SALISBURY BEACH ACCESS IMPROVEMENTS

CONTRACT 1

The Massachusetts Department of Conservation and Recreation (DCR) requires the removal of debris and installation of fencing over the approximate 4 mile length of coastline. Work items and method of payment shall include the following:

Mobilization/Demobilization to include the mobilization of all equipment and personnel to accomplish the work specified herein. This item shall also include the demobilization of equipment and personnel and the restoration of the site as impacted by any of the operations required to accomplish this work.

Debris Removal shall include the collection and debris removal of materials from the site and the legal offsite disposal, as directed by DCR. This work will be paid for by the ton of material removed from the site, as measured by the weight of the truck before and after the loading of the material for removal. Weight confirmation will either be by certified weigher or by weight slips as provided by the disposal site.

Snow Fencing shall include the supplying of fence material as well as the installation of the fencing in locations designated by DCR. Material and installation requirements shall include the following:

1. Snow fence shall consist of 4-foot high wooden fencing strips galvanized wire connected, and supported by galvanized coated steel posts.
2. Posts shall be steel, minimum 7 foot long, galvanized coated, in accordance with the recommendations of the fence manufacturer. Posts shall be spaced at a maximum of 10 feet on center, with a post placed at every change in direction.
3. Wooden pickets shall have a minimum width of 1½ inches, and a minimum thickness of 3/8 inch. Wood shall be #1 Spruce or Poplar and natural coated.
4. Wire connections shall be #5 galvanized wire, double rows construction. Snow fencing shall be connected to the posts utilizing existing picket wire and supplemental tie wire.
5. Attachments shall be made tight to minimize bends in alignment as approved by the Engineer.

The unit price for the fencing shall include the providing and installation snow fence including layout, post installation, fence/post connection, including all labor, material, tools, equipment, and all other incidental work necessary to complete the work under this item, as shown by the Drawings, specified herein, and as directed.

The following unit prices shall be applied to these work items:

ITEM NO.	QUANTITY	BASE BID ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	PRICE
1	1 LS	Mobilization/Demobilization at_____ _____ Dollars & Cents/lump sum		
2	200 Ton	Debris Removal at_____ _____ Dollars & Cents/Ton		
3	31,680 LF	Snow Fencing at_____ _____ Dollars & Cents/Linear Foot		
TOTAL BASE BID PRICE IN WORDS:			TOTAL BASE BID PRICE: $	

By:

_____
(Name of General Bidder)

_____
(Print Name as Signed Above)

_____
(Title)

_____
(Business Address)

_____
(Date)

SALISBURY BEACH ACCESS IMPROVEMENTS

CONTRACT 2

The Massachusetts Department of Conservation and Recreation (DCR) requires improvements to public access ways at 4 locations including one at the State Reservation and three located along the beach. This contract also includes the delivery and grading of sand at these locations as directed by DCR. Attached Figure 1 provides an overall site plan indicating the location of the four access ways, and Figures 2 through 9 indicating site plans and sections indicating the proposed work. Further description of work items and methods of payment shall include the following:

Item 1 - Mobilization/Demobilization to include the mobilization of all equipment and personnel to accomplish the work specified herein. This item shall also include the demobilization of equipment and personnel and the restoration of the site as impacted by any of the operations required to accomplish this work.

Item 2 - Access Way No. 8; Item 3 - Access Way No. 9; Item 4 - Access Way No. 10; and Item 5 - Repairs at Reservation Site 2 shall include the installation of temporary stairway structures as indicated by the Drawings and specified herein. Item 2 through 4 work at the three Access Ways shall include the installation of helix anchors, gangways, CCA treated heavy timber for posts, cross bracing, stairway supports, framing and stringers, and ACQ treated timber decking. Item 5 work shall include the repairs to the existing timber walkway including sistering of members, new timber decking and the resetting of existing concrete foundations as indicated by the Drawings and specified herein.

Timber shall be Southern Yellow Pine No. 1 or better, or Douglas Fir Select. Timber decking and handrail members shall be S4S. Timber decking and handrails shall have pressure treatment in conformance with AWPA M4 and P8 Ammonacal copper Quatenary (ACQ) in accordance with AWPA C2 and C18 timber exposed to marine borer attack. Decking, rail posts and railings shall have 0.4 ACQ treatment. All timber decking shall be supplied at a maximum moisture content of 30 %. Cut or drilled surfaces of all timbers shall be treated with a minimum of two saturating coats of copper naphthenate preservative (min.2%metalliccopper) in accordance with AWPA M4 and P8. All handrail timber shall be supplied at a maximum moisture content of 19%.

Heavy timber for posts, cross bracing, stairway supports, framing and stringers shall be S2E. All heavy timber shall have pressure treatment in conformance with AWPA M4 and P8 chromated copper arsenate (CCA) in accordance with AWPA C2 and C18 timber exposed to marine borer attack. Pile caps, bracing and stringers shall have minimum retention of 2.5 pounds per cubic foot of CCA treatment. Cut or drilled surfaces of all timbers shall be treated with a minimum of two saturating coats of copper naphthenate preservative (min. 2% metallic copper) in accordance with AWPA M4 and P8. All timber that is cut or drilled in any manner on-site shall receive penetrating sealer in accordance with AITC requirements. The presence of the AWPB quality mark MLP shall be accepted as evidence of conformance to this specification.

Fasteners for heavy timber shall be carbon steel ASTM A307 and galvanized in accordance with ASTM A123 and A153 for exterior and treated wood locations, as shown on Contract Drawings. Washers shall be round steel and 1/4" minimum thickness, galvanized. Fasteners for decking and handrail shall be as recommended for ACQ treated timber.

Set structural members level and plumb, in correct position as indicated on the Contract Drawings. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing. Holes for machine bolts shall be bored with a bit 1/16" larger than the bolt diameter, and holes for drift bolts shall be 1/16" smaller than the bolt diameter as approved by the Engineer. Drilled holes shall be thoroughly flushed with preservative. Similarly, cut timber surfaces shall be given two brush coats of preservative before installation, in accordance with AWPA STD. M4. All bolts shall bear on round plate washers under the nut and the head. Fender system bolts shall be countersunk. After nuts have been tightened, there shall be at least 1/2", but not more than 2", of exposed thread beyond the nuts. After erection, touch-up galvanized surfaces with primer consistent with shop coat.

Fastening to in-place construction shall include providing anchorage devices and fasteners where necessary for securing structural timber to itself, or to in-place construction. Provide temporary bracing as required.

For items required to fit previously constructed spaces, take measurements at job and fabricate to fit actual spaces. Repair cut surface with preservative brushed on to dry surface as recommended by the manufacturer. Fit exposed connections accurately together to form tight joints. Cut exposed joints smooth and repair cut surfaces. Do not cut or abrade the surfaces of items which have been hot-dip galvanized. Fastening of one member to another shall be accomplished in such a manner that no cracking or splitting of timber members shall occur. Cracked or split members shall be replaced by the Contractor, to the approval of the Engineer, at no additional cost to the Owner.

Install the decking with heartwood down; using 8-inch long lag bolts (2 per intersection). Deck planks shall be spaced 1/4-inch using dry timber.

The unit price for Items 2 through 5 shall include the furnishing and installation of all members including all labor, material, tools, equipment, and all other incidental work necessary to complete the work under this item, as shown by the Drawings, specified herein, and as directed.

Item 6 - Sand shall include the supplying of fence material as well as the installation of the fencing in locations designated by DCR. Material and installation requirements shall include the following:

1. Dune Fill Material: The new sand material required shall have soil gradation as indicated below:

Sieve U.S. Standard	Percent Passing by Weight Minimum		Maximum
½"	100		
No. 4	95		100
No. 10	75		98
No. 20	35		85
No. 40	5		57
No. 60	0		30
No. 100	0		10
No. 200	0		5

Sand material shall match the color of existing sediments as closely as possible, as approved by the DCR. This material shall be delivered from off-site and shall not be excavated from surrounding beaches. Sand material approved for use as dune fill shall be clean, granular, free from roots or other organic material, trash and frozen material and shall be capable of meeting the size requirements hereinafter specified.

Placement of sand shall be made in continuous layers not exceeding 12 (twelve) inches loose depth, without approval of the Engineer. Changes in grade shall be gradual, blending slopes into level areas. Do not place, spread, or roll any fill material during unfavorable weather conditions. Do not resume operations until moisture content and fill density are satisfactory to the approval of the Engineer.

