



# Dune Walkover Guidance

This resource contains copies of the following two publications, which provide design criteria for beach walkover structures:

*Beach/Dune Walkover Guidelines*, by the Florida Bureau of Beaches and Coastal Systems, Florida Department of Environmental Protection, Revised January 2006.

*Beach Dune Walkover Structures*, SUSF-SG-76, by Todd L. Walton, Jr., and Thomas C. Skinner. Published by the Marine Advisory Program of the Florida Cooperative Extension Service and the Florida Sea Grant, March 1983.





## Beach and Dune Walkover Guidelines

Florida Department of Environmental Protection  
Division of Water Resource Management  
Bureau of Beaches and Coastal Systems  
3900 Commonwealth Boulevard, MStation  
Tallahassee, Florida 32399-3000  
(850) 488-7708

On many of Florida's beaches, sand dunes and coastal vegetation provide significant protection to upland property, upland development, and the beach dune system. The Florida Department of Environmental Protection (DEP) encourages the design of beach access, including beach and dune walkovers, to protect the dune topography and dune vegetation from pedestrian traffic and allow for the natural recovery of damaged or eroded dunes.

### PERMIT REQUIREMENTS

A permit from DEP is required for construction of walkovers on most sandy beaches fronting on the open waters of the Atlantic Ocean or Gulf of Mexico. In areas where a Coastal Construction Control Line (CCCL) has been established pursuant to provisions of Section 161.053, Florida Statutes (F.S.), a permit is required for all excavation, construction, or other activities with the potential to cause beach erosion or damage coastal vegetation. On sandy shorelines where a CCCL line has not been established, a permit is required for construction activities within 50 feet of the mean high water line (see Section 161.052, F.S.).

Permits for walkovers contain standard conditions that require construction to be conducted in a manner that minimizes short-term disturbance to the dune system and existing vegetation. Replacing vegetation destroyed during construction with similar plants suitable for beach and dune stabilization is required. Only limited excavation for the placement of support posts is authorized, and construction of walkovers may not occur during the marine turtle-nesting season, which extends May 1 through October 31 (except for Brevard through Dade counties, which extends March 1 through October 31).

### GENERAL SITING GUIDELINES

The walkover shall be designed and sited to protect dune features, to minimize disturbance of native vegetation, to not restrict lateral beach access and to minimize the amount of construction material that may become debris during a storm. Elevated walkovers are not required for all beach accesses, such as in sparsely vegetated, low profile dune areas where on-grade sand or shell paths are suitable for controlling foot traffic. Walkovers should generally be constructed perpendicular to the shoreline and extend at least to the seaward toe of the frontal dune or the existing line of vegetation but not farther than 10 feet seaward of the vegetation. The optimum siting of the walkover structure can be determined by contacting a CCCL field inspector.

### GENERAL DESIGN GUIDELINES

Walkovers are designed to be minor, expendable structures that pose a minimal interference with coastal processes and generate minimal amounts of debris. Walkovers constructed across native beach and dune vegetation should be post-supported and elevated a sufficient distance above the existing or proposed vegetation to allow for sand build-up and clearance above the vegetation. Whenever possible, stairways and ramps leading from the dune bluff or crest down to the beach should be designed with posts that completely span the seaward slope of the dune. The structure should be designed to minimize the quantity of material used in construction, such as avoiding the use of vertical wood pickets, and reducing the length and width of construction on the beach.

Single family walkovers should not exceed 4 feet in overall width and the support posts shall not be greater than 4-inch wide posts. Multi-family walkovers shall not exceed 6 feet in overall width and the support posts shall not be greater than 6-inch wide posts. Round posts are preferred to square posts. Support posts shall not be

encased in concrete nor installed into dune slopes that are steeper than approximately 30 degrees. Support posts should have a minimum 5 feet of soil penetration. Applicants should consult with the Bureau prior to requesting a permit for a walkover that contains switchbacks, long ramps or other features required to comply with the Americans with Disabilities Act Accessibility Guidelines.

### **WALKOVER ELEVATION GUIDELINES**

Site conditions affecting walkover heights vary as the structure traverses the beach/dune system. The ground cover changes from the uplands, commonly covered with woody scrub or coastal strand vegetation (saw palmetto/sea grape/scrub oaks), over a dune bluff or one or several dune crest(s), covered with either coastal strand or coastal grassland (sea oats/bitter panicum/marsh hay), down the slope to the dry sand beach, either uncovered bare escarpment or partially covered with beach/dune vegetation (railroad vine/sea rocket/sea oats). The type of structure and height from the dune bluff or crest down to the beach also must be considered in setting the walkover elevation. Increased elevation of the structure requires a longer run to the beach and additional construction material within this high energy area. This creates additional storm generated debris, sea turtle nesting habitat impacts, sand losses due to storm wave scour, and interferes with people's ability to walk along the beach.

Walkover Elevations in Uplands. The upland environment of coastal scrub/coastal strand habitat is characterized by more stable soil conditions with less blowing sands and infrequent storm overwash events. The stable conditions allow for the development of a mature woody vegetation and saw palmetto dominated plant community. In addition to thick above ground stem and leaf vegetation between 5 and 15 feet in height, this plant community has an extensive below ground woody root mat. Walkovers in these upland habitats need be elevated only a sufficient distance above the ground to avoid disturbance of the soil and root systems or cutting of low tree and palmetto trunks. An elevation of the stringers from 6" to 2'-0" above existing grade should be sufficient. Walkover elevations crossing coastal wetlands within upland areas may require increased elevations. Elevation of the walkover above the leaf canopy is in most cases impractical in coastal scrub or coastal strand habitats.

Walkover Elevations over Bluffs. The low stringer elevation recommended for uplands can be carried to an eroded bluff line. This will reduce the length of a ramp or walkover down to the beach. Again the objective the walkover elevation is to reduce damage to coastal scrub soils and root systems.

