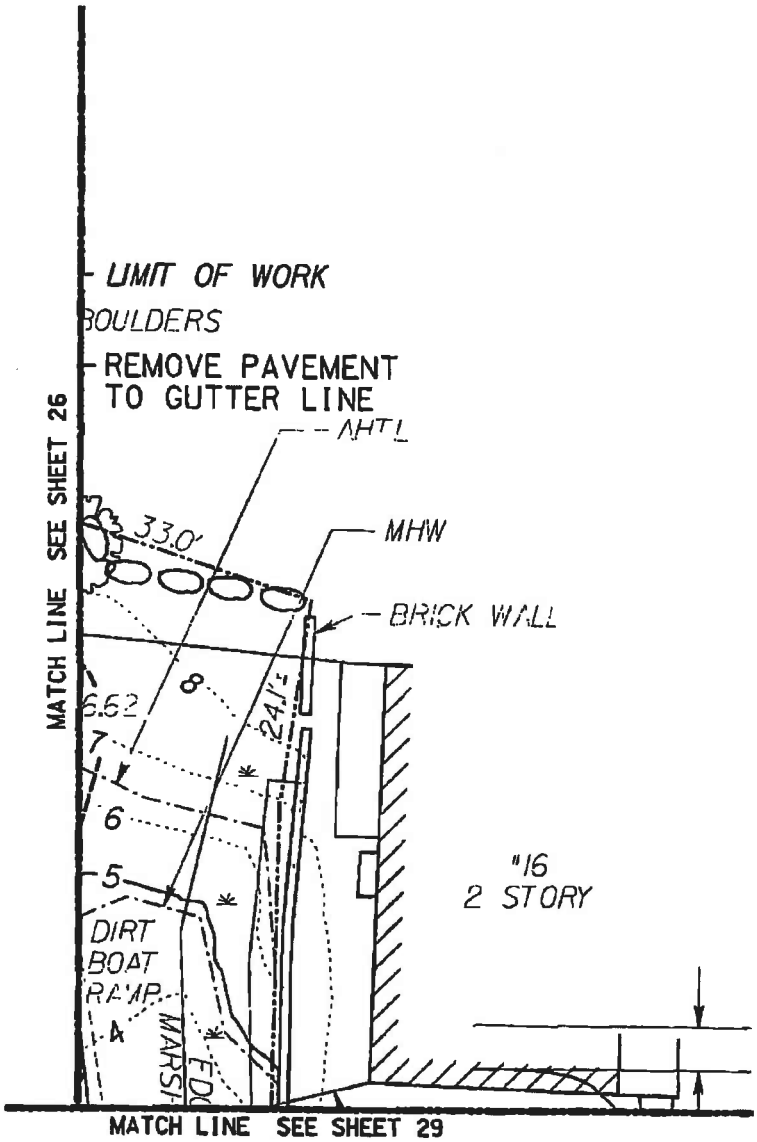

PERMIT PLAN

TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

BORING LOCATION PLAN

CONTRACT NO 3423-D

MAY 9,2001 | SHEET 27 OF

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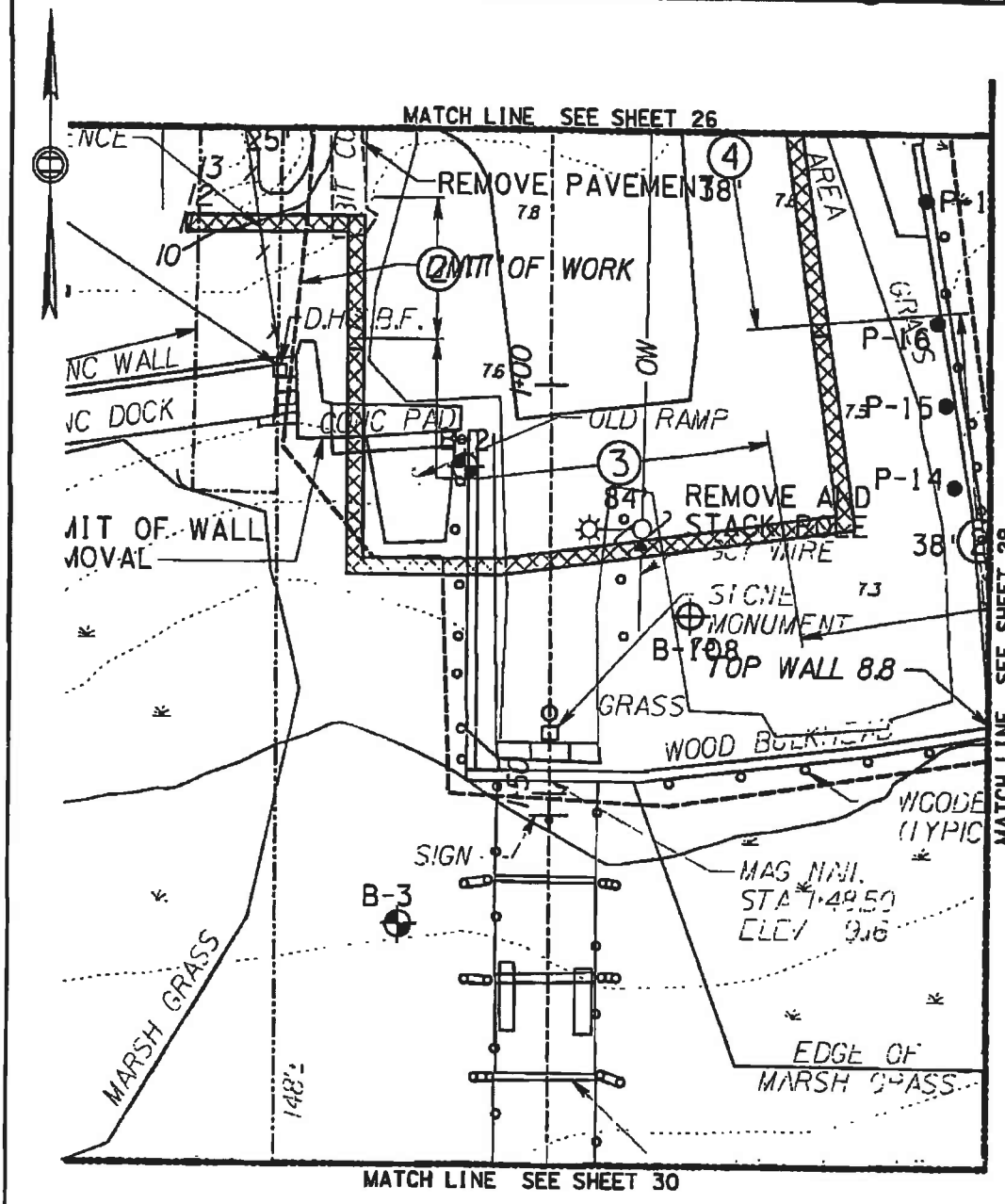

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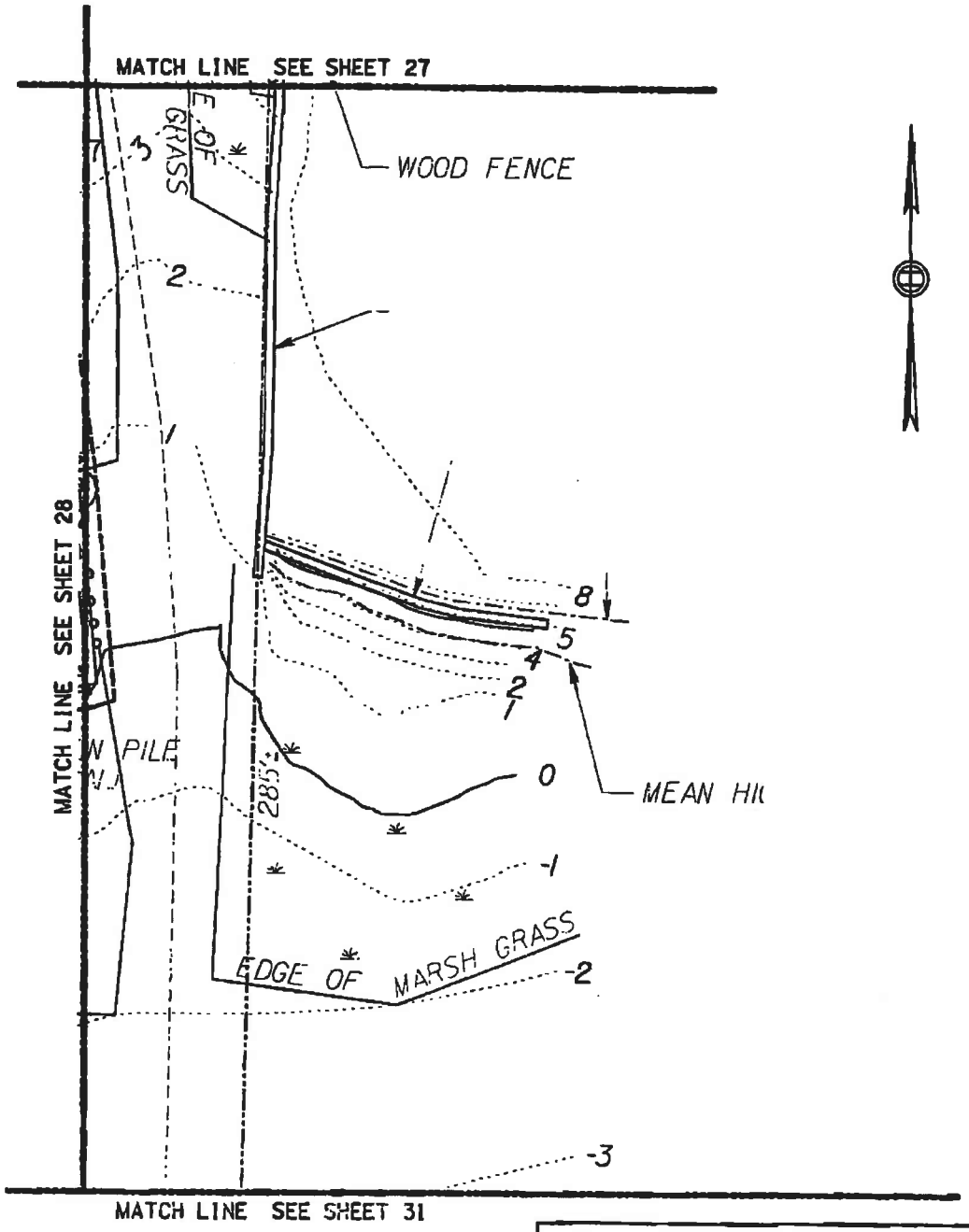
PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
BORING LOCATION PLAN	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 28 OF

065-007-000-010-100



PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
BORING LOCATION PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 29 OF

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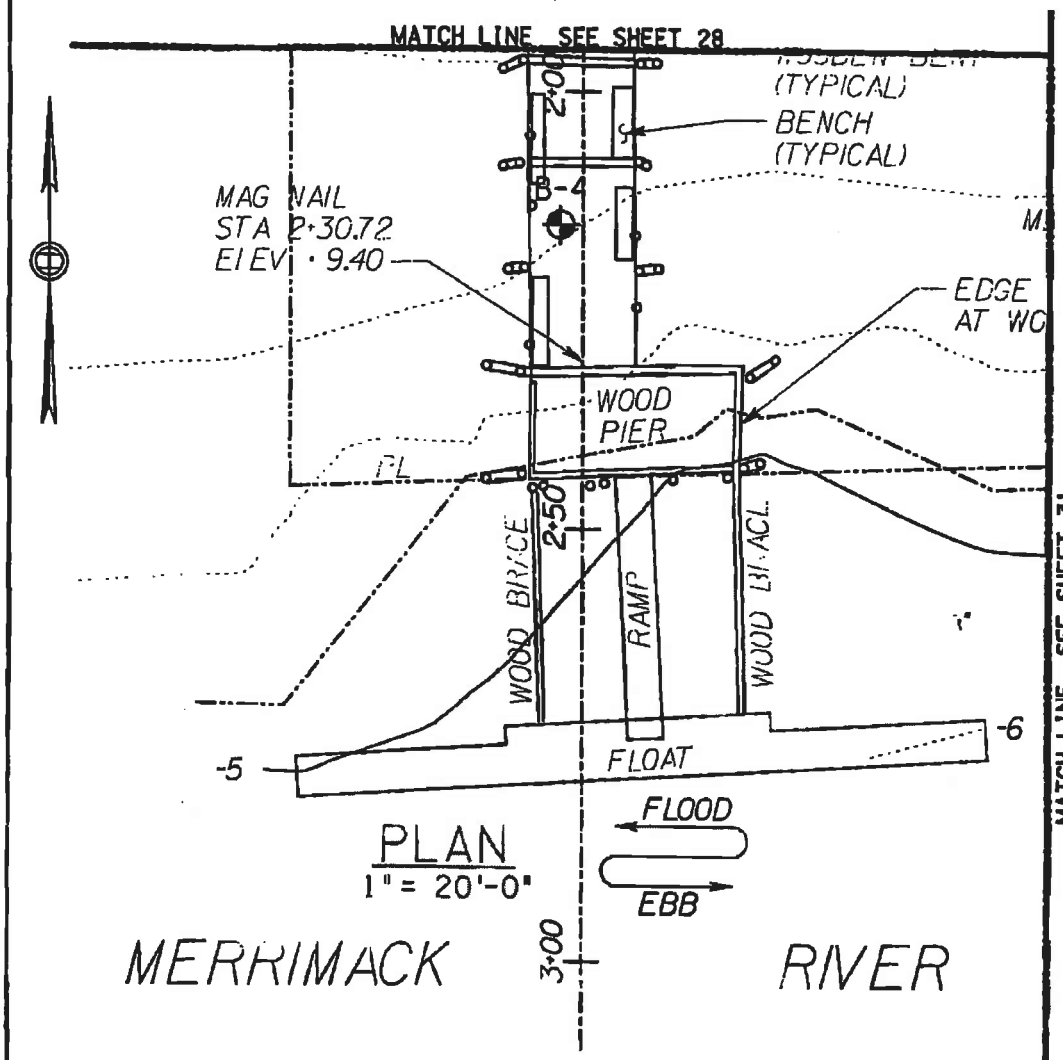

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TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
BORING LOCATION PLAN	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 30 OF

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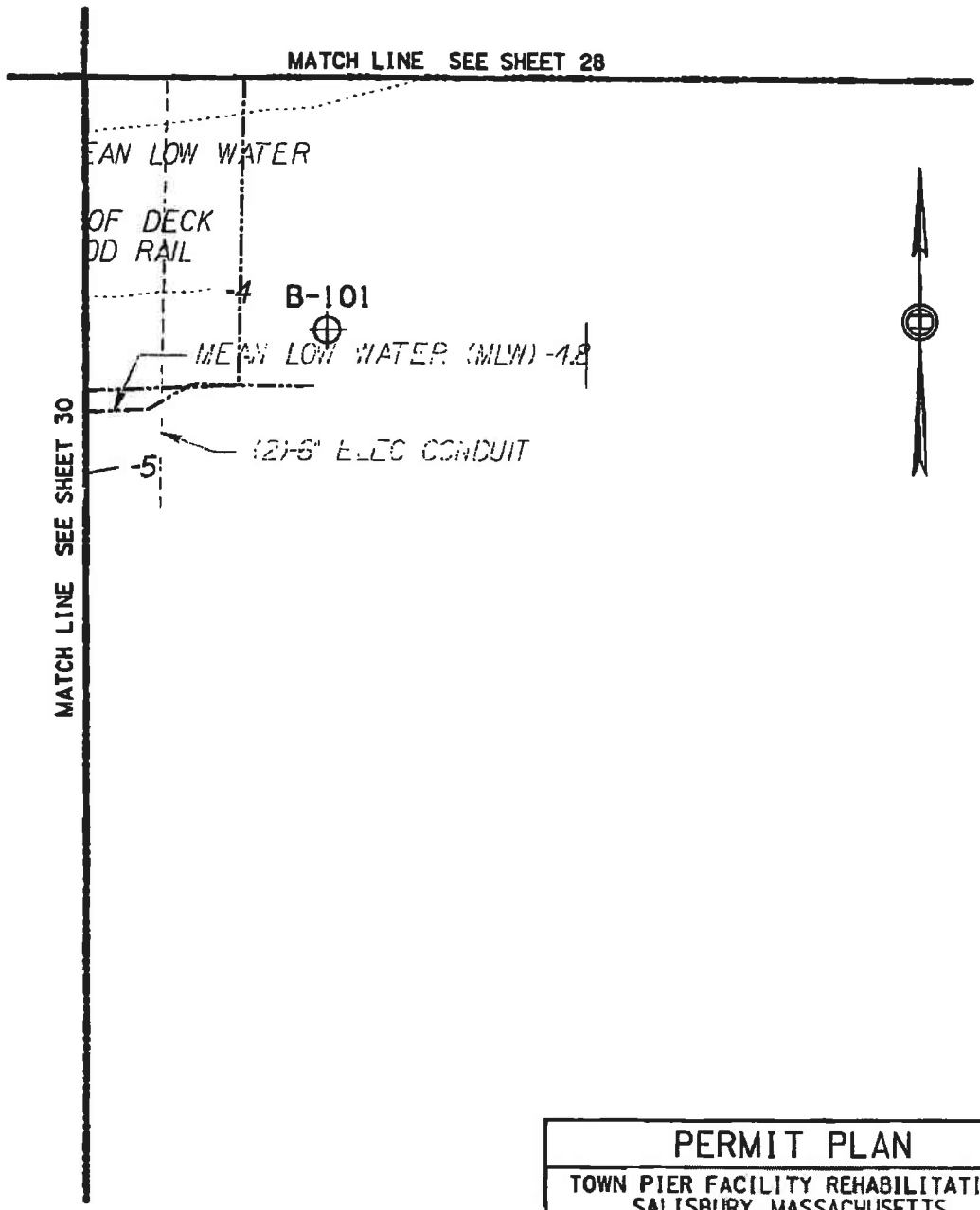

PERMIT PLAN

TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

BORING LOCATION PLAN

CONTRACT NO 3423-D

MAY 9,2001 | SHEET 31 OF

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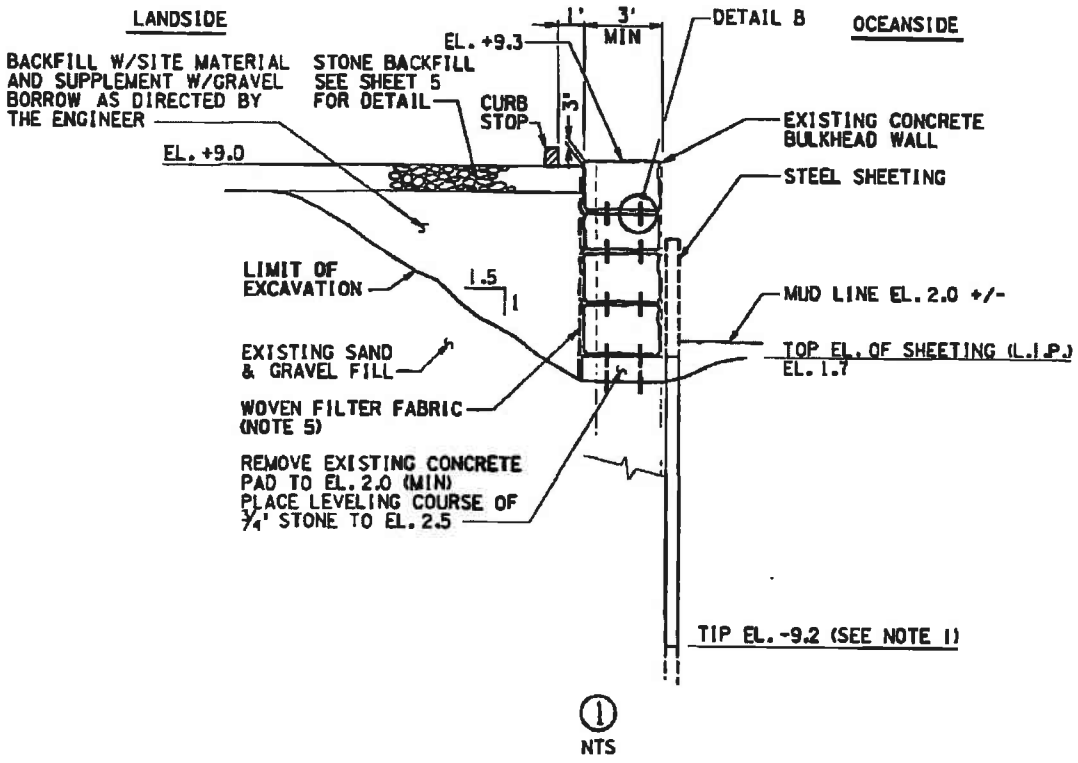

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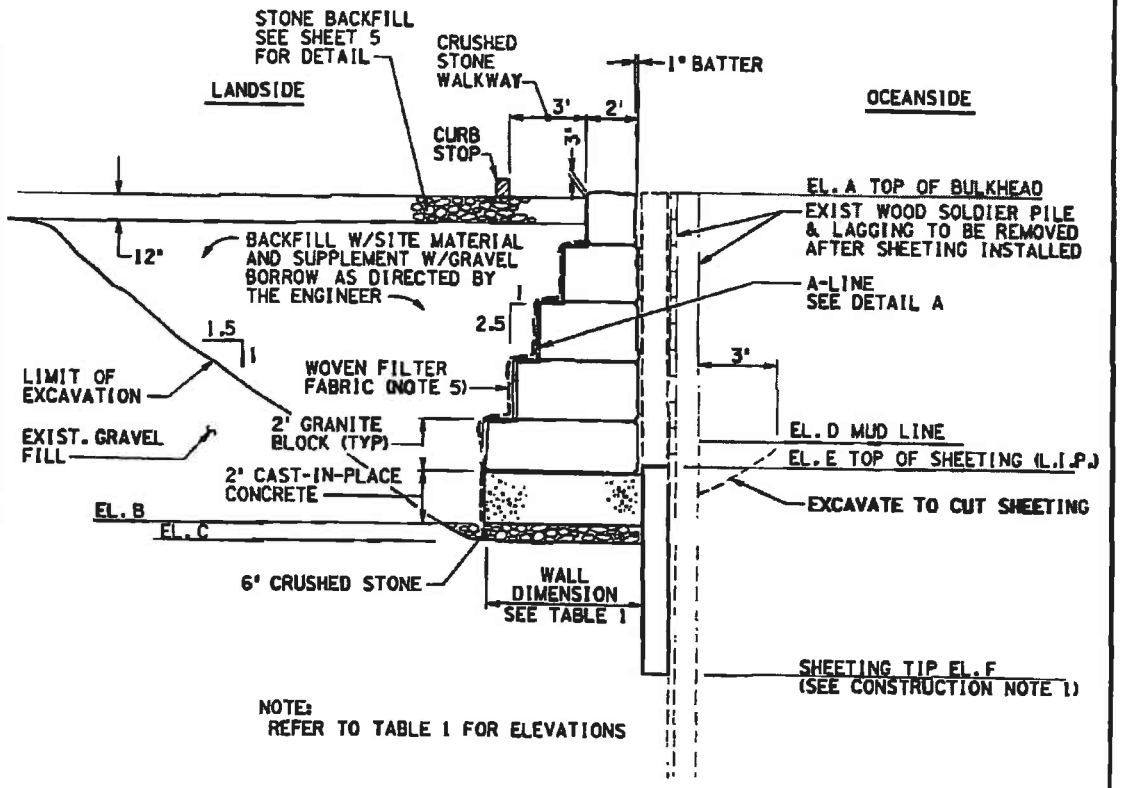
NTS

FILE: J:\35402\PERMIT\SHEET32.DGN
DATE: 11-May-01 14:37

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
BORING LOCATION PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 32 OF

065-007-000-010-100



②③④⑤
NTS

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PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
BORING LOCATION PLAN	
CONTRACT NO 3423-D	
MAY 9,2001	SHEET 33 OF

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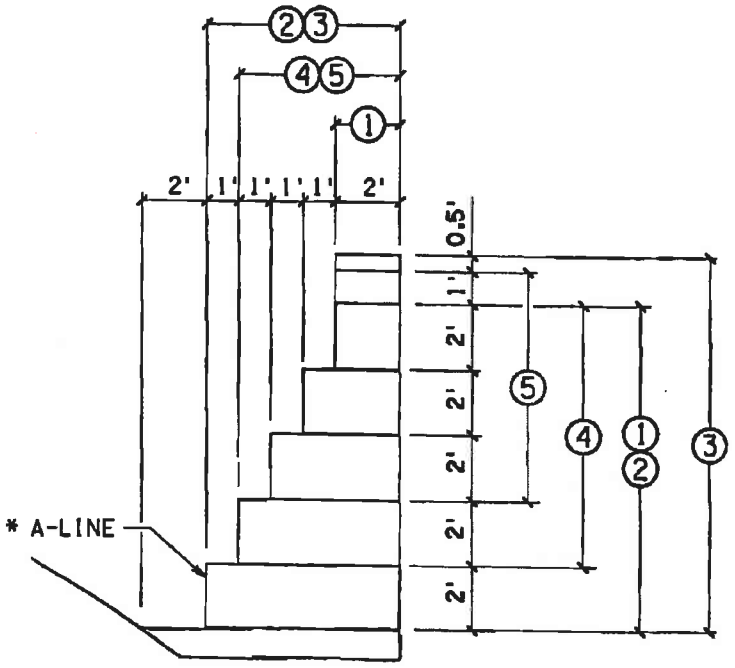

DETAIL A (STONE SIZE)

NTS

* SEE GENERAL NOTE 3

TABLE I - BULKHEAD ELEVATIONS						
BULKHEAD SECTION	A	B	C(1)	D	E	F
①	9.3	2.5	2.0	2.7	1.7	-9.2
②	9.3	-2.7	-3.2	0.5	-0.7	-9.2
③	10.7	-2.7	-3.2	0.0	-0.7	-9.2
④	9.3	-0.7	-1.5	1.0	0.5	-7.2
⑤	10.3	1.3	0.8	3.0	2.5	-7.2

(1) REFER TO CONSTRUCTION NOTE 4 IF ROCK ENCOUNTERED.

MLW -4.8
MHW 4.6
AHTL 6.3

PERMIT PLAN

TOWN PIER FACILITY REHABILITATION
SALISBURY, MASSACHUSETTS

BORING LOCATION PLAN

CONTRACT NO 3423-D

MAY 9,2001 | SHEET 34 OF

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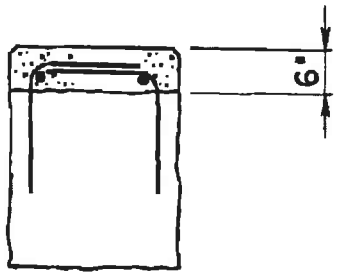

DETAIL B

NTS

CONSTRUCTION NOTES:

1. INSTALL STEEL SHEETING TIGHT TO THE LANDSIDE OF THE EXISTING SOLDIER PILE & LAGGING (②③④⑤) AND TO WATERSIDE OF CONCRETE WALL (①) TO TIP ELEVATION SHOWN ON TABLE 1 OR TO TOP OF ROCK IF ENCOUNTERED ABOVE DESIGNATED ELEVATION.
2. EXCAVATE TO STONE BLOCK BULKHEAD SUBGRADE ELEVATION AS SHOWN ON TABLE 1. REMOVE CONCRETE WALL TO ELEVATION SHOWN ON ①
3. PLACE ¾" STONE LEVELING COURSE TO ELEVATION B.
4. IF ROCK IS ENCOUNTERED ABOVE ELEVATION B, DELETE CRUSHED STONE.
5. INSTALL WOVEN FILTER FABRIC (SPECIFICATION 02200) AGAINST STONE AND BACKFILL WITH ONSITE MATERIAL AS INDICATED ON THE DRAWINGS. COMPACT TO 93% OF MAXIMUM DRY DENSITY AS PER ASTM D1557, METHOD C.
6. REMOVE EXISTING SHEET PILING AND LAGGING.
7. CUT AND REMOVE STEEL SHEETING TO ELEVATIONS SHOWN ON THE DRAWINGS.
8. IMPACTS DUE TO REMOVAL OF EXISTING BULKHEAD AND CUTTING OF STEEL SHEET WILL BE MITIGATED BY REGRADING DISTURBED SOIL AND REPLANTING EXISTING PLANTS DAILY WITH THE TIDE CYCLE.

GENERAL NOTES:

1. ELEVATIONS REFER TO NGVD (1929). THE BENCH MARK BEING THE TOP OF A STONE BOUND EL = 10.51'.
2. FOR BORING LOGS SEE SPECIFICATION. PROBES WERE DRILLED WITH A 2½" SOLID AUGER TO 5.0 FT. ALL PROBES REACHED 5.0 FT WITHOUT REFUSAL EXCEPT P-17 WHICH ENCOUNTERED PROBABLE BOULDER AT 4.7 FT.

PERMIT PLAN	
TOWN PIER FACILITY REHABILITATION SALISBURY, MASSACHUSETTS	
BORING LOCATION PLAN CONTRACT NO 3423-D	
MAY 9,2001	SHEET 35 OF

FILE: JN3540\2\PERMIT\SHEET34.DGN
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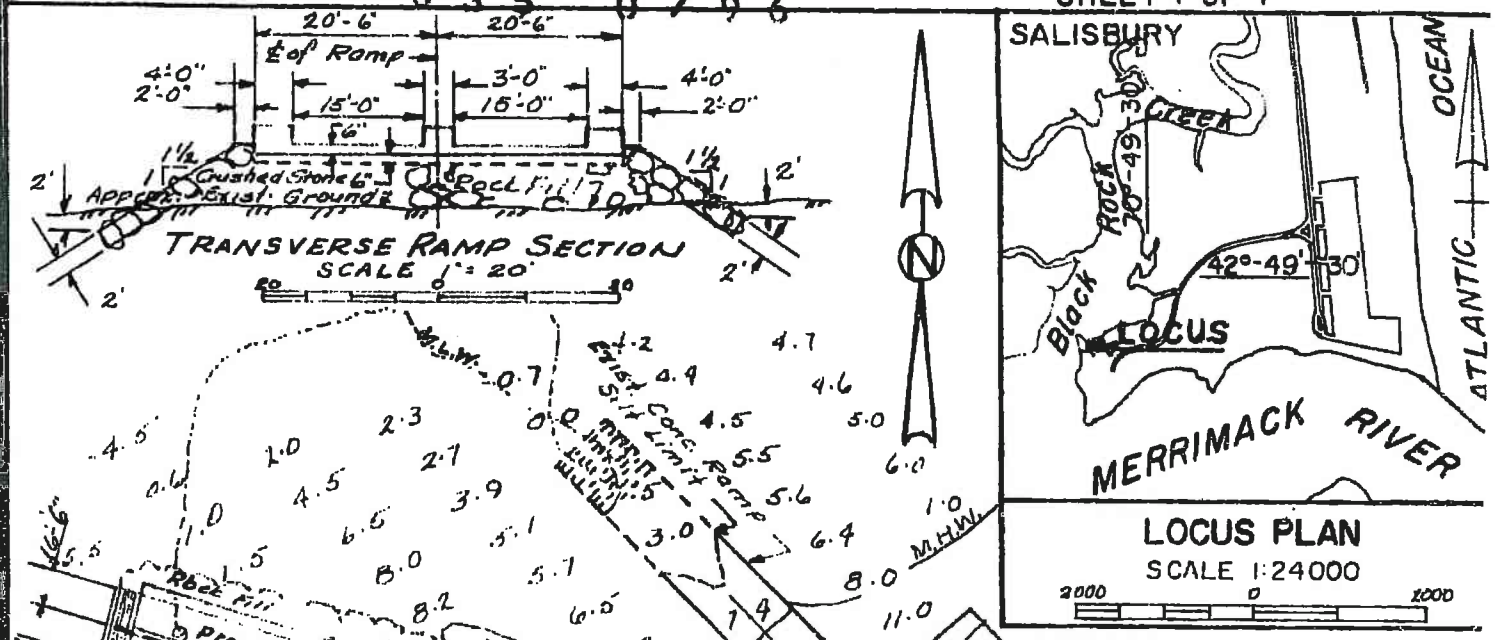
065-030-000-001-100

0 3 5 0 7 9 6

SHEET 1 OF 1



LOCUS PLAN
SCALE 1:24000
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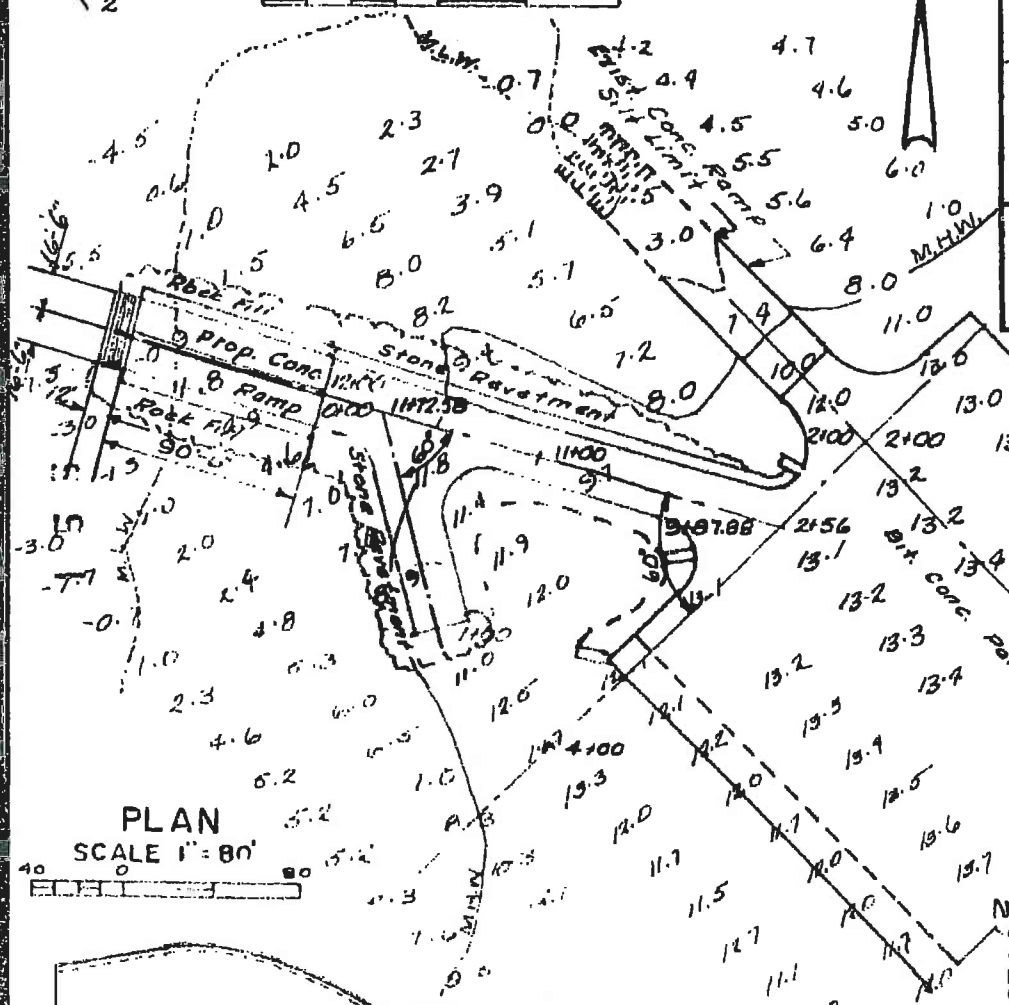
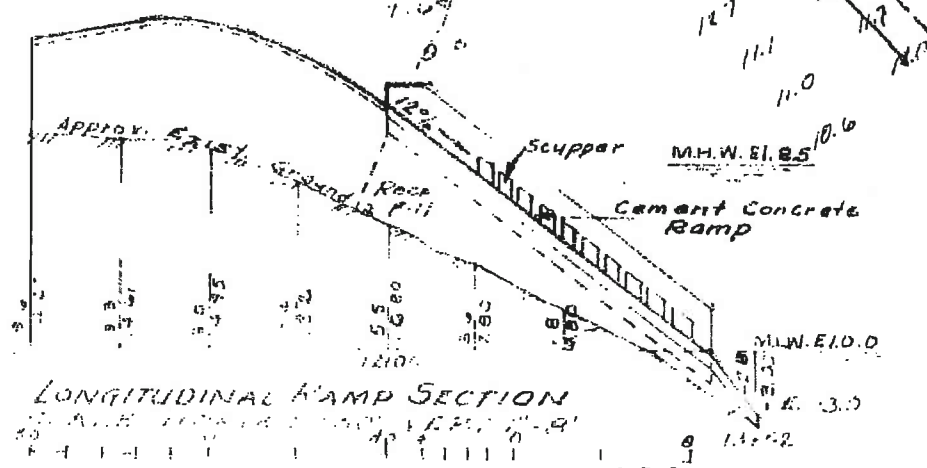




COMMONWEALTH OF MASSACHUSETTS
DEPT. OF NATURAL RESOURCES

NOTE: Elevations are in feet and tenths and refer to the plane of Mean Low Water, minus figures denote depths below that plane.
CONTRACT NO. BIRA.
LOCATION OF PROPOSED WORK SHOWN IN RED.