Measurement for payment for Item 6 - SAND shall be per the contract unit price per ton furnished and unloaded to a location along the beach as directed by DCR. This unit price shall include full compensation for the furnishing of all labor, materials, tools, and equipment, and all other incidental work necessary to furnish, transport and unload the sand, The quantity to be paid for sand shall be based upon the weight of material as shown on weight slips attested to by a sworn weigher. Contractor shall provide moisture content of sand material as directed by the Department. For sand deliveries having water content, measured per ASTM requirements in excess of 5 percent, the weight of water in excess of 5 percent shall be subtracted from the total weight slip payment amount, as calculated by the Engineer.

Item 7 – Grading shall include the work efforts to transport the sand provided under Item 6 to one of the four access ways being improved under Items 2 through 5, then spread and grade the sands as directed by DCR. Such equipment will include loaders, graders, and trucks for accomplishing this work. Measurement for payment for GRADING shall be per the contract unit price per day of providing equipment and personnel to transport and grade the sand. Mobilization of equipment, storing of equipment not in use, and demobilization will not be included for payment, but shall be paid for under Item 1 – Mobilization/Demobilization for the contract.

The following unit prices shall be applied to these work items:

ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	PRICE
1	1 LS	Mobilization/Demobilization at_____ _____Dollars & Cents/lump sum		
2	1 LS	Access Way No. 8 at_____ _____Dollars & Cents/lump sum		
3	1 LS	Access Way No. 9 at_____ _____Dollars & Cents/lump sum		
4	1 LS	Access Way No. 10 at_____ _____Dollars & Cents/lump sum		
5	1 LS	Repairs at Reservation Site 2 at_____ _____Dollars & Cents/lump sum		
6	Ton	Sand at_____ _____Dollars & Cents/ton		
7	Day	Grading at_____ _____Dollars & Cents/Day		
TOTAL BASE BID PRICE IN WORDS:			TOTAL BASE BID PRICE: $	

By:

_____
(Name of General Bidder)

_____
(Print Name as Signed Above)

_____
(Title)

_____
(Business Address)

_____
(Date)

SUMMIT LTD.
32 Charles St.
Waltham, MA 02453
Fax: 781-893-7372

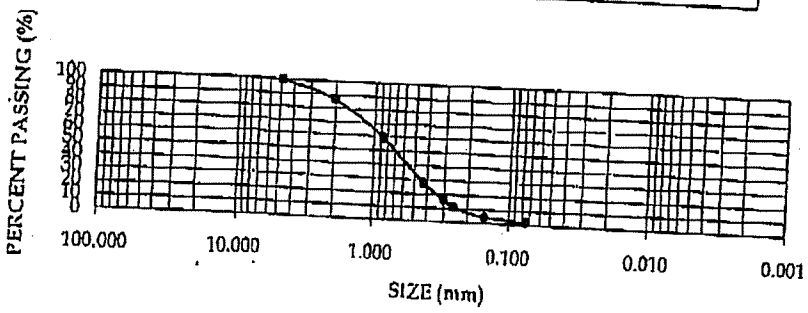
Libby sand

Client: Bentley Warren
Project: Laboratory Services
Date: 03/30/07
Summit Sample #: S-2
Project No.: 7105
Source: B.Warren Yard
Visual Description: Title V Sand / Screened

PARTICLE-SIZE DISTRIBUTION (ASTM D422)

SIEVE SIZE		GRADATION	
Inches	*mm*	*Percent Passing*	*Specifications*
6-inches	150.0	100	
4-inches	100.0	100	
3-inches	75.0	100	
2-inches	50.0	100	
1.5-inches	37.5	100	
1-inch	25.0	100	
3/4-inch	19.0	100	
1/2-inch	12.5	100	
3/8-inch	9.5	100	
1/4-inch	6.3	97	
No. 4	4.8	93	55 - 100 %
		Portion Passing #4	
No. 4	4.800	100	
No. 10	2.000	87	100%
No. 20	0.850	59	
No. 40	0.425	28	
No. 50	0.300	16	
No. 60	0.250	11	10 - 100 %
No. 100	0.150	5	
No. 200	0.075	2.3	0 - 20 %
	0.050		0 - 5 %
	0.010		
	0.001		

PORTION PASSING No.4 GRAIN SIZE ANALYSIS			
Coarse Sand	13%	Fine Sand	26%
Medium Sand	59%	Fines	2%



Notes: Split sieve was performed on material passing the #4 sieve as per specifications. Specifications call for 0 - 45% retained on the #4 sieve. In this sample, 7 % was retained on the #4. **Sample passed specifications for the Title V Sand.**

Tested by: I. Golberg

Reviewed by:

DIFF JOB

SECTION 06520

SCREW ANCHORS

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope of Work: Furnish all supervision, labor, tools, equipment, and materials necessary to install screw anchors where shown on the Drawings, as specified herein.

B. Related Sections:

05500	Miscellaneous Metals
06130	Heavy Timber Framing

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. The Owner through the Engineer, reserves the right of approval of the Subcontractor selected for this portion of the work. Approval will be based, in part, on demonstrated successful experience in performing related work and equipment to be used in executing the work.

1.03 SUBMITTALS

A. The proposed subcontractor's qualifications, a list and description of equipment to be used and proposed schedule.

B. Provide field copies of installation records faxed to the Engineer on a daily basis.

C. Installation records shall include, but are not limited to, the following information:

1. Date and time of installation.
2. Name and model of installation equipment.
3. Type of torque indicator used.
4. Location of anchor.
5. Elevation of anchor tip and cut-off elevation.
6. Identification of lead section (manufacturer's description, catalog number, and number and size of helix plates).
7. Identification of extension sections (manufacturer's catalog number).

8. Total length of anchor (lead section and extensions).
9. Inclination of anchor.
10. Installation torque at one-foot intervals for the final 10 feet.
11. Anchor installation duration and observations.
12. Comments, pertaining to interruptions, obstructions, or other pertinent information.

1.04 SUBSURFACE INFORMATION AND DESIGN

A. Design Criteria: Helical screw plates shall be designed to meet the specified loads and acceptance criteria as shown on the drawings. The calculations and drawings required from the Contractor shall be submitted to the Engineer for review and acceptance in accordance to Section 1.03

B. The overall length and installed torque of an anchor shall be such that the required soil capacity is developed by end-bearing on the helix plate(s) in an appropriate strata.

C. The cap bracket shall distribute the design load to the timber beam such that the stresses in the steel plates/welds does not exceed AISC allowable stresses for steel members.

D. Ground Conditions: The logs of soil borings, as included in Section 01000, shall be considered to be representative of the in-situ subsurface conditions likely to be encountered on the project site. Said boring logs shall be used as the basis for helical screw plate design, including number, size and configuration, using generally accepted engineering judgment and methods.

PART 2 PRODUCTS

2.01 SCREW ANCHORS

A. The central steel shaft, consisting of lead sections, helical extensions, and plain extensions, shall be Type HS or a combination of Types SS and HS as manufactured by the A.B. Chance Company of Centralia, MO or equivalent equal as approved by the Engineer. HS 3-1/2" OD Material shall be structural steel tube or pipe, seamless or straight-seam welded, per ASTM A53, A252, ASTM A500, or ASTM A618. Wall thickness is 0.300" (schedule 80).

B. Helix Bearing Plate shall be hot rolled carbon steel sheet, strip, or plate formed on matching metal dies to true helical shape and uniform pitch. Bearing plate material shall conform to the following ASTM specifications:

HS Material: Per ASTM A36, or A572, or A1018, or A656 depending on

helix diameter, per the minimum yield strength requirements cited above. Plate thickness is 3/8".

C. Bolts: The size and type of bolts used to connect the central steel shaft sections together shall conform to the following ASTM specifications:

HS 3-1/2" OD Material: 3/4" diameter bolts (3 per coupling) per SAE J429 Grade 5.

D. Couplings shall be formed as integral part of the plain and helical extension material. For Type HS material, the couplings shall be hot forge expanded sockets.

E. Plates, Shapes, or Pier Caps: Structural steel plates and shapes for anchor top attachments shall conform to ASTM A36 or ASTM A572 Grade 50.

2.02 EQUIPMENT REQUIREMENTS

Installation Machinery

1. Shall be a rotary type, hydraulically-operated drilling machine with forward and reverse torque capabilities equal to one another. The equipment should include appropriate gauges to indicate the down pressure applied. Percussion drilling equipment will not be permitted.
2. Shall have a minimum torque capacity of 20-percent or 2,000 ft.-lb. greater than the rated capacity of the anchor to be installed, whichever is lesser.
3. Shall be capable of providing sufficient down pressure at the recommended rate of rotation within the soil materials associated with this project.
4. Shall have sufficient capacity for reverse rotation and uplift to withdraw wrench from installed depth.
5. Shall have a drive head capable of multiple positioning to accommodate adjustments in anchor alignment.
6. Shall be maintained in good working order and safe to operate at all times.

