

Conclusion

It should be noted that the access survey is not necessarily a substitute for a building program. It does without question, provide the necessary basis for a building program and enables administrators to plan areas in sections where access is most critical.

Secondly, the access survey permits a distribution of fishing pressure through information on areas otherwise not well known and possibly underfished.

In conclusion, and perhaps of greatest importance, good publications on state wide access to public fishing waters provides a valuable service to a wide range of sportsmen. Maximum usage of public fishing waters already in existence is a possible requisite to expensive building programs, and leaves potential funds available for additional development and research in new areas.

SOME EXAMPLES OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF BOAT LAUNCHING RAMPS

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The need for free access to public waters is recognized by administrators of various State, Federal and private agencies throughout the United States. Programs to provide access to these waters have mushroomed in popularity. These include the development of small waterfront areas with the minimum construction and maintenance of an access road, parking lot and boat launching ramp. More elaborate developments include picnicking, camping and sanitation facilities. The value of these programs to fisheries management should not be overlooked. They provide excellent opportunities to open up inaccessible waters and better distribute fishing pressure. Headwater areas on many large reservoirs, where conditions often exist unfavorable to commercial development, are examples where access development can contribute much to the harvest. To insure the most judicious use of available funds, access area development programs should follow preliminary surveys designed to determine not only present needs but projected future needs of the ever-increasing number of fishermen.

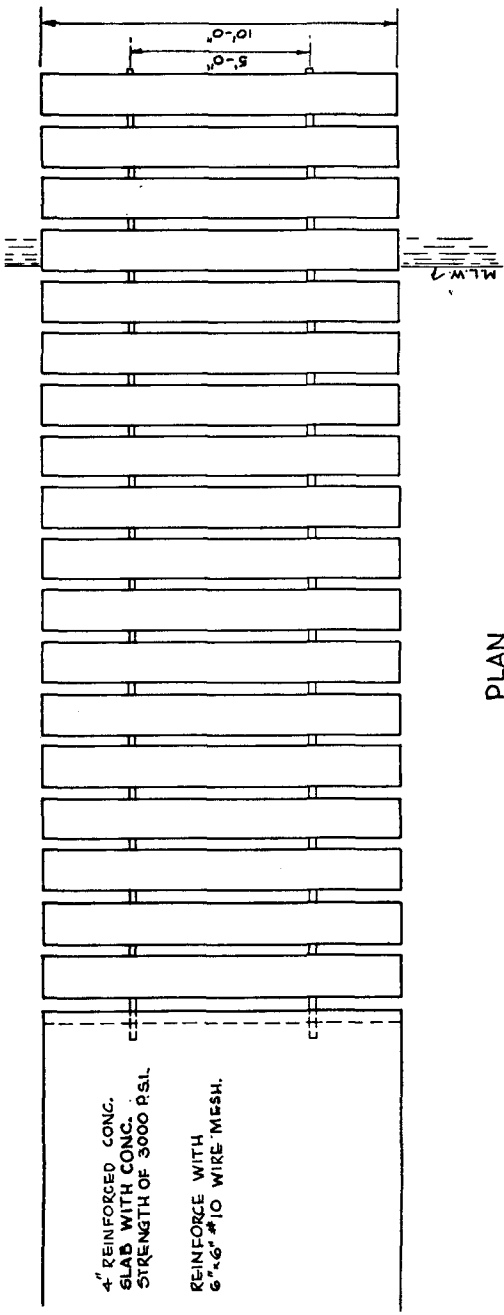
Plans and specifications for roads and parking lots can be obtained from State Highway Departments. It is unusual, however, to have plans and specifications for boat launching ramps readily available. Furthermore, many of the agencies responsible for access area development do not employ qualified engineers experienced in the design of structures such as launching ramps. Personnel with little or no experience in engineering design and construction work often are placed in charge of access programs. When this occurs, one of the most difficult problems encountered is designing and installing economical and suitable boat launching ramps. In this paper several types of ramps are discussed. Examples of plans and specifications are presented. These may be modified for individual situations.