PROPOSED ACCESS RAMP & FACILITIES

BLACK ROCK CREEK AT MERRIMACK RIVER

SALISBURY, MASS.

APPLICATION BY
DEPARTMENT OF PUBLIC WORKS
of MASSACHUSETTS
DIVISION OF WATERWAYS
APRIL 1974

Fred C. Schweler

Section III

Newburyport

Section III – Community Findings – City of Newburyport

COMMUNITY DESCRIPTION

The City of Newburyport consists of a land area of 8.38 square miles out of a total area of 10.58 square miles and had a population of 17,189 in the 2000 census. The City is located on the North Shore of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline that is directly exposed to open ocean waves is 1 miles with the remaining shoreline semi-protected by offshore structures or landforms. The City is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the City were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the City of Newburyport, there were 17 structures which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen in Sheets 1 through Sheet 3 in Section III-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

STRUCTURE TYPE AND QUANTITY - City of Newburyport

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Length
Bulkhead / Seawall	11	1	5	5			2850
Revetment	5		4	1			2150
Breakwater							
Groin / Jetty	1			1			25
Coastal Dune							
Coastal Beach							
	17	1	9	7			5025

Within the above table, the total length of each type of structure is also provided. The structures are listed by the type which is providing the primary coastal protection. Many sites have multiple structure types at the same location (i.e. revetment in front of seawall). These secondary structures, although not identified within these tables, are included in the development of repair/rehabilitation costs.

The development of repair costs has been included by structure type and by condition. In the City of Newburyport's case there are a total of 16 structures which would require approximately $ 2.1 million to bring all the coastal structures to "A" Rating. Most critical will be the structures in the "D" and "F" classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event of which Newburyport has none.

STRUCTURE REPAIR / RECONSTRUCTION COST - City of Newburyport

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Bulkhead / Seawall	11		$ 499,191	$ 1,260,454			$ 1,759,645
Revetment	5		$ 256,885	$ 66,528			$ 323,413
Breakwater							$ -
Groin / Jetty	1			$ 30,025			$ 30,025
Coastal Dune							$ -
Coastal Beach							$ -
	17	$ -	$ 756,076	$ 1,357,007	$ -	$ -	$ 2,113,083

Based on the limited research within the scope of this project research, the presumed ownership of the structures was established on an initial basis and would be subject to more intense review in future tasks. Structures identified as being owned privately were excluded from further consideration. Although ownership of the land on which the structure was located was a factor, the structure ownership was treated as a separate issue from land ownership. For the City of Newburyport, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - City of Newburyport

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Town Owned	16		$ 756,076	$ 1,180,226			$ 1,936,302
Commonwealth of Massachusetts	1			$ 176,781			$ 176,781
Federal Government Owned							$ -
Unknown Ownership							$ -
	17	$ -	$ 756,076	$ 1,357,007	$ -	$ -	$ 2,113,083

The identification of presumed ownership was not based on the investigation of legal documents but relied on property ownership and from construction and regulatory documents that were found. A more detailed investigation of legal documents and agreements would be required where structure ownership is disputed. A more detailed identification of structure type, length, condition and location can be found in Section III-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

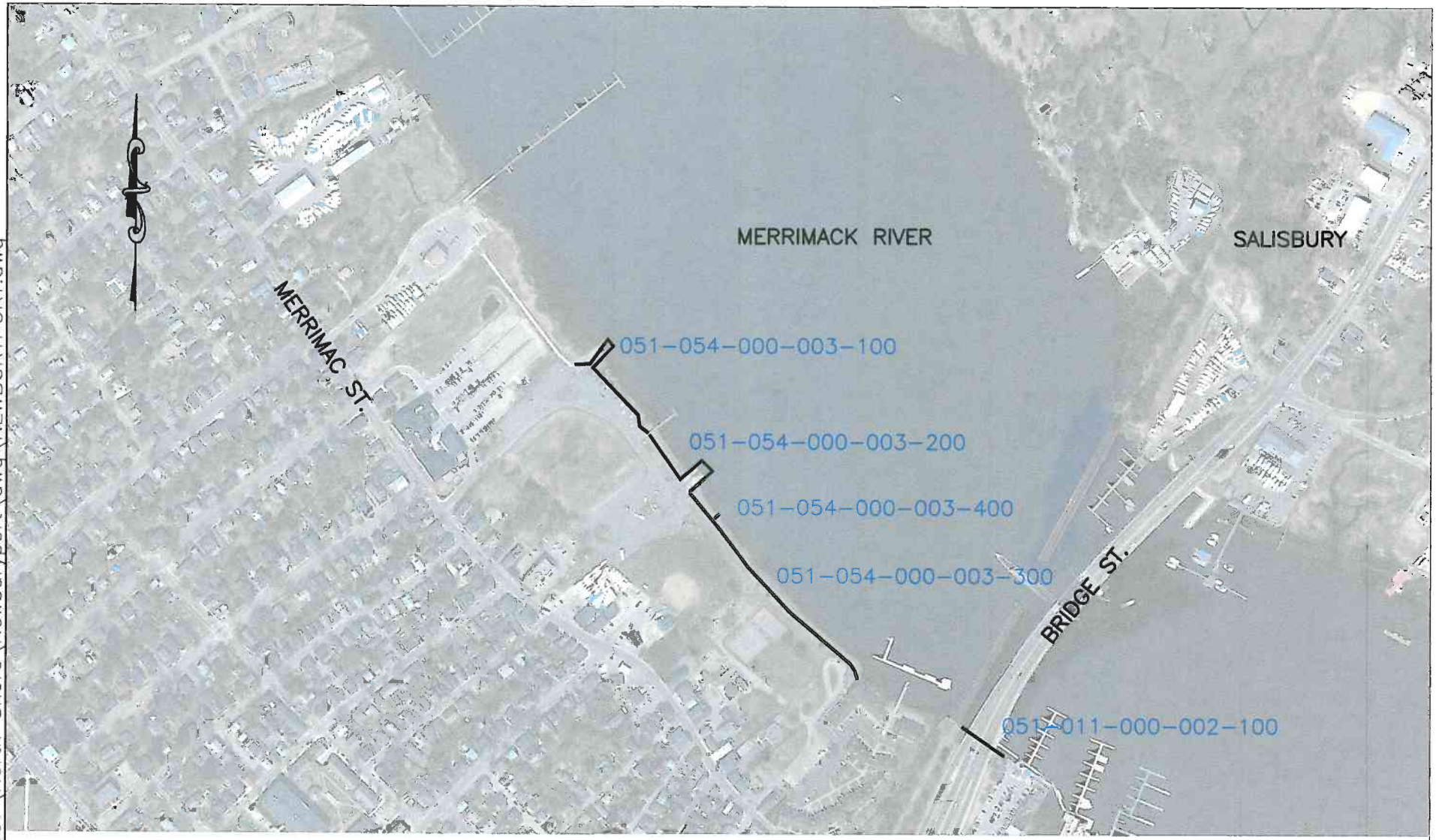
The enclosed reports and associated documents reflects the City of Newburyport's coastal structure information that will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

This database will also provide relatively quick access to identify available documentation for these structures as well as the ability to be updated as coastal structure improvements are made.

Section III - Newburyport

Part B

Structure Assessment Reports



COASTAL STRUCTURE LOCATION PLAN

CITY OF NEWBURYPORT
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150

SCALE: 1" = 150'

Bourne Consulting Engineering

SHEET 1

File: X:\27652-\27667\North Shore\Newburyport\dwg\NEWBURYPORT.dwg

COASTAL STRUCTURE LOCATION PLAN

CITY OF NEWBURYPORT
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150

SCALE: 1" = 150'

Bourne Consulting Engineering

SHEET 2

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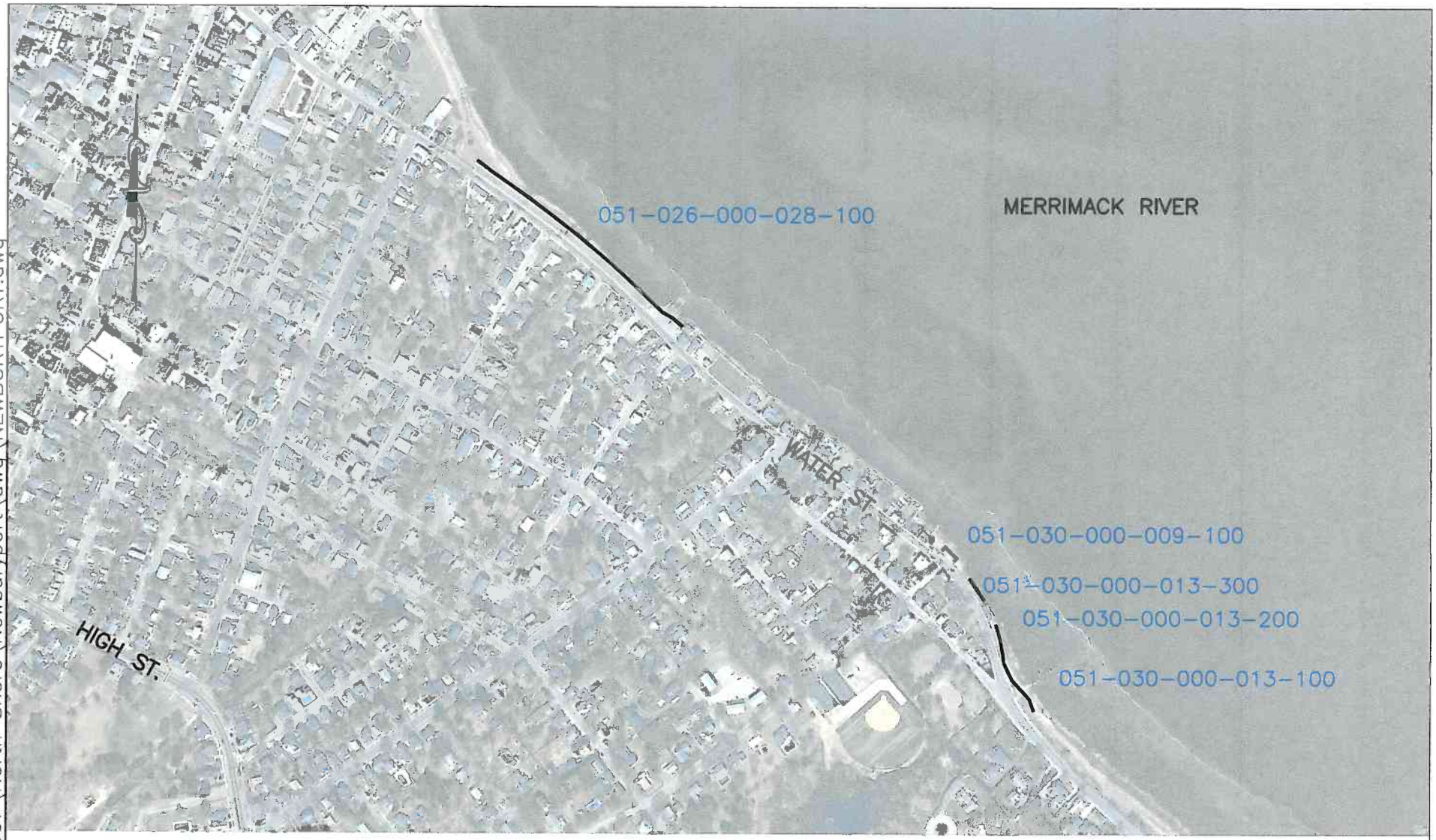

COASTAL STRUCTURE LOCATION PLAN

CITY OF NEWBURYPORT
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'

BCE Bourne Consulting Engineering

SHEET 3

File: X:\27652-\27667\North Shore\Newburyport\dwg\NEWBURYPORT.dwg

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-011-000-001B-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Railroad Avenue	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	1975	$918,060.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
535		V3	13
Feet	Feet NAVD 88		Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Steel	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Steel sheetpile cells with a concrete cap with moderate sheetpile corrosion in splash and tidal zones. There are minor defects on the concrete cap. It is in fair condition for storm protection. The boardwalk and park are above.

Condition Rating	C
	Fair
Level of Action	Moderate
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority Rating	II
	Low Priority
Action	Future Project Consideration
Description	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-011-000-001B-100-PHO1A.JPG

051-011-000-001B-100-PHO1B.JPG

Structure Documents:

USACE	July 1975	Propose Rebuild of	051-011-000-001B-100-COE1A
MA-DCR	November 2	Boardwalk	051-011-000-001B-100-DCR1A
DEP	June 1976	Plans Accompanying	051-011-000-001B-100-LIC1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-011-000-001B-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Railroad Avenue	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	1975	$109,824.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
320 Feet	Feet NAVD 88	V3	13 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Steel	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A steel sheetpile bulkhead with tie-backs and concrete cap with moderate steel corrosion in the splash and tidal zones. It is in satisfactory condition for storm protection.

Condition Rating	B
Level of Action	Good
Description	Minor
	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority Rating	II
Action	Low Priority
Description	Future Project Consideration
	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-011-000-001B-200-PHO2A.JPG
051-011-000-001B-200-PHO2B.JPG
051-011-000-001B-200-PHO2C.JPG

Structure Documents:

USACE	July 1975	Propose Rebuild of	051-011-000-001B-200-COE2A
MA-DCR	November 2	Boardwalk	051-011-000-001B-200-DCR2A
DEP	June 1976	Plans Accompanying	051-011-000-001B-200-LIC2A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-011-000-001B-300

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Railroad Avenue	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	1975	$80,652.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
235 Feet	Feet NAVD 88	V3	13 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Steel	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Steel sheetpile cells with a concrete cap. There is moderate corrosion in the splash and tidal zones and minor defects on concrete cap. It is in satisfactory condition for storm protection.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-011-000-001B-300-PHO3A.JPG

Structure Documents:

USACE	July 1975	Propose Rebuild of	051-011-000-001B-300-COE3A
MA-DCR	November 2	Boardwalk	051-011-000-001B-300-DCR3A
DEP	June 1976	Plans Accompanying	051-011-000-001B-300-LIC3A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-011-000-001B-400

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Railroad Avenue	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	2001	$0.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
125 Feet	Feet NAVD 88	V3	13 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Steel	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A coated steelsheet pile bulkhead with concrete cap in good condition. There is a park area behind the wall.

Condition Rating	A Excellent	*Priority Rating*	II Low Priority
Level of Action	None	*Action*	Future Project Consideration
Description	Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-011-000-001B-400-PHO4A.JPG

Structure Documents:

MA-DCR	November 2	Boardwalk	051-011-000-001B-400-DCR4A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-011-000-002-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Gillis Bridge	3/13/2009

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MHD	Unkown	$176,781.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
55 Feet	Feet NAVD 88	A2	10 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Stone	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:
Revetment	Stone	Over 15 Feet

Structure Summary :

Stone blocks that are approximately 4 feet by 2 feet by 2 feet with dumped stone that varies in size in front of them. Most of the dumped stones are 3 feet in diameter. Heavy rotation and movement of the stones behind structure is the bridge abutment for Gillis Bridge.

Condition Rating	C Fair
Level of Action	Moderate
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority Rating	III Moderate Priority
Action	Consider for Active Project Improvement Listing
Description	Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

051-011-000-002-100-PHO1A.JPG

051-011-000-002-100-PHO1B.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-012-000-009-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Fish Coop	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	2001	$96,096.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
280 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Steel	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A steel sheetpile bulkhead with tie-backs in satisfactory condition with minor general corrosion. A portion of the area behind the bulkhead is a commercial boat loading/unloading area.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-012-000-009-100-PHO1A.JPG

Structure Documents:

MA-DCR	November 2	Boardwalk	051-012-000-009-100-DCR1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-012-000-009-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Harbor Master Office Area	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	2001	$27,456.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
80 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Steel	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A steel sheetpile bulkhead with park boardwalk above, with general minor corrosion of sheet pile. In satisfactory condition.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-012-000-009-200-PHO2A.JPG

Structure Documents:

MA-DCR	November 2	Boardwalk	051-012-000-009-200-DCR2A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-012-000-009-300

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Harbor Master Building	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	2001	$29,858.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
60 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:
Bulkhead/ Seawall	Steel	10 to 15 Feet

Structure Summary :

A steel framed deck spanning over placed stone block revetment and drainage outfall, in satisfactory condition. The Harbor Master building is set back.

Condition Rating	B Good	*Priority Rating*	V Immediate / Highest Priority
Level of Action	Minor	*Action*	Consider For Immediate Action Due to Public Safety and Welfare Issues
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Critical Inshore Structures Present with Potential for Infrastructure Damage and/or High Density Residential Dwellings Condition of structure may warrant emergency stabilization as failure may result in potential loss of property and/or life. (>10 dwellings impacted / 100 feet of shoreline)

Structure Images:

051-012-000-009-300-PHO3A.JPG

Structure Documents:

MA-DCR	November 2	Boardwalk	051-012-000-009-300-DCR3A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-026-000-028-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Harrison Street Joppa Park	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	1971	$185,163.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
905 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Concrete	Under 5 Feet

Secondary Type:	Secondary Material:	Secondary Height:
Revetment	Stone	5 to 10 Feet

Structure Summary :

A precast concrete wave return wall above large placed stone revetment along Water Street. Above the salt marsh, there are two areas with small localized sinkholes in the sidewalk; in satisfactory condition.

Condition Rating	B Good
Level of Action	Minor
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority Rating	II Low Priority
Action	Future Project Consideration
Description	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-026-000-028-100-PHO1A.JPG

051-026-000-028-100-PHO1B.JPG

Structure Documents:

USACE	March 1971	Proposed Shore	051-026-000-028-100-COE1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-030-000-009-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Water Street	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	Unkown	$36,128.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
85 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Stone	Under 5 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A mortared rubble stone wall with granite cap stones and some repair concrete cast in place. There is a collapsed area 8 feet long with overtopping erosion in fair condition. Located at the Bus Stop, adjacent to Water street.

Condition Rating	C
	Fair
Level of Action	Moderate
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority Rating	I
	None
Action	Long Term Planning Considerations
Description	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

051-030-000-009-100-PHO1A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-030-000-013-100

Key: community-map-block-parcel-structure

Property Owner: Local

Location: Simons Beach

Date: 7/23/2007

Presumed Structure Owner: Local

Based On Comment:

Owner Name: Newburyport

Earliest Structure Record: Unkown

Estimated Reconstruction/Repair Cost: $57,380.00

Length: 135 Feet

Top Elevation: Feet NAVD 88

FIRM Map Zone: V3

FIRM Map Elevation: 12 Feet NGVD

Primary Type: Bulkhead/ Seawall

Primary Material: Stone

Primary Height: Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:

Structure Summary :

A stone seawall inshore of salt marsh along Water Street, in fair condition. It is mortared rubble with a granite block cap. There is some mortar missing and overtopping scour damage.

Condition Rating	C
	Fair
Level of Action	Moderate
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority Rating	II
	Low Priority
Action	Future Project Consideration
Description	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images: 051-030-000-013-100-PHO1A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-030-000-013-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Simons Beach	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	Unkown	$66,528.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
200 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	Under 5 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A dumped rubble stone revetment with random alignment in fair condition, along Water Street.

Condition Rating	C Fair	*Priority Rating*	II Low Priority
Level of Action	Moderate	*Action*	Future Project Consideration
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-030-000-013-200-PHO2A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-030-000-013-300

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Simons Beach	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	Unkown	$72,105.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
95 Feet	Feet NAVD 88	V3	12 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Bulkhead/ Seawall	Stone	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A mortared rubble stone wall with precast concrete cap, along Water Street at top of salt marsh. There are some joints missing mortar and a few missing stones. It is in fair condition.

Condition Rating	C Fair	*Priority Rating*	II Low Priority
Level of Action	Moderate	*Action*	Future Project Consideration
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-030-000-013-300-PHO3A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-054-000-003-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Cashman Park	7/23/2007
Presumed Structure Owner:	**Based On Comment:**	
Local		
Owner Name:	**Earliest Structure Record:**	**Estimated Reconstruction/Repair Cost:**
Newburyport	1974	$70,270.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
585 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	5 to 10 Feet
Secondary Type:	**Secondary Material:**	**Secondary Height:**

Structure Summary :

A medium size stone placed revetment parallel with slope that protects the parking lot and sidewalk including the apparently abandoned boat ramp. The revetment is in satisfactory condition.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-054-000-003-100-PHO1A.JPG

Structure Documents:

USACE	June 1974	Proposed	051-054-000-003-100-COE1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-054-000-003-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Cashman Park	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	1993	$52,853.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
440 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A medium size stone placed revetment parallel with slope, protecting sidewalk and parking lot, including active boat ramp. Some loss of undersized underlayer, but in satisfactory condition.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-054-000-003-200-PHO2A.JPG

Structure Documents:

DEP	February 19	Plan Accompanying	051-054-000-003-200-LIC2A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-054-000-003-300

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Cashman Park	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	2001	$103,904.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
865 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A medium size stone placed revetment parallel with slope, protecting sidewalk and lawn area. There is some loss of undersized underlayer and areas with wave over erosion and scour. It is in satisfactory condition.

Condition Rating	B Good	*Priority Rating*	I None
Level of Action	Minor	*Action*	Long Term Planning Considerations
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

051-054-000-003-300-PHO3A.JPG

Structure Documents:

DEP	November 2	Plan Accompanying	051-054-000-003-300-LIC3A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newburyport

Structure ID: 051-054-000-003-400

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Cashman Park	7/23/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newburyport	2001	$30,025.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
25 Feet	Feet NAVD 88	A2	9 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Groin/ Jetty	Stone	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A placed stone groin with concrete end wall at drain outfall. There is some erosion of the undersized underlayer, and crest stones with poor interlocking and open joints. It is in fair condition.

Condition Rating	C Fair	*Priority Rating*	II Low Priority
Level of Action	Moderate	*Action*	Future Project Consideration
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

051-054-000-003-400-PHO4A.JPG

Structure Documents:

DEP	November 2	Plan Accompanying	051-054-000-003-400-LIC4A

Prepared By: Bourne Consulting Engineering

Section III - Newburyport

Part C

Structure Photographs

CITY: NEWBURYPORT
SOURCE: WFE - FIELD PHOTOGRAPHS
LOCATION: Bourne Consulting Engineering
DATE OF RESEARCH: AUGUST 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
051-011-000-001B-100	051-011-000-001B-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-011-000-001B-100	051-011-000-001B-100-PHO1B.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-011-000-001B-200	051-011-000-001B-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-011-000-001B-200	051-011-000-001B-200-PHO2B.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-011-000-001B-200	051-011-000-001B-200-PHO2C.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-011-000-001B-300	051-011-000-001B-300-PHO3A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-011-000-001B-400	051-011-000-001B-400-PHO4A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-011-000-002-100	051-011-000-002-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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051-012-000-009-100	051-012-000-009-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-012-000-009-200	051-012-000-009-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-012-000-009-300	051-012-000-009-300-PHO3A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-026-000-028-100	051-026-000-028-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-026-000-028-100	051-026-000-028-100-PHO1B.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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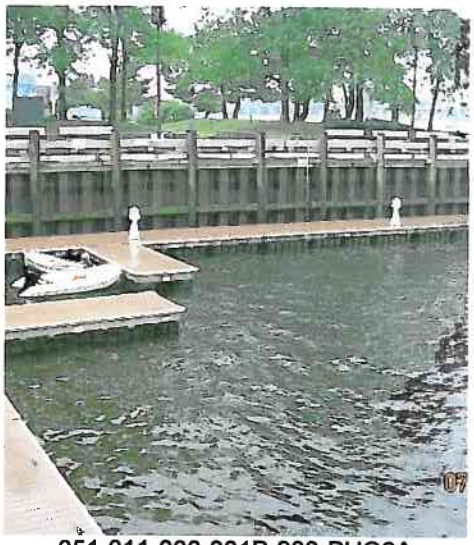
051-030-000-013-300	051-030-000-013-300-PHO3A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-054-000-003-100	051-054-000-003-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-054-000-003-200	051-054-000-003-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-054-000-003-300	051-054-000-003-300-PHO3A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
051-054-000-003-400	051-054-000-003-400-PHO4A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey


051-011-000-001B-100-PHO1A


051-011-000-001B-100-PHO1B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051-011-000-001B-200-PHO2B


051-011-000-001B-200-PHO2C


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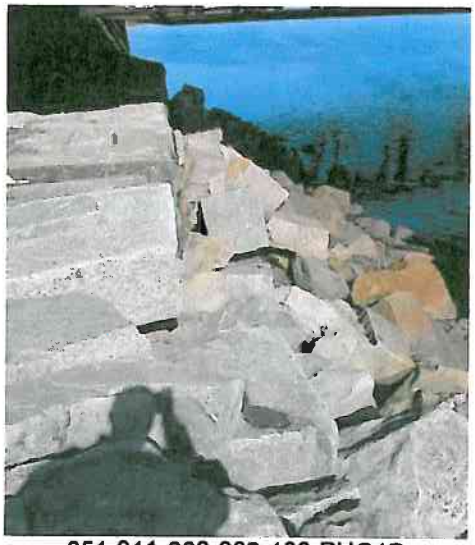
051-011-000-002-100-PHO1A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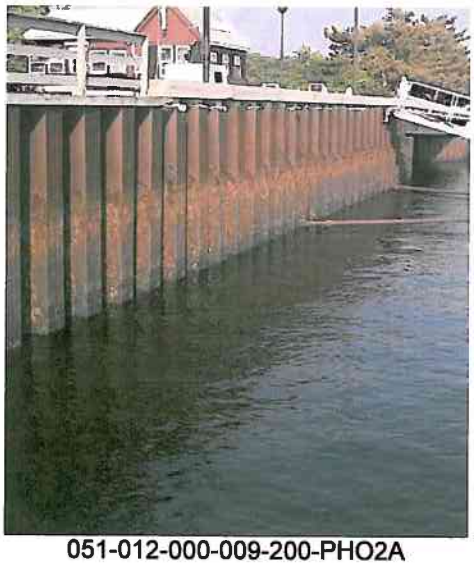
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051-030-000-009-100-PHO1A


051-030-000-013-100-PHO1A


051-030-000-013-200-PHO2A


051-030-000-013-300-PHO3A

051-054-000-003-100-PHO1A

051-054-000-003-200-PHO2A

051-054-000-003-300-PHO3A

051-054-000-003-400-PHO4A

Section III - Newburyport

Part D

Structure Documents

TOWN DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents

CITY: NEWBURYPORT
SOURCE: City of Newburyport
LOCATION: CITY
DATE OF RESEARCH: JULY 2007

No City Documents for the City of Newburyport

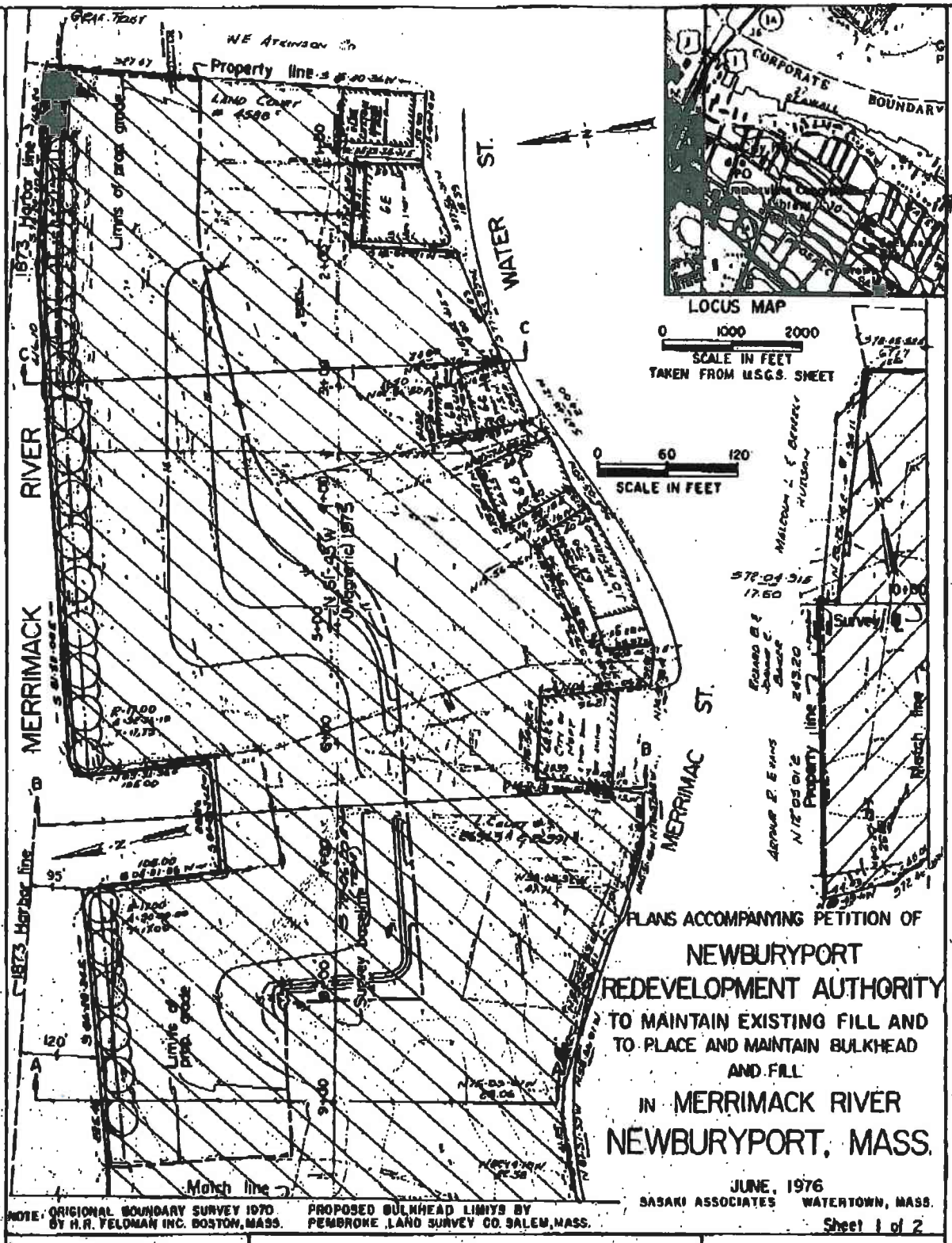
BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

CITY: NEWBURYPORT
SOURCE: MA-DCR
LOCATION: MA-DCR BOSTON and HINGHAM, MA
DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
051-011-000-001B-100	051-011-000-001B-100-DCR1A	2002-01	MA-DCR	Newburyport	November 2001	Boardwalk Renovations and Extension Project	44	Between Center Street and Green Street	Bulkhead
051-011-000-001B-200	051-011-000-001B-200-DCR2A	2002-01	MA-DCR	Newburyport	November 2001	Boardwalk Renovations and Extension Project	44	Between Center Street and Green Street	Bulkhead
051-011-000-001B-300	051-011-000-001B-300-DCR3A	2002-01	MA-DCR	Newburyport	November 2001	Boardwalk Renovations and Extension Project	44	Between Center Street and Green Street	Bulkhead
051-011-000-001B-400	051-011-000-001B-400-DCR4A	2002-01	MA-DCR	Newburyport	November 2001	Boardwalk Renovations and Extension Project	44	Between Center Street and Green Street	Bulkhead
051-012-000-009-100	051-012-000-009-100-DCR1A	2002-01	MA-DCR	Newburyport	November 2001	Boardwalk Renovations and Extension Project	44	Between Center Street and Green Street	Bulkhead
051-012-000-009-200	051-012-000-009-200-DCR2A	2002-01	MA-DCR	Newburyport	November 2001	Boardwalk Renovations and Extension Project	44	Between Center Street and Green Street	Bulkhead
051-012-000-009-300	051-012-000-009-300-DCR3A	2002-01	MA-DCR	Newburyport	November 2001	Boardwalk Renovations and Extension Project	44	Between Center Street and Green Street	Bulkhead

CITY: NEWBURYPORT
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
051-011-000-001B-100	051-011-000-001B-100-LIC1A	194	DEP	Newburyport	June 1976	Plans Accompanying Petition of Newbury Port Authority to Maintain Existing Fill and to Place and Maintain Bulkhead and Fill In Merrimack River, Newburyport, MA	2	Railroad Ave	Bulkhead and Fill
051-011-000-001B-200	051-011-000-001B-200-LIC2A	194	DEP	Newburyport	June 1976	Plans Accompanying Petition of Newbury Port Authority to Maintain Existing Fill and to Place and Maintain Bulkhead and Fill in Merrimack River, Newburyport, MA	2	Railroad Ave	Bulkhead and Fill
051-011-000-001B-300	051-011-000-001B-300-LIC3A	194	DEP	Newburyport	June 1976	Plans Accompanying Petition of Newbury Port Authority to Maintain Existing Fill and to Place and Maintain Bulkhead and Fill in Merrimack River, Newburyport, MA	2	Railroad Ave	Bulkhead and Fill
051-054-000-003-200	051-054-000-003-200-LIC2A	3214	DEP	Newburyport	February 1993	Plan Accompanying Petition of City of Newburyport to License and Maintain a Boat Ramp, Floats, Piles and Dolphin Cluster - Merrimack River - Newburyport, Essex County, MA	4	Cashman Park	Existing Riprap
051-054-000-003-300	051-054-000-003-300-LIC3A	9105	DEP	Newburyport	November 2001	Plan Accompanying Petition of City of Newburyport, MA. to Construct Stone Revetment	8	Merrimack River	Stone Revetment
051-054-000-003-400	051-054-000-003-400-LIC4A	9105	DEP	Newburyport	November 2001	Plan Accompanying Petition of City of Newburyport, MA. to Construct Stone Revetment Merrimack River	8	Merimack River	Stone Revetment



PLANS ACCOMPANYING PETITION OF

NEWBURYPORT REDEVELOPMENT AUTHORITY

TO MAINTAIN EXISTING FILL AND TO PLACE AND MAINTAIN BULKHEAD AND FILL

IN MERRIMACK RIVER

NEWBURYPORT, MASS.