2.03 TORQUE MONITORING DEVICE

1. Shall be capable of providing continuous measurement of applied torque throughout the installation process.
2. Shall be capable of torque measurements in increments of 500 ft.-lb. or less.
3. Shall be calibrated prior to pre-production testing or start of work. Torque indicators which are an integral part of the installation equipment, shall be calibrated on-site. Torque indicators which are mounted in-line with the installation tooling, shall be calibrated either on-site or at an appropriately equipped test facility. Indicators that measure torque as a function of hydraulic pressure shall be calibrated at normal operating temperatures.
4. Shall be subject to reasonable care and protected from shock or impact during

use, storage, and transportation. A torque indicator shall be recalibrated if, in the opinion of the Engineer or Owner's representative, it has been exposed to conditions that may adversely influence the accuracy of the torque measurements or reasonable doubt exists as to the accuracy of the torque measurements.

PART 3 EXECUTION

3.01 INSTALLATION PROCEDURE

A. Positioning and Alignment

1. The anchor shall penetrate the ground surface at the location shown on the Drawings.
2. Top elevation of anchor shall be within+/- one-inch of the design vertical elevation.
3. The bolted coupling provided with the thread bar adapter shall be used to connect the helical lead section and the adapter. Tighten coupling bolts to approximately 40 ft.-lb. of torque.

B. Advancing the Helical Lead Section

1. Engage and advance the lead section in a smooth and continuous manner. Extension sections shall be provided to obtain the required minimum overall length and installation torque as shown on the Drawings. Connect section together using coupling bolt(s) and nut. Avoid abrupt starts after interruptions.
2. Apply sufficient down pressure to advance the lead section approximately 3 inches per revolution. The rate of rotation and magnitude of down pressure must be adjusted for different soil conditions and depths in order to maintain the penetration rate.

3.02 TERMINATION CRITERIA

A. The maximum installation torque shall not exceed the torque rating of the anchor as specified by the manufacturer.
B. Both the minimum installation torque and minimum length criteria indicated on the Drawings must be satisfied.
C. In the event the torque rating of the anchor is exceeded before the minimum length is achieved, the installation shall be terminated and the Engineer immediately informed.
D. The anchor shall be designed to have an ultimate capacity of 16 kips.
E. If the minimum installation torque as shown on the working drawings is not achieved at the minimum overall length, the Contractor shall remove the existing anchor and install a new one with additional and/or larger diameter helix plates. The new helix

configuration shall be subject to review and acceptance of the Owner. If re-installing in the same location, the top-most helix of the new anchor shall be terminated at least (3) three feet beyond the terminating depth of the original anchor.

F. In the event the lead section is stopped or deflected by a subsurface obstruction, the installation shall be terminated and the Engineer or Owner's representative contacted. The drive end wrench should not be disengaged from the lead section without the approval of the Engineer or Owner's representative.

G. The average torque for the last 3 feet of penetration shall be used as a basis of comparison with the minimum installation torque.

H. The completed anchor installation shall be within 5 degrees of the inclination shown on the drawings.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Item 06520-1, SCREW ANCHOR MOBILIZATION, shall be measured as a lump sum as measured by the Engineer.

B. Item 06520-2, SCREW ANCHOR, shall be measured by linear foot installed in place complete, as specified, and as measured by the Engineer.

4.02 PAYMENT

A. Item 06520-1, Screw Anchor Mobilization, shall be paid for the lump sum price, which price shall include but is not limited to full compensation for survey of anchor locations, mobilization and demobilization of installation equipment for 51 anchors, excavation, cap bracket and modification of anchor head to accept timber cap, submittals as required in Section 1.04 above, and all other material, equipment, labor, and incidental or appurtenant work required to install and test the anchors, as shown on the Drawings, as specified herein, and as directed by the Engineer.

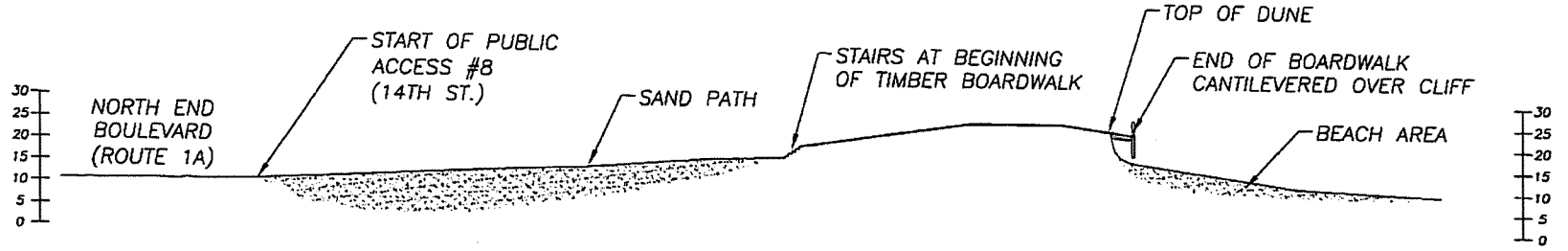
B. Item 06520-2, Screw Anchor, shall be paid for under per linear foot installed complete, which price shall include full compensation for the anchors. Payment shall include full compensation for all hardware, fastenings, material, and other incidental or appurtenant work required to install the anchors as shown on the Drawings, as specified herein, and as directed by the Engineer.

C. Payment for timber cap to span between unit anchors shall be paid for by the unit cost under Item 06130-1, Heavy Timber Framing.

D. Payment Items

ITEM	DESCRIPTION	UNIT COST
06520-1	Screw Anchor Mobilization	Lump Sum
06520-2	Screw Anchor	Linear Foot

END OF SECTION



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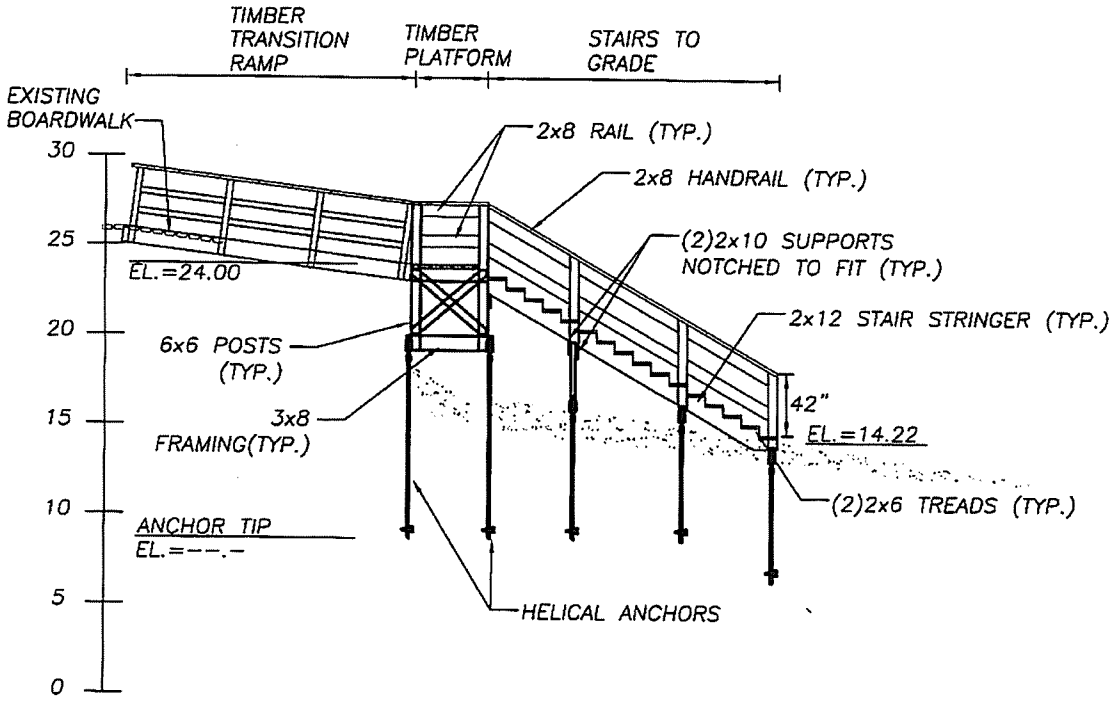