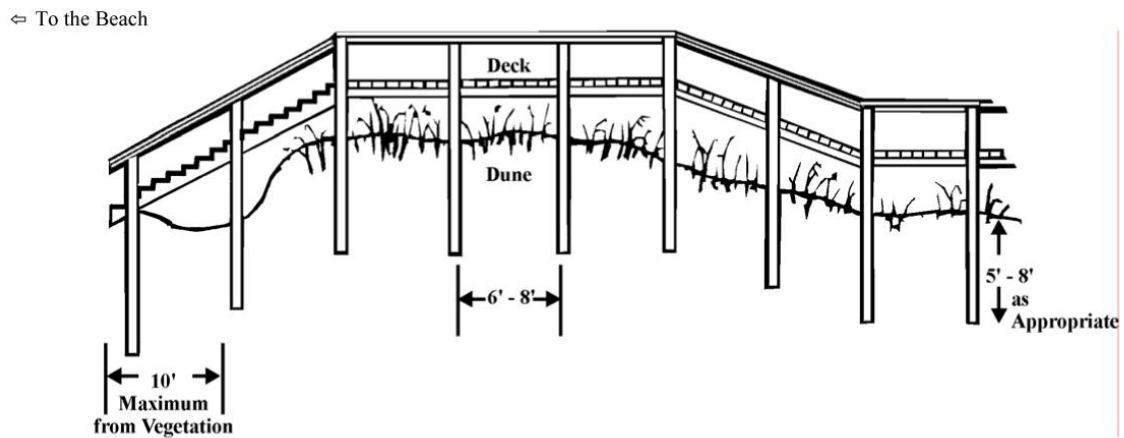
Walkover Elevations over Dune Crests. Dune environments are characterized by mobile sands subject to storm effects (which lower grade elevations) and wind effects (which can raise elevation as sand is trapped). Dunes are dominated by coastal grassland plants adapted to the dynamic environment. These include sea oats, bitter panicum, and little bluestem. Walkovers sited within active dune systems are required to be elevated sufficiently to allow for sand movement and growth of vegetation. Walkover designs published in "Beach/Dune Walkover Structures" referenced below specify a 3'-10" minimum clearance from existing grade to the bottom of the stringers of an up to 6-foot wide (overall dimension) multi-family or public beach access structures, and a 3'-0" minimum clearance to the top of the deck for an up to 4-foot wide single family structures.

Walkover Elevations on Seaward Dune or Bluff Slopes. The elevation of the walkover at the dune crest and the distance of the seaward terminus from the water's edge determine the height of the steps or ramps crossing the seaward slope. The design objective is to get the structure down to the beach in as short a shore-normal (perpendicular to the shoreline) distance as possible while reducing the shore-parallel coverage of the slope. Department guidelines require that the seaward terminus of the structure be no farther seaward than 10 feet from the line of permanent beach dune vegetation or the toe of the frontal dune. Reducing the seaward encroachment and shore-parallel width decreases the potential for storms interacting with the structure, occupation of sea turtle nesting habitat by the structure, and interference with lateral public beach access. Walkovers designed for the Americans with Disabilities Act often increase the length of walkover ramps on the beach. This requires the need for a site specific review for environmental impacts. The burial of the ramp or

step terminus a minimum amount (0.5 to 1.0 feet)-foot below grade may allow for use of the walkover after some lowering of the beach elevation from minor storms. However, placement of this terminus below the depth of a post storm beach profile is discouraged as this portion of the walkover will most likely have been damaged by larger storms and to have interfered with coastal processes.

On Grade Walkovers. Elevated walkovers are not necessary in all site conditions and use situations. Where dune development is minimal, beach dune vegetation sparse or use infrequent, on-grade footpaths may be preferred. The Department discourages solid concrete walks and footpath surfaces such as stepping stones that create debris or missiles. Other surfaces such as geotextile fabrics, cabled wood planks, or shell require a case by case review. No permanent path surfaces are allowed seaward of the dune or within sea turtle nesting habitat.

#### TYPICAL WALKOVER PROFILE



#### References

Beach/Dune Walkover Guidelines, the Florida Bureau of Beaches and Coastal Systems, Florida Department of Environmental Protection, Revised January 1998.

Beach/Dune Walkover Structures, SUSF-SG-76 by Todd L. Walton, Jr., and Thomas C. Skinner. Published by the Marine Advisory Program of the Florida Cooperative Extension Service and the Florida Sea Grant, March, 1983.