JUNE, 1976

SASAKI ASSOCIATES WATERTOWN, MASS.

Sheet 1 of 2

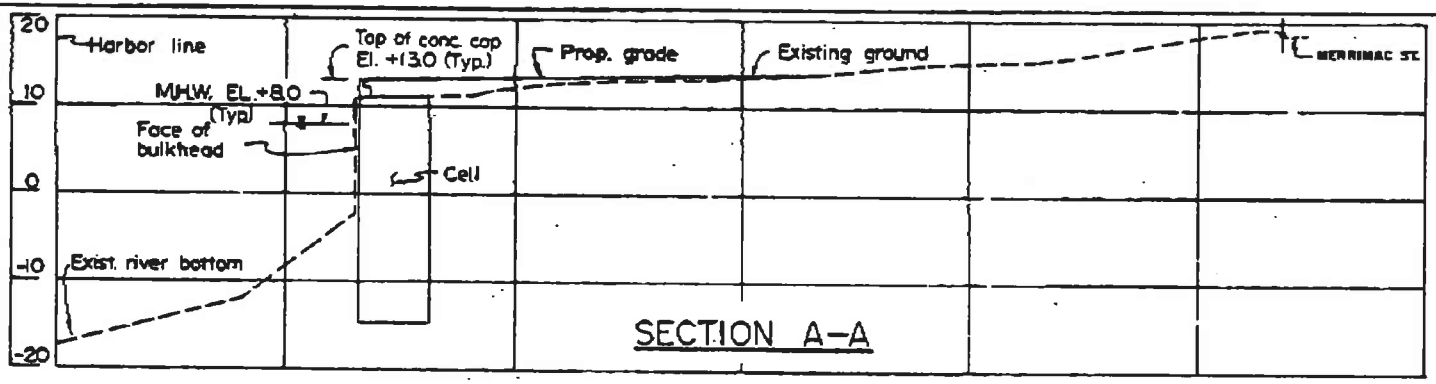
NOTE: ORIGIONAL BOUNDARY SURVEY 1970 BY H.R. FELONAN INC. BOSTON, MASS. PROPOSED BULKHEAD LIMITS BY PEMBROKE LAND SURVEY CO. SALEM, MASS.

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS G.L. Ch. 36, Sec. 13A (Rev. 71, 1973)

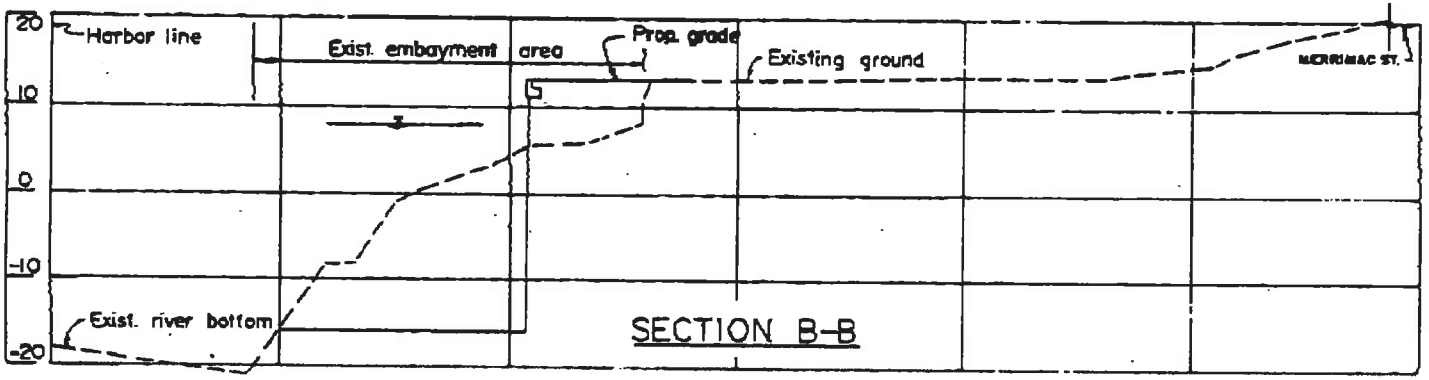
APPROVAL UNDER THE SUBDIVISION CONTROL LAW IS NOT REQUIRED

7/19/1976

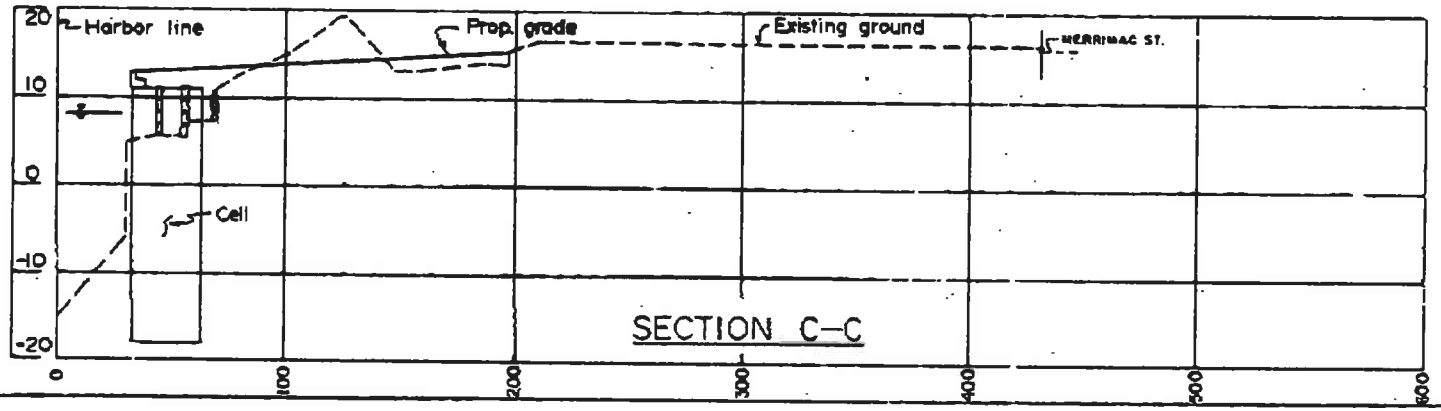
051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300



SECTION A–A



SECTION B–B



SECTION C–C

Horiz. scale in feet

0 20 40 80 120

Vert. scale in feet

0 10 20 30

SECTIONS THROUGH
LAND OWNED BY CITY
OF

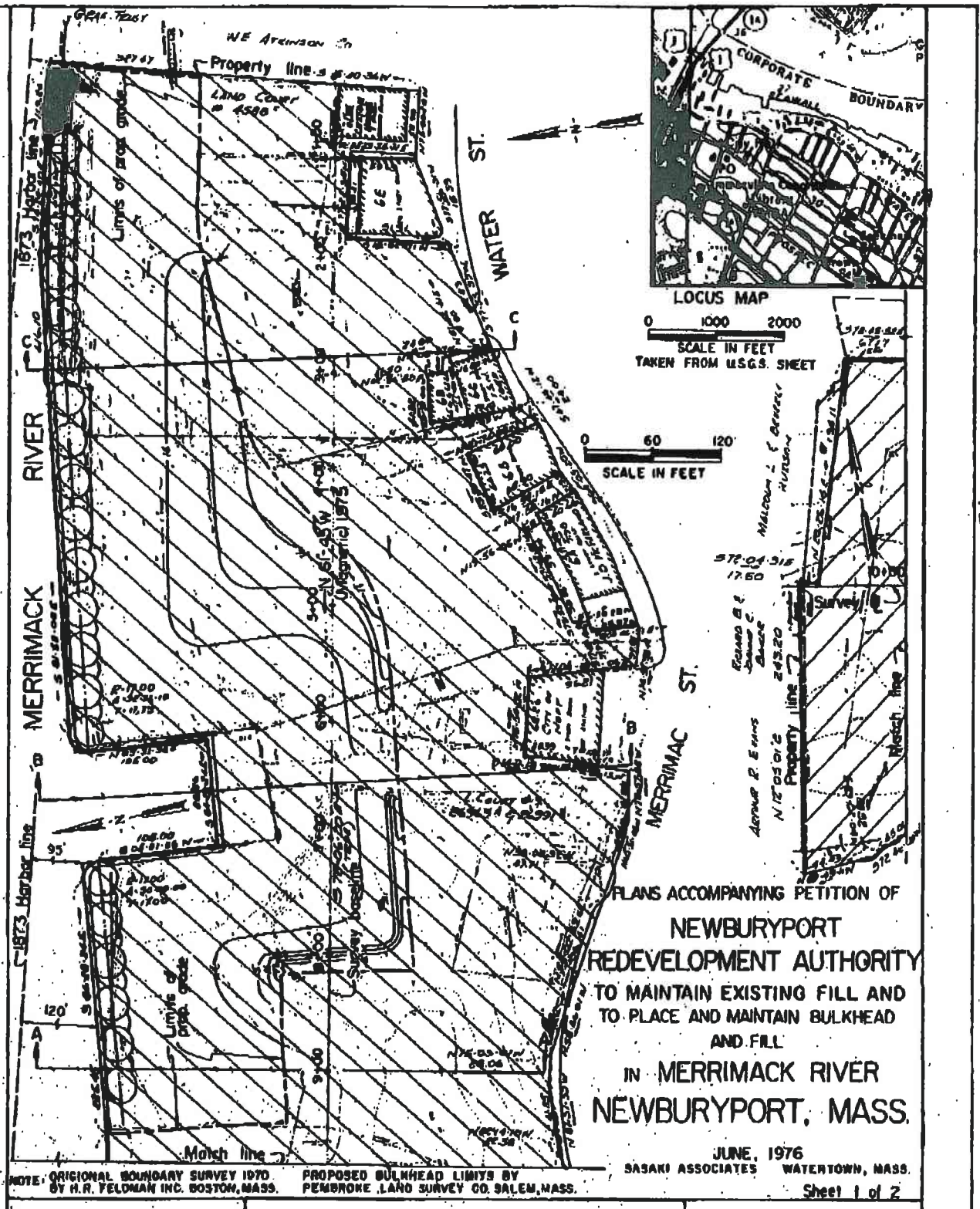
NEWBURYPORT, MASS.

JUNE 1976

PREPARED BY · SASAKI ASSOCIATES
WATERTOWN, MASS

Sheet 2 of 2

051-011-000-001B-100
051-011-000-001B-200
051-011-000-001B-300

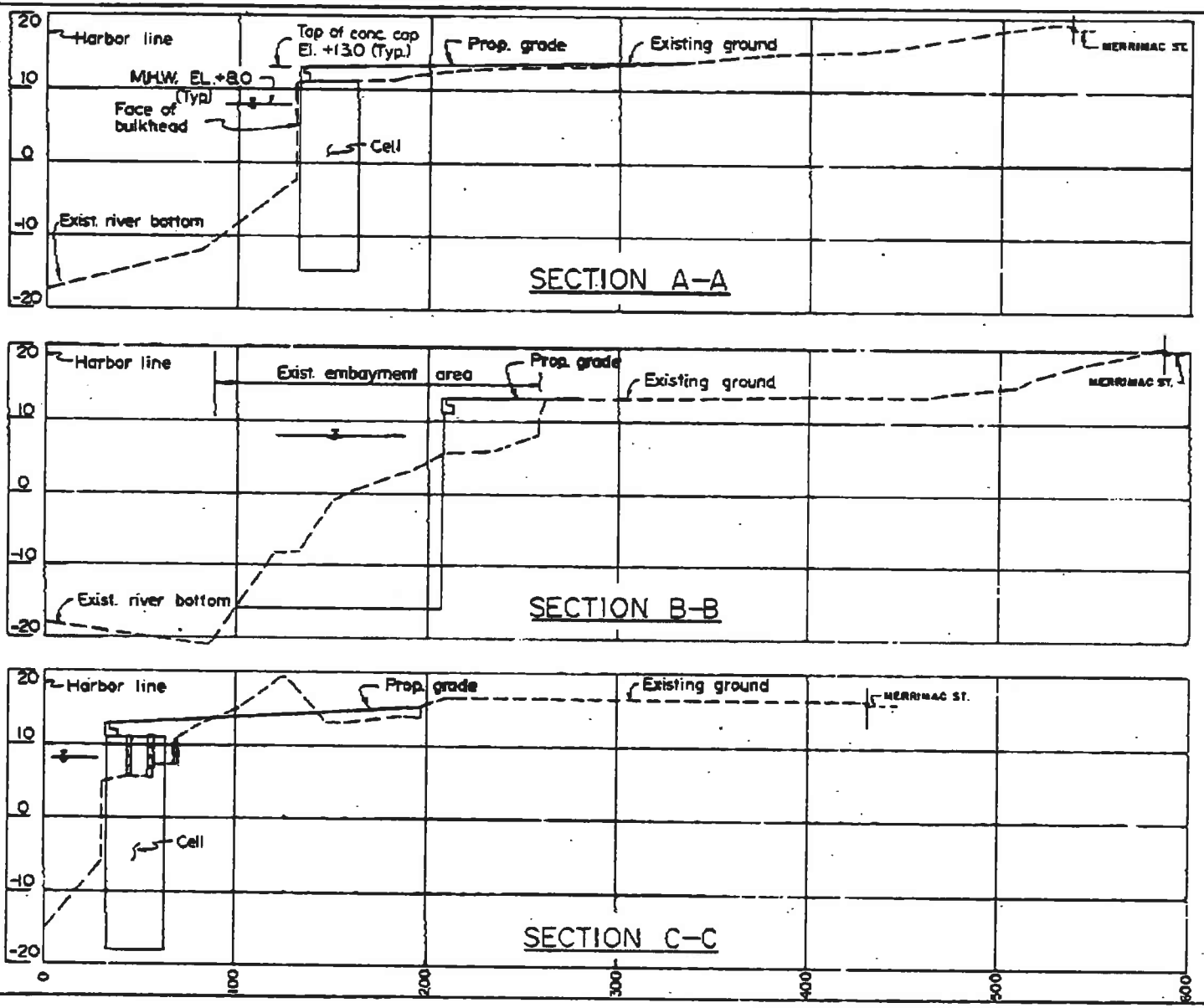


I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS G.L. Ch. 36, Sec. 13A (Nov. 71, 1975)

APPROVAL UNDER THE SUBDIVISION CONTROL LAW IS NOT REQUIRED

7/14/1976

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300



Horiz. scale in feet
0 20 40 80 120

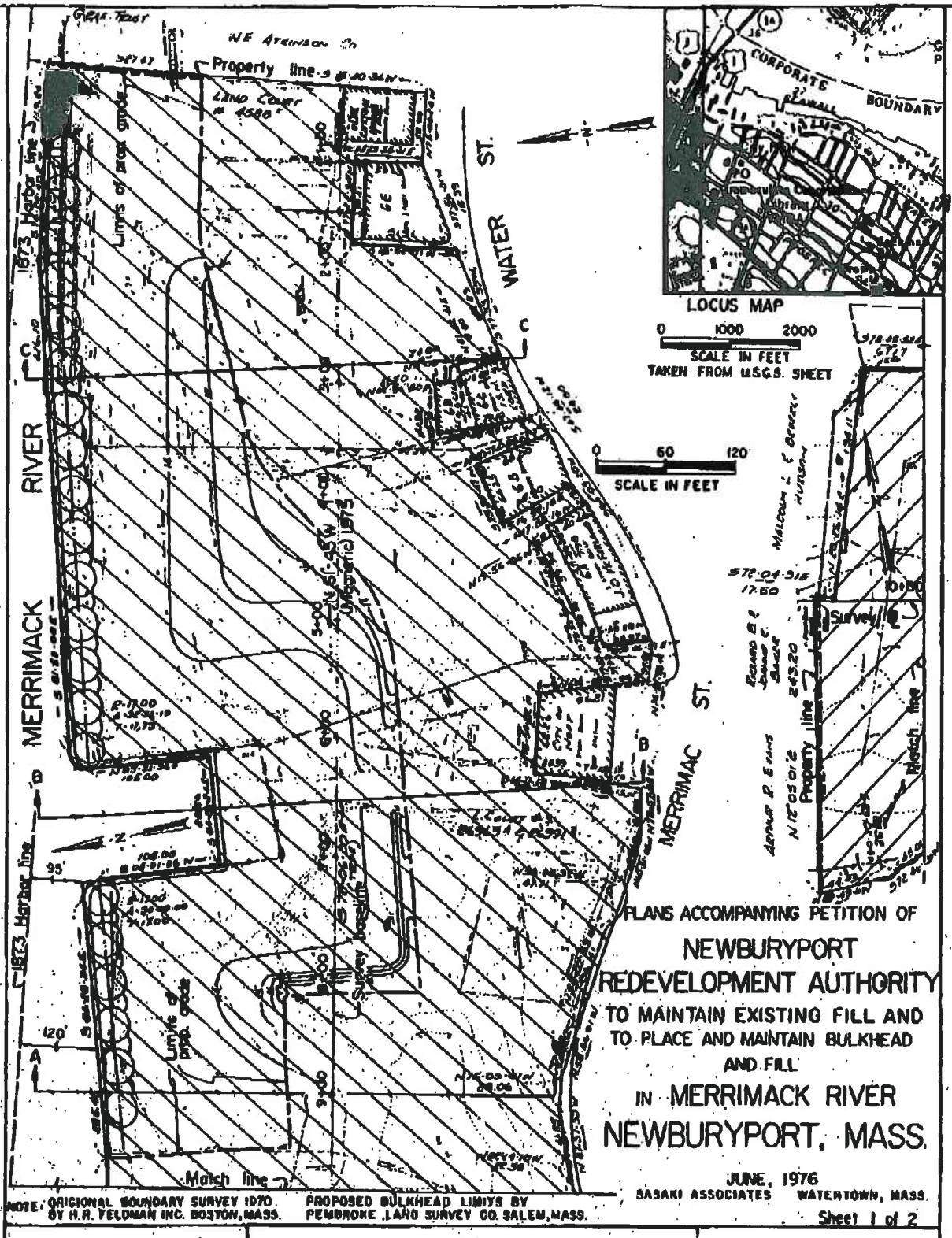
Vert. scale in feet
0 10 20 30

SECTIONS THROUGH
LAND OWNED BY CITY
OF
NEWBURYPORT, MASS.
JUNE 1976

PREPARED BY · SASAKI ASSOCIATES
WATERTOWN, MASS

Sheet 2 of 2

051-011-000-001B-100
051-011-000-001B-200
051-011-000-001B-300

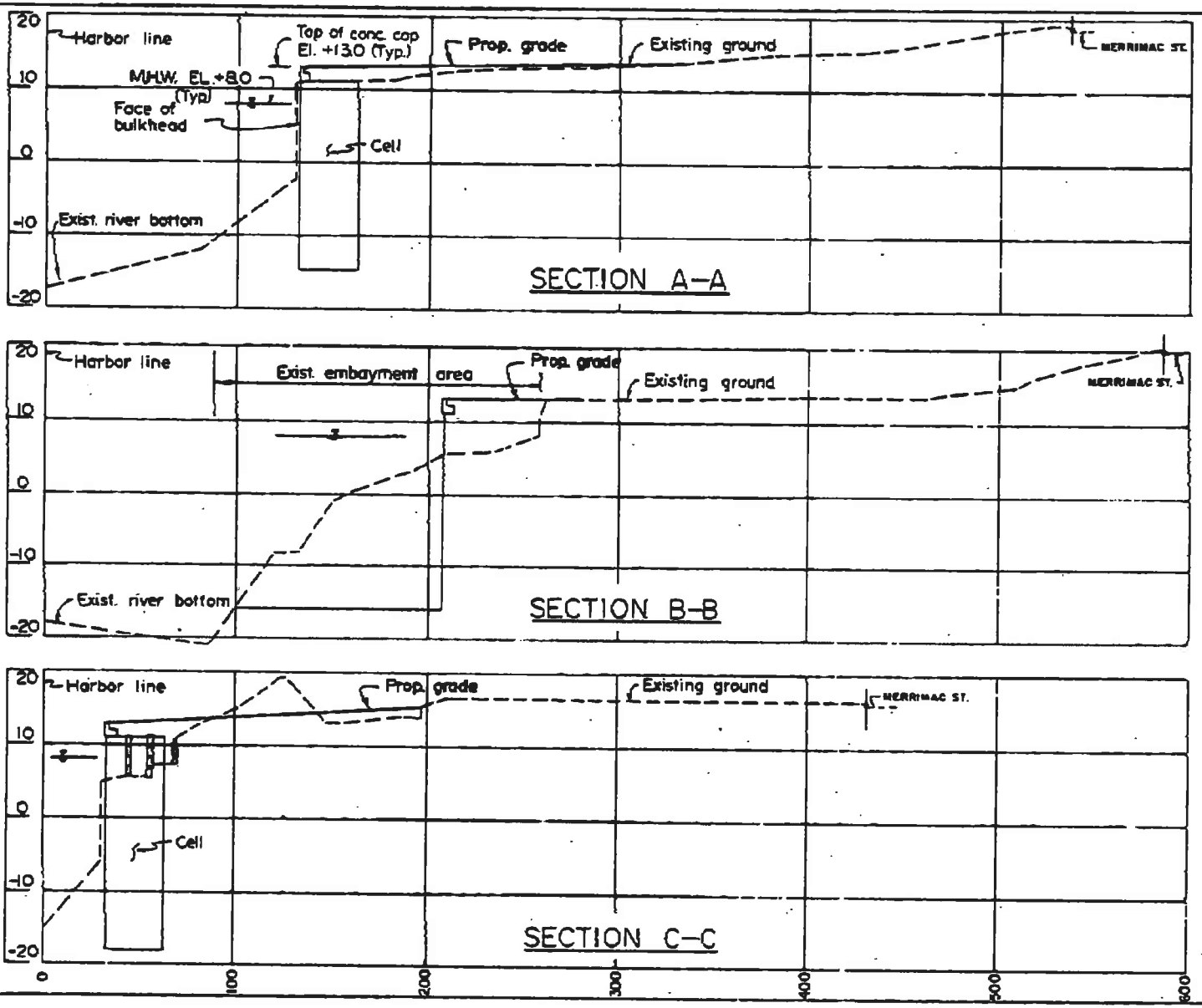


I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS: G.L. Ch. 36, Sec. 13A (Nov. 7), 1973).

APPROVAL UNDER THE SUBDIVISION CONTROL LAW IS NOT REQUIRED

7/13/1976

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300



Horiz. scale in feet

0 20 40 80 120

Vert. scale in feet

0 10 20 30

SECTIONS THROUGH
LAND OWNED BY CITY
OF

NEWBURYPORT, MASS.

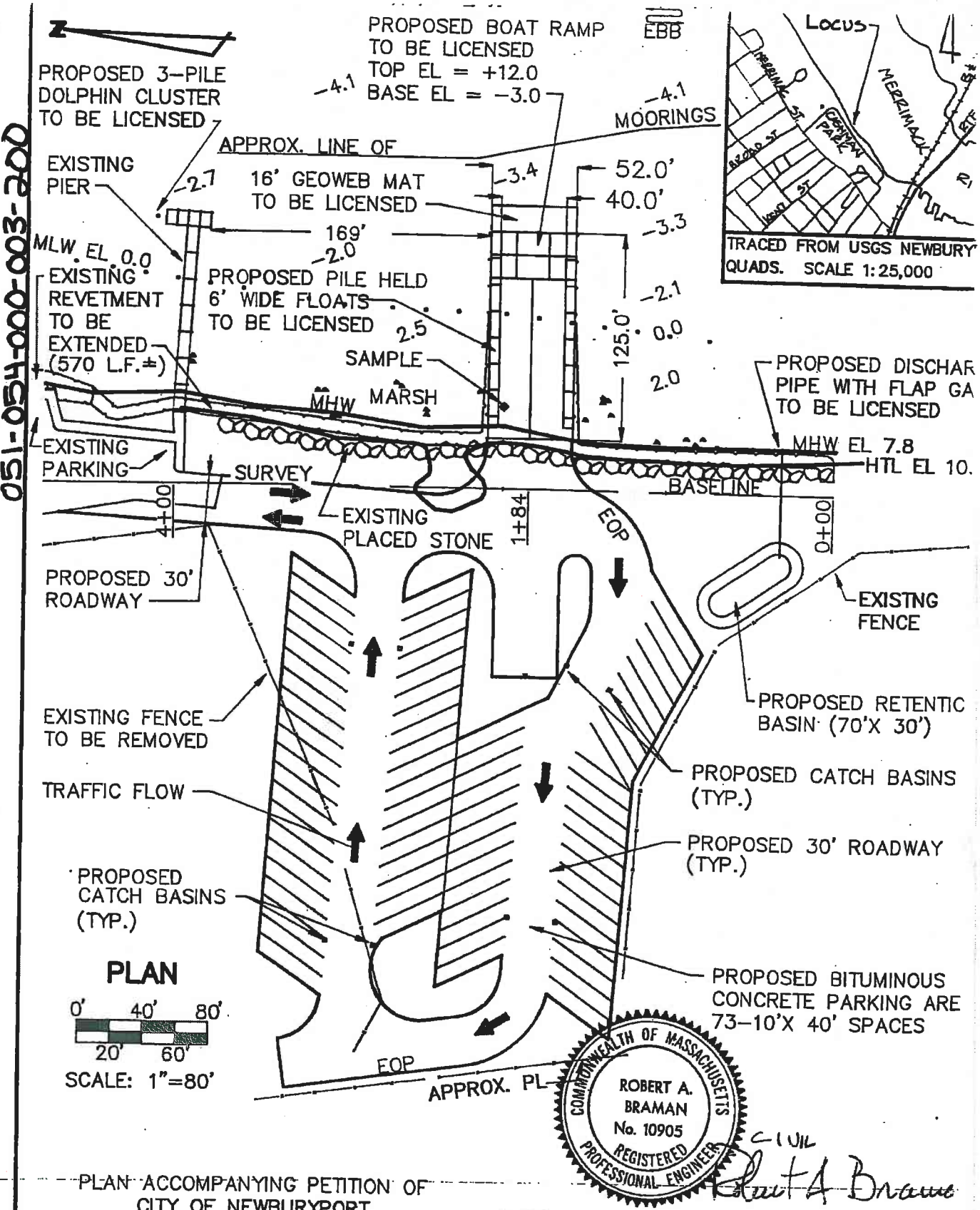
JUNE 1976

PREPARED BY · SASAKI ASSOCIATES
WATERTOWN, MASS

Sheet 2 of 2

051-011-000-001B-100
051-011-000-001B-200
051-011-000-001B-300

051-054-000-003-200



COMMONWEALTH OF MASSACHUSETTS
ROBERT A. BRAMAN
No. 10905
REGISTERED PROFESSIONAL ENGINEER
CIVIL

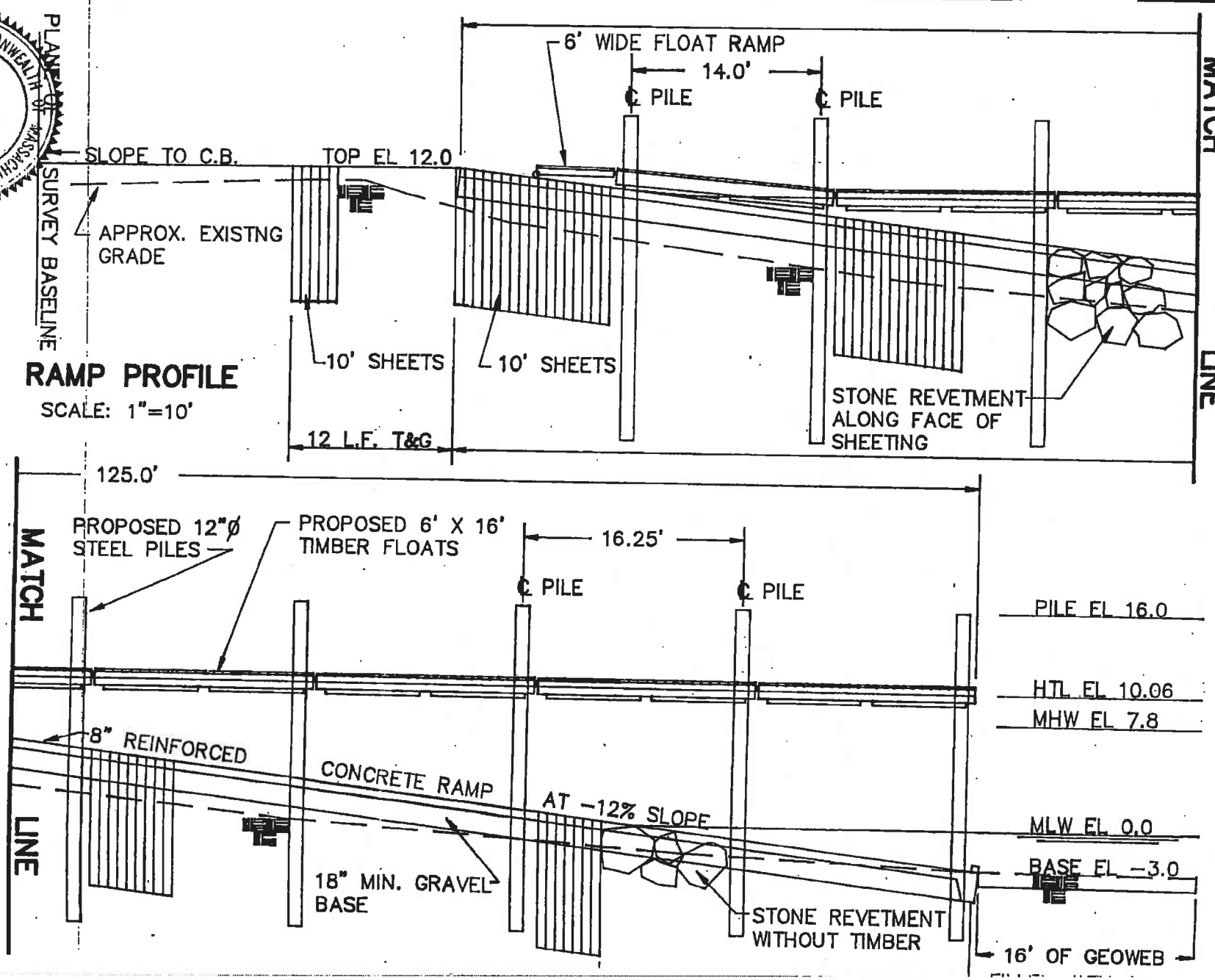
Robert A Braman

PLAN ACCOMPANYING PETITION OF
CITY OF NEWBURYPORT
TO LICENSE AND MAINTAIN A BOAT RAMP
FLOATS, PILES AND DOLPHIN CLUSTER
MERRIMACK RIVER
NEWBURYPORT, ESSEX CO., MA
MAY 7, 1992 SHEET 1 OF 4

BRAMAN ENGINEERING COMPANY, LTD
CIVIL ENGINEERS & SURVEYORS
258 MAIN ST., BUZZARDS BAY, MA

LICENSE PLAN NO. 3214
Approved by Department of Environmental Protection
COMMISSIONER
DIRECTOR
SECTION CHIEF
FEB 10 1993