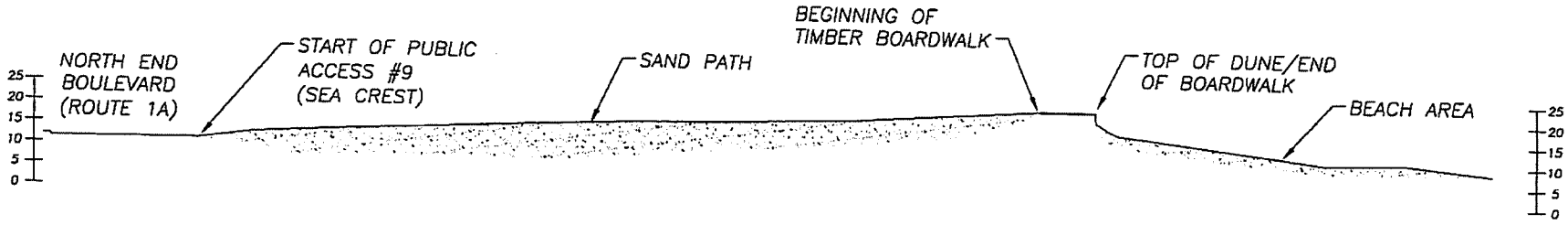
PROPOSED STAIR DETAIL

SCALE:1"=10'

Vine ASSOCIATES, INC.
372 MERRIMAC STREET
NEWBURYPORT, MA 01950
tel. (978)465-1426
fax (978)465-2640

SALISBURY BEACH SURVEY

ACCESS NO. 8



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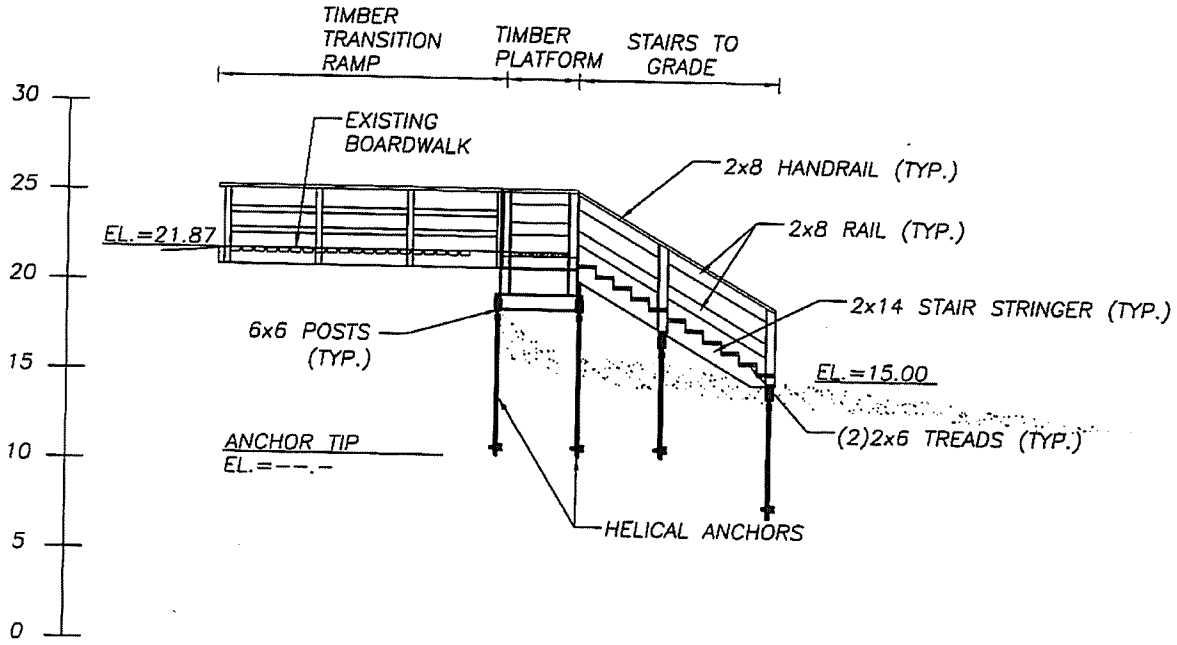


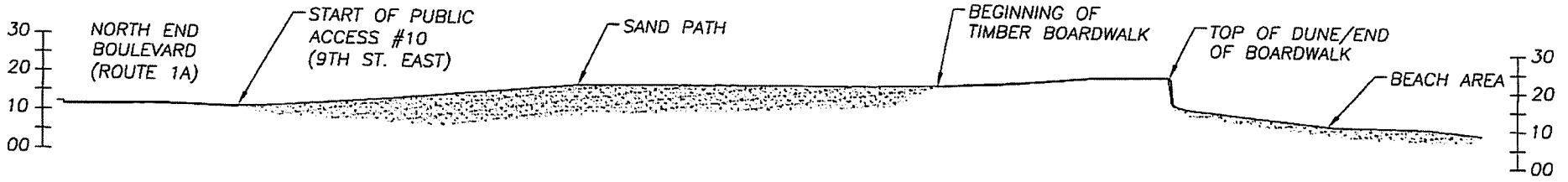
PROPOSED STAIR DETAIL

SCALE:1"=10'

Vine ASSOCIATES, INC.
372 MERRIMAC STREET
NEWBURYPORT, MA 01950
tel. (978)465-1425
fax (978)465-2640

SALISBURY BEACH SURVEY

ACCESS NO. 9



EXISTING SECTION

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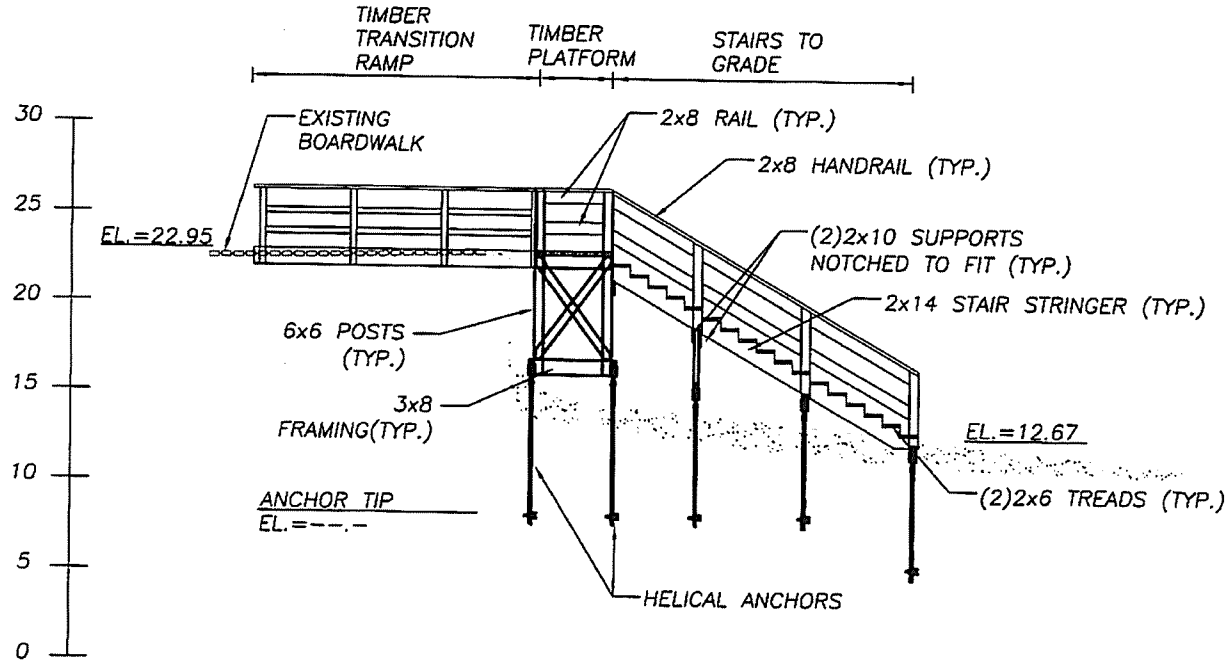