The most popular ramp presently being installed is constructed of pre-fabricated concrete logs (Figure 1). Such ramps can be placed by inexperienced personnel. They give satisfactory service for an indefinite period. An added feature is the ease with which they can be taken up and relocated. Maintenance and repairs usually are limited to the replacement of deteriorated logs. These logs are constructed of standard 3,000-pound-per-square-inch concrete 10"x16"x4" in size. Reinforcement is provided by three 1/2 inch new intermediate grade, billet steel reinforcing rods, equally spaced. Tied perpendicular to these rods are two 1/2"x1 1/2"x19" flat steel straps extending through the logs, five feet apart (Figure 2). These straps have 5/8" holes punched or drilled

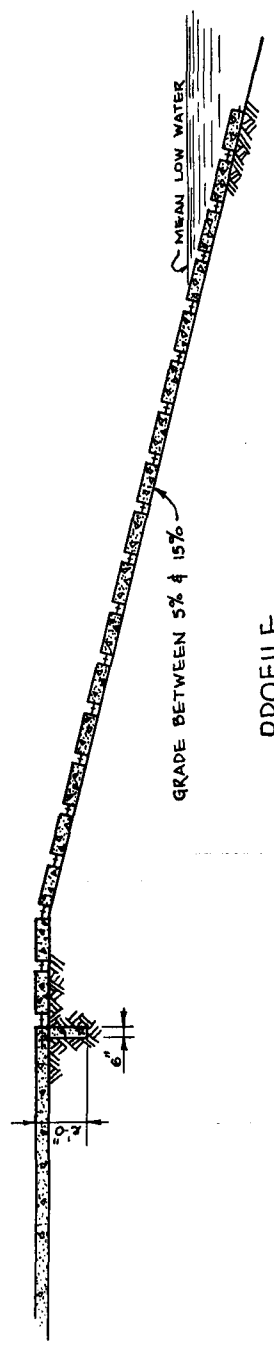
¹ The extensive aid received from Billy F. Horton, Regional Engineer, Bureau of Sport Fisheries and Wildlife, and Francis J. Guscio, South Atlantic Engineering Division, Corps of Engineers, in the preparation of this paper is gratefully acknowledged. Ideas illustrated in Figures 1 and 4 were derived, in part, from plans of the Alabama Department of Conservation and the Florida Game and Freshwater Fish Commission.

4" REINFORCED CONC.
 SLAB WITH CONC.
 STRENGTH OF 3000 P.S.I.

REINFORCE WITH
 6" x 6" #10 WIRE MESH.



PLAN



PROFILE

Figure 1. Examples of plan and profile drawings illustrating the arrangement of header and logs in a pre-fabricated concrete log boat launching ramp. The preferred grade exists between 9% - 12%.