051-054-000-003-200



COMMONWEALTH OF MASSACHUSETTS
ROBERT A. BRAMAN
No. 10905
REGISTERED PROFESSIONAL ENGINEER
Civil

Robert A Braman

CITY OF NEWBURYPORT

MAY 7, 1992

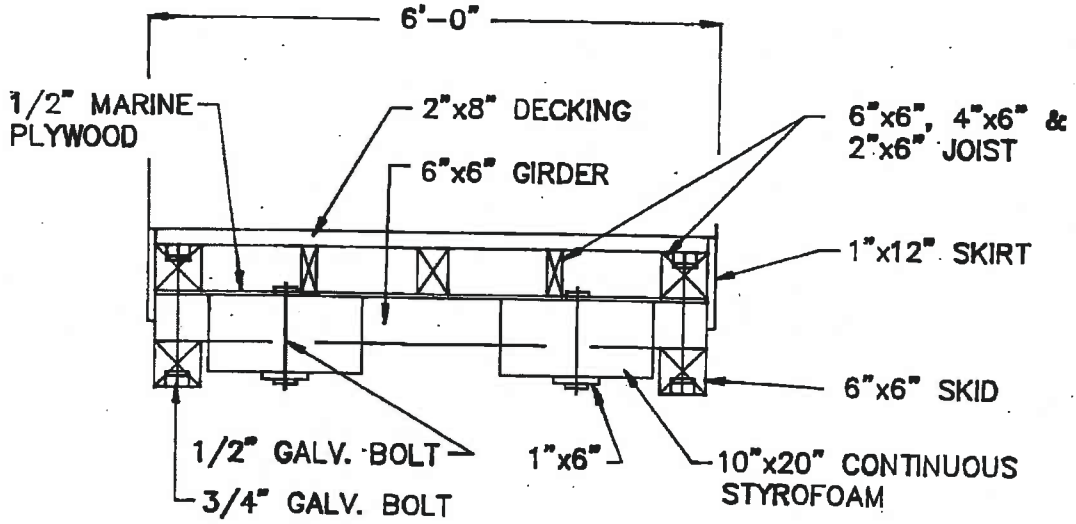
SHEET 2 OF

LICENSE PLAN NO. 324
FEB 10 1993
Protection

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. BRAMAN
No. 10905
REGISTERED PROFESSIONAL ENGINEER
CIVIL

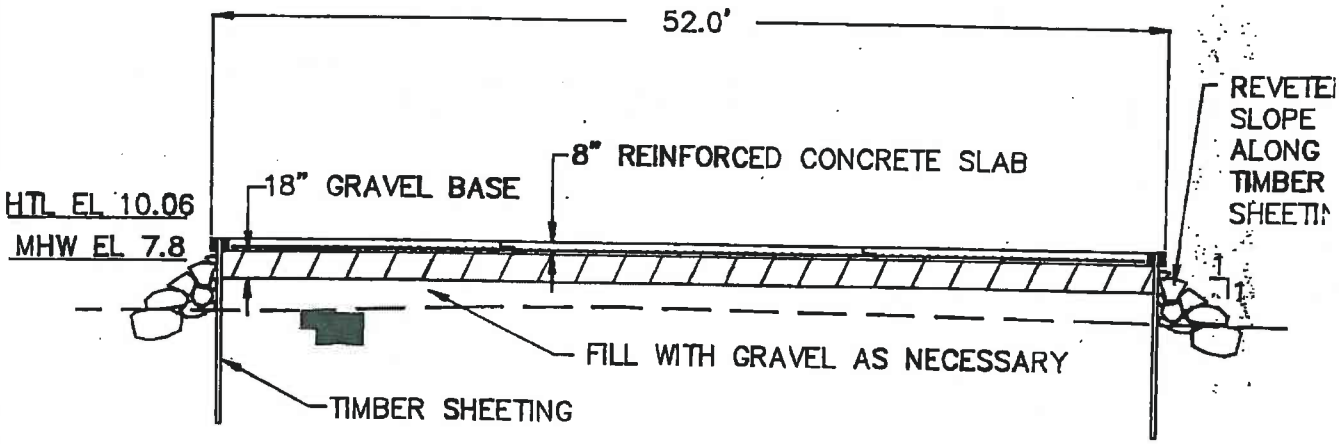
Robert A Braman

051-054-000-003-206



TIMBER FLOAT SECTION

SCALE: 1"=2'

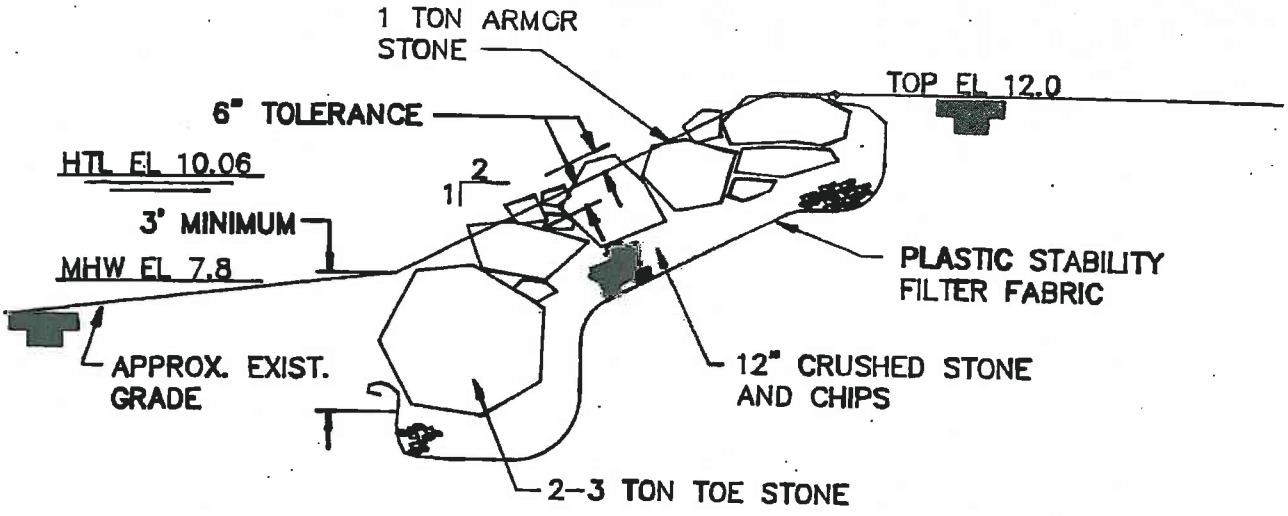


CONCRETE RAMP SECTION

SCALE: 1"=10'

LICENSE PLAN NO. 3214
Approved by Department of Environmental Protection
Date: FEB 10 1993

051-054-000-003-100

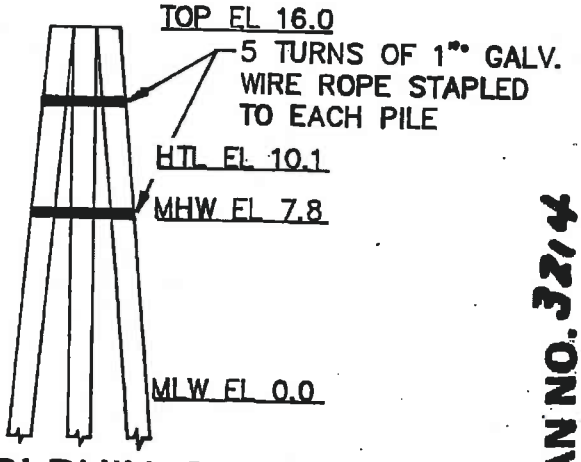


REVETMENT SECTION

DATUM EL 0.0 SCALE: 1"=4'

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. BRAMAN
No. 10905
REGISTERED PROFESSIONAL ENGINEER
CIVIL

Robert A Braman



3 PILE DOLPHIN DETAIL

SCALE: 1"=4'

LICENSE PLAN NO. 3214
Approved by Department of Environmental Protection
Date: FEB 10 1993

NOTES:

ELEVATIONS ARE SHOWN IN FEET AND TENTHS BASED ON THE PLANE OF MEAN LOW WATER. NEGATIVE VALUES REPRESENT DEPTHS BELOW THAT SAME PLANE.
FLOOD ZONE A2 EL 9 MSL
ALL TIMBER ABOVE THE HIGH TIDE LINE SHALL BE CCA TREATED AT 1.0 pcf.
ALL TIMBER BELOW THE HIGH TIDE LINE SHALL BE CCA TREATED AT 2.5 pcf.
ALL HARDWARE SHALL BE GALVANIZED.
FACILITIY PROVIDES PUBLIC ACCESS TO NAVIGABLE WATERS.
VOLUME OF FILL BELOW THE MEAN HIGH WATER LINE = 564 C.Y.
VOLUME OF FILL BELOW THE HIGH TIDE LINE = 1,028 C.Y.

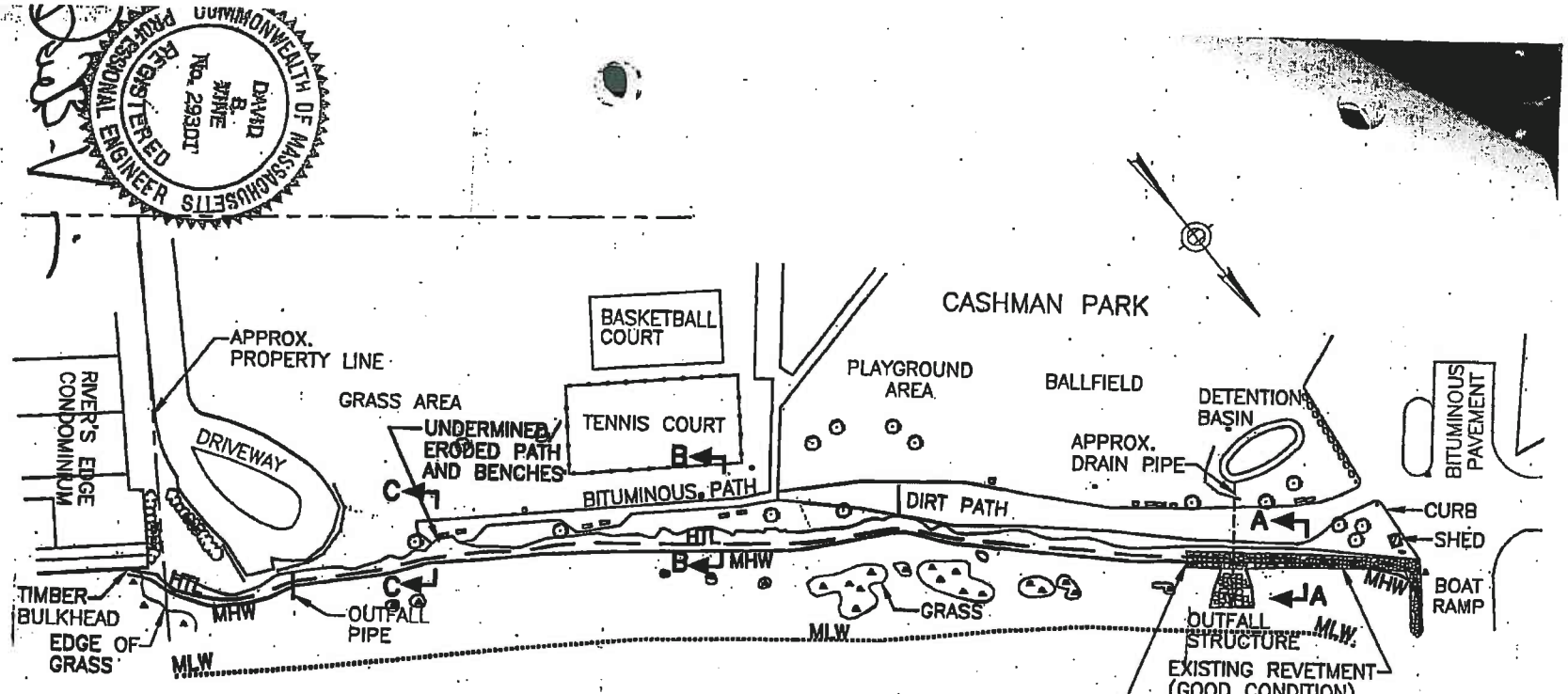
ABUTTERS:

NORTHERLY:
MERRIMAC CORPORATION
TOWLE
260 MERRIMAC
NEWBURYPORT, MA 01950

SOUTHERLY:
RIVERS EDGE CONDO ASSOC.
WILLIAM KRUMPSKY
126 MERRIMAC UNIT 40
NEWBURYPORT, MA 01950

PLAN ACCOMPANYING PETITION OF:
CITY OF NEWBURYPORT, MA.
TO CONSTRUCT ±730 LF OF
STONE REVETMENT
MERRIMACK RIVER
NEWBURYPORT, MASSACHUSETTS

COMMONWEALTH OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER
No. 29301
DAVID R. MINE



SCALE IN FEET
0 60 120

EXISTING CONDITIONS PLAN

NOTES:

1. DATUM: MLW=0.0; MHW=8.0; HTL=9.0;
   FEMA 100YR FLOOD PLAIN EL.=12.1
2. SURVEY PERFORMED BY NUCCI VINE ASSOCIATES, INC. ON FEB. 16 AND FEB. 23, 2001. BEACH LEVEL CAN VARY DUE TO SEASONAL AND WEATHER CONDITIONS. SURVEY ON FEB. 23 PERFORMED WITH GROUND SNOW COVER. PARK SITE FEATURE LOCATIONS APPROXIMATE.
3. PROPERTY LINE AND SOME SITE FEATURES APPROXIMATE, SCALED FROM CITY ASSESSOR PLANS AND AVAILABLE DOCUMENTS.

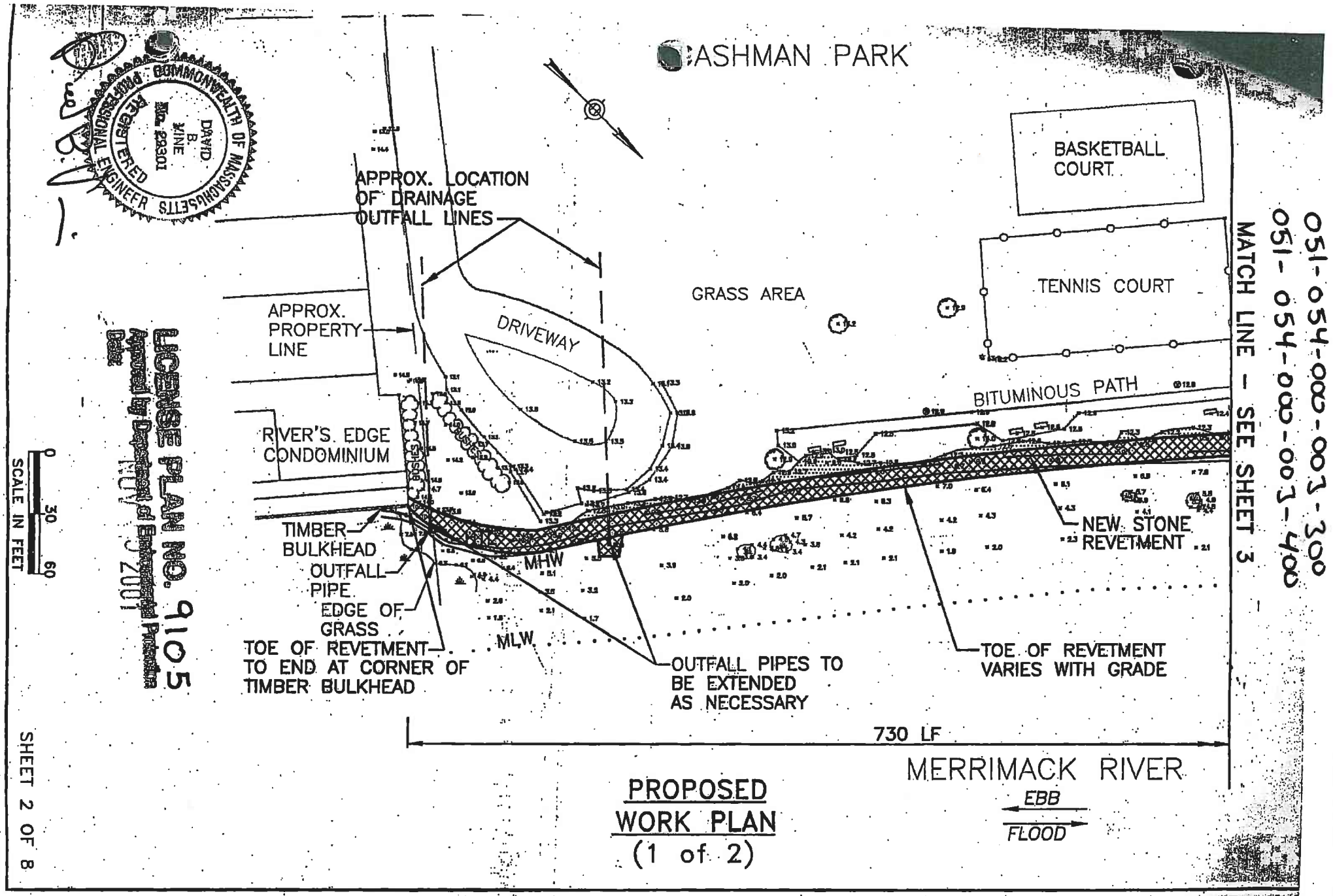
051-054-000-003-300
051-054-00-003-400

LOCUS MAP

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
of Massachusetts
[illegible] 2001

SHEET 1 OF 8

6690-100



COMMONWEALTH OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER
DAVID B. KINE
No. 28301

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: MAY 2001

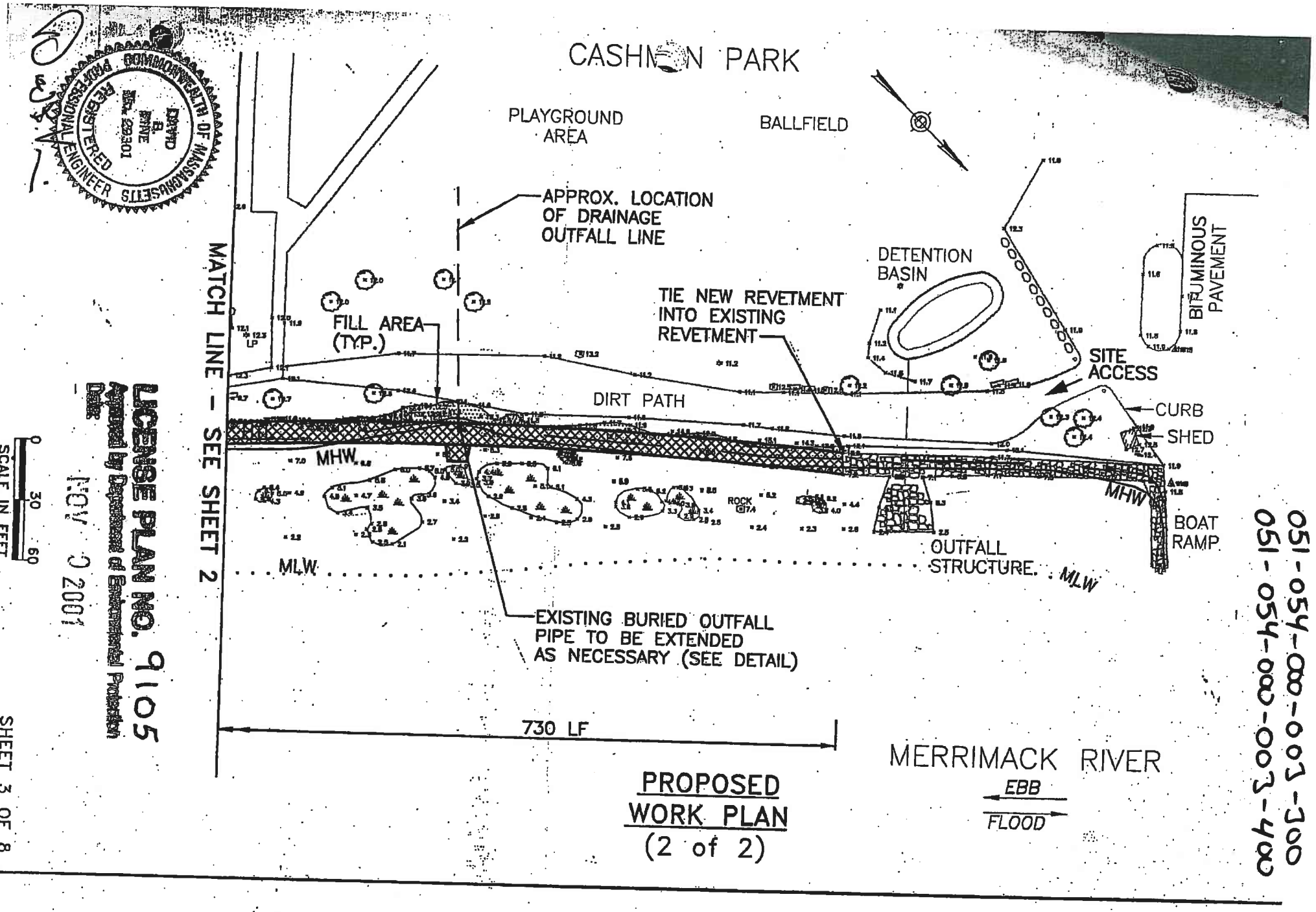
051-054-000-003-300
051-054-000-003-400

MATCH LINE - SEE SHEET 3

SHEET 2 OF 8

PROPOSED WORK PLAN (1 of 2)

4660-100



DAVID B. BYRNE No. 23301 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date NOV 0 2001

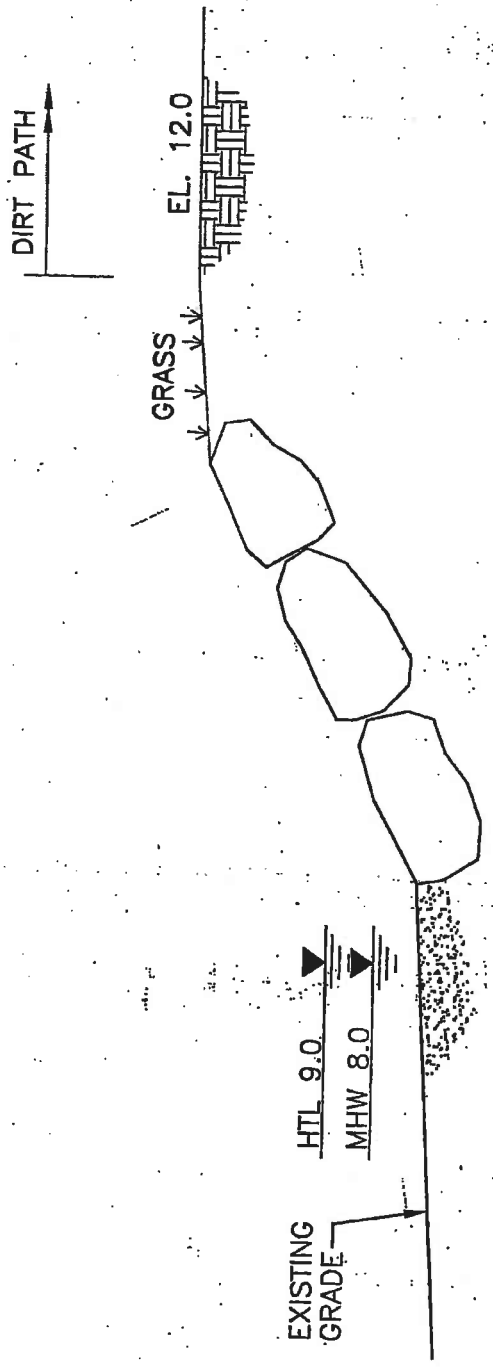
PROPOSED WORK PLAN (2 of 2)

SHEET 3 OF 8

051-054-00-003-300
051-054-00-003-400

eeea-107

051-054-000-003-300
051-054-000-003-400



EXISTING
SECTION A-A

COMMONWEALTH OF MASSACHUSETTS
DAVID B. BINE
No. 29301
REGISTERED PROFESSIONAL ENGINEER

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: NOV 9 2001

0 2 4
SCALE IN FEET

SHEET 4 OF 8

051-054-000-003-300
051-054-000-003-400

EXISTING
SECTION B–B

COMMONWEALTH OF MASSACHUSETTS
DAVID B. BENE
No. 23801
REGISTERED PROFESSIONAL ENGINEER

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: NOV 0 2001

0 2 4
SCALE IN FEET

SHEET 5 OF 8

051-054-000-003-300
051-054-000-003-400

EXISTING
SECTION C-C

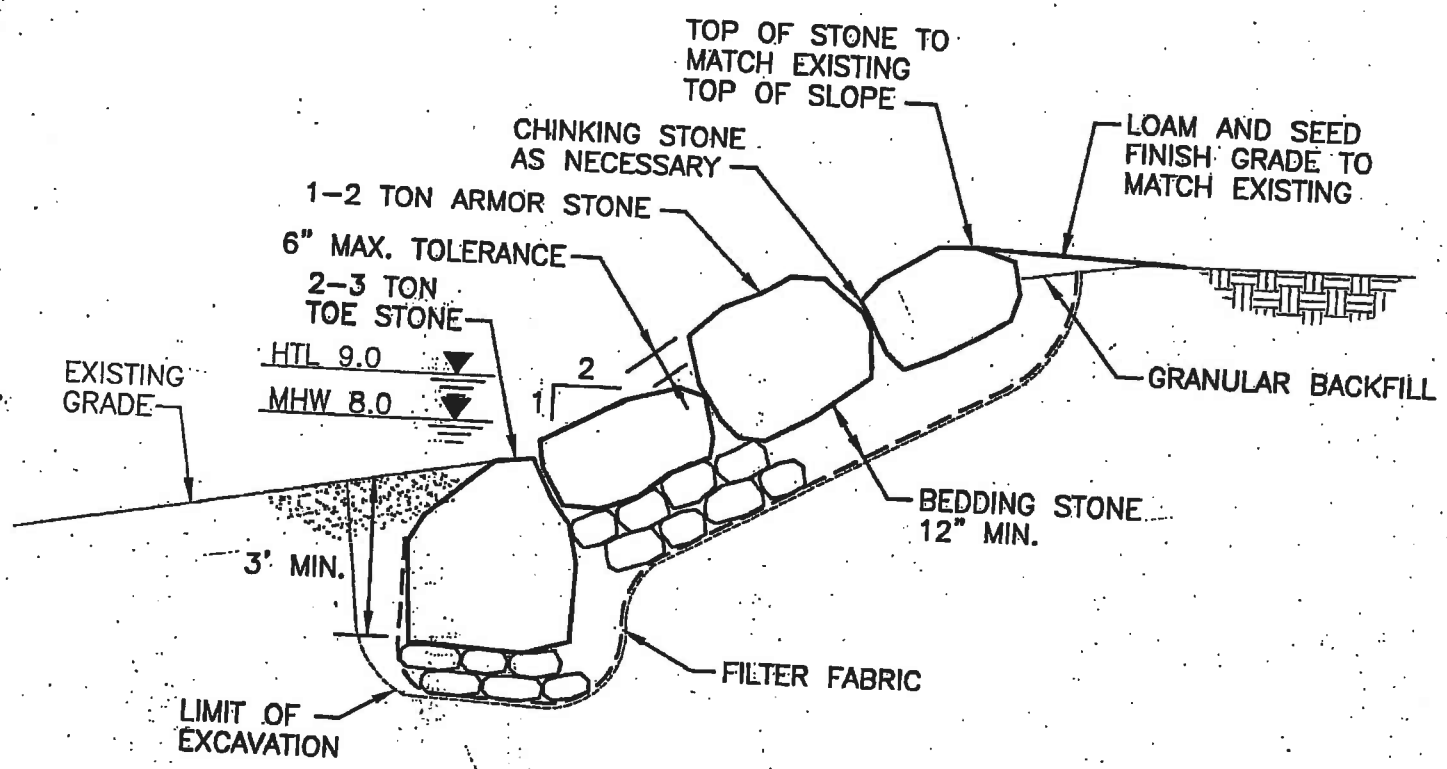
COMMONWEALTH OF MASSACHUSETTS
DAVID B. EANE
No. 29301
REGISTERED PROFESSIONAL ENGINEER

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date:
NOV 0 2001

0 2 4
SCALE IN FEET

SHEET 6 OF 8

ASSOCIATES, INC.

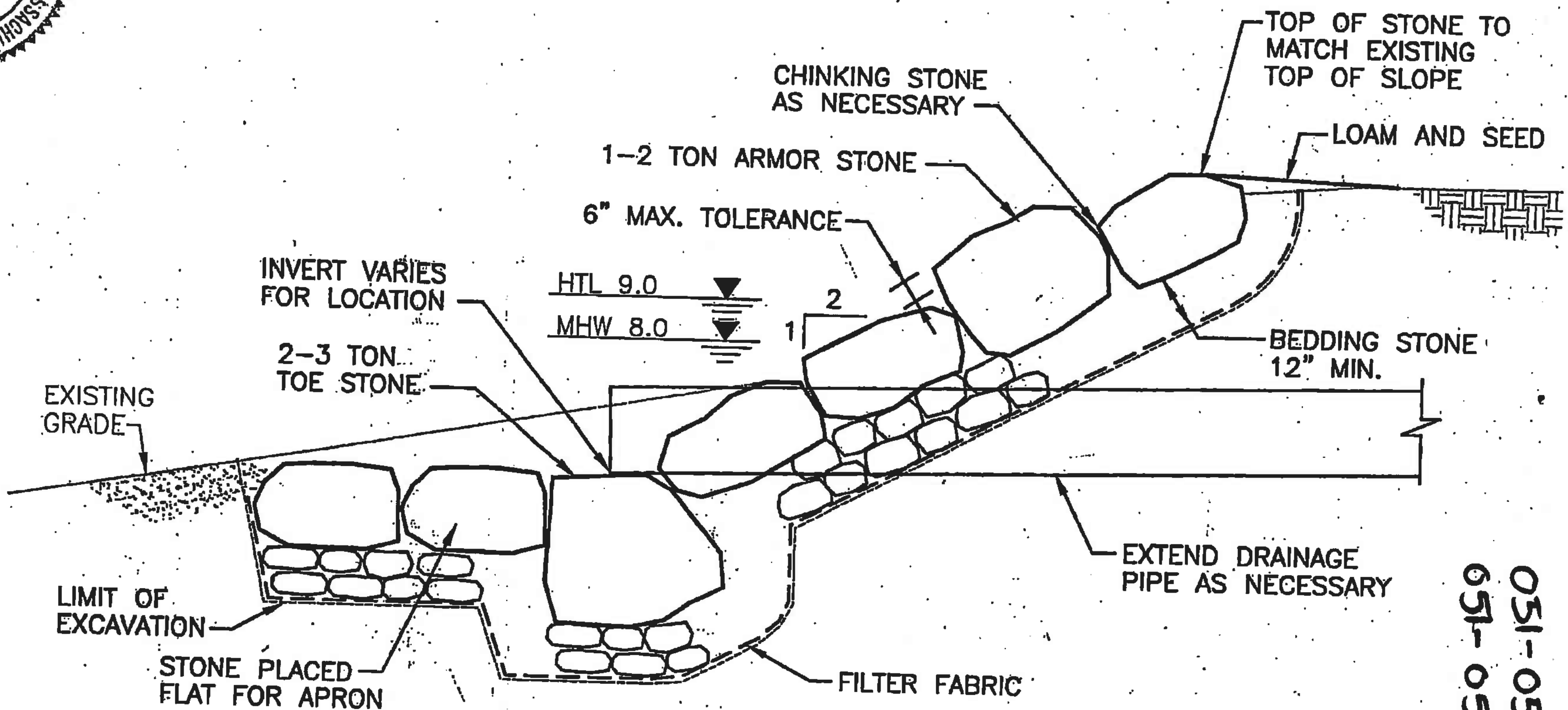


PROPOSED TYPICAL REVETMENT SECTION

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date OCT 3 2001

051-054-000-003-300
051-054-000-003-400

E220-1037



051-054-000-003-300
051-054-000-003-400

PROPOSED TYPICAL PIPE EXTENSION SECTION

COMMONWEALTH OF MASSACHUSETTS
DAVID B. BINE
No. 29301
REGISTERED PROFESSIONAL ENGINEER

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date:
NOV 9 2001

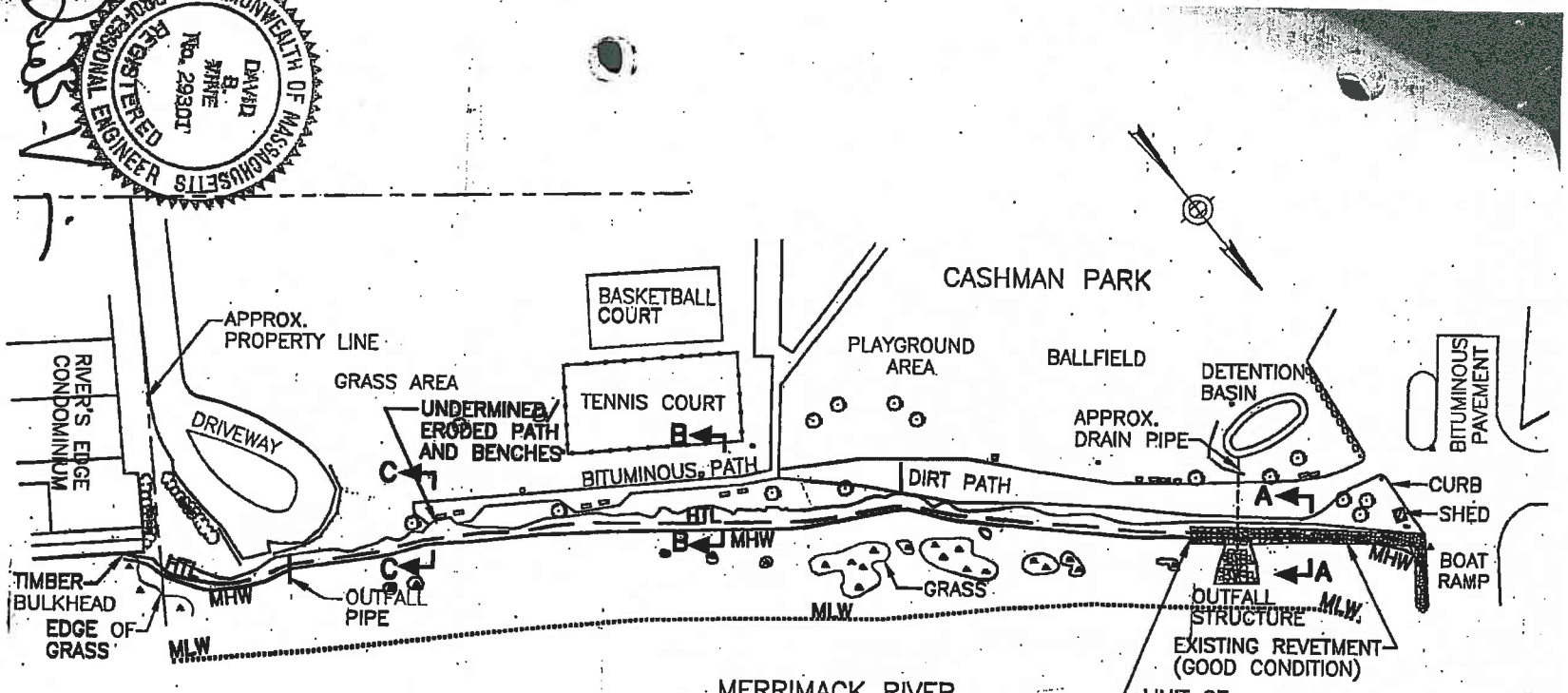
0 2 4
SCALE IN FEET

SHEET 8 OF 8

2001-0333

PLAN ACCOMPANYING PETITION OF:
CITY OF NEWBURYPORT, MA.
TO CONSTRUCT ±730 LF OF
STONE REVETMENT
MERRIMACK RIVER
NEWBURYPORT, MASSACHUSETTS

COMMONWEALTH OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER
DAVID B. VINE
No. 29301



SCALE IN FEET
0 60 120

EXISTING CONDITIONS PLAN

051-054-000-003-300
051-054-000-003-400

NOTES:

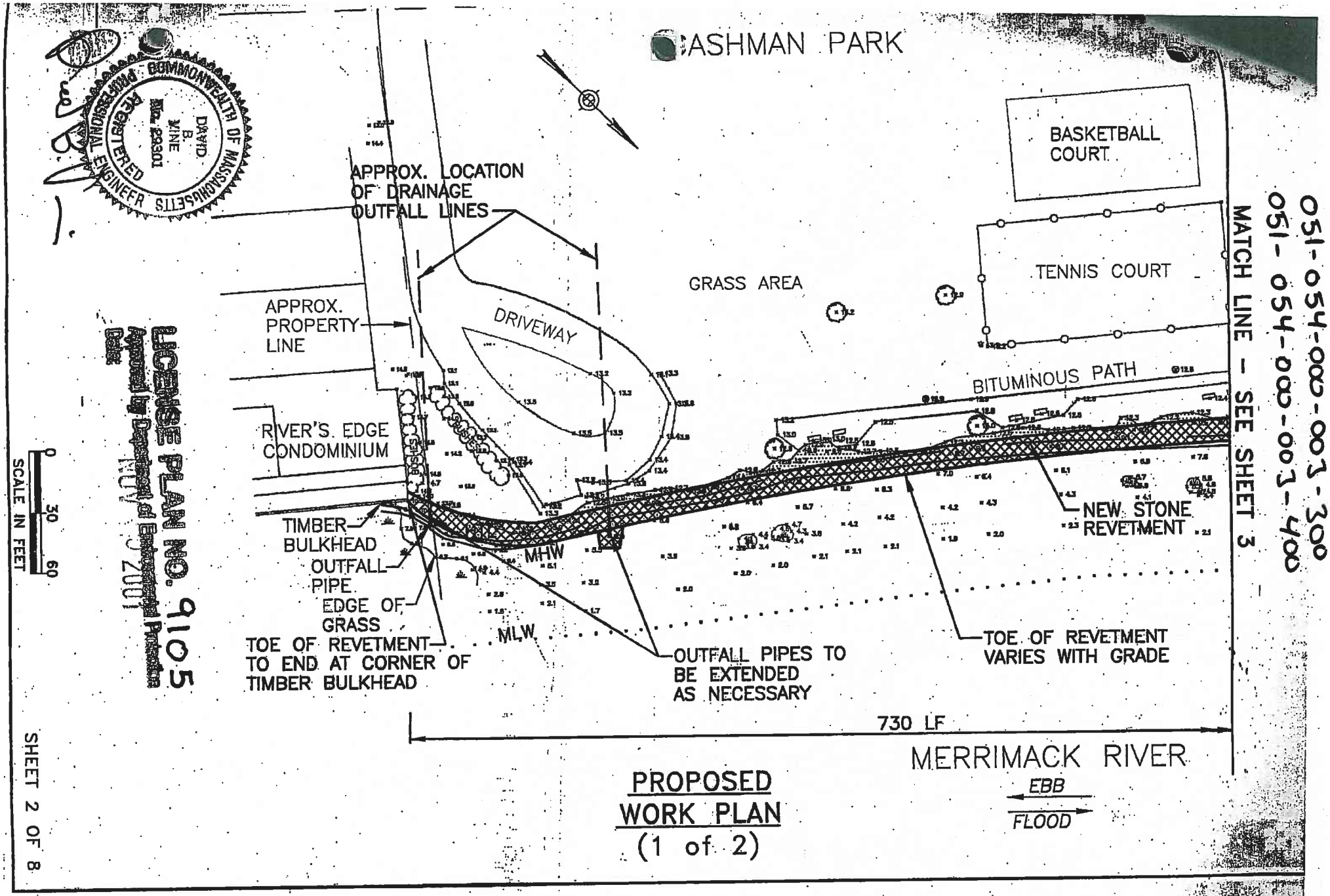
1. DATUM: MLW=0.0; MHW=8.0; HTL=9.0;
   FEMA 100YR FLOOD PLAIN EL.=12.1
2. SURVEY PERFORMED BY NUCCI VINE ASSOCIATES, INC. ON FEB. 16 AND FEB. 23, 2001. BEACH LEVEL CAN VARY DUE TO SEASONAL AND WEATHER CONDITIONS. SURVEY ON FEB. 23 PERFORMED WITH GROUND SNOW COVER. PARK SITE FEATURE LOCATIONS APPROXIMATE.
3. PROPERTY LINE AND SOME SITE FEATURES APPROXIMATE, SCALED FROM CITY ASSESSOR PLANS AND AVAILABLE DOCUMENTS.