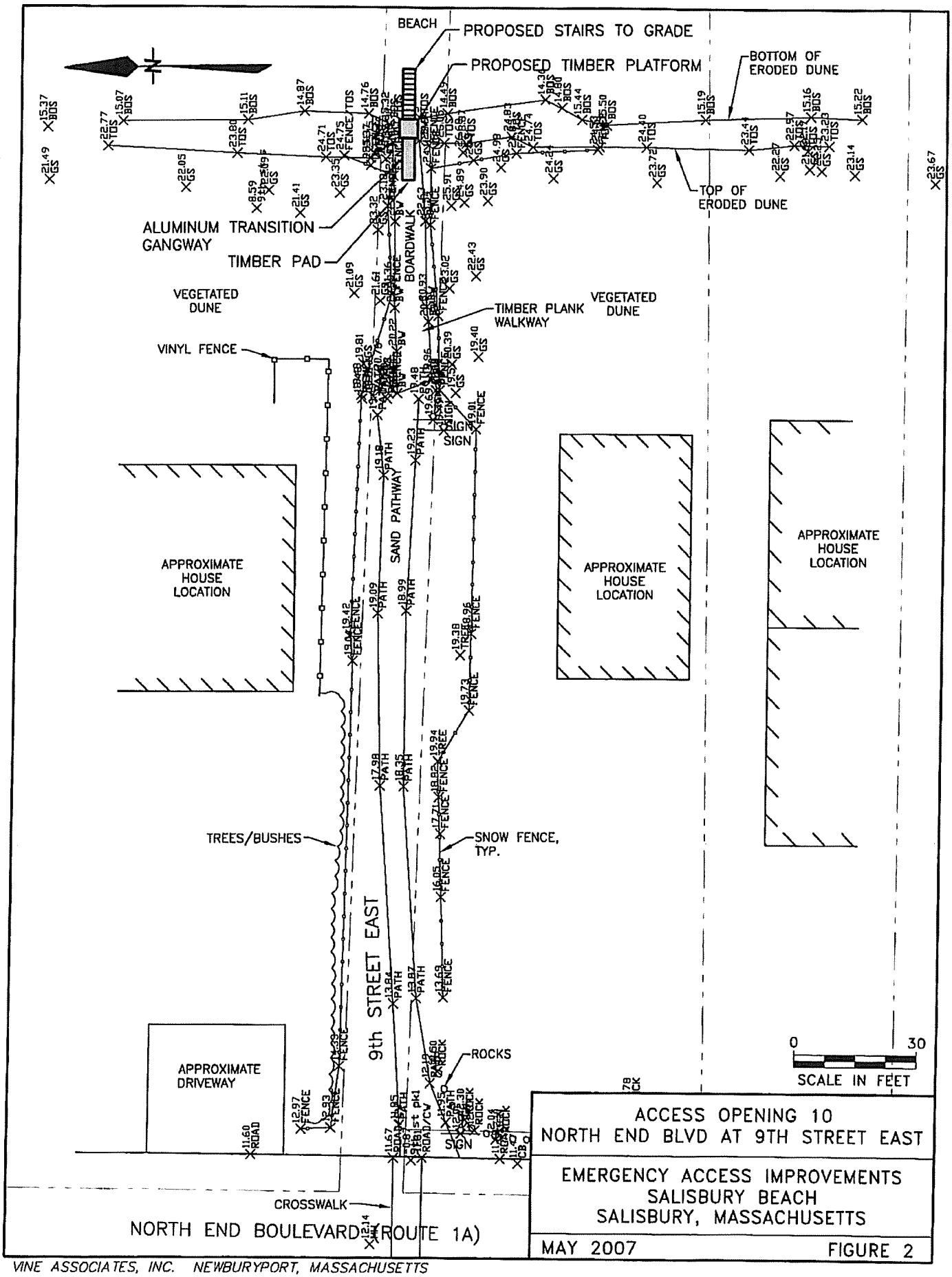
PROPOSED STAIR DETAIL

SCALE:1"=10'