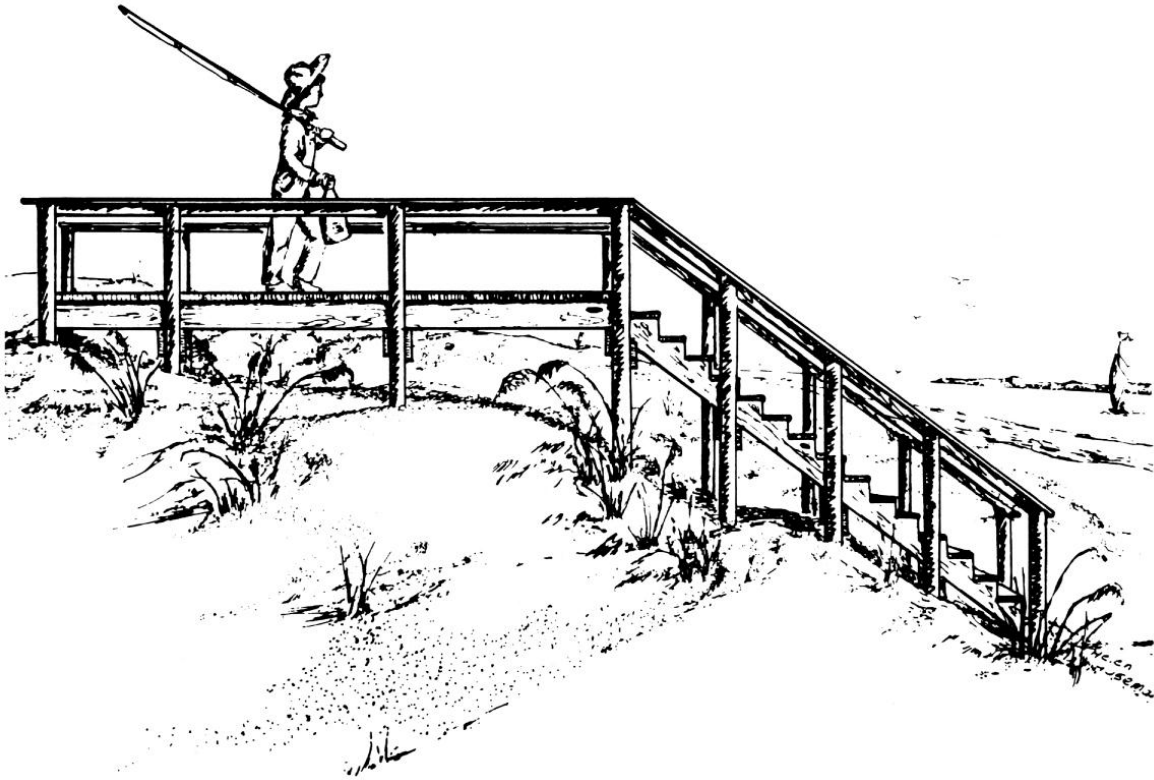




MAP-18

# Beach Dune Walkover Structures

Todd L. Walton, Jr. and Thomas C. Skinner



Florida Cooperative Extension  
Marine Advisory Bulletin

MARCH 1983\*

*The State University System of Florida Sea Grant College is supported by award of the Office of Sea Grant, National Oceanic and Atmospheric Administration, U. S. Department of Commerce, grant number NA80AA-D-00038, under provisions of the National Sea Grant College and Programs Act of 1966. This information is published by the Marine Advisory Program which functions as a component of the Florida Cooperative Extension Service, John T. Woeste, dean, in conducting Cooperative Extension work in Agriculture, Home Economics, and Marine Sciences, State of Florida, U. S. Department of Agriculture, U. S. Department of Commerce, and Boards of County Commissioners, cooperating. Printed and distributed in furtherance of the Acts of Congress of May 8 and June 14, 1914. The Florida Sea Grant College is an Equal Employment Opportunity-Affirmative Action employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, or national origin.*

This public document was promulgated at a cost of \$166.25 or 11 cents per copy, to provide information on construction of beach dune walkover structures. Cost does not include postage and handling.

12/3M/76  
11/1M/81  
3/1.5M/83

\*This publication is a reprint with revisions of Marine Advisory Bulletin SUSF-SG-76-006 originally published in 1976. The number has been changed to MAP-18.

## BEACH DUNE WALKOVER STRUCTURES

by

Todd L. Walton, Jr.<sup>1</sup> and Thomas C. Skinner<sup>2</sup>

### INTRODUCTION

The idea behind this publication originally came from the Bureau of Beaches and Shores, Department of Natural Resources, State of Florida. It was recognized that numerous dune systems within our state were undergoing destruction due to the loss of vegetation caused by unrestricted access to the beach over the dune systems. As the vegetation was lost, the wind became capable of eroding the dune and caused a progressive deterioration of the entire dune system.

In areas of high human traffic, a beach walkover structure is needed to save this vegetation. Two structure designs are presented in this publication. Figures 1 through 7 give details of a structure for use in areas of heavy foot traffic. A good example of such use might be for a condominium or a community public access ramp. The depths of pilings account for both depth necessary for structure stability and added depth to account for possible dune deflation losses.

Figures 8 and 9 give details of a smaller structure more suitable for the typical coastal land owner where only light foot traffic is expected. The depth of pilings in sand is correspondingly less which should minimize interference with the dune system in construction of the walkway. It should be noted that any construction seaward of the State Coastal Construction

---

<sup>1</sup> Coastal Engineering Advisory Specialist, Marine Advisory Program, with the Coastal and Oceanographic Engineering Laboratory, University of Florida.

<sup>2</sup> Extension Agricultural Engineer, Florida Cooperative Extension Service, IFAS University of Florida.

Setback Line (Reference 1) must be permitted by the Bureau of Beaches and Shores, Department of Natural Resources.

The designs are basic enough such that various alternatives can be added to the designs without altering the structures to a great degree. One such alteration would be a transverse extension of the deck section with benches for people to sit on overlooking the beach area. The addition of properly spaced skid resistant materials to the decking of the ramp section of the large walkover structure would make the deck and the deck extension accessible to handicapped people in wheelchairs. Additional features which could also be added are limited only by the planner's imagination.

The authors would like to thank both Mr. Gill Hill and Mr. William Sensabaugh of the Bureau of Beaches and Shores, Department of Natural Resources, for the ideas and suggestions used in these plans. The authors hope that this publication will lead to the building of more walkover structures in areas where dune systems are threatened by human traffic. The authors also hope to hear any suggestions, comments, or criticism which might be included in a future revision of this publication.

## MATERIALS SPECIFICATION SHEET

### (1) Wood

All wood to be pressure treated in accordance with American Wood Preservers Association Standard C-2. The preservative used should be a waterborne preservative such as Type B or C or equivalent as covered in Federal Specification TT-W-535 and AWPA Standards P5, C2, and C-14. The type wood to be used depends on the quality of the construction desired. A suitable inexpensive wood for construction would be southern pine. Higher grade and more expensive woods would be the heartwood of Bald Cypress, Redwood, or Eastern Red Cedar. Very expensive but extremely durable and decay resistant woods would be Greenheart or Basra Locus. "Rough cut" lumber can be used on all lumber in the substructure while "dressed" (i.e. surfaced) lumber should be used on the flooring and hand-rails. Further information on the specifications for buying lumber can be found in Reference 2.

### (2) Hardware

All bolts and other hardware to be hot dipped galvanized.