LOCUS MAP

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
of Massachusetts
May 2, 2001

SHEET 1 OF 8

6690-100

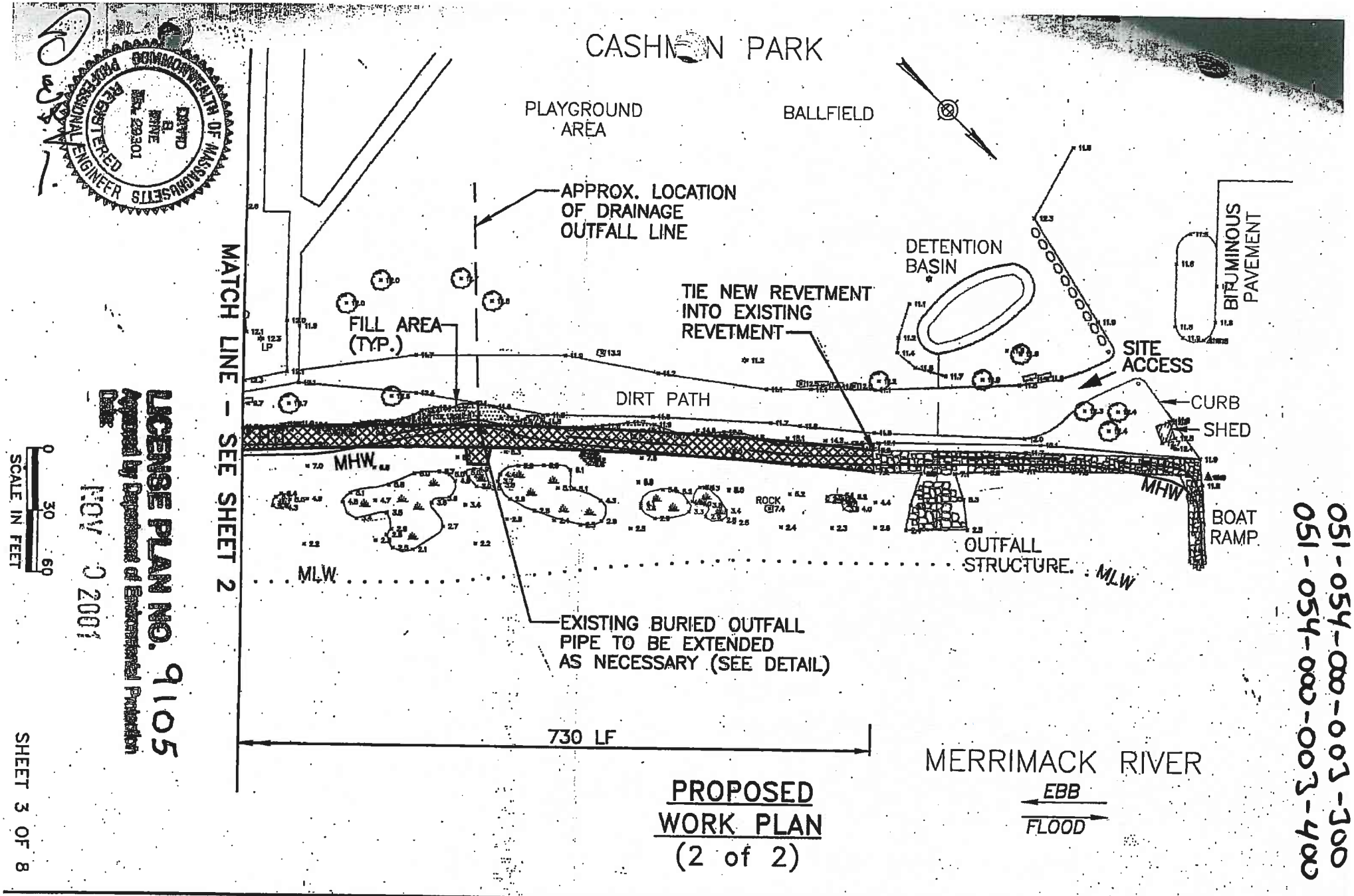


PROPOSED WORK PLAN (1 of 2)

051-054-003-300
051-054-003-400

SHEET 2 OF 8

4660-100



PROPOSED WORK PLAN
(2 of 2)

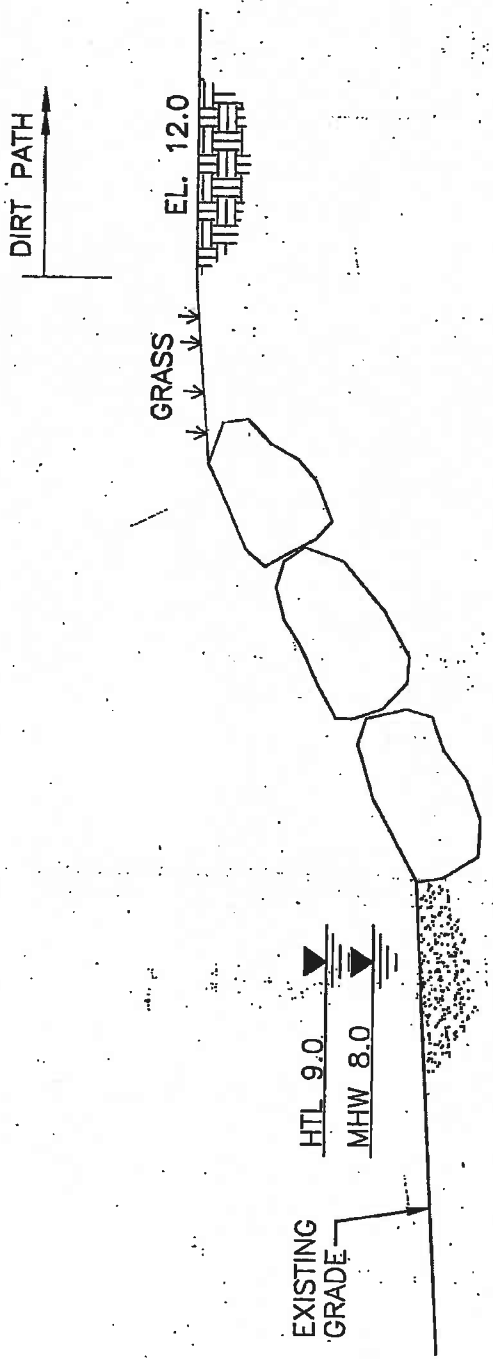
LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection

SHEET 3 OF 8

051-054-00-003-300
051-054-00-003-400

eeeo-10m

051-054-000-003-300
051-054-000-003-400



EXISTING
SECTION A-A

2001-02-23

COMMONWEALTH OF MASSACHUSETTS
DAVID B. NIVE
No. 29301
REGISTERED PROFESSIONAL ENGINEER

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: NOV 0 2001

0 2 4
SCALE IN FEET

SHEET 4 OF 8

051-054-000-003-300
051-054-000-003-400

EXISTING
SECTION B–B

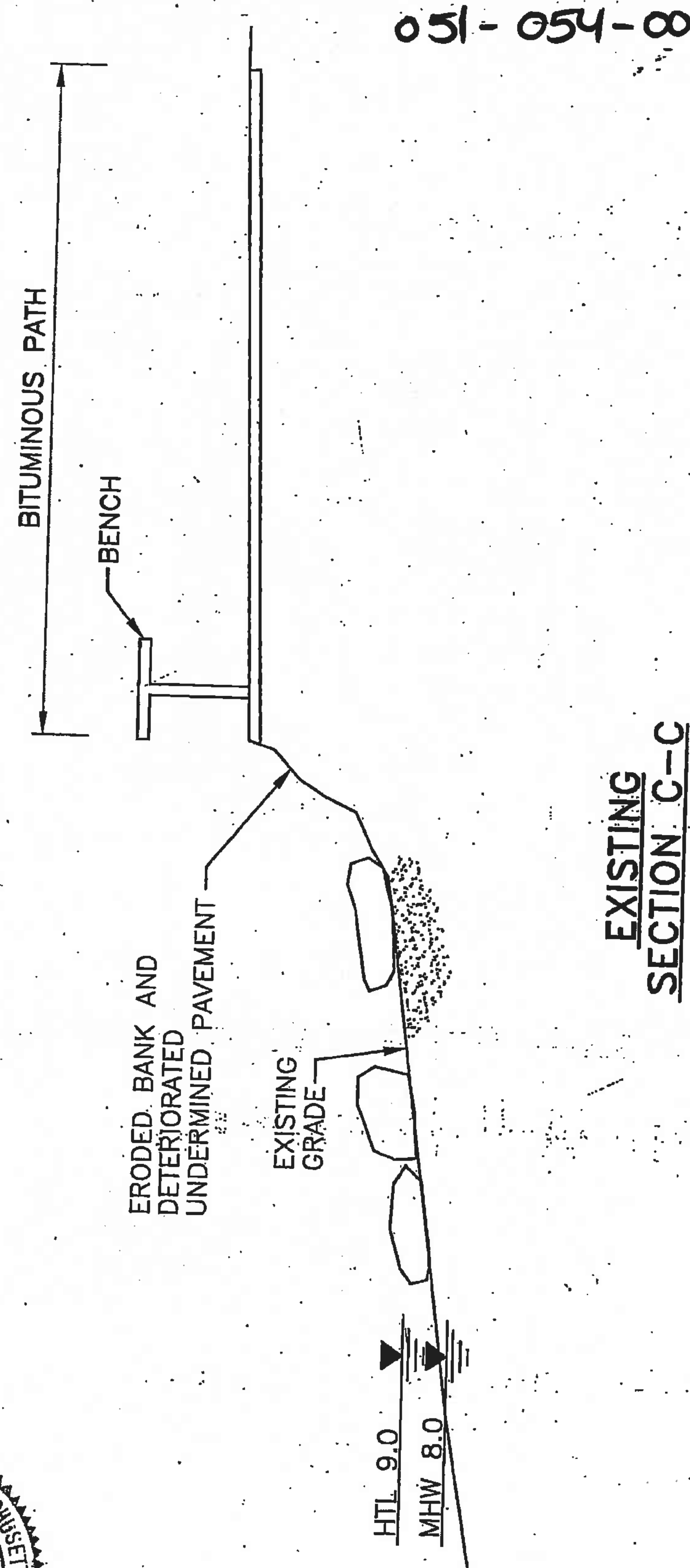
LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: NOV 0 2001

SCALE IN FEET 0 2 4

SHEET 5 OF 8

COMMONWEALTH OF MASSACHUSETTS
DAVID B. BEANE
REGISTERED PROFESSIONAL ENGINEER

051-054-000-003-300
051-054-000-003-400



COMMONWEALTH OF MASSACHUSETTS
DAVID
B.
[illegible]
No. 39301
REGISTERED
PROFESSIONAL ENGINEER

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: NOV 0 2001

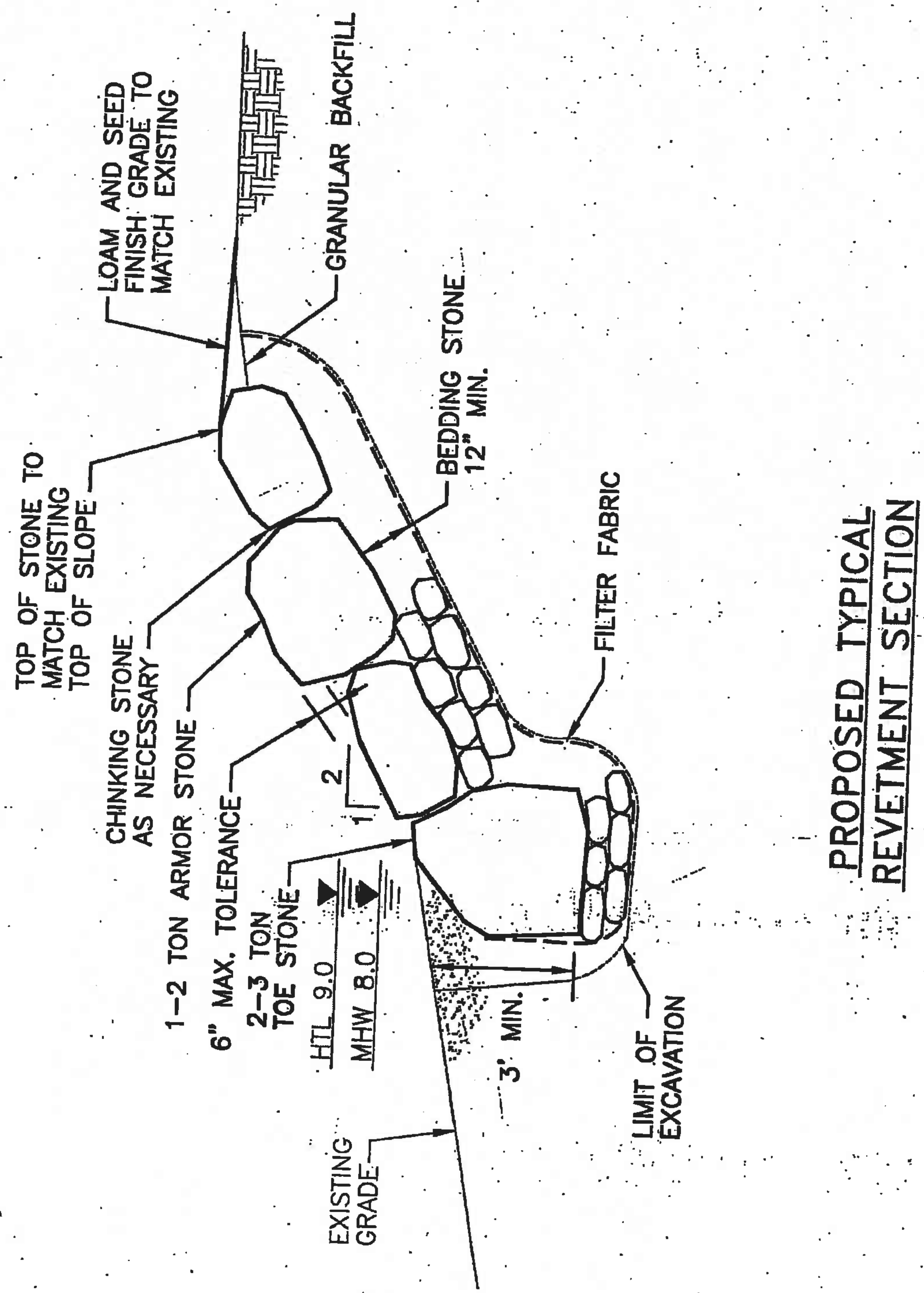
0 2 4
SCALE IN FEET

SHEET 6 OF 8

...OCIATES, INC.

02-0029

051-054-000-003-300
051-054-000-003-400



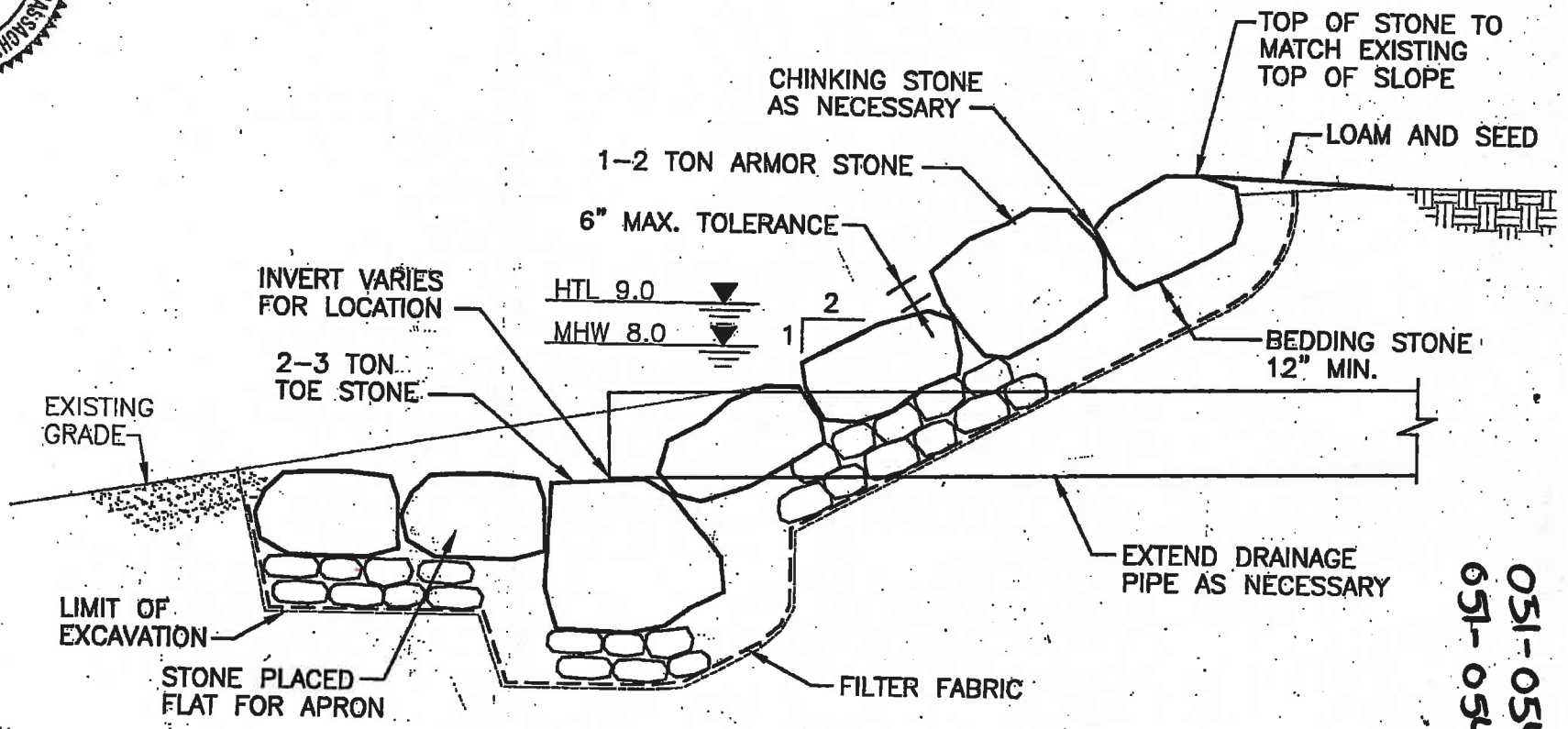
COMMONWEALTH OF MASSACHUSETTS
DAVID B. WINE
No. 29301
REGISTERED PROFESSIONAL ENGINEER

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: NOV 0 2001

0 2 4

SHEET 7 OF 8

2001-0093



PROPOSED TYPICAL
PIPE EXTENSION
SECTION

LICENSE PLAN NO. 9105
Approved by Department of Environmental Protection
Date: OCT 3 2001

SCALE IN FEET 0 2 4

SHEET 8 OF 8

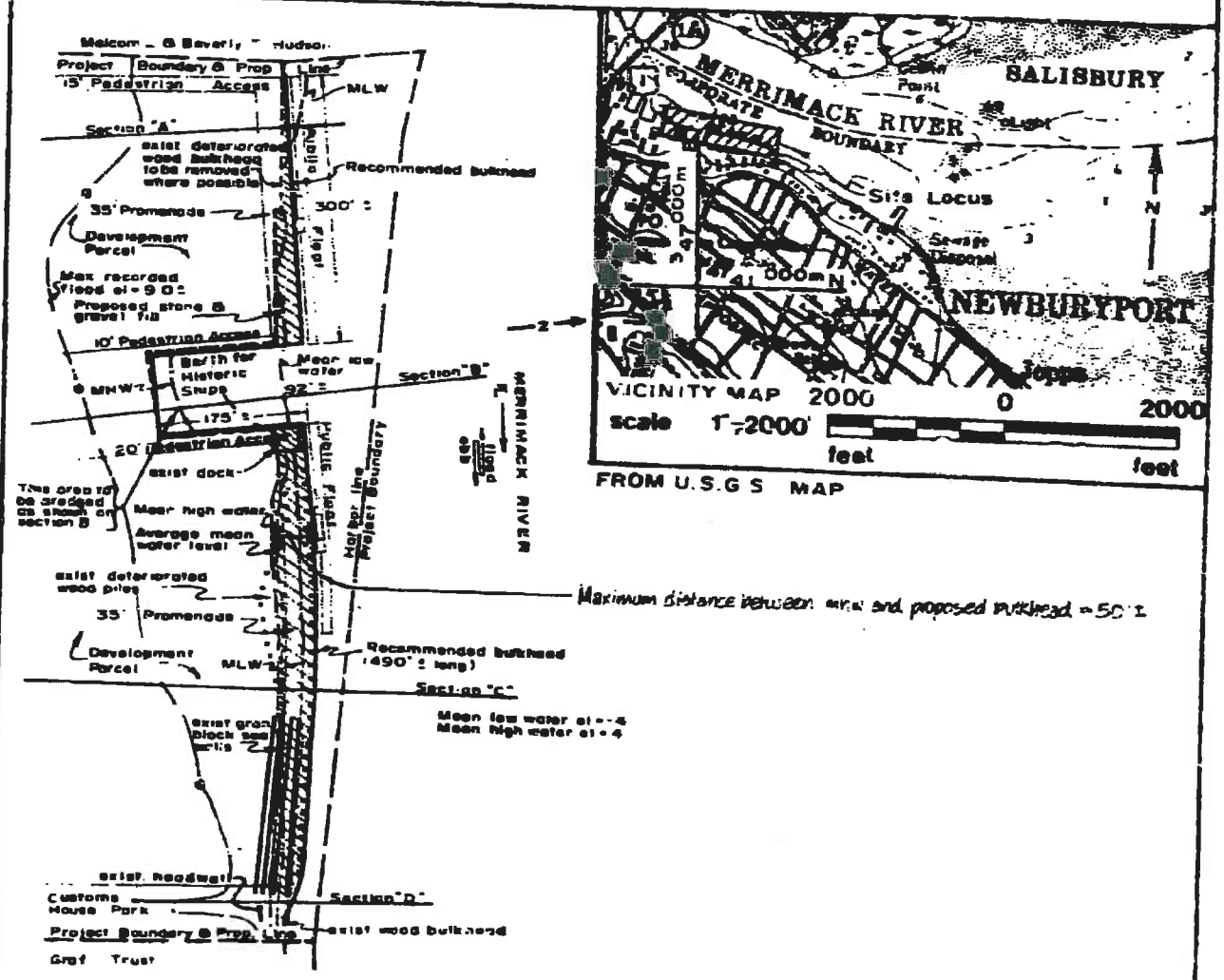
051-054-000-003-309
651-054-000-003-400

2660-1057

CITY: NEWBURYPORT
SOURCE: US ACOE
LOCATION: CONCORD, MA
DATE OF RESEARCH: AUGUST 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
051-011-000-001B-100	051-011-000-001B-100-COE1A	75-253	USACE	Newburyport	July 1975	Propose Rebuild of Seawall with Public Dock in Merrimack River at Newburyport - County of Essex, State of Massachusetts	5	Water Street	Seawall Rebuild
051-011-000-001B-200	051-011-000-001B-200-COE2A	75-253	USACE	Newburyport	July 1975	Propose Rebuild of Seawall with Public Dock in Merrimack River at Newburyport - County of Essex, State of Massachusetts	5	Water Street	Seawall Rebuild
051-011-000-001B-300	051-011-000-001B-300-COE3A	75-253	USACE	Newburyport	July 1975	Propose Rebuild of Seawall with Public Dock in Merrimack River at Newburyport - County of Essex, State of Massachusetts	5	Water Street	Seawall Rebuild
051-026-000-028-100	051-026-000-028-100-COE1A	71-174	USACE	Newburyport	March 1971	Proposed Shore Protection - Concrete Seawall - Merrimack River - Newburyport - Application by DPW of Massachusetts - Division of Waterways	1	Water Street	Concrete Seawall
051-054-000-003-100	051-054-000-003-100-COE1A	74-203	USACE	Newburyport	June 1974	Proposed Reconstruction of Access Ramp and Facilities - Merrimack River - Cashman Park - Newburyport, Massachusetts - Application by DPW of Massachusetts - Division of Waterways	4	Cashman Park	Revetment

051-011-000-001B-100
051-011-000-001B-200
051-011-000-001B-300



PURPOSE: Propose to rebuild seawall with public dock

DATUM: Mean sealevel

ADJACENT PROPERTY OWNERS

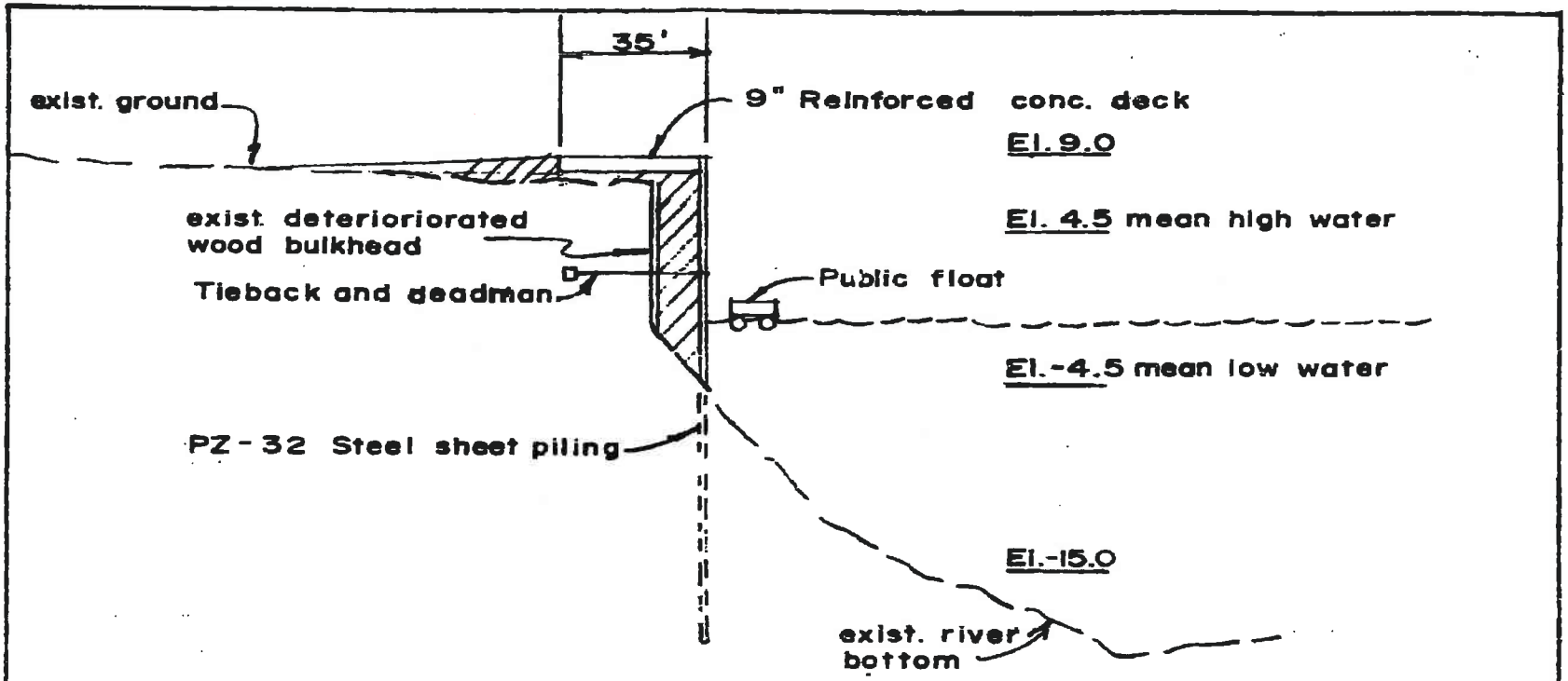
(1) Malcom L. & Beverly T. Hudson

(2) Graf Trust

IN Merrimack River
AT Newburyport
COUNTY OF Essex STATE Mass.
APPLICATION BY

SHEET 1 OF 5 DATE: 7-9-75

162-0301



SECTION "A"

HORIZONTAL

1" = 40'

40 0 40 80

scale feet

VERTICAL

1" = 10'

