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# Beach Dune Walkover Structures

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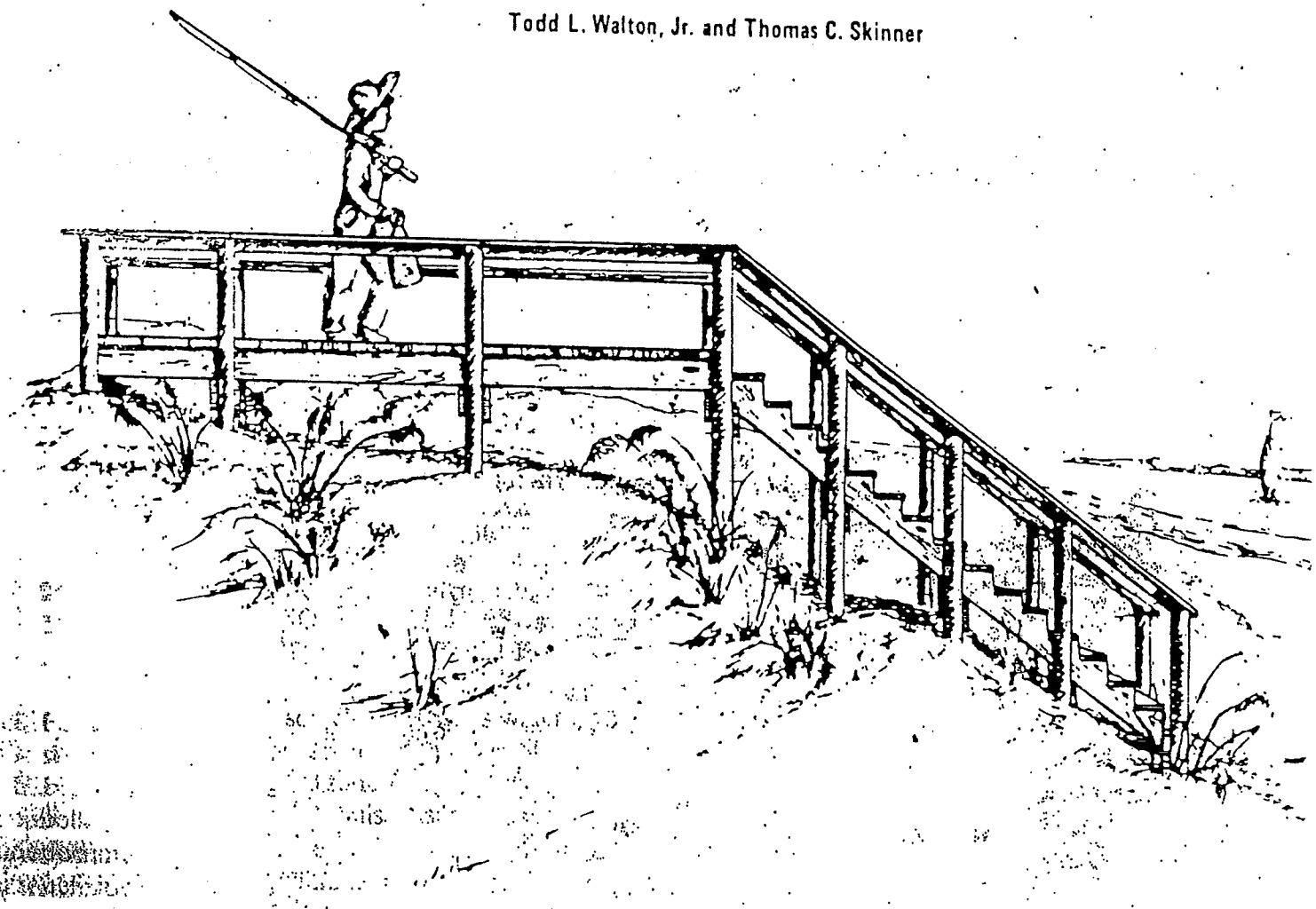

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This public document was promulgated at a cost of [illegible] or 16 cents per copy, to provide information on construction of a beach dune walkover structure.

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# BEACH DUNE WALKOVER STRUCTURES

by

Todd L. Walton, Jr.[1] and Thomas C. Skinner[2]

## 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

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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 handrails. 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) All connections to posts to be by bolts.

(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 (200.0%) 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.
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. Gurfinkel, Southern Forest Products Association, 1973.