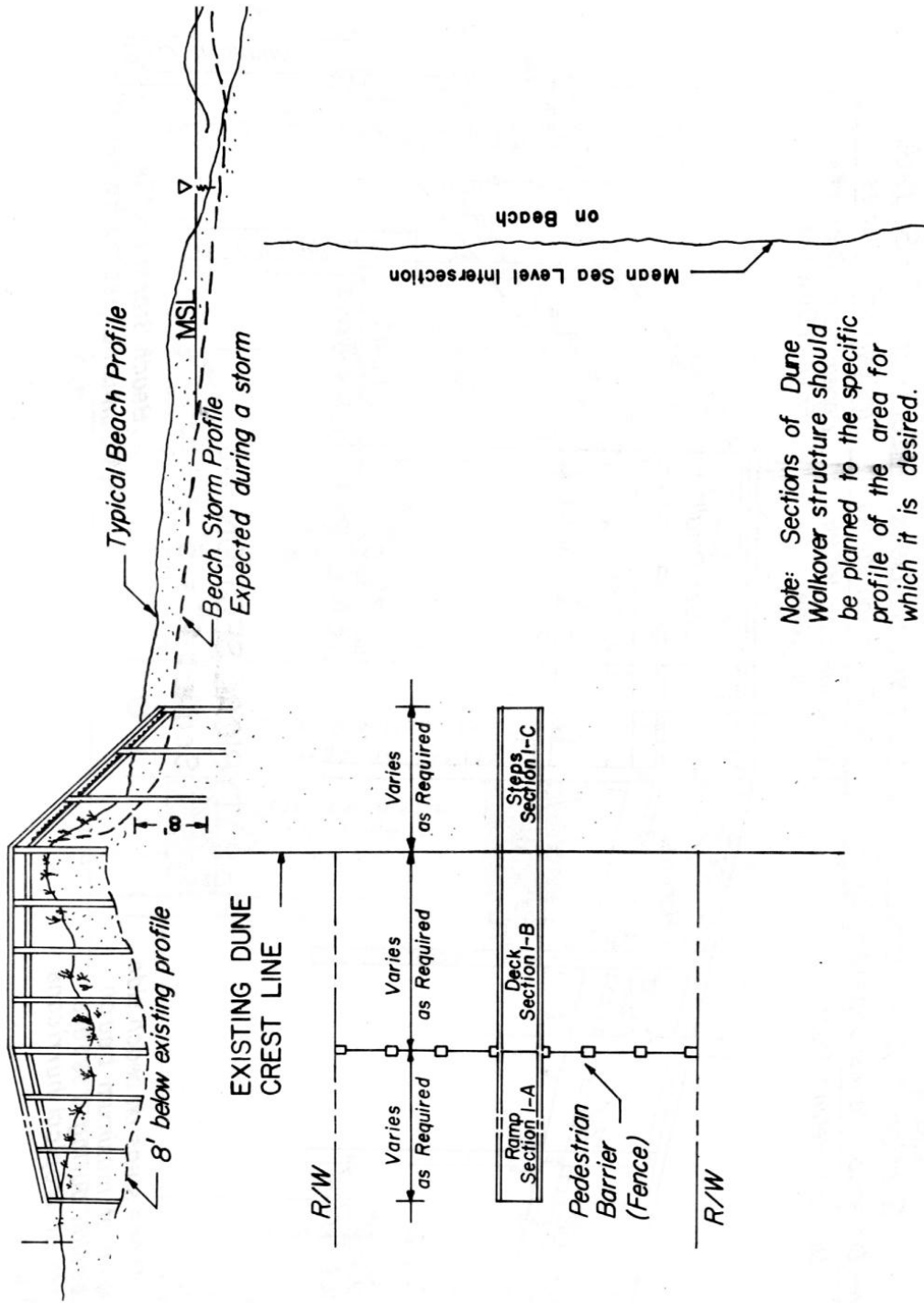
### (3) Nails

All nails to be galvanized.

#### GENERAL NOTES

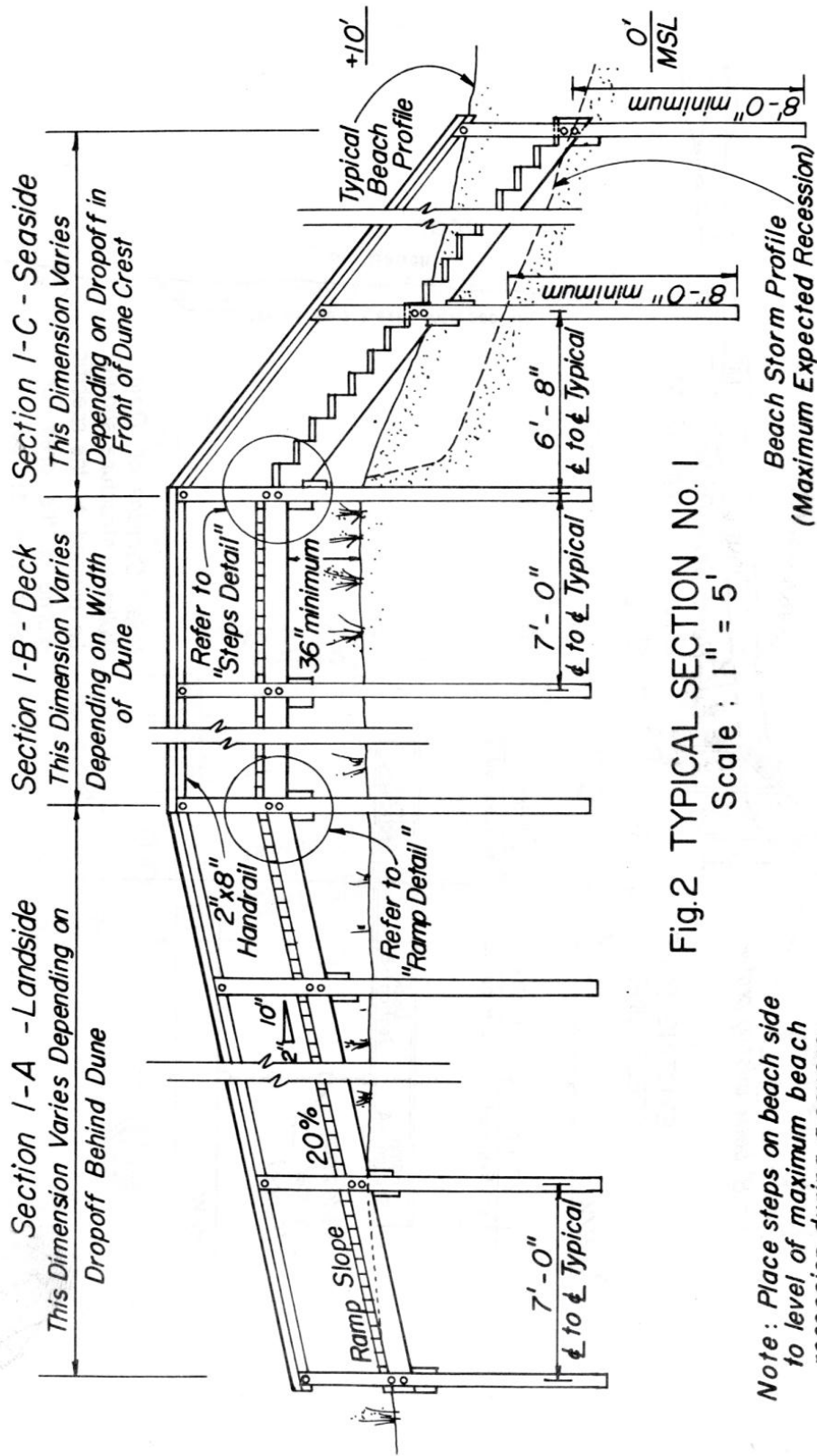
- (1) Bolts in handrails shall have nut end toward post. Countersink so that bolt does not project beyond post. Trim excess of projecting bolts after fastening.
- (2) Use bolts for all connections to posts.
- (3) Do not encase bottoms of pilings in concrete. This would be termed objectionable construction in obtaining a permit from the Bureau of Beaches and Shores.
- (4) Some may find the pitch of the steps (8 on 10) too steep; likewise the ramp slope (20%) is too steep for handicap access (8.33% recommended). The design may be modified accordingly.
- (5) Check with local building officials to make sure the design contained herein, or as modified, conforms to local codes and ordinances.