10 5 10 20

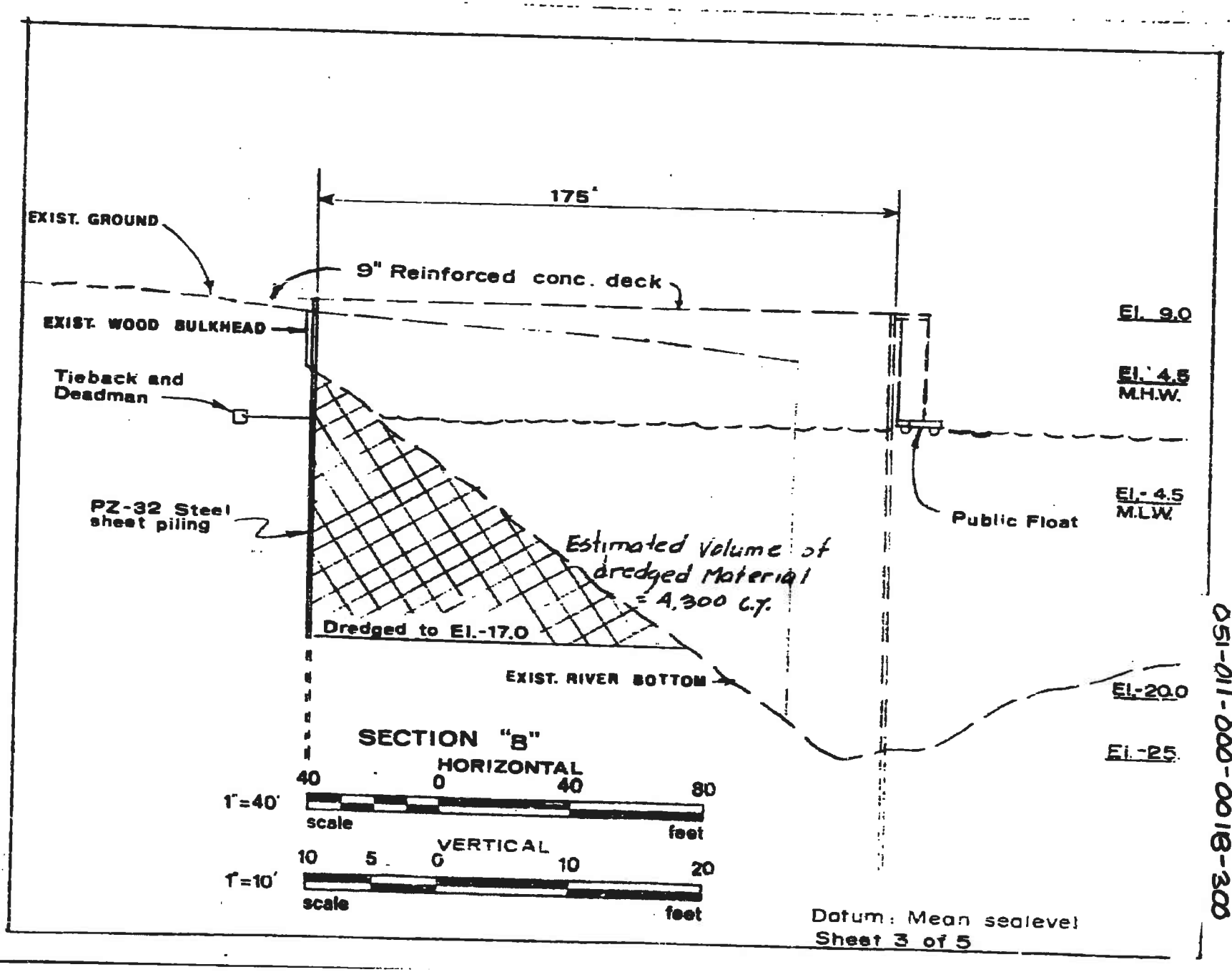
scale feet

Datum mean sea level

Sheet 2 of 5

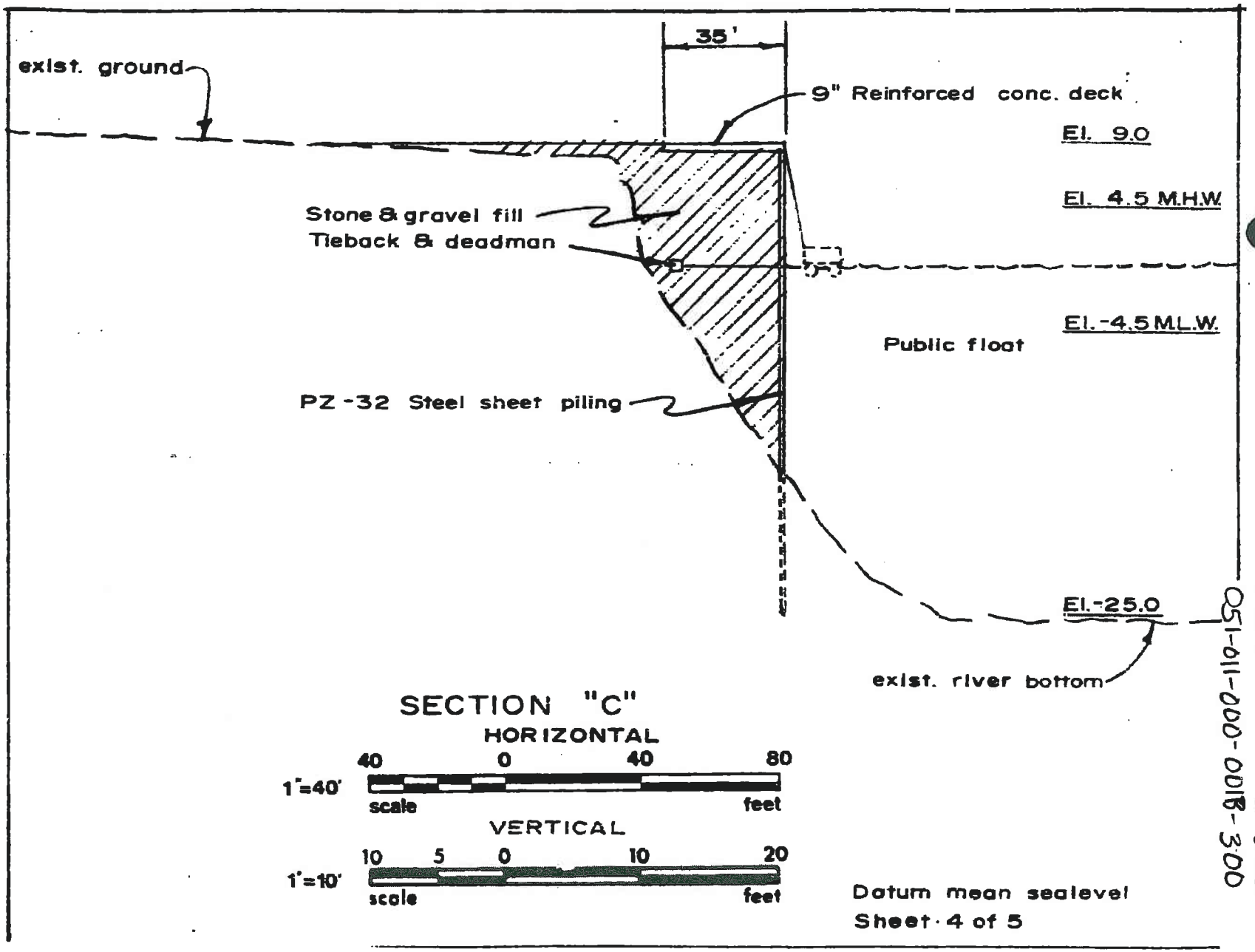
051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300

162 0302



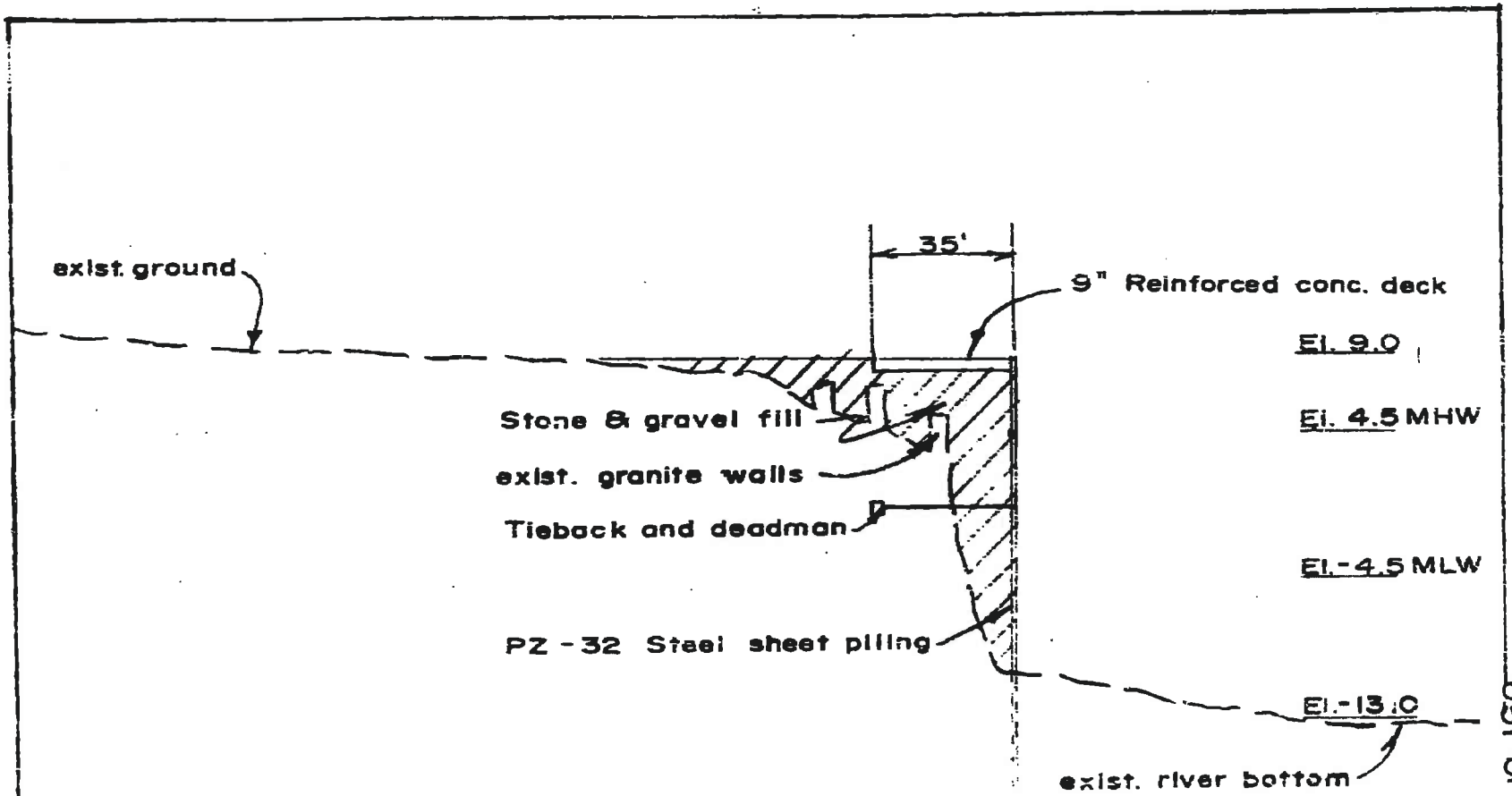
Sheet 3 of 5

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300



051-011-000-0018-100
051-011-000-0013-200
051-011-000-0018-300

162 0304



SECTION "D"

HORIZONTAL

1' = 40'

40 0 40 80

scale feet

VERTICAL

1" = 10'

10 5 0 10 20

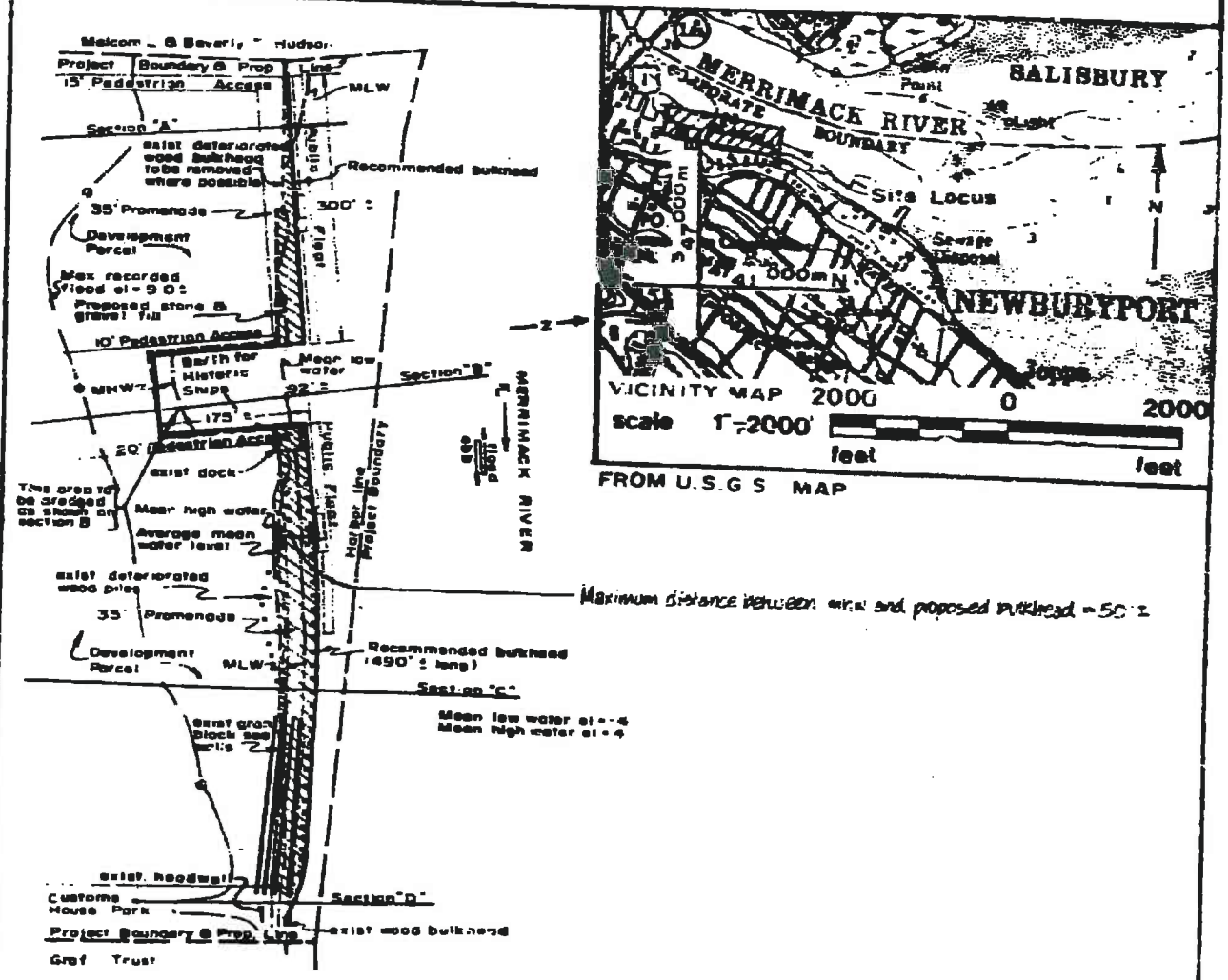
scale feet

Datum mean sea level

Sheet 5 of 5

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300

051-011-000-001B-100
051-011-000-001B-200
051-011-000-001B-300



PURPOSE: Propose to rebuild seawall with public dock

DATUM: Mean sealevel

ADJACENT PROPERTY OWNERS

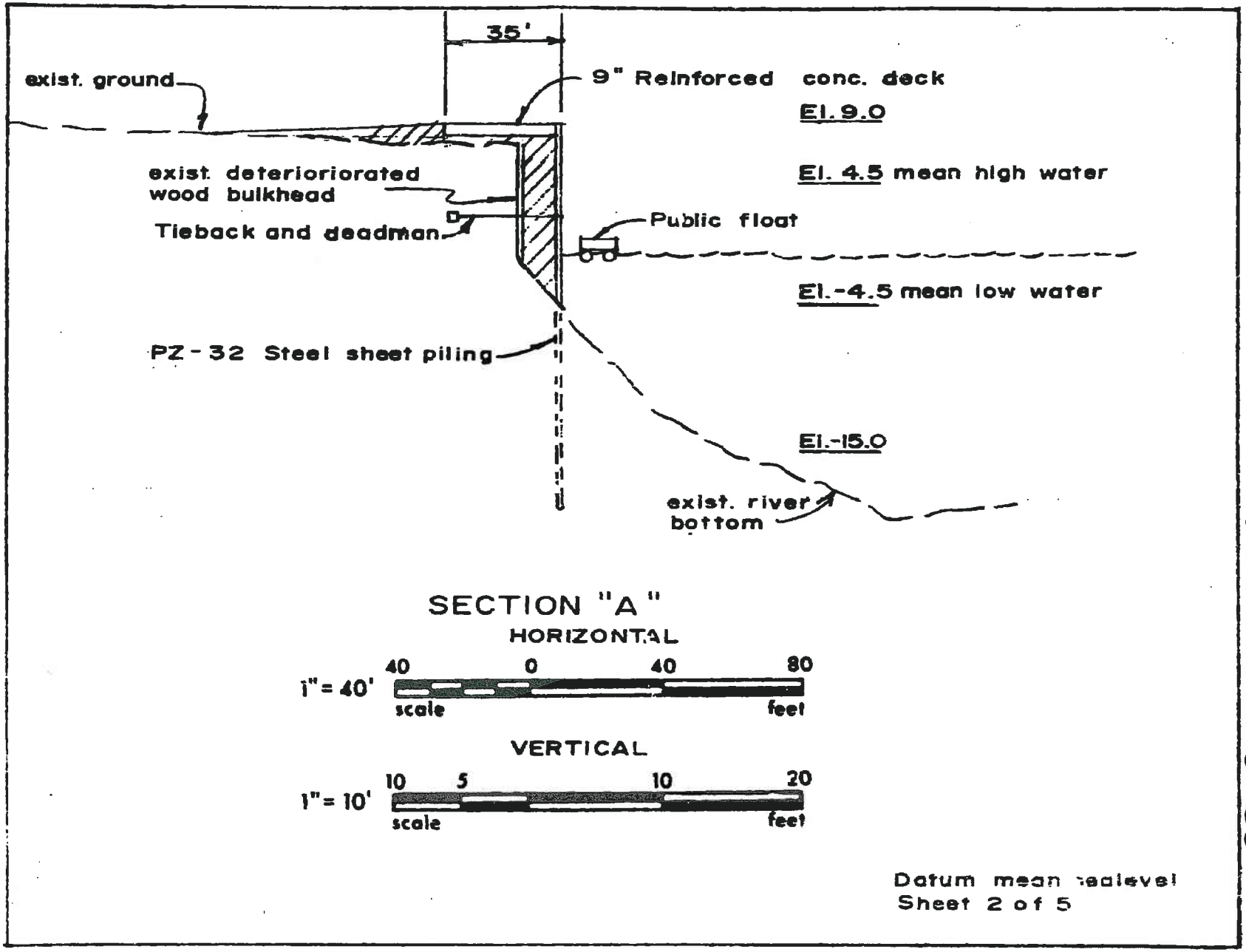
(1) Malcom L. & Beverly T. Hudson

(2) Graf Trust

IN Merrimack River
AT Newburyport
COUNTY OF Essex STATE Mass.
APPLICATION BY

SHEET 1 OF 5 DATE: 7-9-75

162 0301



SECTION "A"

HORIZONTAL

1" = 40'

40 0 40 80

scale feet

VERTICAL

1" = 10'

10 5 10 20

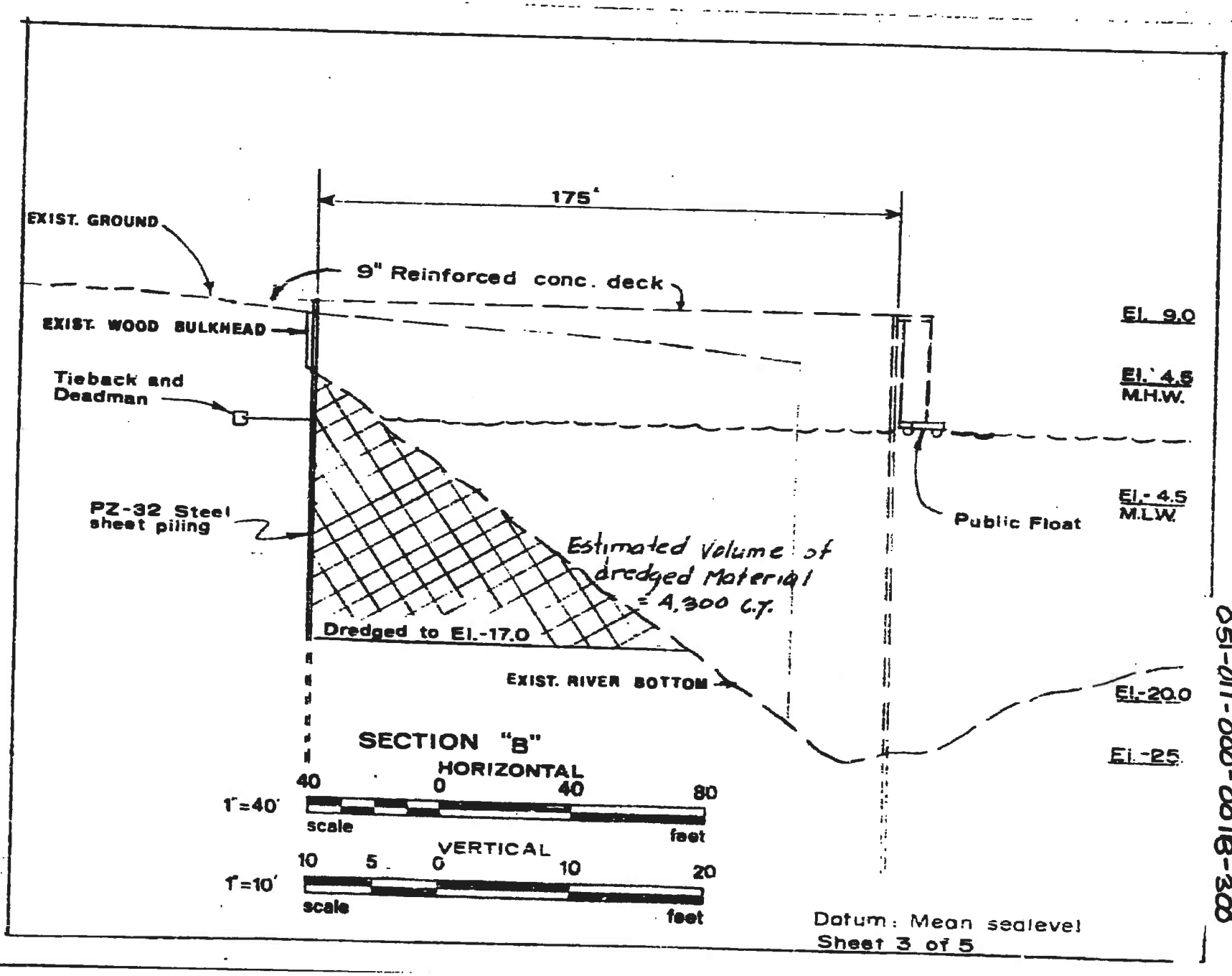
scale feet

Datum mean sea level

Sheet 2 of 5

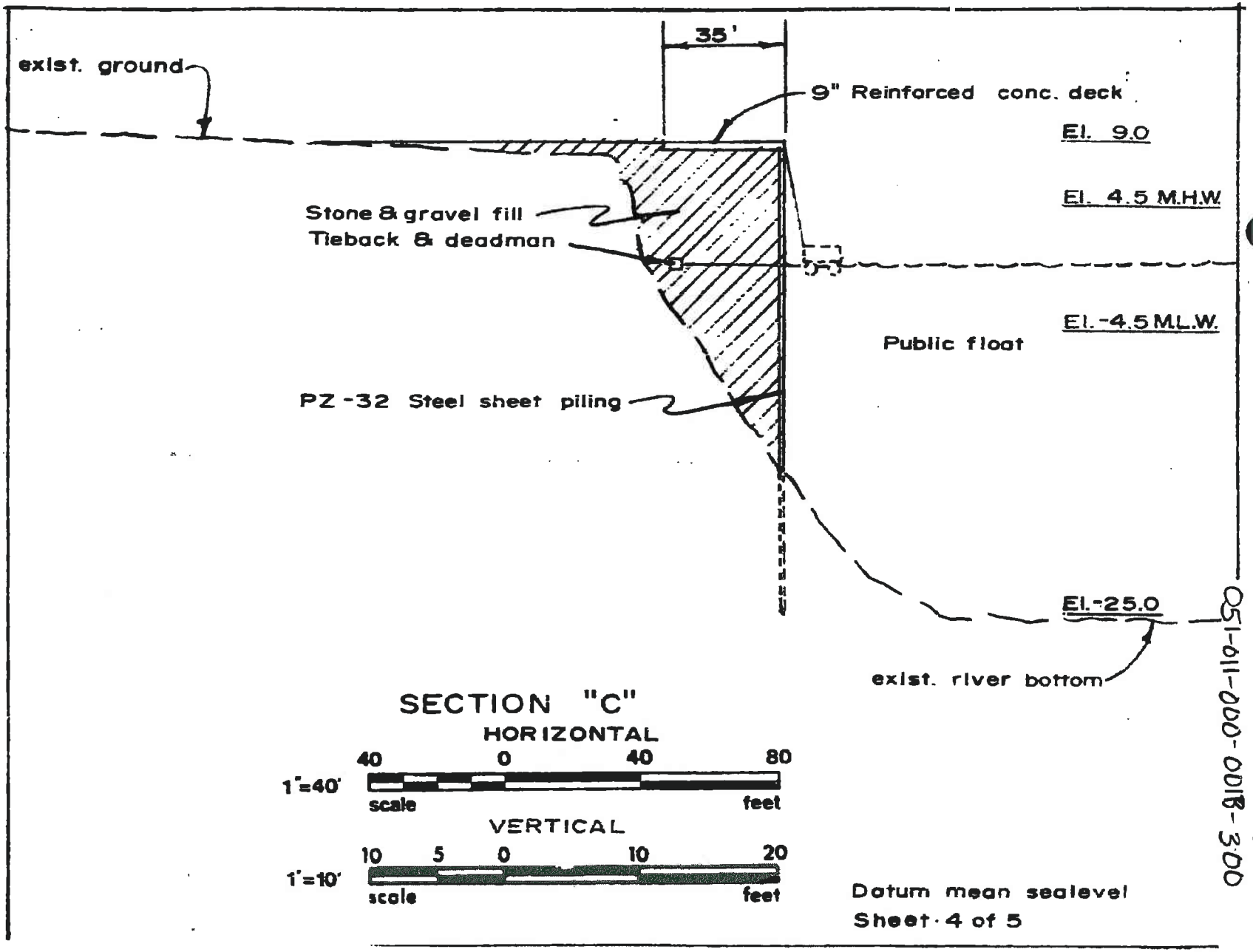
051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300

162030'2



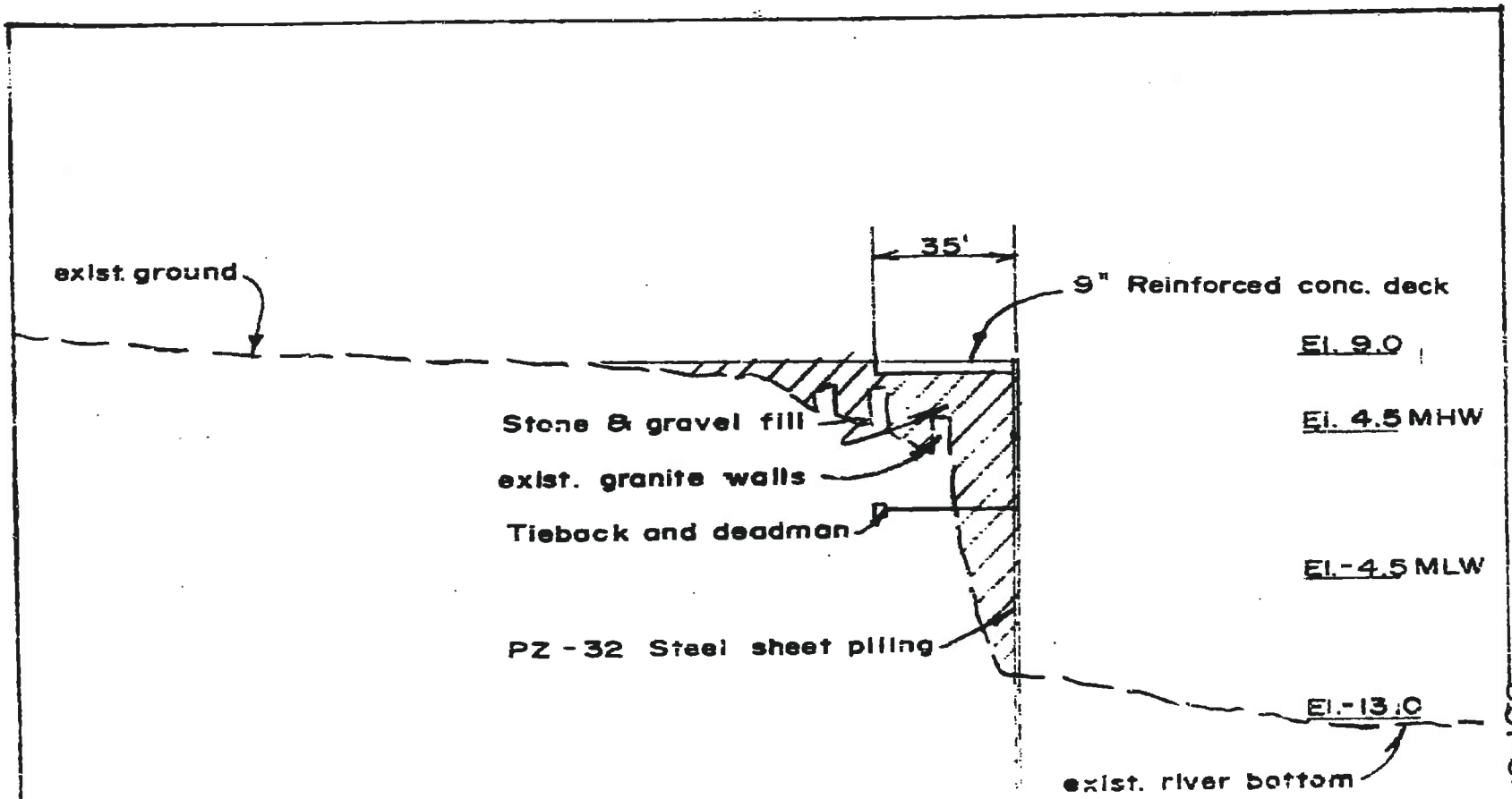
Sheet 3 of 5

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300



051-011-000-0018-100
051-011-000-0013-200
051-011-000-0018-300

1620304



SECTION "D"

HORIZONTAL

1' = 40'

40 0 40 80

scale feet

VERTICAL

1" = 10'

10 5 0 10 20

scale feet

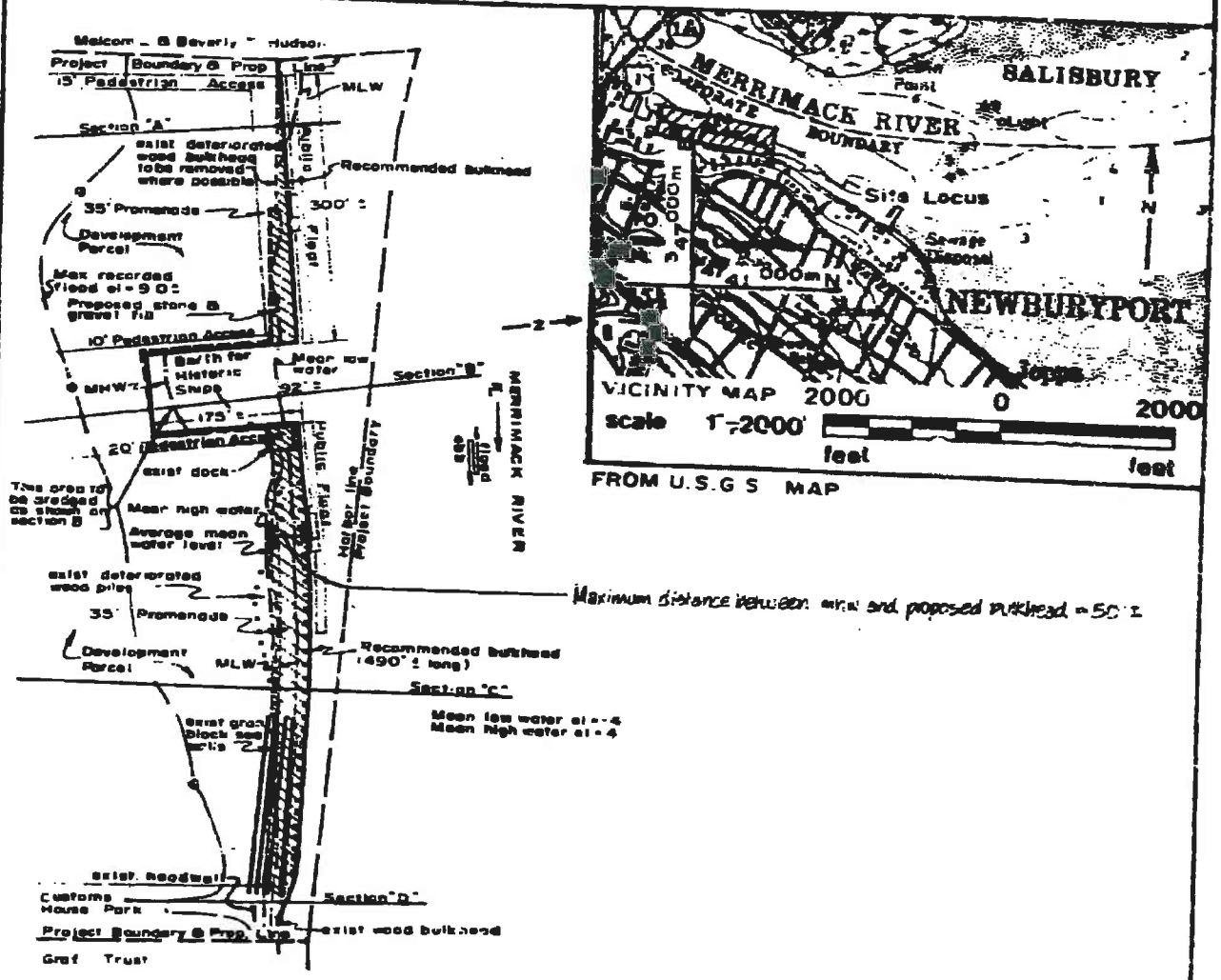
Datum mean sealevel

Sheet 5 of 5

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300

162-0301

051-011-000-001B-100
051-011-000-001B-200
051-011-000-001B-300



PURPOSE: Propose to rebuild seawall with public dock

DATUM: Mean sealevel

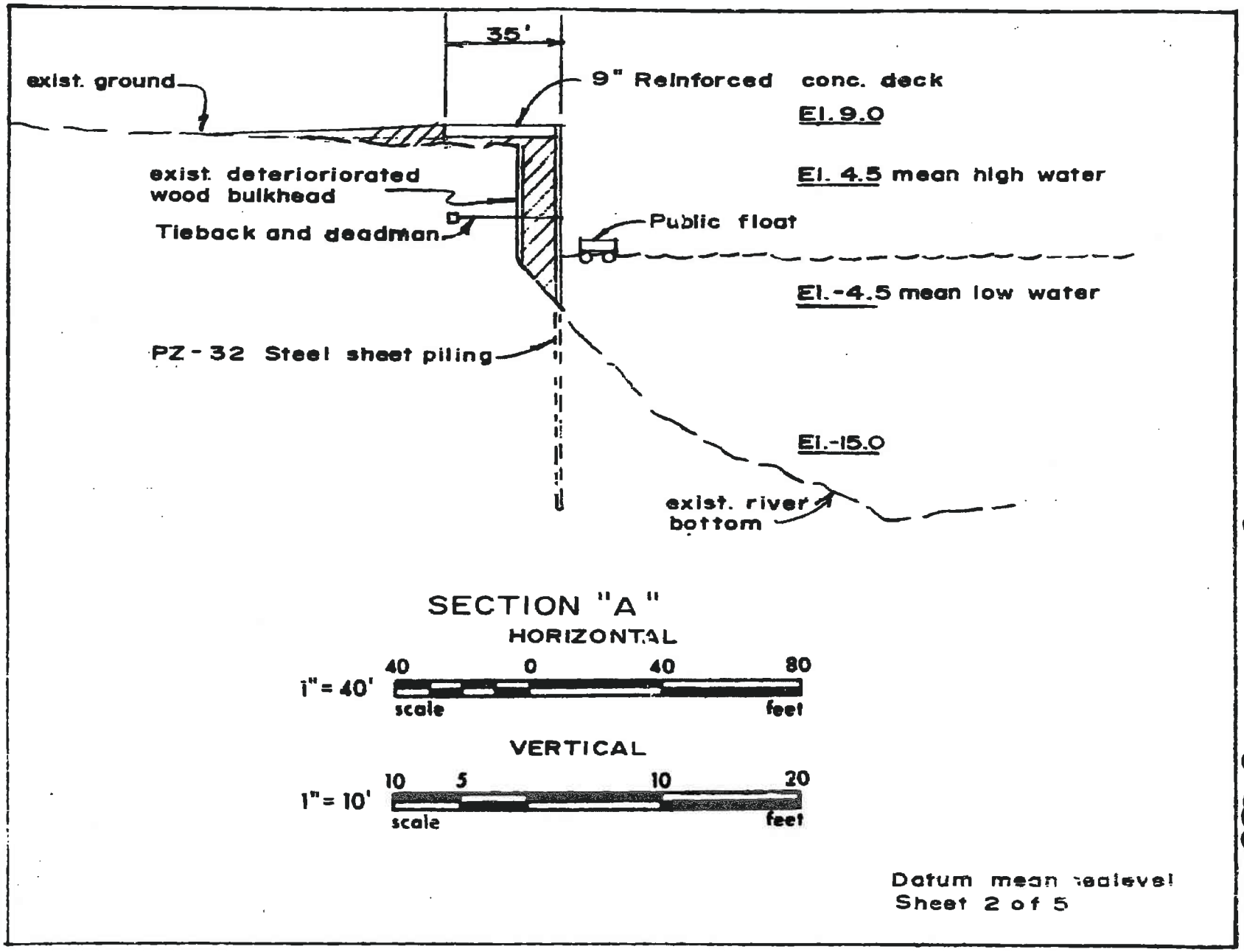
ADJACENT PROPERTY OWNERS

(1) Malcom L. & Beverly T. Hudson

(2) Graf Trust

IN Merrimack River
AT Newburyport
COUNTY OF Essex STATE Mass.
APPLICATION BY

SHEET 1 OF 5 DATE: 7-9-75



SECTION "A"