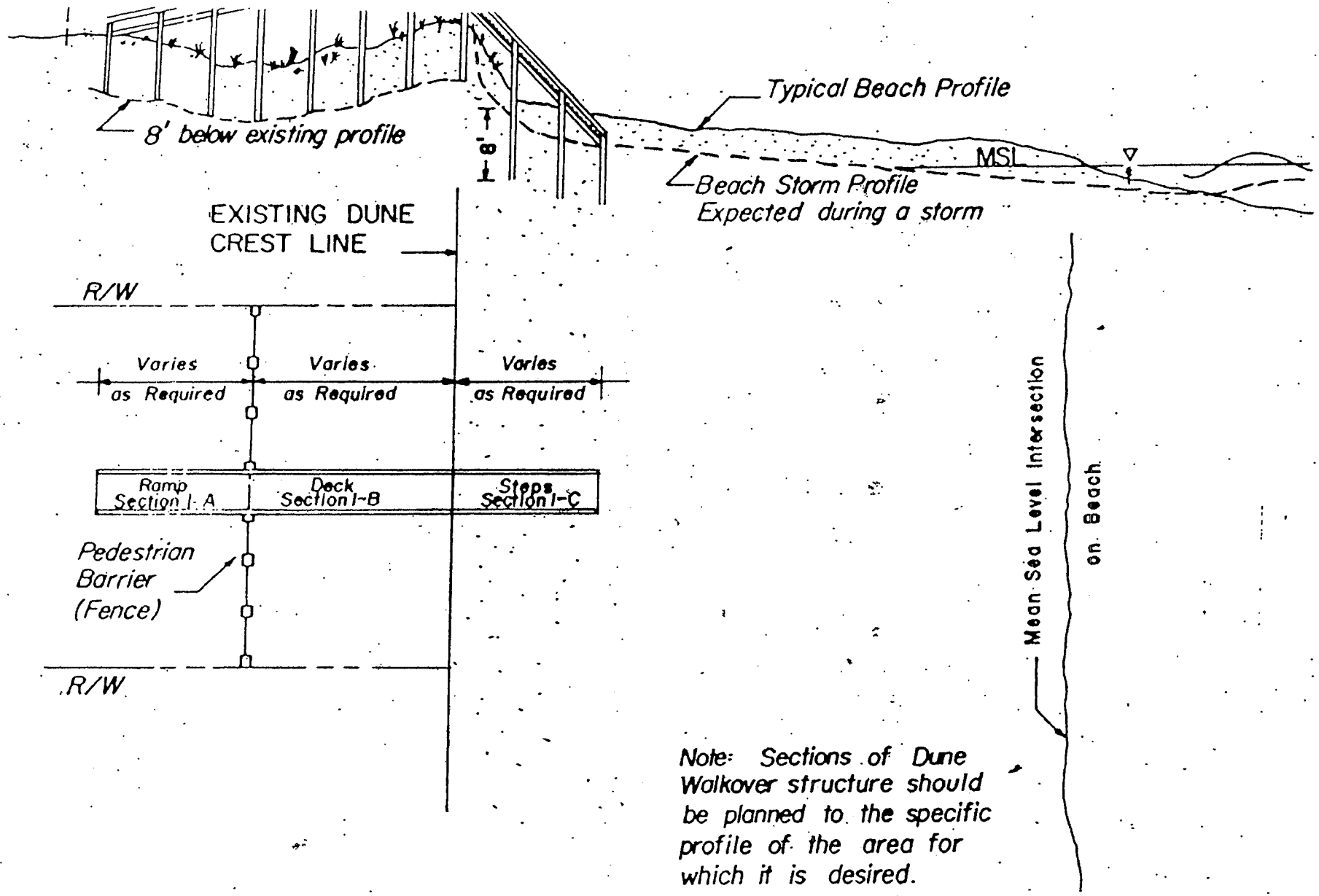



Fig. 1 TYPICAL PLAN and ELEVATION VIEW

Scale: 1" = 20'