Vine ASSOCIATES, INC.
372 MERRIMAC STREET
NEWBURYPORT, MA 01950
tel (978)465-7428
fax (978)465-2840

SALISBURY BEACH SURVEY

ACCESS NO. 10

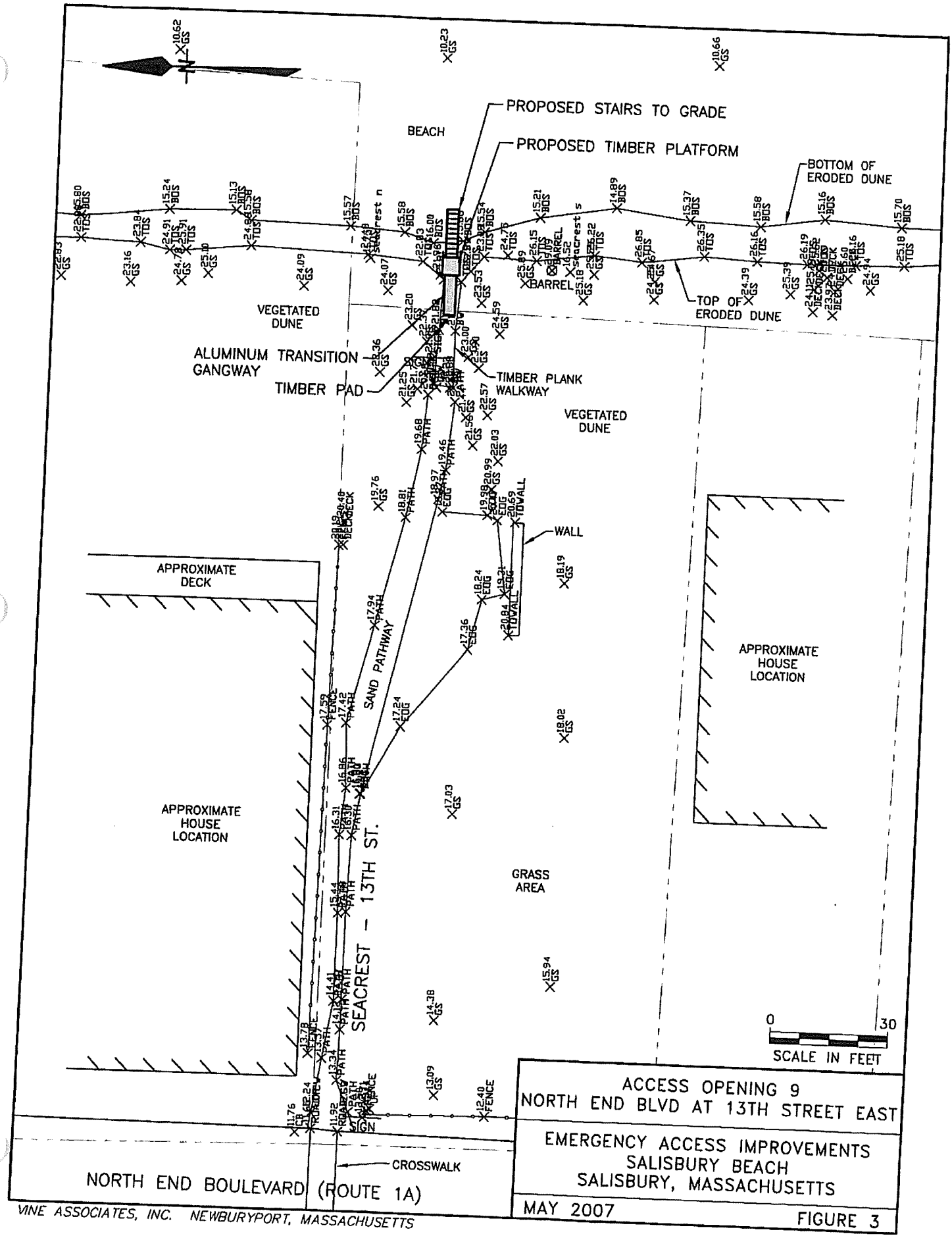


ACCESS OPENING 10
NORTH END BLVD AT 9TH STREET EAST

EMERGENCY ACCESS IMPROVEMENTS
SALISBURY BEACH
SALISBURY, MASSACHUSETTS

MAY 2007 FIGURE 2

VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS

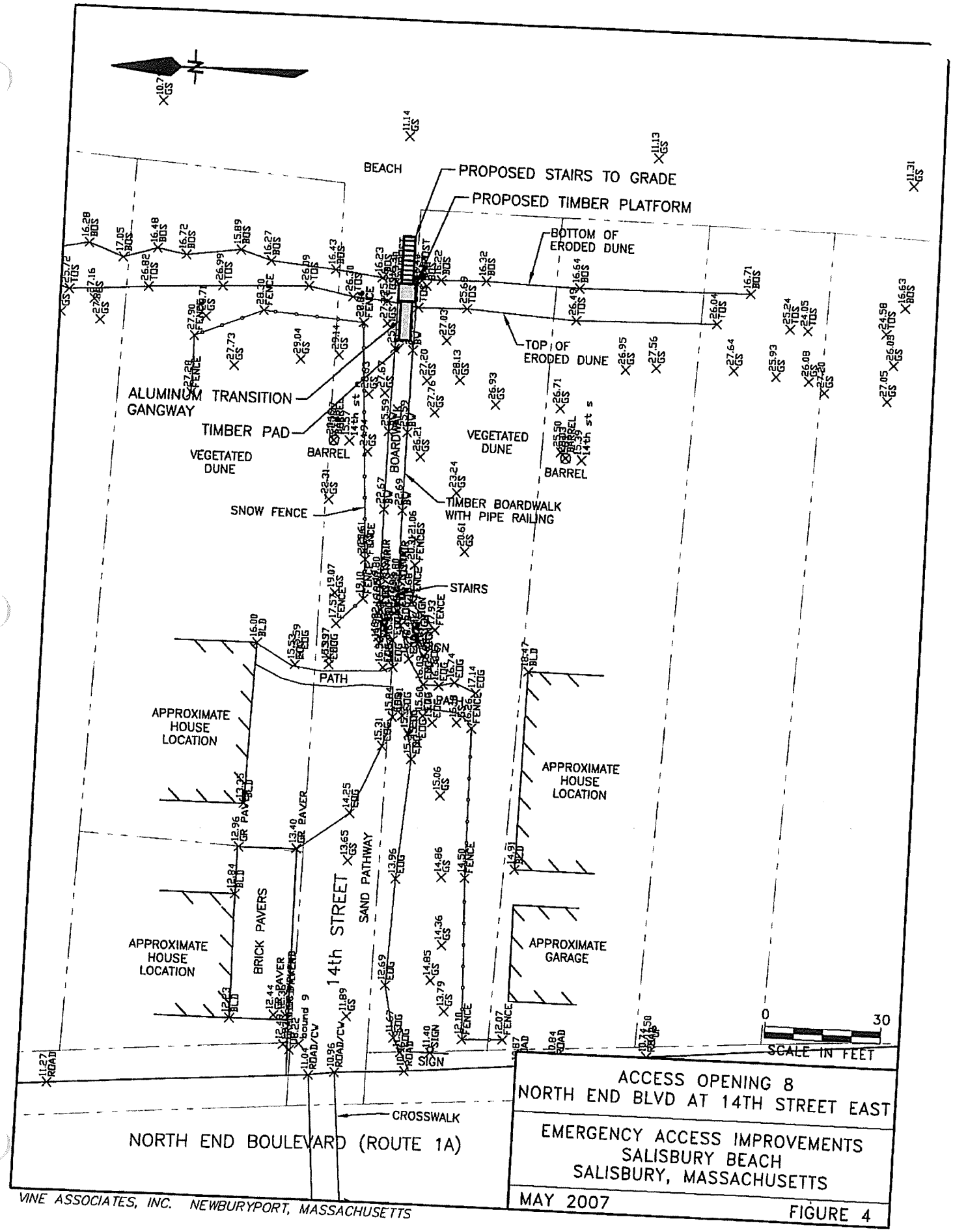


ACCESS OPENING 9
NORTH END BLVD AT 13TH STREET EAST

EMERGENCY ACCESS IMPROVEMENTS
SALISBURY BEACH
SALISBURY, MASSACHUSETTS

MAY 2007 FIGURE 3

VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS

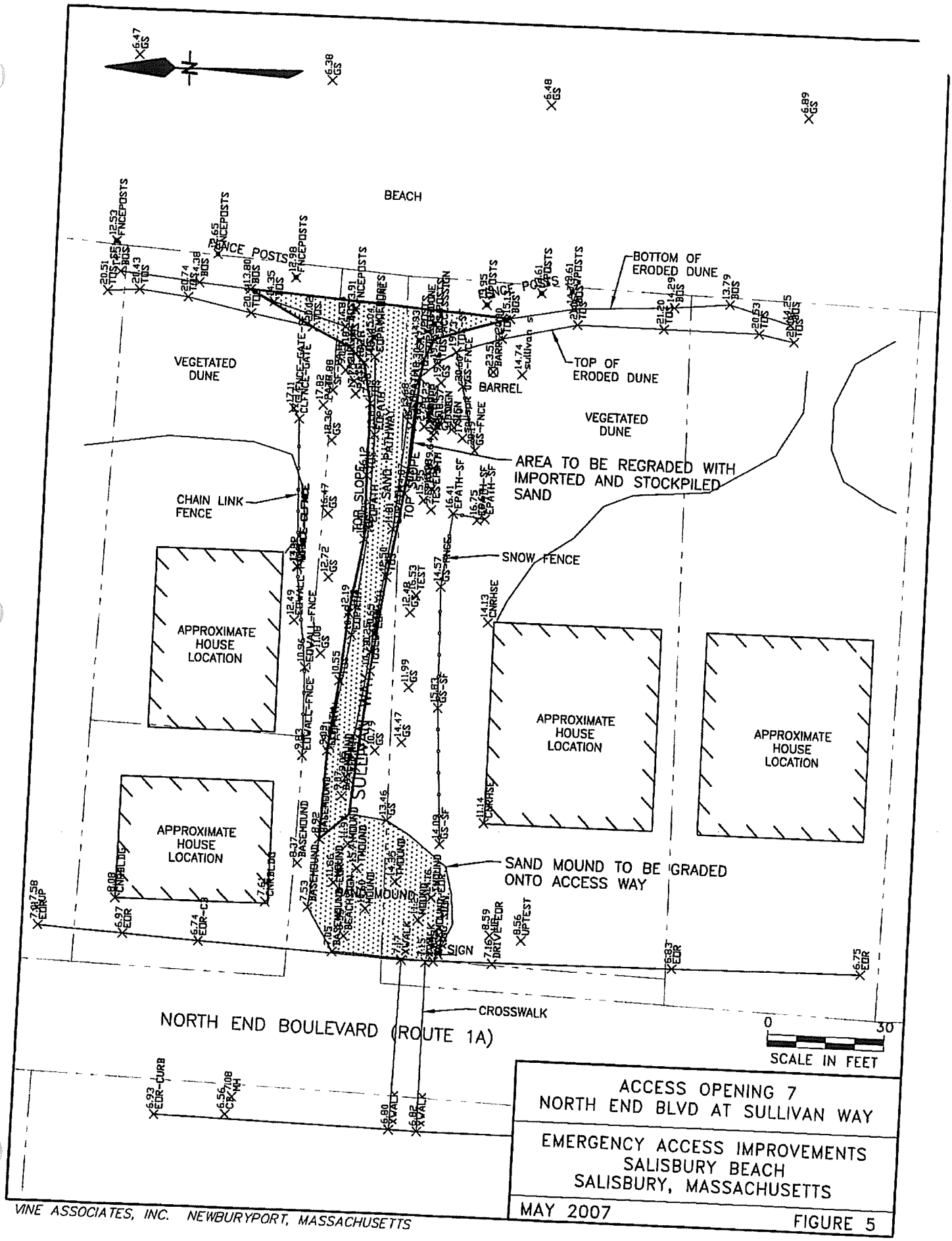


ACCESS OPENING 8
NORTH END BLVD AT 14TH STREET EAST

EMERGENCY ACCESS IMPROVEMENTS
SALISBURY BEACH
SALISBURY, MASSACHUSETTS

MAY 2007 FIGURE 4

VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS

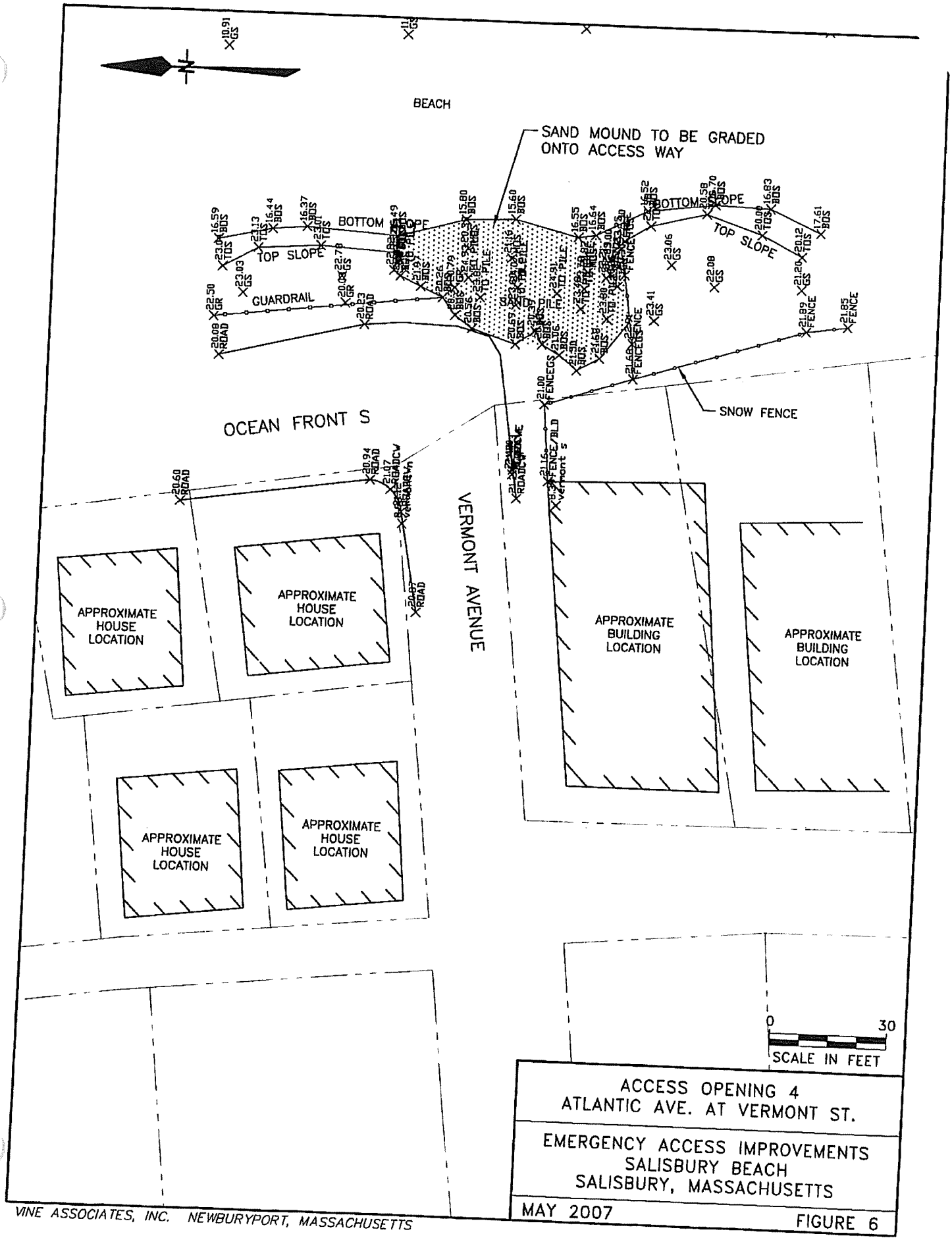


ACCESS OPENING 7
NORTH END BLVD AT SULLIVAN WAY

EMERGENCY ACCESS IMPROVEMENTS
SALISBURY BEACH
SALISBURY, MASSACHUSETTS

MAY 2007 FIGURE 5

VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS



ACCESS OPENING 4
ATLANTIC AVE. AT VERMONT ST.

EMERGENCY ACCESS IMPROVEMENTS
SALISBURY BEACH
SALISBURY, MASSACHUSETTS

MAY 2007 FIGURE 6

VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS

Waterfront
Engineering
Consultants

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May 10, 2007

Mr. Raul Silva, Deputy Chief Engineer
Department of Conservation and Recreation (DCR)
251 Causeway Street Suite 700
Boston, MA 02114

Re: ***Public Access Condition Assessment***
Salisbury Beach
Salisbury, MA

Dear Mr. Silva:

Vine Associates, Inc. (VAI) has performed a condition assessment inspection of the fourteen (14) public access ways located along Salisbury Beach extending from the Massachusetts-New Hampshire border south to the Salisbury Beach State Reservation and the four (4) access locations within the Salisbury Beach State Reservation. Inspection was performed to determine the impacts to each accessway that were recently impacted by the recent April 15-18, 2007 storm event.

VAI has performing site surveys at each access location to define current topographic conditions and to assist in the development of work plans for immediate repairs and to assist in the development of long-term measures that may be suitable for future rehabilitation work at each access location.

Presented below is a summary of the existing conditions observed at each access location (starting from the NH border listing in order extending to the south) along with recommended immediate repair measures that can provide and maintain public safety and access to the beach until long-term solutions can be put in place. In addition to the measures identified below, VAI will also be assisting DCR in resetting temporary marker barrels at access way locations, as previously performed in July 2005.

Access 14 – Bay State (NH/MA State Line)

- Major debris including portion of stairways, snow fencing, wood and trash exist seaward of the end of the access.
- Beach access sign at the seaward end of the access has fallen over.
- Tops of prior set barrels laying on beach (bases not observed)
- Timber mat walkway undermined/shifted at beach end, otherwise smooth transition to beach.
- Most of walkway covered by sand.
- Snow fencing along both sides of walkway has fallen over in several

Recommended Improvements

1. ***Remove debris***
2. ***Fencing repairs and/or new fencing installation along walkway edges and at intersection of walkway and beach.***
3. ***Regrade around end of timber walkway***
4. ***General sweeping of walkway***