- 
1. Coastal Construction Setback Line by J. A. Purpura and W.M. Sensabaugh, Marine Advisory Bulletin, SUSF-SG-74-002, Florida Cooperative Extension Service, 1974. (Out-of-Print).
  2. Wood Handbook: Wood as an Engineering Material, U.S.D.A., Forest Products Laboratory, 1974.
  3. Timber Design and Construction Handbook, McGraw Hill Publishing Co., 1956.
  4. Wood Engineering, G. Gurfinke1, Southern Forest Products Association, 1973.



**Fig. I TYPICAL PLAN and ELEVATION VIEW**

Scale: 1" = 20'





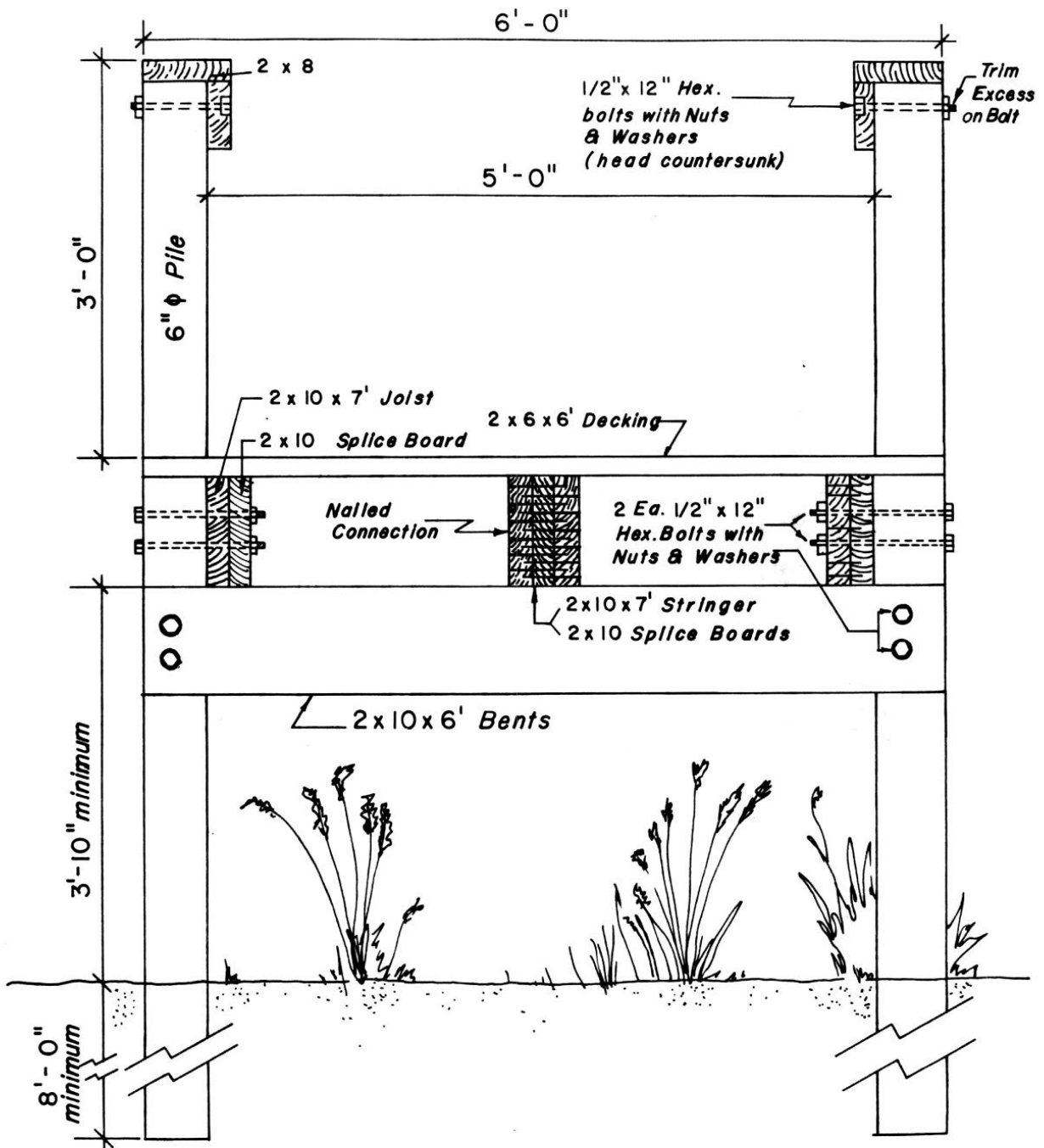


Fig.3 TYPICAL SECTION I-B DECK  
 Scale: 1" = 1'-0"