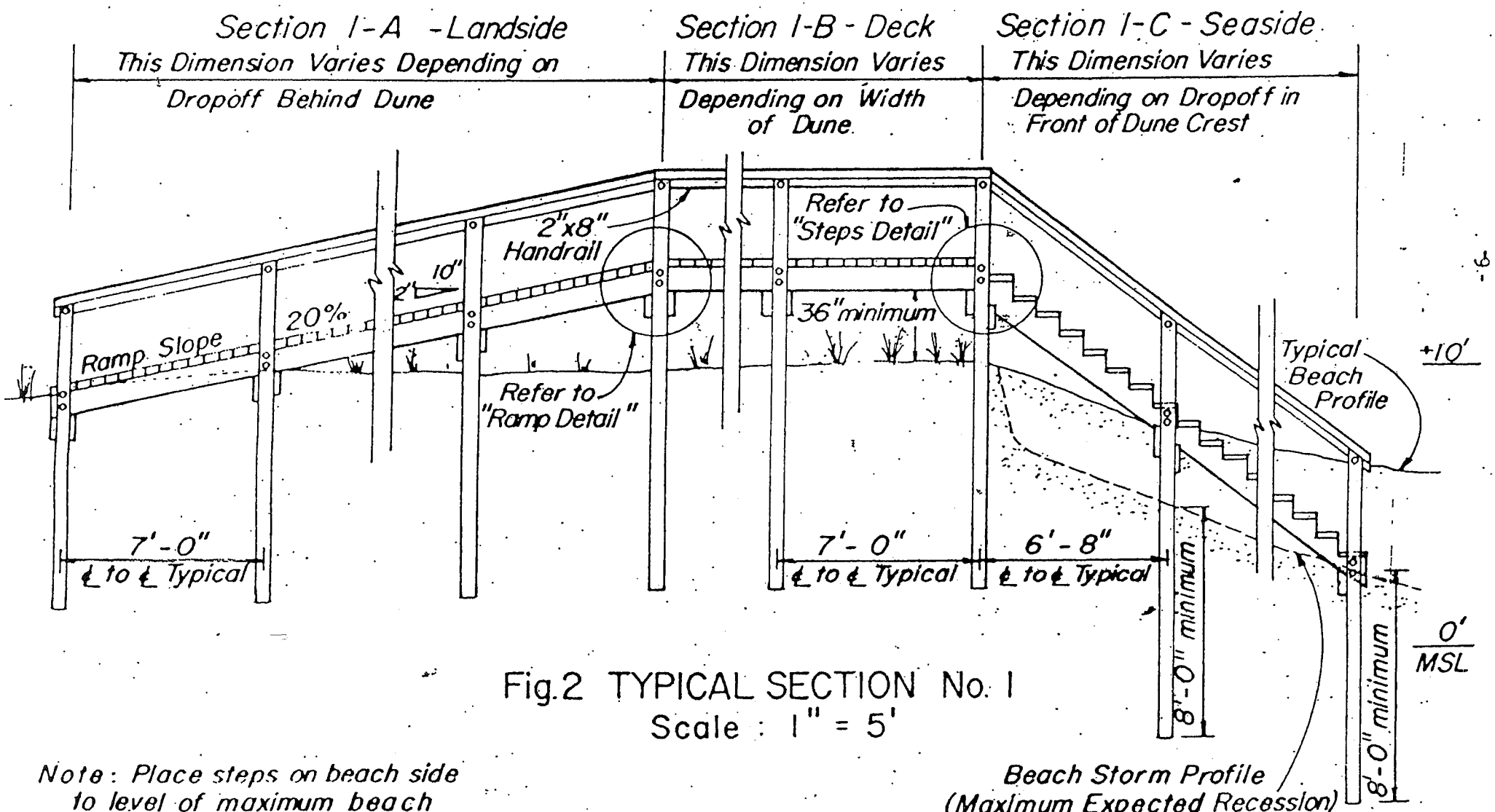



Fig.2 TYPICAL SECTION No. 1
Scale : 1" = 5'

Note: Place steps on beach side to level of maximum beach recession during a severe storm or tropical hurricane