HORIZONTAL

1" = 40'

40 0 40 80

scale feet

VERTICAL

1" = 10'

10 5 10 20

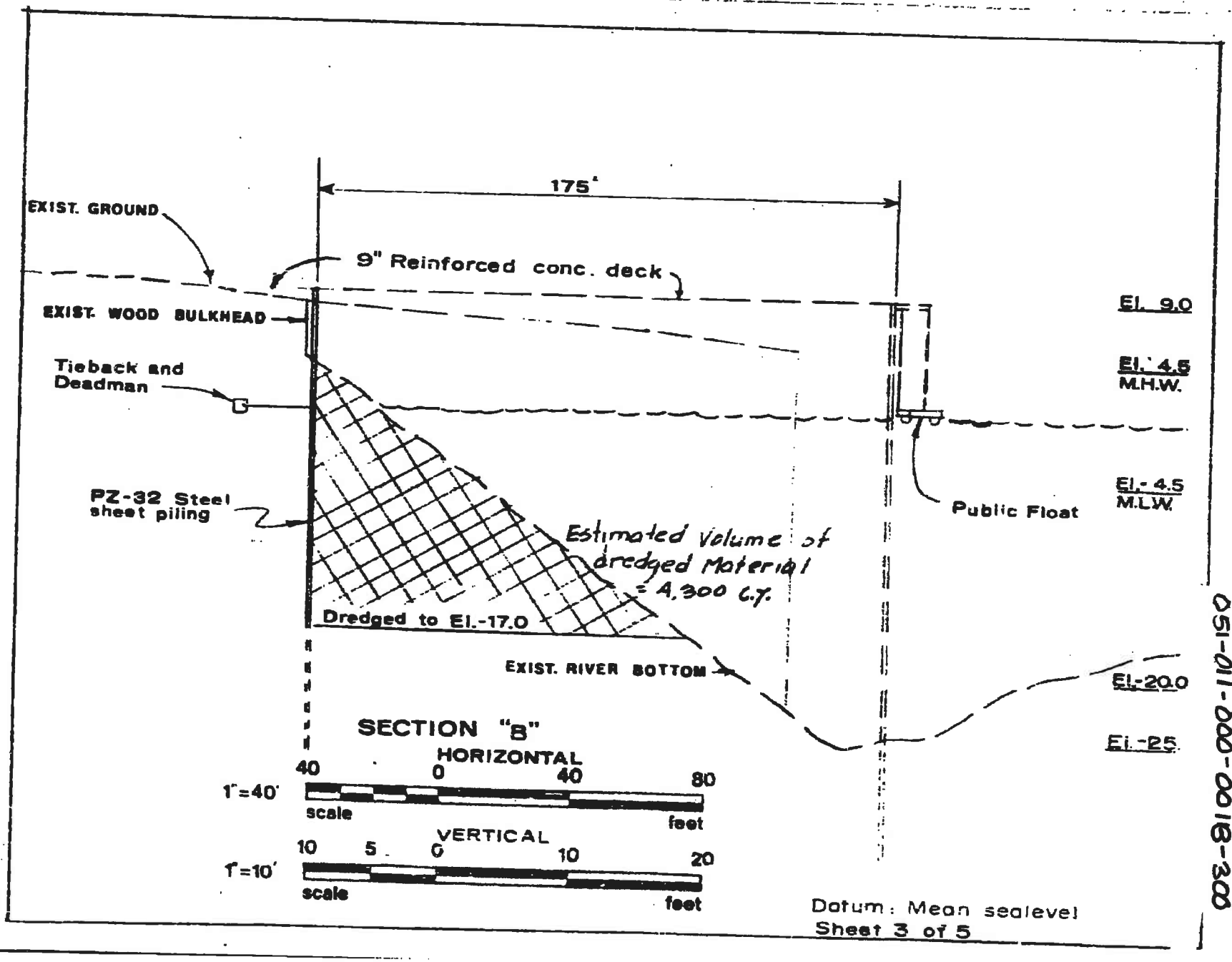
scale feet

Datum mean sealevel

Sheet 2 of 5

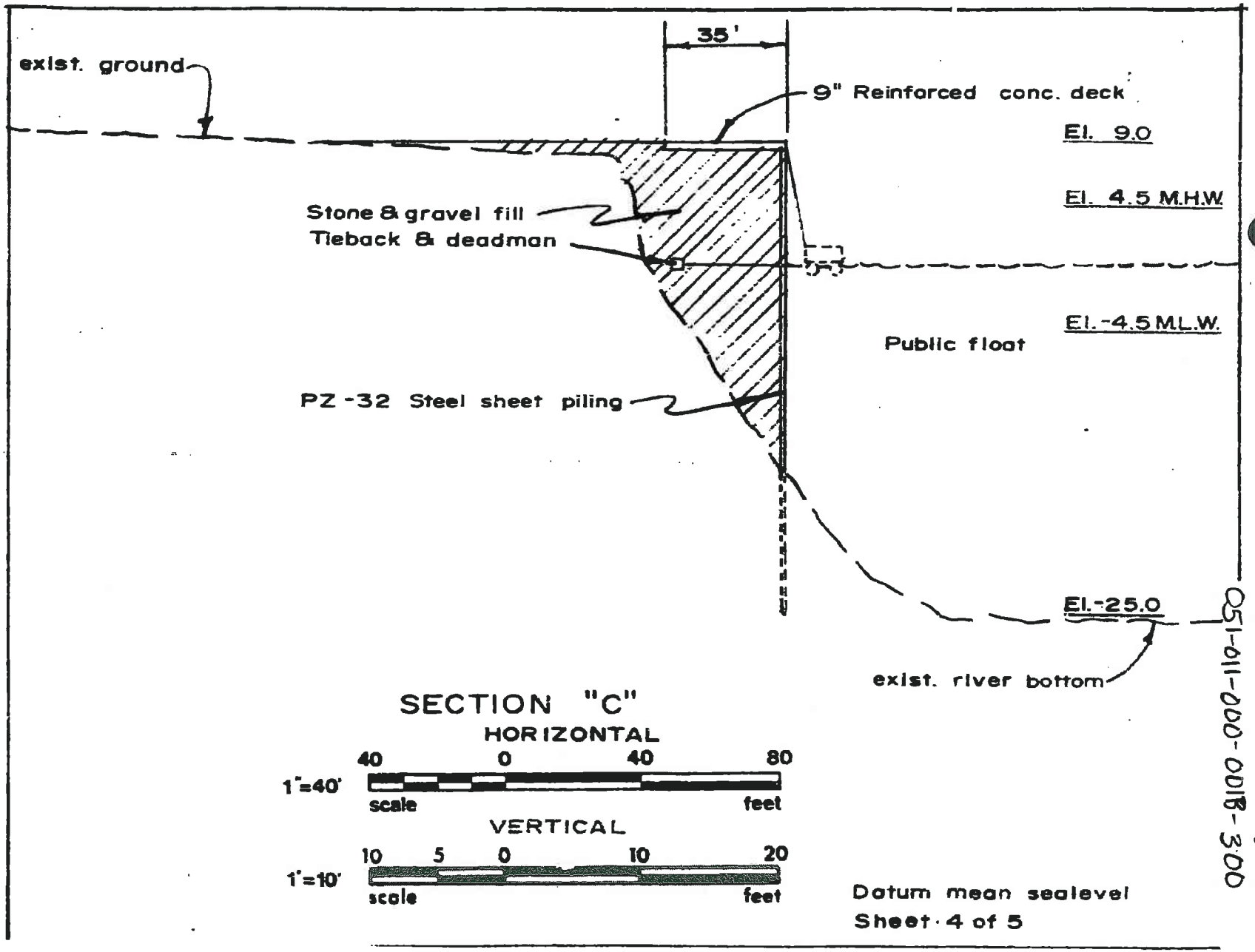
051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300

162-0302



Sheet 3 of 5

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300



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051-011-000-0018-300

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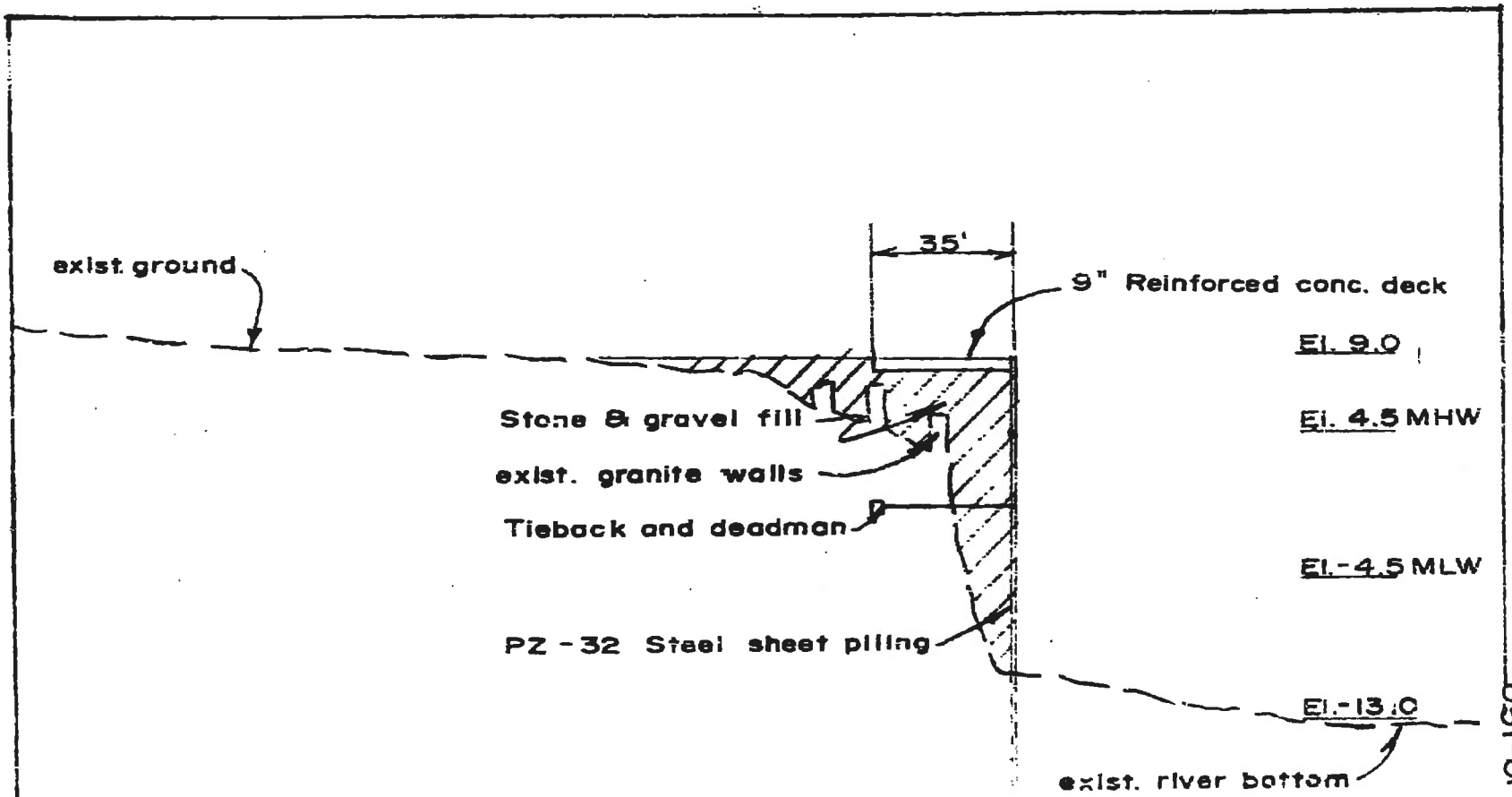


SECTION "D"

HORIZONTAL

1' = 40'

40 0 40 80

scale feet

VERTICAL

1" = 10'

10 5 0 10 20

scale feet

Datum mean sea level

Sheet 5 of 5

051-011-000-0018-100
051-011-000-0018-200
051-011-000-0018-300

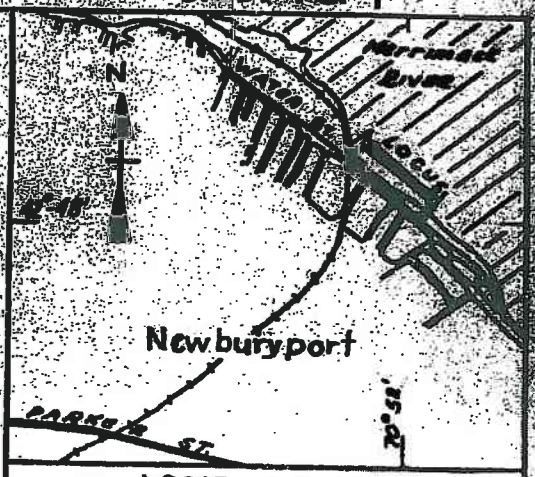
051-1258

MA-NEDE-71-174

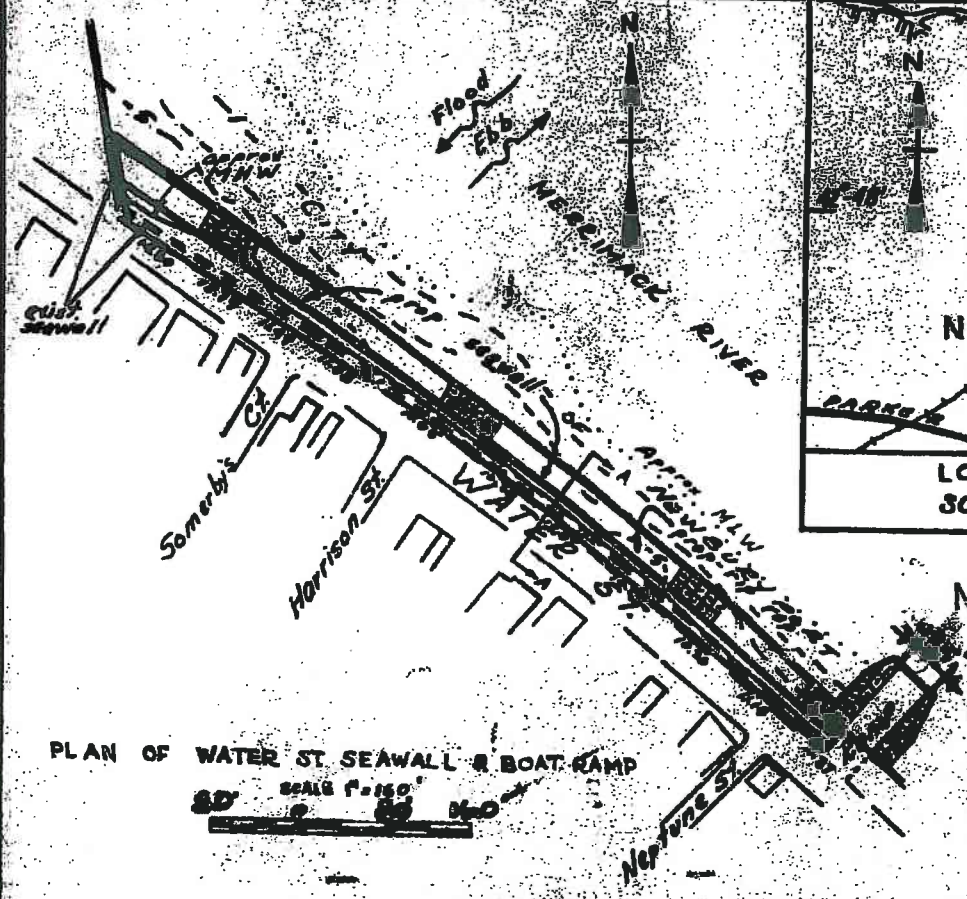
31 Aug. 71

051-026-000-028-100

SHEET 1 OF 1



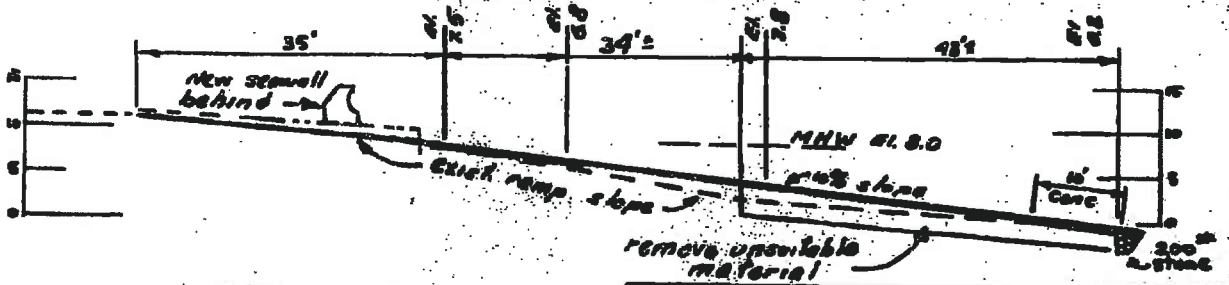
LOCATION PLAN
SCALE 1:24000



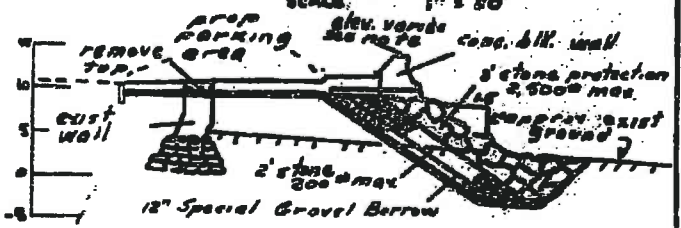
PLAN OF WATER ST. SEAWALL & BOAT RAMP

NOTE:
ELEVATIONS ARE IN FEET AND TENTHS ABOVE THE PLANE OF MEAN LOW WATER
MINUS FIGURES SHOW DEPTHS BELOW THE SAME PLANE
LOCATION OF PROPOSED WORK SHOW IN RED
SURVEY DATE: APRIL 1970
CONTRACT NO. 2715

SECTION THRU BOAT RAMP



SECTION A-A



Note: elev. top of seawall varies from elev. 12.75 to elev. 13.49

PROPOSED SHORE PROTECTION
CONCRETE SEAWALL
MERRIMACK RIVER
NEWBURYPORT

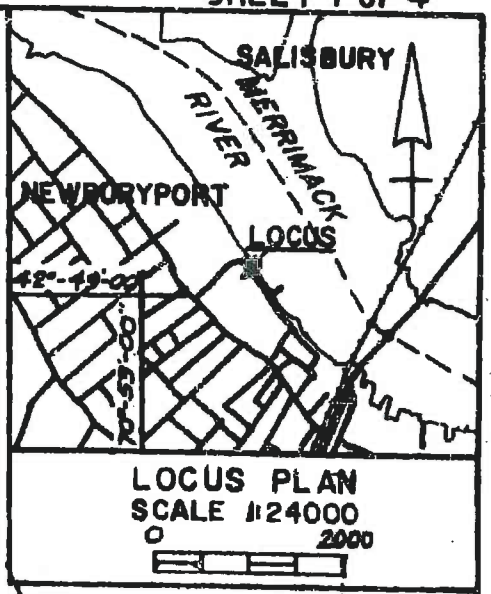
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
MARCH 1971

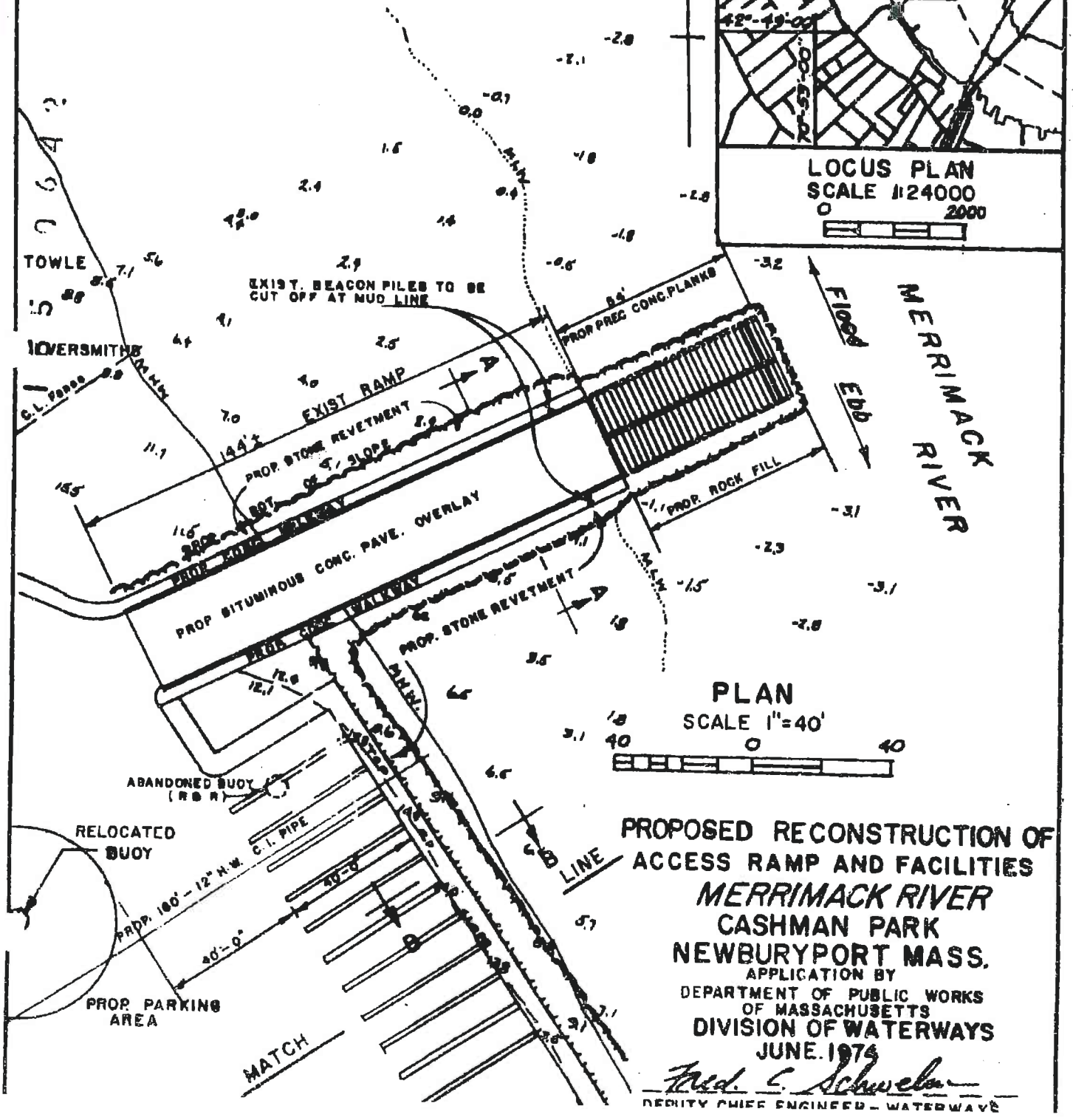
Fred. C. Schwelm
ACT. DEPUTY CHIEF ENGINEER FOR WATERWAYS

034 642 051-05H-000-003-100

SHEET 1 of 4

NOTE: Elevations are in feet and tenths and refer to the plane of Mean Low Water, minus figures denote depths below that plane.
CONTRACT NO. 82 P.A.
LOCATION OF PROPOSED WORK SHOWN IN RED





PLAN
SCALE 1"=40'
40 0 40

PROPOSED RECONSTRUCTION OF ACCESS RAMP AND FACILITIES

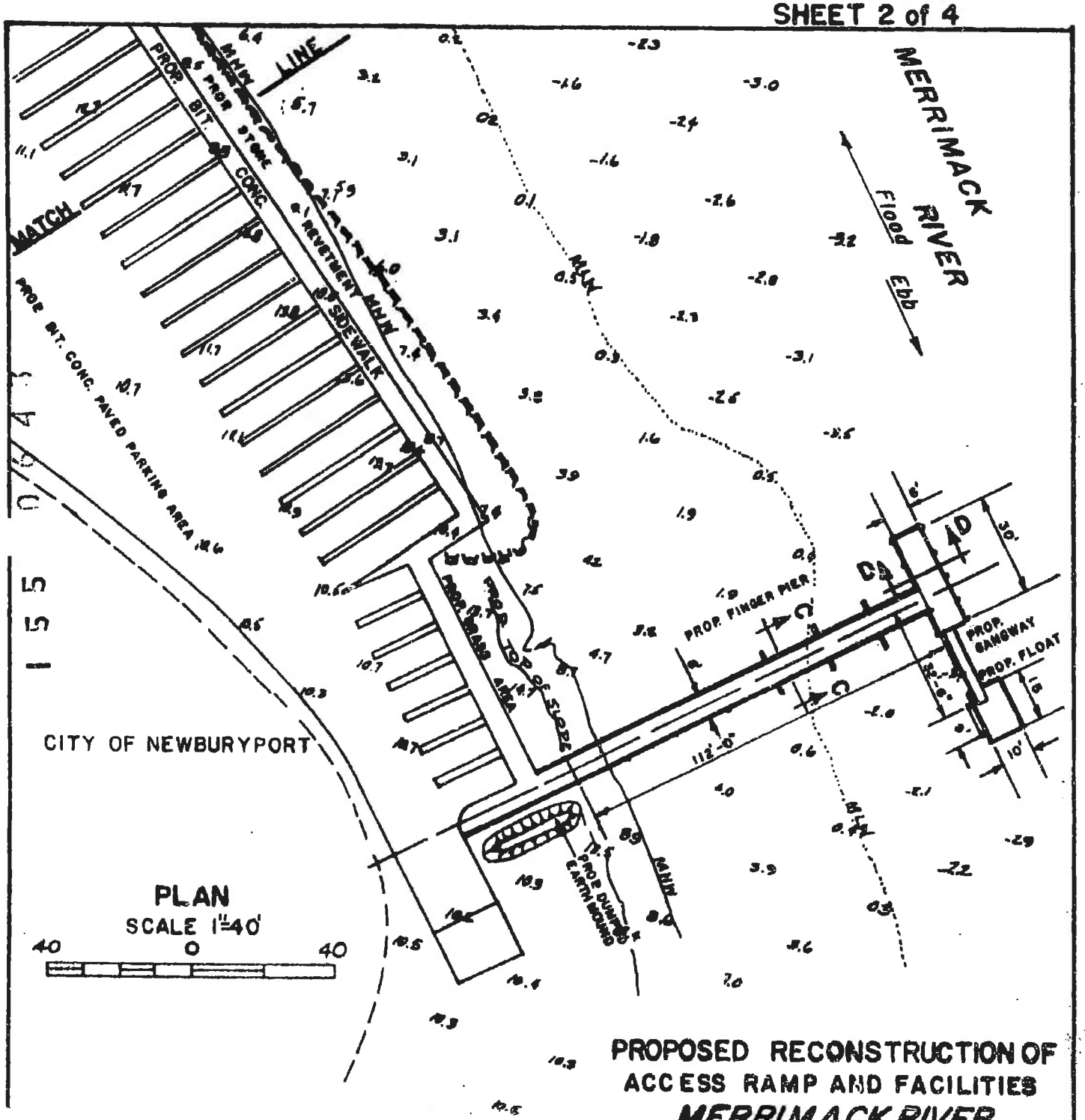
MERRIMACK RIVER

CASHMAN PARK
NEWBURYPORT MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS
OF MASSACHUSETTS
DIVISION OF WATERWAYS
JUNE 1974

Fred C. Schweler
DEPUTY CHIEF ENGINEER - WATERWAYS

0 3 4 1 6 4 3 051-054-000-003-100

SHEET 2 of 4

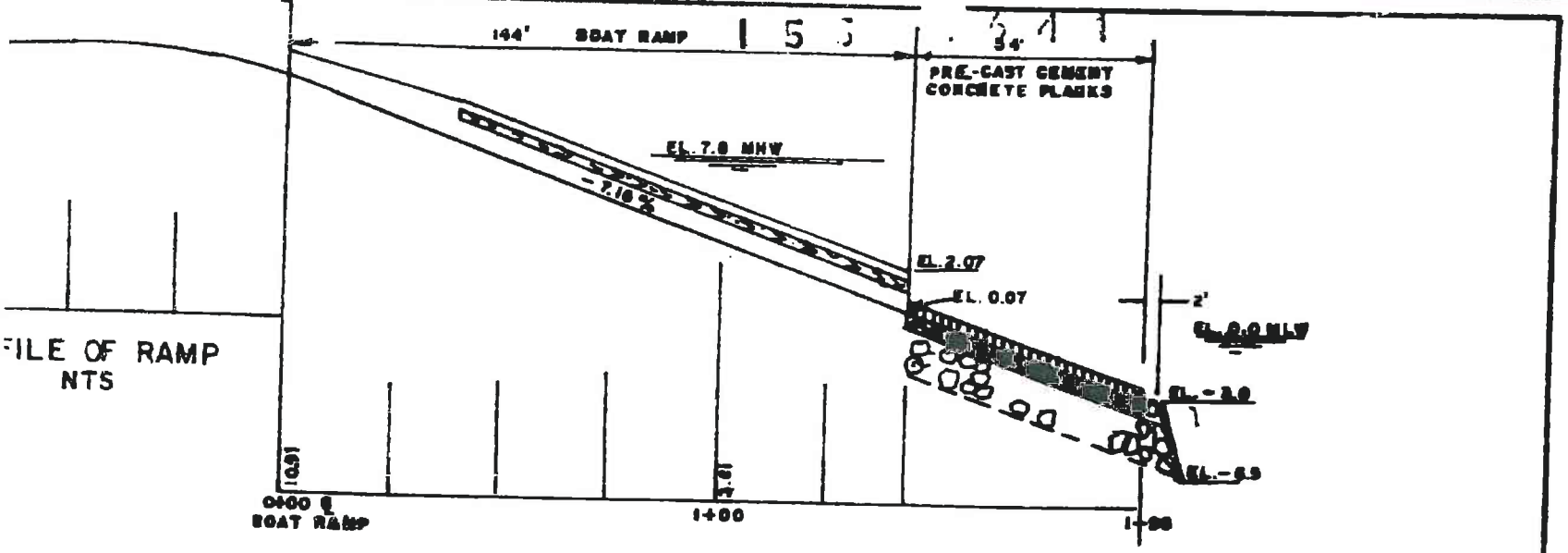


PROPOSED RECONSTRUCTION OF ACCESS RAMP AND FACILITIES

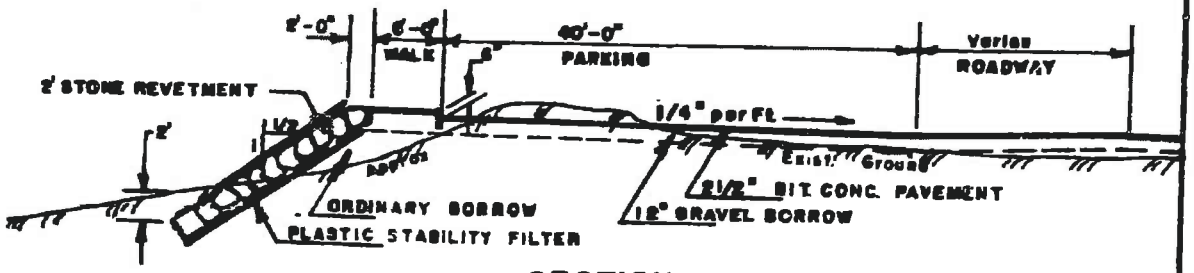
MERRIMACK RIVER

CASHMAN PARK
NEWBURYPORT MASS.