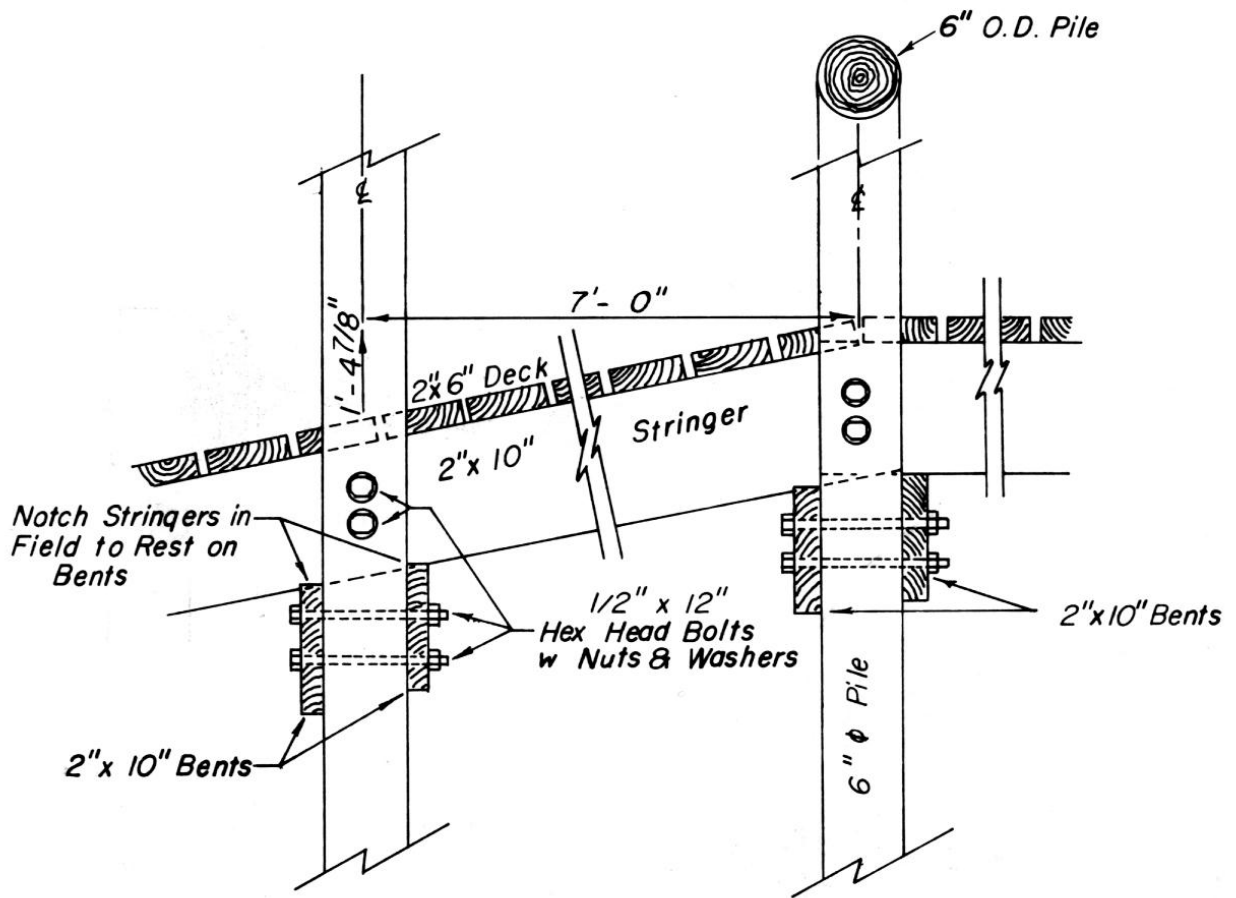


Fig. 4 TYPICAL RAMP DETAIL

Scale: 1" = 1'- 0"

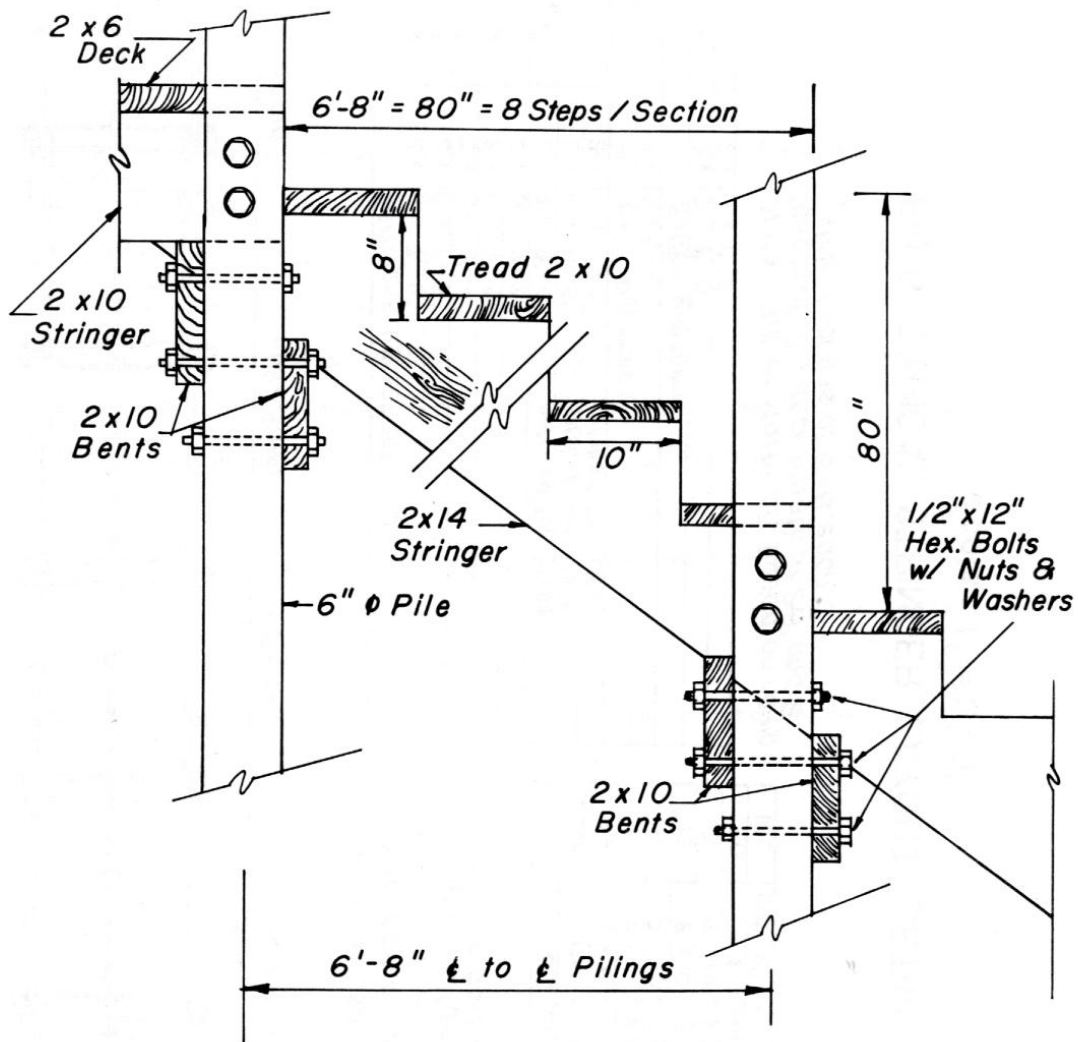
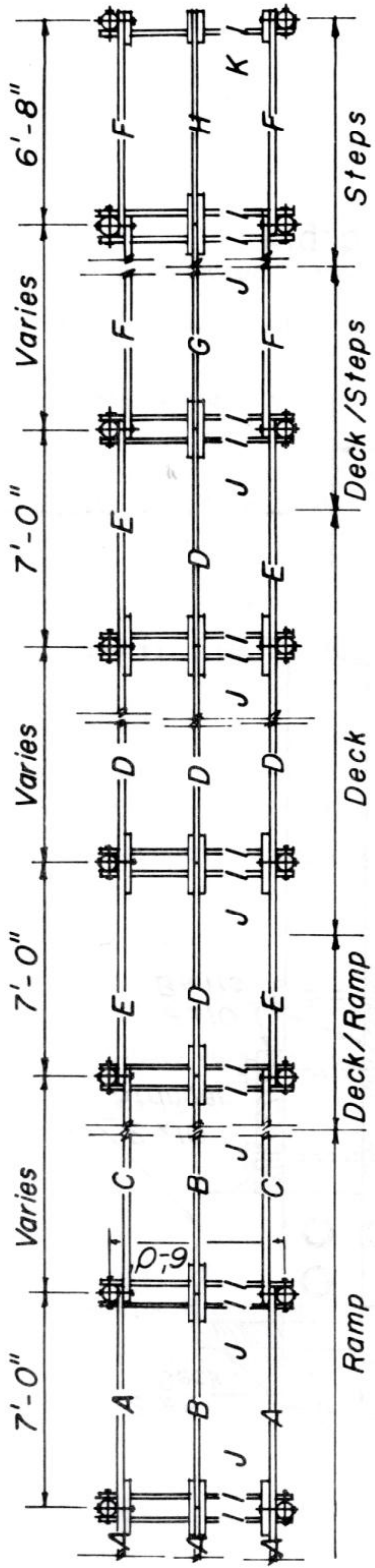