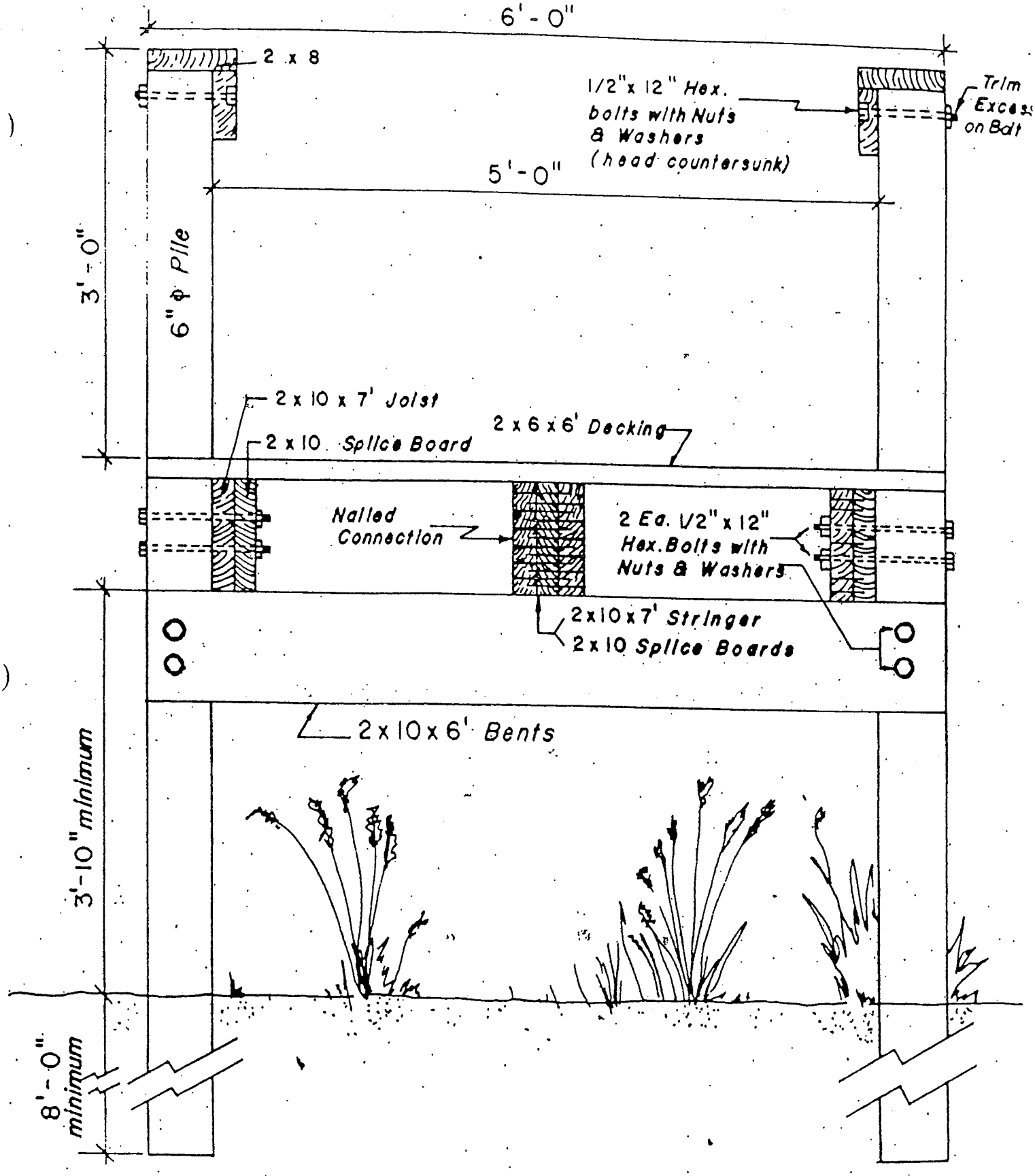



Fig. 3 TYPICAL SECTION I-B DECK
Scale: 1" = 1'-0"