5. ***Reinstall beach access sign***

Access 13 – Beacon Street

- Timber mat walkway with a small portion of the walkway covered in sand.
- A portion of the snow fencing approximately 20 feet south of the path has fallen over.
- No fencing adjacent to path on both sides or at intersection of beach/path.
- Both north and south barrels set in 2005 still on location.
- Minor walkway undermining at beach end otherwise smooth transition to beach.
- Minor debris along edge of path.
- No access signage observed at beach.
- Smooth transition to beach.

Recommended Improvements

1. *Remove debris*
2. *Fencing repairs and/or new fencing installation especially along edges of path and at the path/beach intersection*
3. *Regrade around end of timber walkway.*
4. *General sweeping of walkway*
5. *Provide and install beach access sign*

Access 12 – Brookline Street

- No fencing observed along path or at end of path/beach intersection.
- North barrel set on 2005 location. South barrel is approximately 12 feet away from 2005 set location.
- Sand on path – unknown if timber mat walkway is underneath.
- Smooth transition to beach.
- Has been used recently for vehicle access.
- No access signage observed at beach

Recommended Improvements

1. *New fencing installation especially along edges of path and at the path/beach intersection.*
2. *Provide and install beach access sign.*
3. *Reset timber walkway, if present. (further investigations will determine this).*

Access 11 – 7th Street (East)

- Fencing in poor condition or non-existent on both sides.
- Smooth transition to beach.
- Has been used recently for vehicle access.
- North barrel set at 2005 location. South barrel is missing (prior set location in center of path).
- No access signage observed at beach.
- 4 to 8 foot dune cuts on both sides of path at intersection w/beach.
- Soft sand on path to roadway.
- Unknown if a timber walkway exists at this location

Recommended Improvements

1. *New fencing installation especially along edges of path and at the path/beach intersection.*
2. *Provide and install beach access sign.*
3. *Reset timber walkway, if present. (further investigations will determine this).*

Access 10 – 9th Street (East)

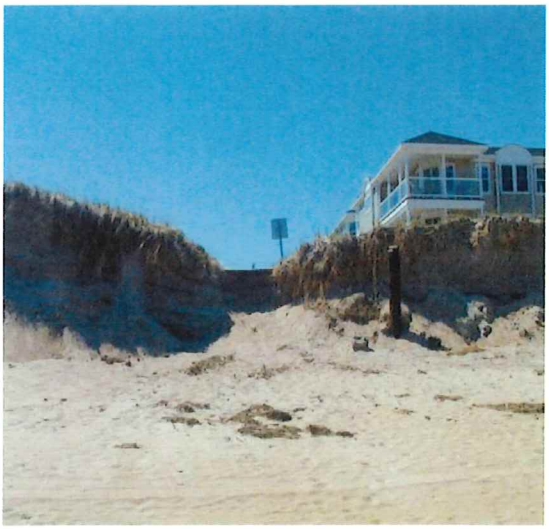
- Access closed – bench/sign at road and snow fence and "closed" sign at start of timber mat walkway.
- Approximately 10 foot of timber mat walkway draped over dune cliff at beach
- Fencing debris on beach.
- Barrels were never set in 2005 at this location due to discrepancies on path location.
- Snow fencing in fair condition along path to the edge of dune cut.
- Approximately 8 to 10 foot dune cut at beach/path intersection.
- No access signage observed at beach.

Recommended Improvements

1. *Maintain short-term closure until repairs/reconstruction can be performed. Immediately secure site and provide signage to direct people to next available access location.*
2. *Construct stairs to provide access.*
3. *Remove debris.*
4. *New fencing installation especially along edges of path and at the path/beach intersection.*

Access 9 – Sea Crest

- Access closed – 10 foot section of snow fence with a "closed" sign at start of timber mat walkway. Easy access is possible around fence resulting in public safety concerns and concern over impact to beach dunes.
- End of observed timber mat walkway is unsupported with an approximate 4 foot drop to the beach.
- No snow fence observed along edge of path and at beach.
- South barrel set at 2005 location. North barrel is missing (will not be able to be reset due to missing portion of dune).
- No access signage observed at beach.