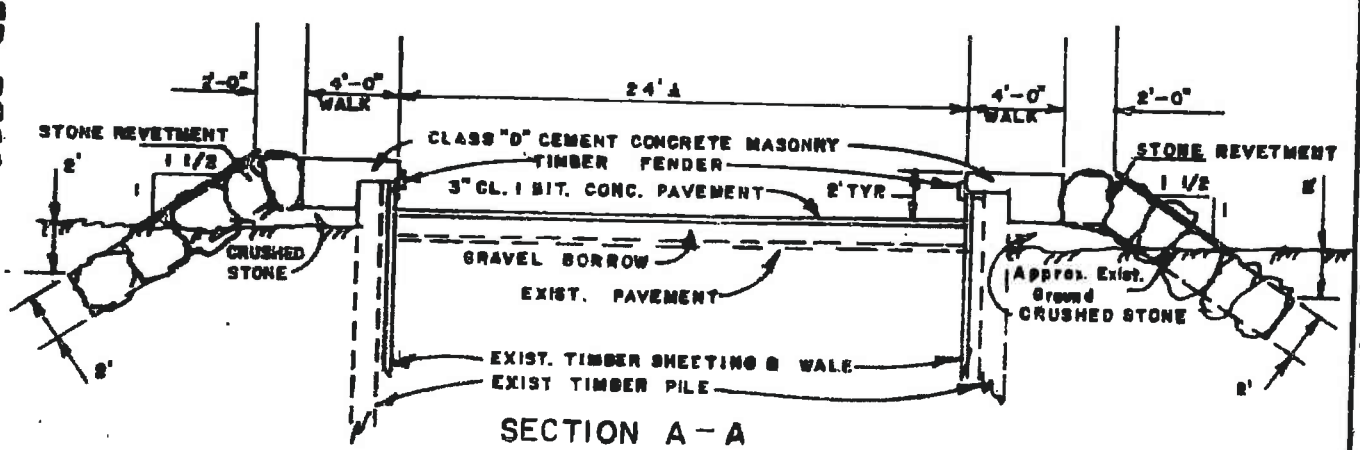
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS
OF MASSACHUSETTS
DIVISION OF WATERWAYS
JUNE 1974



FILE OF RAMP
NTS



SECTION B-B
NTS



SECTION A-A
NTS

PROPOSED RECONSTRUCTION OF
ACCESS RAMP AND FACILITIES
MERRIMACK RIVER
CASHMAN PARK
NEWBURYPORT MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS
OF MASSACHUSETTS
DIVISION OF WATERWAYS
JUNE 1974

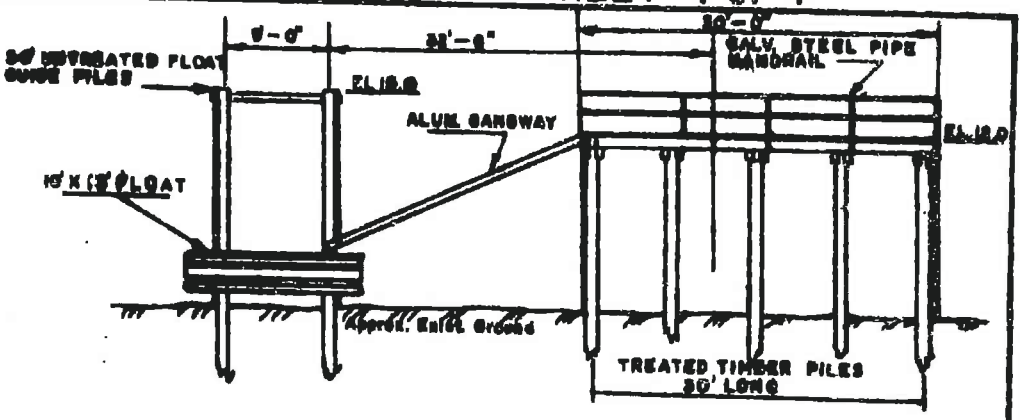
0 3 4 ● 1 6 4 4

051-054-000-003-100

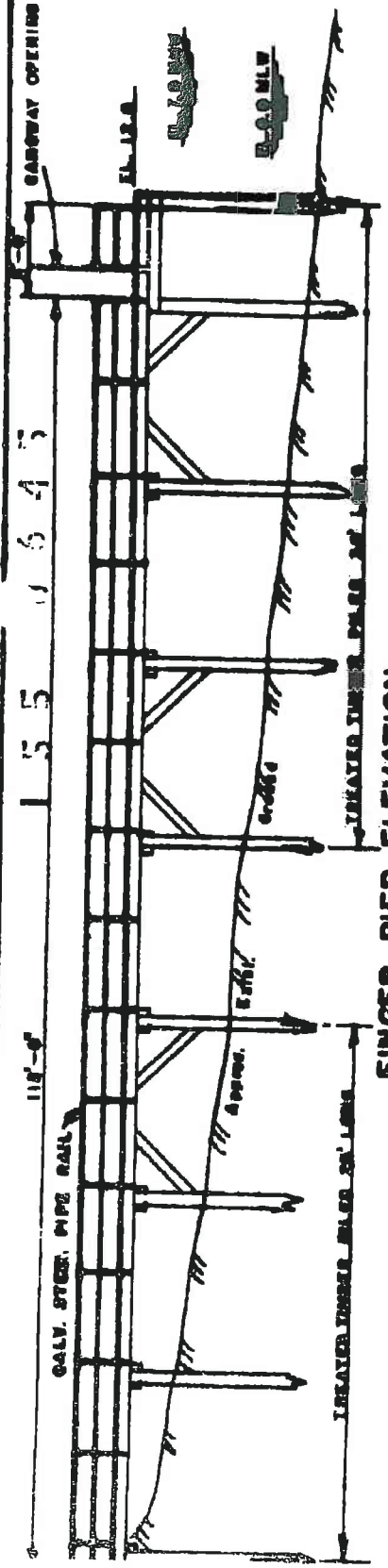
SHEET 3 of 4

0 3 4 1 6 4 5 051-054-000-003-100

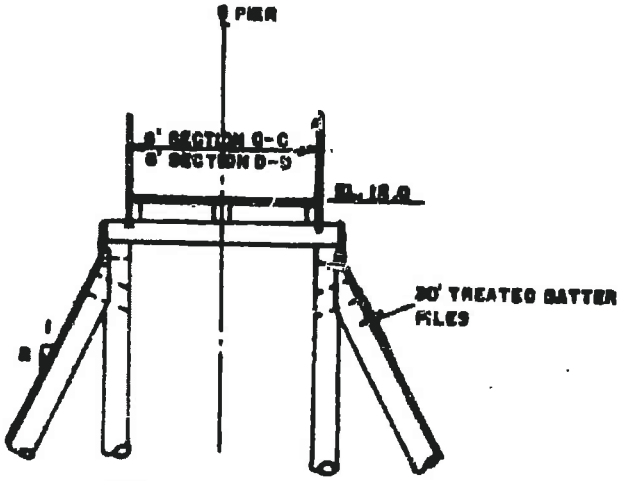
SHEET 4 of 4



END ELEVATION
NTS



FINGER PIER ELEVATION
NTS



SECTION C-C
SECTION D-D
NTS

PROPOSED RECONSTRUCTION OF
ACCESS RAMP AND FACILITIES
MERRIMACK RIVER
CASHMAN PARK
NEWBURYPORT MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS
OF MASSACHUSETTS
DIVISION OF WATERWAYS

Section IV

Newbury

Section IV – Community Findings – Town of Newbury

COMMUNITY DESCRIPTION

The Town of Newbury consists of a land area of 24.25 square miles out of a total area of 26.45 square miles and had a population of 6,717 in the 2000 census. The Town is located on the North Shore of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline that is directly exposed to open ocean waves is 5 miles with the remaining shoreline semi-protected by offshore structures or landforms. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Newbury, there were 5 structures which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen on Sheet 1 and 2 in Section IV-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

STRUCTURE TYPE AND QUANTITY - Town of Newbury

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Length
Bulkhead / Seawall							
Revetment							
Breakwater							
Groin / Jetty	2		1		1		300
Coastal Dune	1			1			2000
Coastal Beach	2		2				340
	5		3	1	1		2640

Within the above table, the total length of each type of structure is also provided. The structures are listed by the type which is providing the primary coastal protection. Many sites have multiple structure types at the same location (i.e. revetment in front of seawall). These secondary structures, although not identified within these tables, are included in the development of repair/rehabilitation costs.

The development of repair costs has been included by structure type and by condition. In the Town of Newbury's case there are a total of 5 structures which would require approximately $ 1.1 million to bring all the coastal structures to "A" Rating. Most critical will be the structures in the "D" and "F" classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event. To reconstruct these structures, identified in the preliminary survey as being in poor condition, an estimated $ 139,400 would be required to upgrade the Town's coastal protection.

STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Newbury

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Bulkhead / Seawall							$ -
Revetment							$ -
Breakwater							$ -
Groin / Jetty	2		$ 96,330		$ 139,432		$ 235,762
Coastal Dune	1			$ 790,000			$ 790,000
Coastal Beach	2		$ 43,085				$ 43,085
	5	$ -	$ 139,415	$ 790,000	$ 139,432	$ -	$ 1,068,847

Based on the limited research within the scope of this project research, the presumed ownership of the structures was established on an initial basis and would be subject to more intense review in future tasks. Structures identified as being owned privately were excluded from further consideration. Although ownership of the land on which the structure was located was a factor, the structure ownership was treated as a separate issue from land ownership. For the Town of Newbury, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Newbury

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Town Owned	2		$ 139,415				$ 139,415
Commonwealth of Massachusetts	1			$ 790,000			$ 790,000
Federal Government Owned							$ -
Unknown Ownership	2				$ 139,432		$ 139,432
	5	$ -	$ 139,415	$ 790,000	$ 139,432	$ -	$ 1,068,847

The identification of presumed ownership was not based on the investigation of legal documents but relied on property ownership and from construction and regulatory documents that were found. A more detailed investigation of legal documents and agreements would be required where structure ownership is disputed. A more detailed identification of structure type, length, condition and location can be found in Section IV-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

The enclosed reports and associated documents reflects the Town of Newbury's coastal structure information that will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

This database will also provide relatively quick access to identify available documentation for these structures as well as the ability to be updated as coastal structure improvements are made.

Section IV- Newbury

Part B

Structure Assessment Reports

COASTAL STRUCTURE LOCATION PLAN

TOWN OF NEWBURY
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'

BCE Bourne Consulting Engineering

SHEET 1

File: X:\27652-\27667\North Shore\Newbury\dwg\NEWBURY.dwg

COASTAL STRUCTURE LOCATION PLAN

TOWN OF NEWBURY
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'

Bourne Consulting Engineering

SHEET 2

File: X:\27652-\27667\North Shore\Newbury\dwg\NEWBURY.dwg

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newbury

Structure ID: 050-002U-000-029-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Plum Island Boulevard	9/25/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newbury	1956	$96,330.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
195 Feet	Feet NAVD 88	V2	20 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Groin/ Jetty	Stone	Over 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A stone groin in satisfactory condition and functioning to retain sand to the south. This structure was built by the Army Corps of Engineers.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

050-002U-000-029-100-PHO1A.JPG

Structure Documents:

MA-DCR	February 19	Proposed Shore	050-002U-000-029-100-DCR1A
DEP	February 19	Proposed Stone Jetty	050-002U-000-029-100-LIC1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newbury

Structure ID: 050-002U-000-029-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Plum Island Boulevard	9/25/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newbury	Unkown	$17,107.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
135 Feet	19 Feet NAVD 88	V2	20 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Beach	Sand	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Sand nourishment of a beach access ramps with sand fence, in good condition.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

050-002U-000-029-200-PHO2A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newbury

Structure ID: 050-002U-000-030-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Plum Island	3/13/2009

Presumed Structure Owner:	Based On Comment:
State	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	Unkown	$790,000.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
2000		V2	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Dune	Sand	10 to 15 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Sand dune that has a part of it that was recently repaired with coco mats. Signs of moderate erosion and storm damage. No visable dune grass

Condition Rating	C	*Priority Rating*	I
	Fair		None
Level of Action	Moderate	*Action*	Long Term Planning Considerations
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.	*Description*	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

050-002U-000-030-100-PHO1A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newbury

Structure ID: 050-002U-000-044-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Unknown	Plum Island - Dartmouth Way	9/25/2007

Presumed Structure Owner:	Based On Comment:
Unknown	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Unknown	1959	$139,432.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
105 Feet	Feet NAVD 88	V2	20 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Groin/ Jetty	Stone	Under 5 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A unravelled stone groin that is not functioning to retain sand.

Condition Rating	D
	Poor
Level of Action	Major
Description	Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority Rating	II
	Low Priority
Action	Future Project Consideration
Description	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

050-002U-000-044-100-PHO1A.JPG

Structure Documents:

MA-DCR	Janaury 195	Proposed Shore	050-002U-000-044-100-DCR1A

Prepared By: Bourne Consulting Engineering

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Newbury

Structure ID: 050-002U-000-044-200

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
Local	Plum Island - Dartmouth Way	9/25/2007

Presumed Structure Owner:	Based On Comment:
Local	

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
Newbury	Unkown	$25,978.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
205 Feet	17 Feet NAVD 88	V2	20 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Coastal Beach	Sand	5 to 10 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

Beach nourishment shaped into a two way walking ramp with sand fencing.

Condition Rating	B Good	*Priority Rating*	II Low Priority
Level of Action	Minor	*Action*	Future Project Consideration
Description	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.	*Description*	Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

050-002U-000-044-200-PHO2A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

Section IV - Newbury

Part C

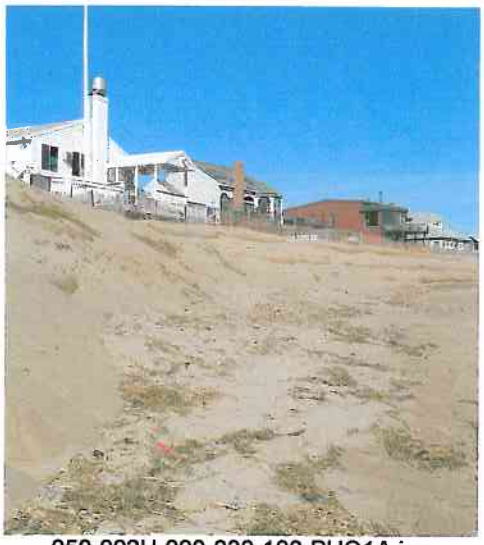
Structure Photographs

TOWN: NEWBURY
SOURCE: WFE - FIELD PHOTOGRAPHS
LOCATION: Bourne Consulting Engineering
DATE OF RESEARCH: AUGUST 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
050-002U-000-029-100	050-002U-000-029-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Stucture Condition Photo at Time of Survey
050-002U-000-029-200	050-002U-000-029-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Stucture Condition Photo at Time of Survey
050-002U-000-030-100	050-002U-000-030-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Stucture Condition Photo at Time of Survey
050-002U-000-044-100	050-002U-000-044-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Stucture Condition Photo at Time of Survey
050-002U-000-044-200	050-002U-000-044-200-PHO2A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Stucture Condition Photo at Time of Survey

050-002U-000-029-100-PHO1A.JPG

050-002U-000-029-200-PHO2A.JPG



050-002U-000-030-100-PHO1A.jpg

050-002U-000-044-100-PHO1A.JPG

050-002U-000-044-200-PHO2A.JPG

Section IV - Newbury

Part D

Structure Documents

TOWN DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents

TOWN: NEWBURY
SOURCE: Town of Newbury
LOCATION: TOWN
DATE OF RESEARCH: JULY 2007

No Town Documents for the Town of Newbury

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

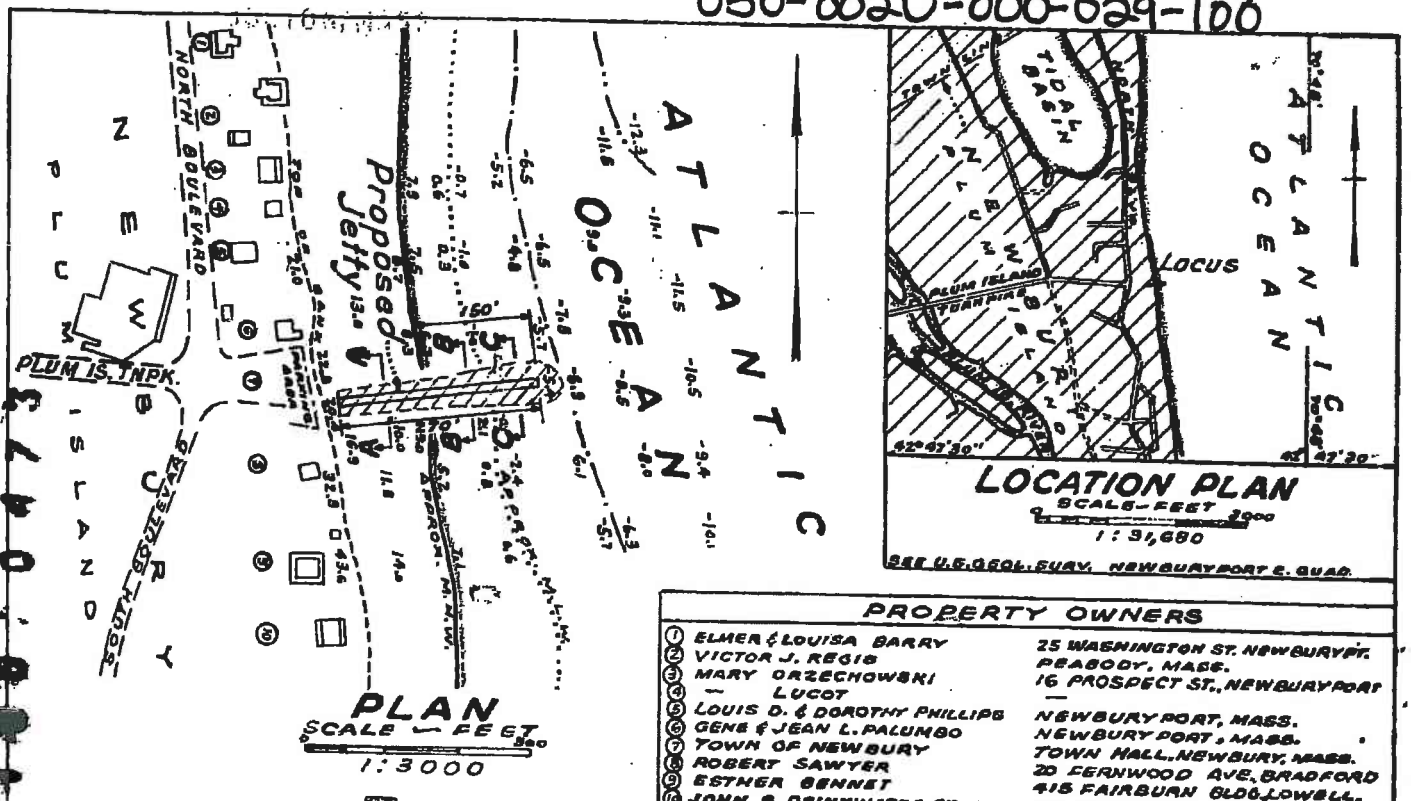
TOWN: NEWBURY
SOURCE: MA-DCR
LOCATION: MA-DCR BOSTON and HINGHAM, MA
DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
050-002U-000-029-100	050-002U-000-029-100-DCR1A	1582	MA-DCR	Newbury	February 1956	Proposed Shore Protection - Stone Jetty - Plum Island Shore - Opposite Plum Island Turnpike - Newbury - Prepared for the DPW of Massachusetts - Division of Waterways	1	Plum Island Turnpike	Jetty
050-002U-000-044-100	050-002U-000-044-100-DCR1A	2013	MA-DCR	Newbury	Janaury 1959	Proposed Shore Protection - Stone Groin - Plum Island Shore - Opposite Dartmouth Way - Prepared for the DPW of Massachusetts - Division of Waterways	1	Dartmouth Way	Groin

TOWN: NEWBURY
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
050-002U-000-029-100	050-002U-000-029-100-COE1	56-57	USACE	Newbury	February 1956	Proposed Stone Jetty Plum Island Shore - Atlantic Ocean - Newbury, Massachusetts - Application by the DPW of Massachusetts - Division of Waterways	1	Plum Island	Groin

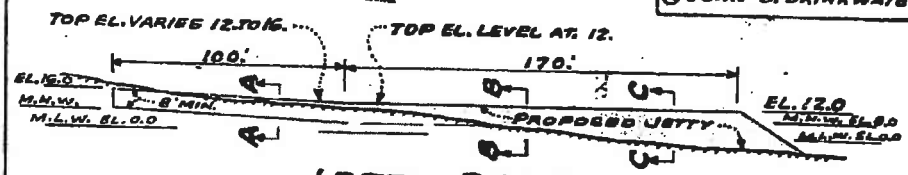
050-002U-000-029-100



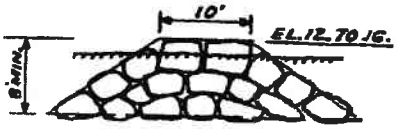
LOCATION PLAN
SCALE - FEET 2000
1 : 31,680
SEE U.S. GEOL. SURV. NEWBURYPORT E. QUAD.

PLAN
SCALE - FEET 500
1:3000

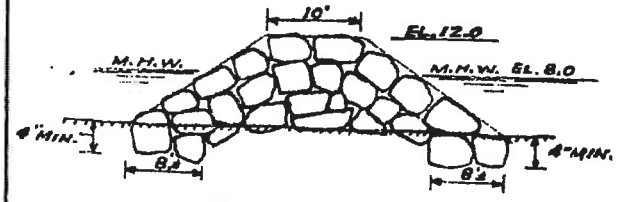
PROPERTY OWNERS	
(1) ELMER & LOUISA BARRY	25 WASHINGTON ST. NEWBURYPT.
(2) VICTOR J. REGIS	PEABODY, MASS.
(3) MARY ORZECHOWSKI	16 PROSPECT ST., NEWBURYPORT
(4) — LUCOT	—
(5) LOUIS D. & DOROTHY PHILLIPS	NEWBURY PORT, MASS.
(6) GENE & JEAN L. PALUMBO	NEWBURY PORT, MASS.
(7) TOWN OF NEWBURY	TOWN HALL, NEWBURY, MASS.
(8) ROBERT SAWYER	20 FERNWOOD AVE., BRADFORD
(9) ESTHER BENNET	415 FAIRBURN BLDG., LOWELL.
(10) JOHN B. DRINKWATER ET UX	191 HOLLAND TERR., NEEDHAM.



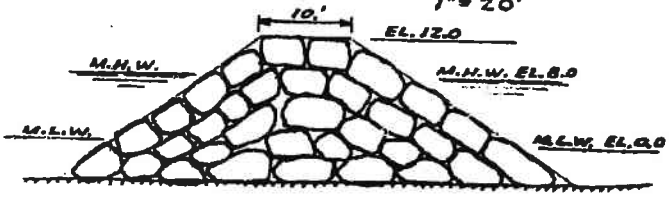
JETTY PROFILE
SCALE - FEET
1" = 80'



SECTION AA
SCALE - FEET 20
1" = 20'



SECTION BB
SCALE - FEET 20
1" = 20'



SECTION CC
SCALE - FEET 20
1" = 20'

NOTE
ELEVATIONS ARE IN FEET AND TENTHS ABOVE THE PLANE OF MEAN LOW WATER. MINUS FIGURES SHOW DEPTHS BELOW THE SAME PLANE.
LOCATION OF WORK TO BE DONE IS SHOWN IN RED.
END AND SIDE SLOPES OF PROPOSED JETTY ARE TO BE 1½ : 1
APPROX. EXISTING GROUND SHOWN THUS: ~~~~

PROPOSED STONE JETTY
PLUM ISLAND SHORE
ATLANTIC OCEAN
NEWBURY - MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
FEBRUARY 1956

Robert B. MacKinnon
DISTRICT WATERWAYS ENGINEER

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

Section V

Rowley

Section V – Community Findings – Town of Rowley

COMMUNITY DESCRIPTION

The Town of Rowley consists of a land area of 18.72 square miles out of a total area of 20.59 square miles and had a population of 5,500 in the 2000 census. The Town is located on the north shore of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline that is directly exposed to open ocean waves is 1 mile with the remaining shoreline semi-protected by offshore structures or landforms. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. According to the Rowley Town Administrator, none of the structures along the Town's coast are publicly owned and/or maintained. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

SUMMARY

Though there were no publicly owned structures at the time of investigation, the project database can be updated as needed for future construction. The Town of Rowley's coastal structure information will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

Section V - Rowley

Part B

Structure Assessment Reports

No Publicly Owned/Maintained Structures in the Town of Rowley

Section V - Rowley

Part C

Structure Photographs

No Publicly Owned/Maintained Structures in the Town of Rowley

TOWN: ROWLEY
SOURCE: WFE - FIELD PHOTOGRAPHS
LOCATION: Bourne Consulting Engineering
DATE OF RESEARCH: OCTOBER 2007

No Field Photographs for the Town of Rowley

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

Section V - Rowley

Part D

Structure Documents

No Publicly Owned/Maintained Structures in the Town of Rowley

BCE

TOWN: ROWLEY
SOURCE: Town of Rowley.xls
LOCATION: TOWN
DATE OF RESEARCH: SEPTEMBER 2007

No Town Documents for the Town of Rowley

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: ROWLEY
SOURCE: MA-DCR
LOCATION: MA-DCR BOSTON and HINGHAM, MA
DATE OF RESEARCH: JULY 2007

No MA - DCR Documents for the Town of Rowley

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: ROWLEY
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

No MA - DEP Ch. 91 Documents for the Town of Rowley

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: ROWLEY
SOURCE: US ACOE
LOCATION: CONCORD, MA
DATE OF RESEARCH: AUGUST 2007

No USACE - Permit Documents for the Town of Rowley

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

Section VI

Ipswich

Section VI – Community Findings – Town of Ipswich

COMMUNITY DESCRIPTION

The Town of Ipswich consists of a land area of 32.61 square miles out of a total area of 42.15 square miles and had a population of 12,987 in the 2000 census. The Town is located on the North Shore of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline is 1 mile that is directly exposed to open ocean. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Ipswich, there was 1 structure which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen on Sheet 1 in Section VI-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

STRUCTURE TYPE AND QUANTITY - Town of Ipswich

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Length
Bulkhead / Seawall							
Revetment							
Breakwater							
Groin / Jetty	1			1			130
Coastal Dune							
Coastal Beach							
	1			1			130

Within the above table, the total length of each type of structure is also provided. The structures are listed by the type which is providing the primary coastal protection. Many sites have multiple structure types at the same location (i.e. revetment in front of seawall). These secondary structures, although not identified within these tables, are included in the development of repair/rehabilitation costs.

The development of repair costs has been included by structure type and by condition. In the Town of Ipswich's case there is 1 structure which would require approximately $ 86,315 to bring all the coastal structures to "A" Rating. Most critical will be the structures in the "D" and "F" classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event of which Ipswich has none.

STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Ipswich

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Bulkhead / Seawall							$ -
Revetment							$ -
Breakwater							$ -
Groin / Jetty	1			$ 86,320			$ 86,320
Coastal Dune							$ -
Coastal Beach							$ -
	1	$ -	$ -	$ 86,320	$ -	$ -	$ 86,320

Based on the limited research within the scope of this project research, the presumed ownership of the structures was established on an initial basis and would be subject to more intense review in future tasks. Structures identified as being owned privately were excluded from further consideration. Although ownership of the land on which the structure was located was a factor, the structure ownership was treated as a separate issue from land ownership. For the Town of Ipswich, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Ipswich

Primary Structure (1)	Total Structures	Structure Condition Rating A	B	C	D	F	Total Cost
Town Owned							$ -
Commonwealth of Massachusetts	1			$ 86,320			$ 86,320
Federal Government Owned							$ -
Unknown Ownership							$ -
	1	$ -	$ -	$ 86,320	$ -	$ -	$ 86,320

The identification of presumed ownership was not based on the investigation of legal documents but relied on property ownership and from construction and regulatory documents that were found. A more detailed investigation of legal documents and agreements would be required where structure ownership is disputed. A more detailed identification of structure type, length, condition and location can be found in Section VI-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

The enclosed reports and associated documents reflects the Town of Ipswich's coastal structure information that will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

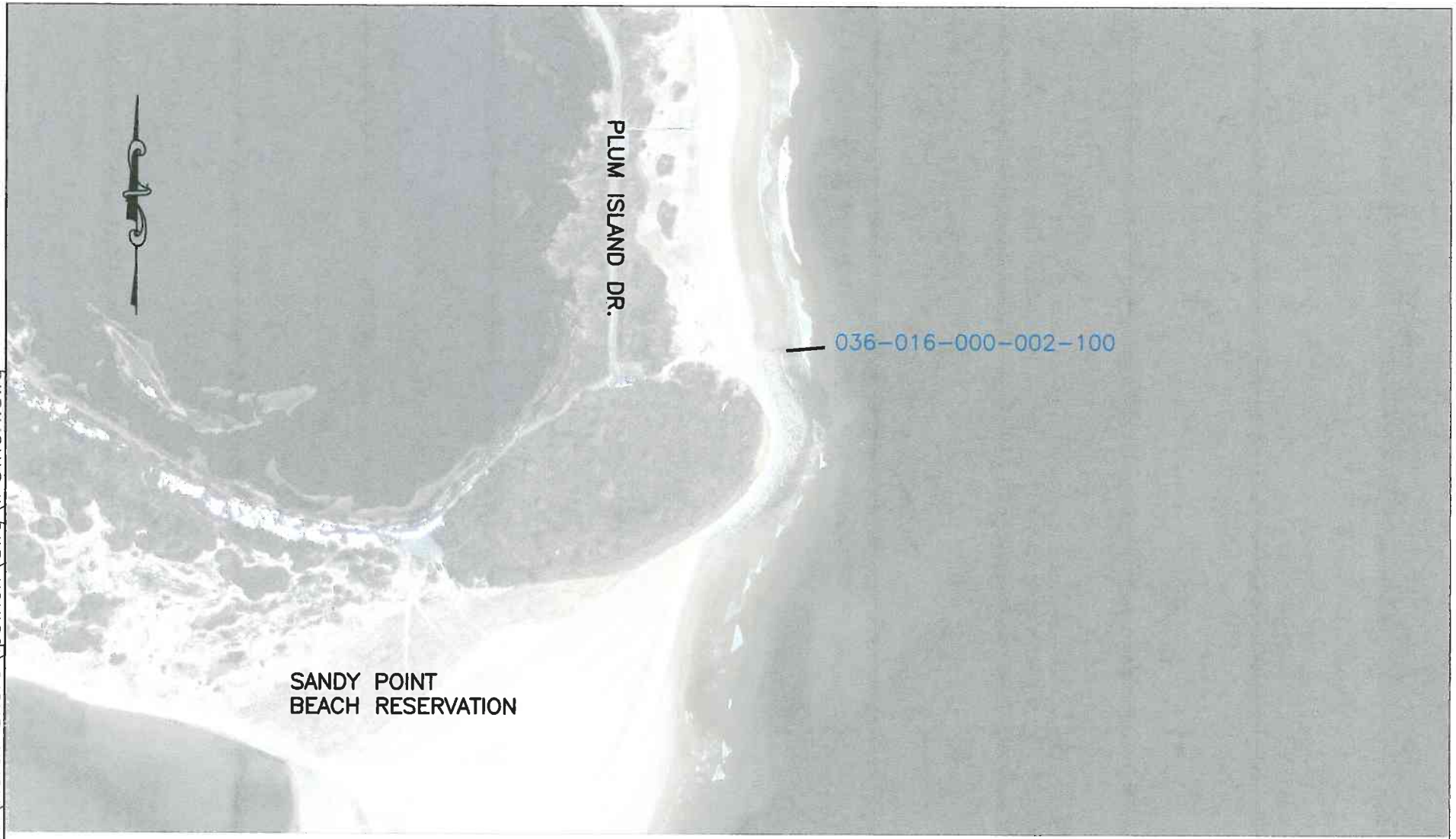
This database will also provide relatively quick access to identify available documentation for these structures as well as the ability to be updated as coastal structure improvements are made.

Section VI - Ipswich

Part B

Structure Assessment Reports

BCE



COASTAL STRUCTURE LOCATION PLAN

TOWN OF IPSWICH
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150

SCALE: 1" = 150'

BCE Bourne Consulting Engineering

SHEET 1

File: X:\27652-\27667\North Shore\Ipswich\dwg\IPSWICH.dwg

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Ipswich

Structure ID: 036-016-000-002-100

Key: community-map-block-parcel-structure

Property Owner:	Location:	Date:
State	Plum Island	9/25/2007

Presumed Structure Owner:	Based On Comment:
State	Tax Map

Owner Name:	Earliest Structure Record:	Estimated Reconstruction/Repair Cost:
MA-DCR	Unkown	$86,320.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
130 Feet	Feet NAVD 88	V3	14 Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Groin/ Jetty	Stone	Under 5 Feet

Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

A stone groin which is substantially unravelled and has reduced function as a groin. There are no nearby structures. The offshore end is in the water at low tide.

Condition Rating	C Fair	*Priority Rating*	I None
Level of Action	Moderate	*Action*	Long Term Planning Considerations
Description	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.	*Description*	No Inshore Structures or Residential Dwelling Units Present

Structure Images:

036-016-000-002-100-PHO1A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering

Section VI - Ipswich

Part C

Structure Photographs

TOWN: IPSWICH
SOURCE: WFE - FIELD PHOTOGRAPHS
LOCATION: Bourne Consulting Engineering
DATE OF RESEARCH: OCTOBER 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
036-016-000-002-100	036-016-000-002-100-PHO1A.JPG		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey

036-016-000-002-100-PHO1A

Section VI - Ipswich

Part D

Structure Documents

TOWN DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents

TOWN: IPSWICH
SOURCE: Town of Ipswich
LOCATION: TOWN
DATE OF RESEARCH: SEPTEMBER 2007

No Town Documents for the Town of Ipswich

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: IPSWICH
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

No MA - DEP Ch. 91 Documents for the Town of Ipswich

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: IPSWICH
SOURCE: US ACOE
LOCATION: CONCORD, MA
DATE OF RESEARCH: AUGUST 2007

No USACE - Permit Documents for the Town of Ipswich

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: IPSWICH
SOURCE: MA-DCR
LOCATION: MA-DCR BOSTON and HINGHAM, MA
DATE OF RESEARCH: JULY 2007

No MA - DCR Documents for the Town of Ipswich

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

Section VII

Essex

Section VII – Community Findings – Town of Essex

COMMUNITY DESCRIPTION

The Town of Essex consists of a land area of 14.16 square miles out of a total area of 15.94 square miles and had a population of 3,267 in the 2000 census. The Town is located on the north shore of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline is 3 miles that are directly exposed to open ocean. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. According to the Essex Town Administrator, none of the structures along the Town's coast are publicly owned and/or maintained. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

SUMMARY

Though there were no publicly owned structures at the time of investigation, the project database can be updated as needed for future construction. The Town of Essex's coastal structure information will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

Section VII - Essex

Part B

Structure Assessment Reports

No Publicly Owned/Maintained Structures in the Town of Essex

Section VII - Essex

Part C

Structure Photographs

No Publicly Owned/Maintained Structures in the Town of Essex

TOWN: ESSEX
SOURCE: WFE - FIELD PHOTOGRAPHS
LOCATION: Bourne Consulting Engineering
DATE OF RESEARCH: OCTOBER 2007

No Field Photographs for the Town of Essex

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

Section VII - Essex

Part D

Structure Documents

No Publicly Owned/Maintained Structures in the Town of Essex

TOWN: ESSEX
SOURCE: Town of Essex
LOCATION: TOWN
DATE OF RESEARCH: SEPTEMBER 2007

No Town Documents for the Town of Essex

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: ESSEX
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

No MA - DEP Ch. 91 Documents for the Town of Essex

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: ESSEX
SOURCE: MA-DCR
LOCATION: MA-DCR BOSTON and HINGHAM, MA
DATE OF RESEARCH: JULY 2007

No MA - DCR Documents for the Town of Essex

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description

TOWN: ESSEX
SOURCE: US ACOE
LOCATION: CONCORD, MA
DATE OF RESEARCH: AUGUST 2007

No USACE - Permit Documents for the Town of Essex

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description