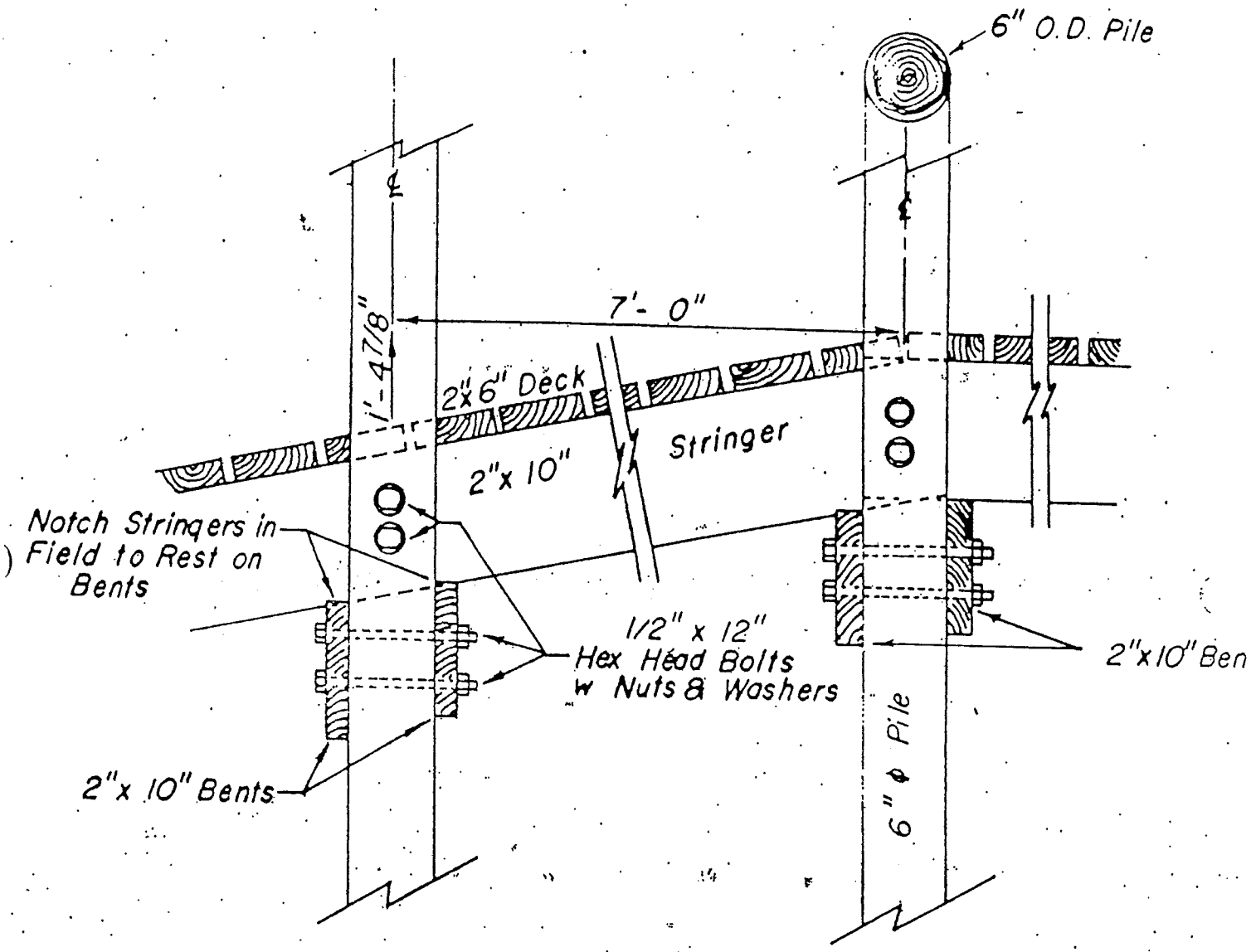



Fig. 4 TYPICAL RAMP DETAIL

Scale: 1" = 1'- 0"