Recommended Improvements

1. ***Maintain short-term closure until repairs/reconstruction can be performed. Immediately secure site with additional security fencing to prohibit access and to protect dunes and provide signage to direct people to next available access location.***
2. ***Construct stairs to provide access.***
3. ***New fencing installation especially along edges of path and at the path/beach intersection.***

Access 8 – 14th Street (East)

- Access closed – approximate 12 foot section of snow fence with a "closed" sign at base of landward walkway stairs. Easy access is possible around fence to the north resulting in public safety concerns and impacts to existing dunes.
- Timber walkway with posts and railing. Pipe railing disconnected and laying in pathway.
- North and south barrels set in 2005 location.
- Beach end of observed walkway unsupported with an approximate 8 to 10 foot dune cut. It appears section of walkway/stairs is missing at beach.
- No snow fence observed along walkway or at beach end.

Recommended Improvements

1. ***Maintain short-term closure until repairs/reconstruction can be performed. Immediately secure site with additional security fencing to prohibit access and to protect dunes and provide signage to direct people to next available access location.***
2. ***Construct stairs to provide access.***
3. ***New fencing installation especially along edges of path and at the path/beach intersection.***

Access 7 – Sullivan Way

- Sand stockpiled at road/path intersection. Approximately 6 foot wide access around sand mound to the north.
- Loss of sand in path. Path is approximately 5 foot wide with cuts into dune on each side up to 3.5 feet in height.
- No snow fence along path edge.
- Smooth transition to beach.
- Many wood and metal snow fence posts exist along both sides of path/beach intersection.
- No access signage observed at beach.
- Unknown if a timber walkway exists at this location.

Recommended Improvements

1. *Install sand to be placed in accessway and at beach/path intersection to buildup dune.*
2. *New fencing installation especially along edges of path and at the path/beach intersection*
3. *Provide and install beach access sign.*
4. *Remove fence posts and debris.*
5. *Install roll-out walkway to improve access.*
6. *Reset timber walkway, if present. (further investigations will determine this).*

Access 6 – 176 North End Boulevard

- Narrow approximate 4 foot wide pathway between houses/fence.
- Smooth transition to beach.
- Unknown if a timber walkway exists at this location.
- Some fencing debris on beach. Many wood and metal snow fence posts exist along both sides of path/beach intersection.
- No prior barrels set at this location due to lack of available information.
- No access signage observed at beach.

Recommended Improvements

1. *New fencing installation especially along edges of path and at the path/beach intersection*
2. *Provide and install beach access sign.*
3. *Remove posts and debris*
4. *Reset timber walkway, if present. (further investigations will determine this).*

Access 5 – Passageway near Motel

- Smooth transition from motel/condo parking lot to beach.
- Parking lot timber barrier damaged.
- Barrel markers missing – only placed in approximate location in 2005 – locations would be in center of path and in front of condo.
- Fencing and wooden debris on beach.
- No defined pathway – access from parking lot directly to beach

Recommended Improvements

1. *New fencing installation especially along edges of parking areas.*
2. *Remove debris.*

Access 4 – Vermont Street

- Stockpiled sand mound at access location.
- No access signage observed at beach.
- Barrel markers missing – only placed in approximate location in 2005 – locations would at building corners opposite street.
- No defined pathway – access from parking lot directly to beach

Recommended Improvements

1. *Regrade using onsite stockpiled sand within accessway.*
2. *New fencing installation especially along edges of road and at the road/beach intersection*
3. *Provide and install beach access sign.*

Access 3 – Fowler Street

- Timber mat walkway from road to beach. Road end of walkway is uneven and partially separated and loose. Minor repairs needed.
- Snow fencing partially fallen over at path/beach intersection.
- Smooth transition to beach.
- Barrel markers missing – south barrel was set in 2005 at house corner over bound. North barrel was set in 2005 in approximate location due to lack of GPS signal next to house.

Recommended Improvements

1. *Reset and/or repair timber mat walkway.*
2. *New fencing installation especially along edges of path and at the path/beach intersection*
3. *Provide and install beach access sign.*

Access 2 – Murray Street

- Smooth soft sand pathway.
- Smooth transition to beach.
- No fencing along path.
- Minor wooden debris on beach.
- Barrel markers not found – may not be able to reset barrels due to dune erosion.
- Snow fencing damage at south end of path/beach intersection.
- No access signage observed at beach.

Recommended Improvements

1. *New fencing installation especially along edges of path and at the path/beach intersection.*
2. *Install sand at path/beach intersection.*
3. *Install roll-out walkway to improve access.*
4. *Provide and install beach access sign.*
5. *Remove debris.*

Access 1 – 295 Atlantic Avenue

- Smooth soft sand pathway over dune to beach.
- Smooth transition to beach
- Snow fencing along both sides of pathway. Several damaged sections.
- No access signage observed at beach.
- No prior barrel markers set at this location due to lack of available information in 2005.

Recommended Improvements

1. *Reset existing and/or new fencing installation especially along edges of path and at the path/beach intersection.*
2. *Install roll-out walkway to improve access.*
3. *Provide and install beach access sign.*

Reservation Parking Lot Access 4

- Timber walkway, ramp and stairs covered with sand. Exposed tops of railings.
- Once past timber structures – smooth transition to beach.
- Snow fencing at beach.

Recommended Improvements

1. ***Install roll-out walkway to improve access. Provide fencing to protect adjacent dunes and to protect public from existing walkway structures.***
2. ***Provide and install beach access sign.***

Reservation Parking Lot Access 3

- Timber walkway covered with sand. Exposed tops of railings.
- Once past timber structures – smooth transition to beach.
- Snow fencing at beach.

Recommended Improvements

1. ***Provide and install beach access sign.***
2. ***Install roll-out walkway to improve access. Provide fencing to protect adjacent dunes and to protect public from existing walkway structures.***

Reservation Parking Lot Access 2

- Beach end of timber walkway/stairs damaged – concrete footing foundation compromised.
- New fencing exists fronting the dune cut.

Recommended Improvements

1. **Reconstruct stairs and reset post foundations**
2. **Provide and install beach access sign.**

Reservation Parking Lot Access 1

- Timber walkway, ramp and stairs covered with sand. Exposed tops of railings.
- Once past timber structures – smooth transition to beach.
- Snow fencing at both sides of walkway.

Recommended Improvements

1. ***Provide and install beach access sign.***
2. ***Install roll-out walkway to improve access. Provide fencing to protect adjacent dunes and to protect public from existing walkway structures.***

CONCLUSION/SUMMARY

The above conditions represent those observed at the fourteen (14) access locations along Salisbury Beach and at the four (4) access locations at the Salisbury Beach State Reservation from May 1-4, 2007.

The recommended improvements to each location assumes work could be performed within the next 30 to 60 days to maintain public access, protect the adjacent dunes from impact and provide safe pedestrian access to the beach. The recommended improvements have been categorized into three levels of repairs; 1) immediate temporary access improvements to provide access via proposed stairways to the beach in locations that are currently closed; 2) Install sand and restore access paths and 3) general lower level improvements including installation of fencing, installation of at-grade roll-out walkway, repairs to timber walkways, regrading, debris removal and signage installation. Improvement level 3 will also apply to all access locations as applicable. The following table summarizes the improvement locations:

Level of Improvements	Accessway Number/Location
1	Access No.'s 8 – 14th Street (East), 9 – Sea Crest, 10 – 9th Street (East), and Reservation Parking Lot Access No. 2
2	Access No.'s 7 – Sullivan Way, 4 – Vermont Street, 2 – Murray St
3	All Accessways as applicable

The four access locations requiring level 1 improvements (No's 8 through 10 and Reservation Lot No. 2) will need significant rehabilitation due to the extreme loss of dune within these areas. It is assumed work at these locations will be performed once emergency approvals have been obtained. VAI recommends that the public be restricted from access at these locations and additional fencing and signage be installed to help protect the adjacent dunes that the public may trespass onto to obtain access to the beach until the improvements are implemented.

We appreciate your immediate attention to this matter. Please feel free to contact me via email at dsmith@vineassociates.net or at (978) 465-1428 should you have any questions or require additional information.

Very truly yours,
VINE ASSOCIATES, INC.

David A. Smith
Project Manager

cc. Joe Halloran/DCR
Mike Magnifico/DCR