Fig.5 TYPICAL STEPS DETAIL  
Scale : 1" = 1'- 0"



Note: All splice blocks to be nailed to stringers to provide both lateral support at joints and bearing support. All pile bolted connections to be 1/2" x 12" hex. bolt with nut and washers.

Stringer Dimensions	
A	2 x 10 x 7'-9"
B	2 x 10 x 7'-6"
C	2 x 10 x 8'-4"
D	2 x 10 x 7'-0"
E	2 x 10 x 7'-3"
F	2 x 14 x 9'-0"
G	2 x 14 x 8'-6"
H	2 x 14 x 8'-9"
Bent Dimension	
I	2 x 10 x 6'-6"
Splice Dimension	
J	2 x 10 x 2'-0"
K	2 x 10 x 1'-6"

Note: Bill of Materials based on ramp length of 21', deck length of 28' and 2 stair sections of 6'-8" each.

Bill of Materials	
Quan.	Item - Description
44	2 x 6 x 20' dressed
9	2 x 8 x 20' dressed
5	2 x 10 x 20' dressed
19	2 x 10 x 20' rough
3	2 x 14 x 20' rough
20	6" Piles @ 16'
100	1/2"x12" hex. bolt with nut and washers

Fig. 6 TYPICAL STRINGER LAYOUT DETAIL  
Scale: 1" = 5'-0"

Include as many step sections as necessary to grade from top of dune + 3 feet to base of rear dune.

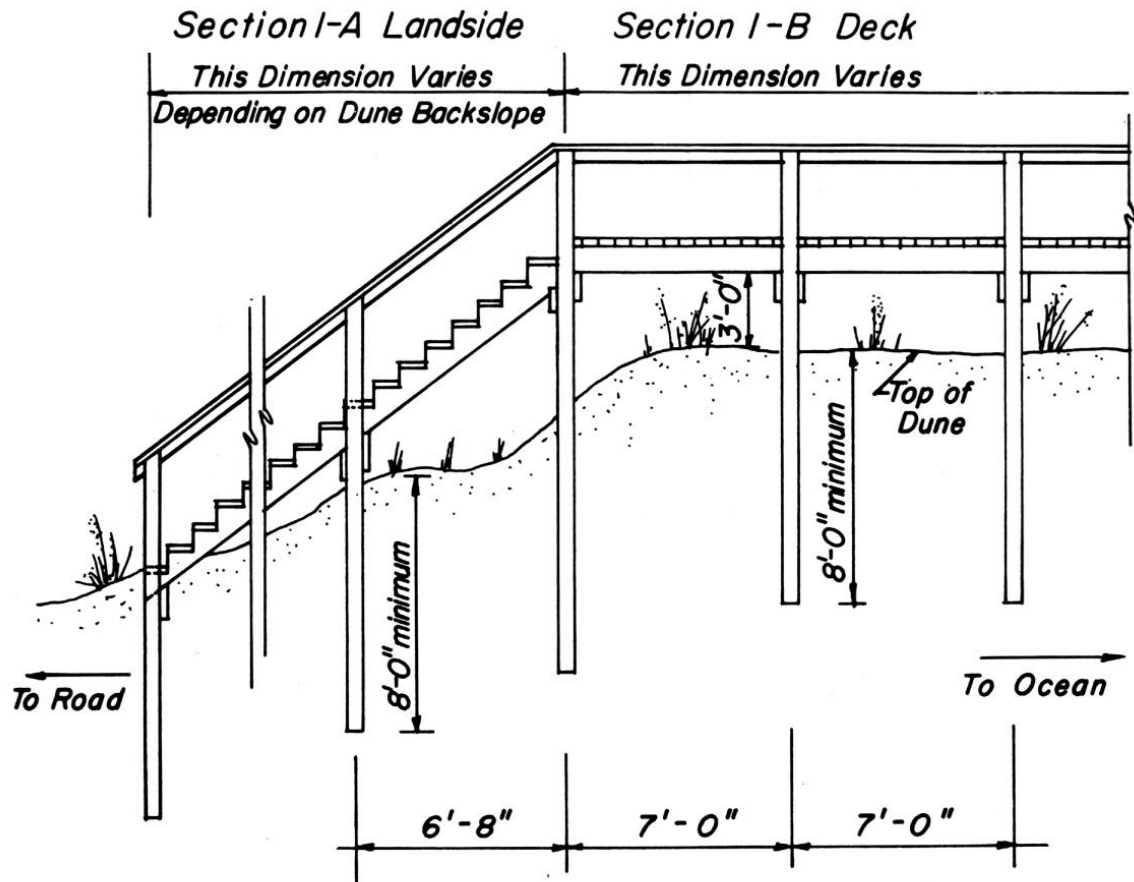


Fig.7 ALTERNATE SECTION No.1

Scale : 1" = 5'-0"

(Refer to details as per Figure 2)