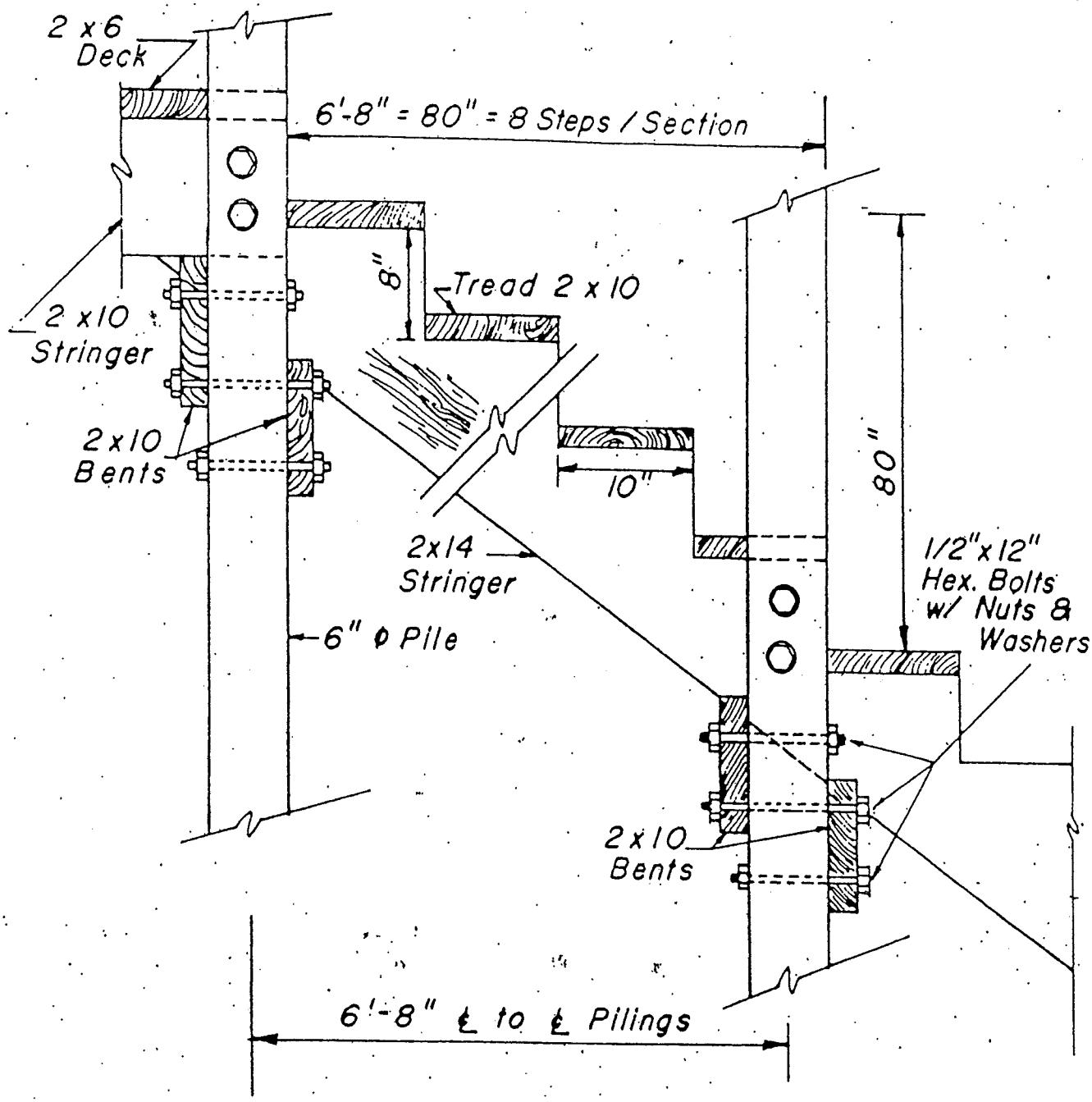
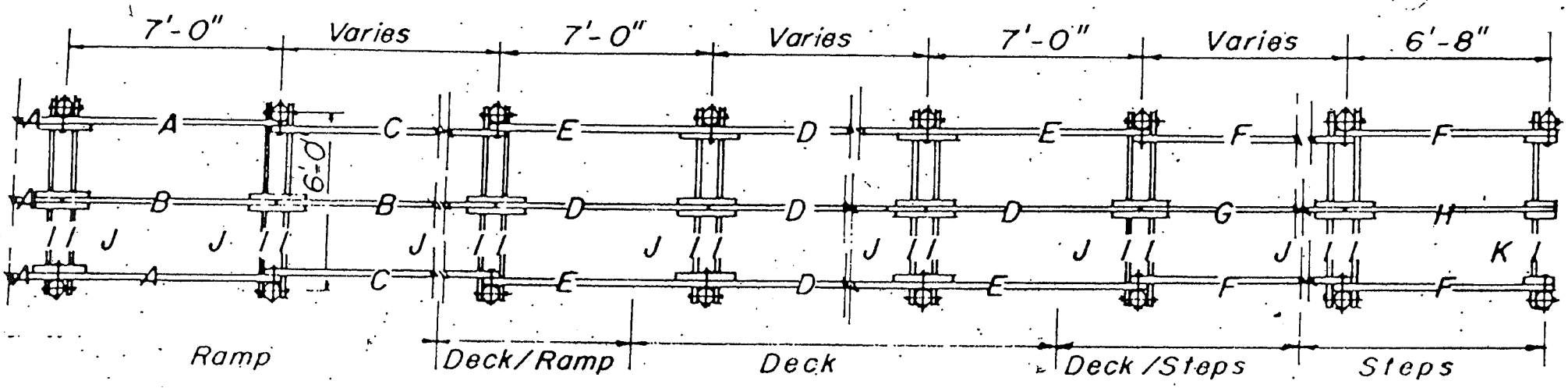



Fig. 5 TYPICAL STEPS DETAIL

Scale : 1" = 1'-0"




| 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" | notched for steps |
| G | 2 x 14 x 8'-6" | notched for steps |
| H | 2 x 14 x 8'-9" | notched for steps |
| 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.

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" x12" hex. bolt with nut and washers.

| 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" ϕ 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.

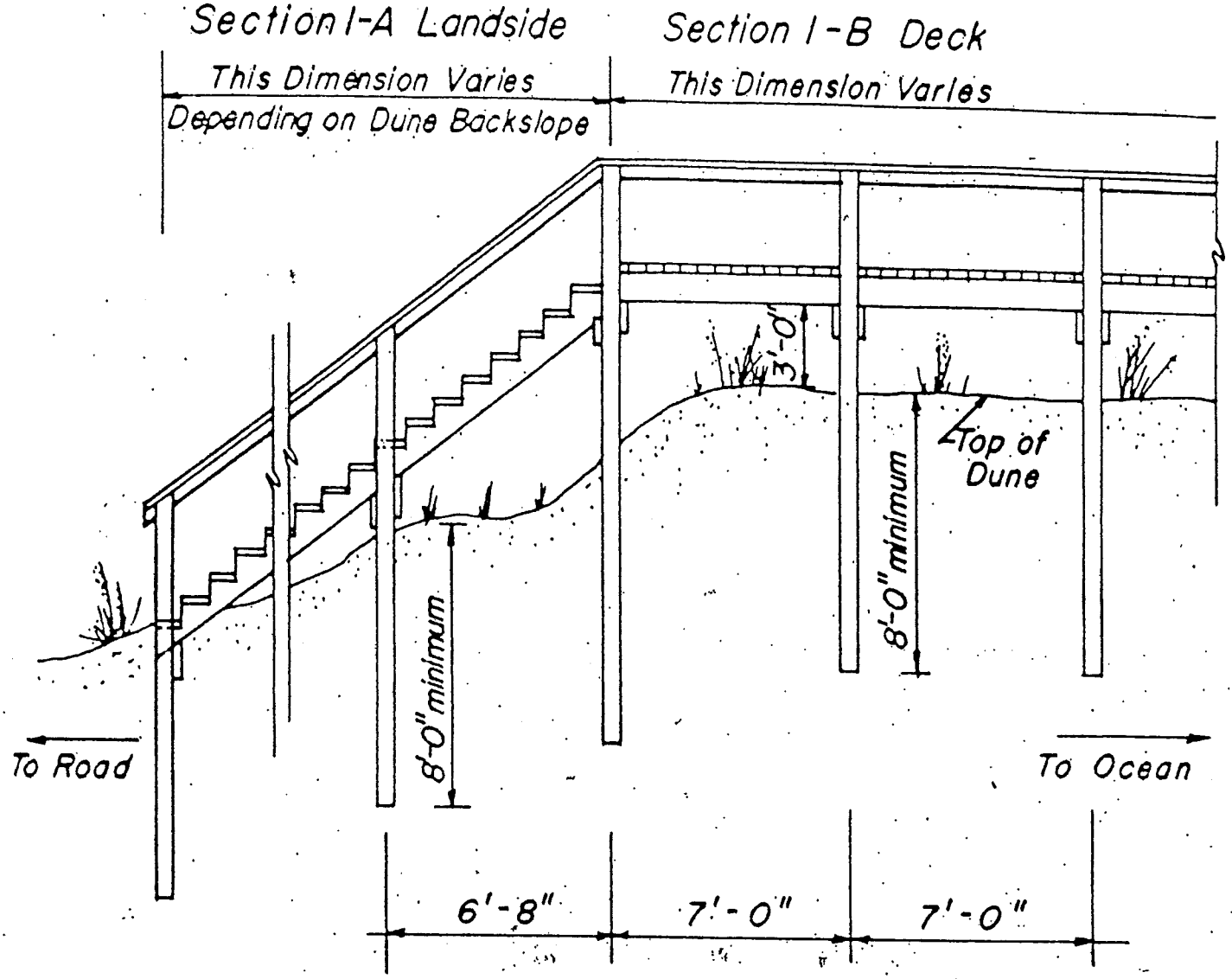



Fig.7 ALTERNATE SECTION No.1

Scale: 1" = 5'-0"

(Refer to details as per Figure 2)