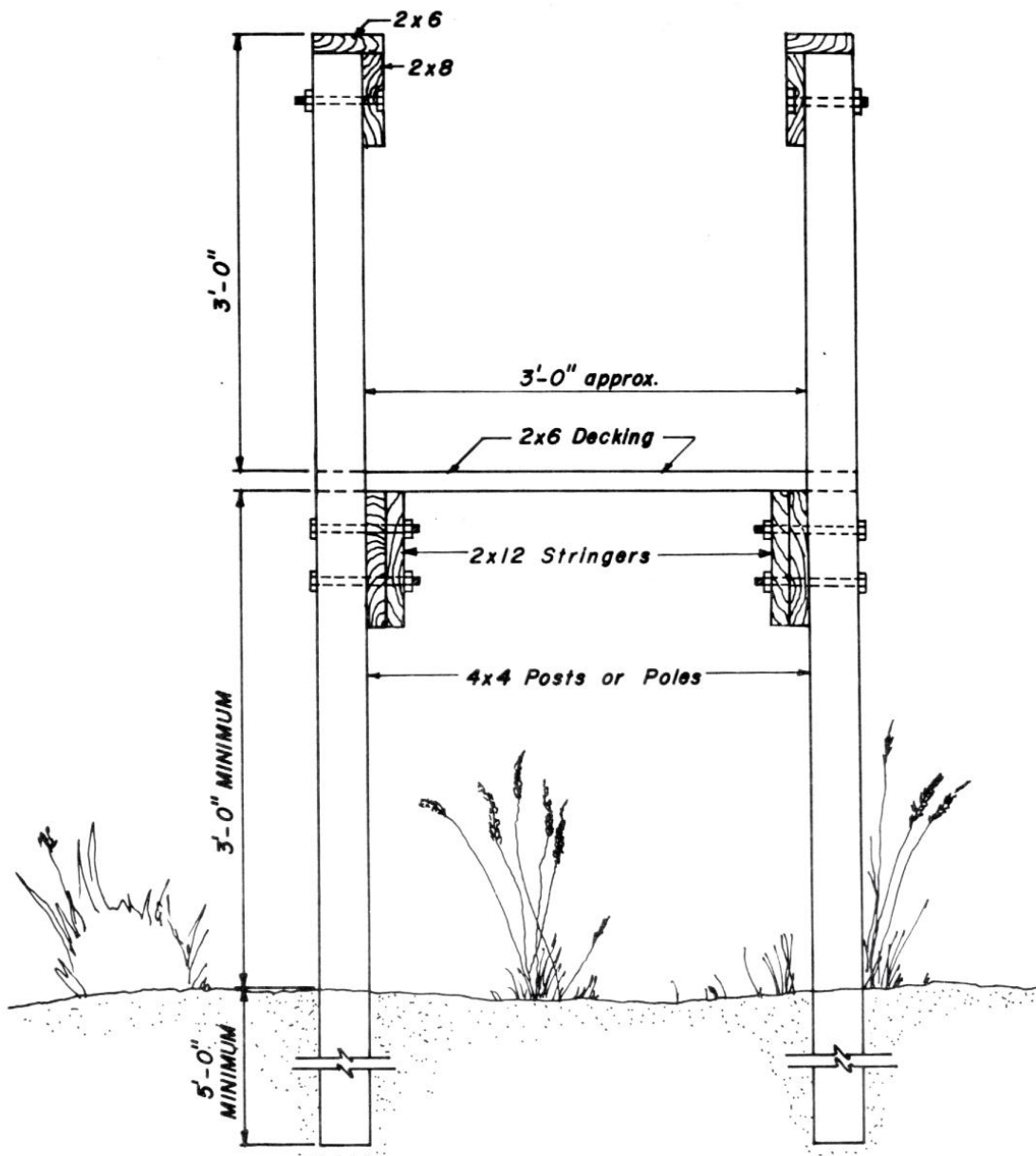
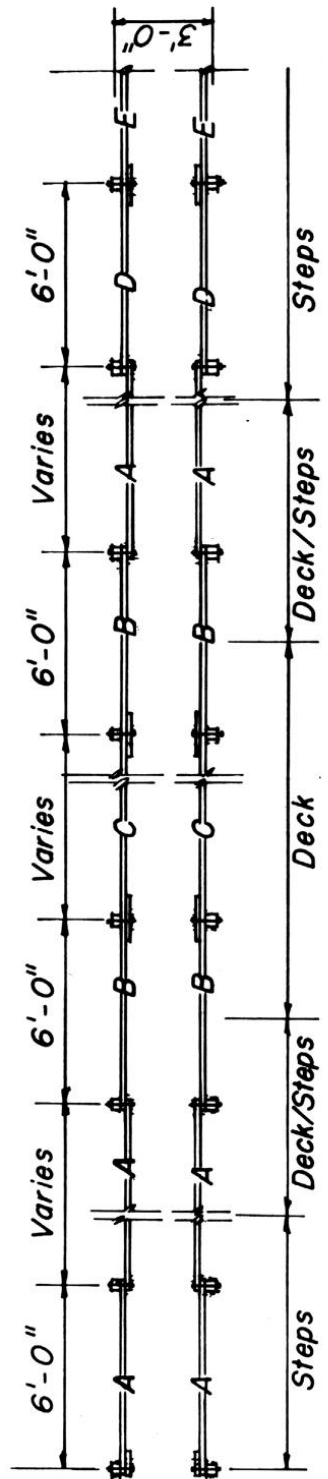


FIG.8 TYPICAL SECTION scale: 1"=1'-0"



**Note:** All splice blocks to be nailed to stringers to provide both lateral and bearing support at joints. All pile bolted connections to be 1/2" x 12" hex bolt with nut and washers.

**Bill of Materials based on 24' deck and step lengths, 6' and 12'.**

STRINGER DIMENSION	
A	2 x 12 x 8' notched for steps
B	2 x 12 x 7'-9"
C	2 x 12 x 6'
D	2 x 12 x 7'-8"
E	2 x 12 x 7'-6"
SPLICE BLOCK DIMENSION	
F	2 x 12 x 1'-6"

BILL OF MATERIALS	
QUANT.	ITEM DESCRIPTION
108'	2x12 Stringers & Splice blocks
16	4' x 4" Posts or Poles
66	1/2x12" Hex bolt w/ nut and washers
36	2x6x20' dressed
28	2x8x20' dressed
4	2x10x20' dressed

**FIG.9 TYPICAL STRINGER LAYOUT**  
scale: 1/4" = 5'