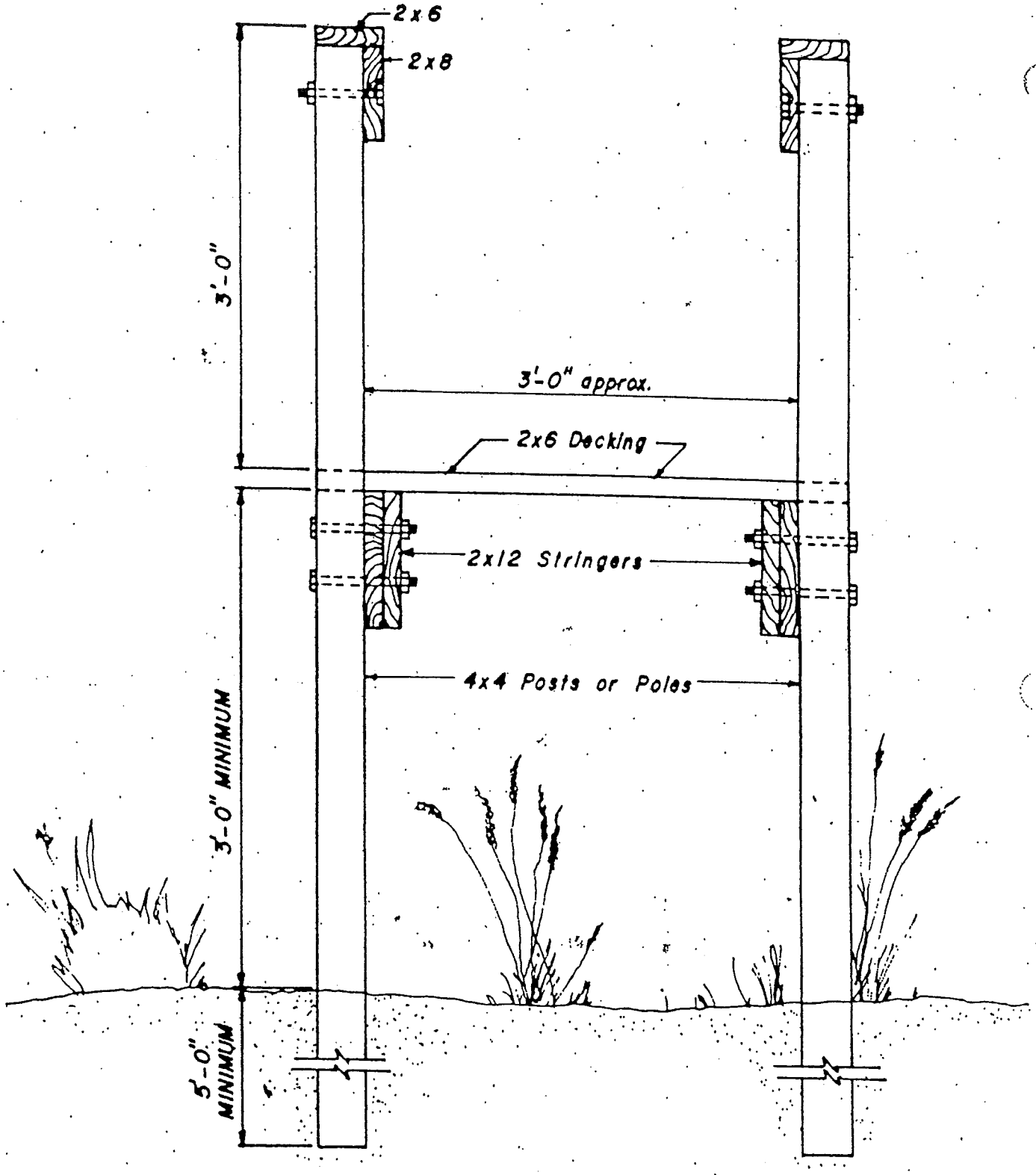
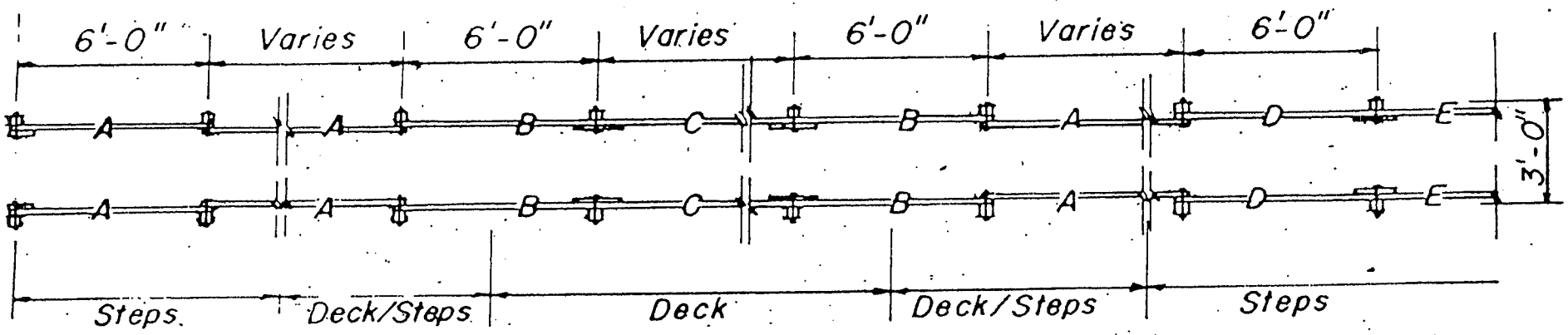



FIG. 8 TYPICAL SECTION scale: 1"=1'-0"




| 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" notched for steps |
| E | 2 x 12 x 7'-6 notched for steps |
| SPLICE BLOCK DIMESION | |
| F | 2 x 12 x 1'-6" |

| BILL OF MATERIALS | |
|---|---|
| QUANT. | ITEM DESCRIPTION |
| 108' | 2x12 Stringers & Splice blocks |
| 16 | 4"x4" Posts or Poles |
| 66 | 1/2"x 12" Hex bolt w/ nut and washers |
| 36 | 2x6x 20' dressed |
| 28 | 2x8x 20' dressed |
| 4 | 2x10x 20' dressed |

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'.

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