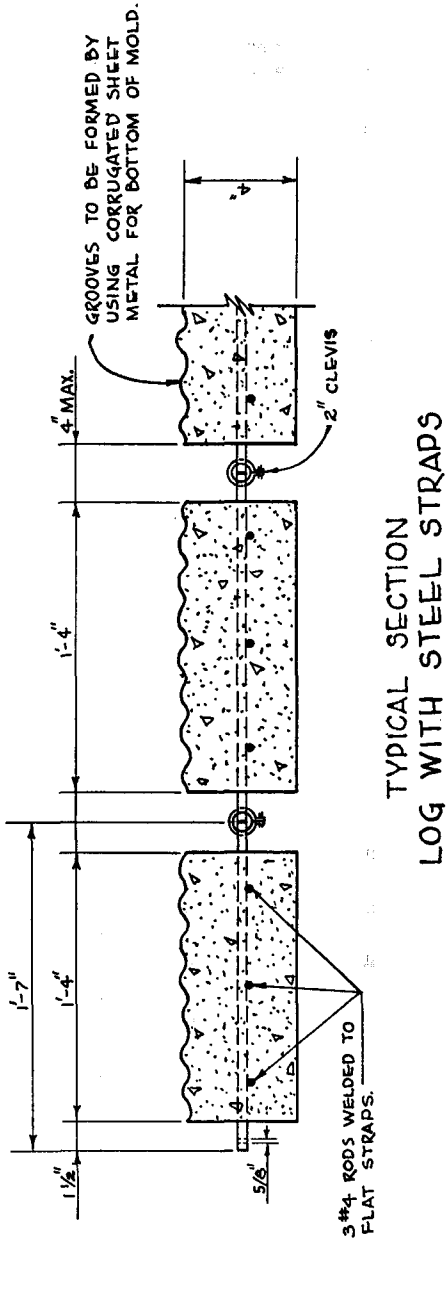
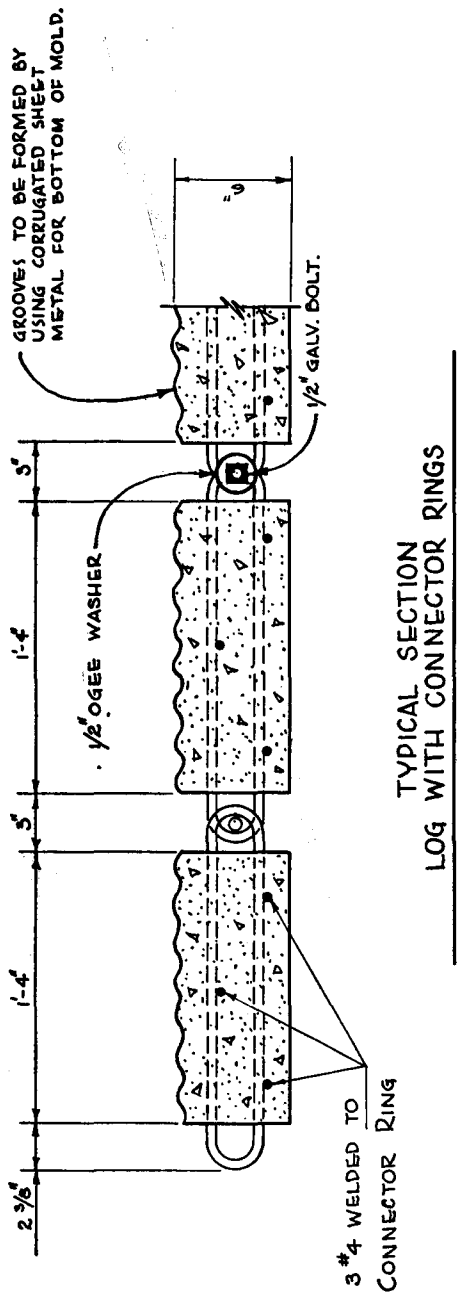


Figure 2. The drawings illustrate cross-sections of concrete logs. Two methods of connection

through each end. A second method is to use connector rings constructed from No. 4 bars set vertically in 10'x16"x6" logs (Figure 2). If these rings are used, logs can be connected by $\frac{1}{2}$ " galvanized bolts using $\frac{1}{2}$ " ogee washers. Where straps are used, logs should be connected using 2" clevises rather than bolts to insure flexibility between logs. In no case should the interval between logs exceed 4".

A concrete slab (reinforced with 6x6 No. 10 welded wire mesh if less than 6" in thickness) should be poured as a header (Figure 1). This slab includes cut-off walls at the head and foot, not less than 2' deep and 6" thick. Connectors similar to those used in the logs are placed in the foot to facilitate attachment of the first concrete log.

Logs should be laid on a prepared base having a minimum of 6" compacted No. 2 stone uniformly graded from $2\frac{1}{2}$ " to $1\frac{1}{4}$ ". It is desirable to lay this base and the ramp during periods of low water due to lower costs, more efficient compaction and less loss of material through bogging or sinking. The base can be placed underwater, however, resulting quality is usually inferior and costs higher. An additional feature of this concrete log ramp is the ease with which logs can be added to increase the length. This is particularly attractive for areas developed on artificial reservoirs with fluctuating water levels.

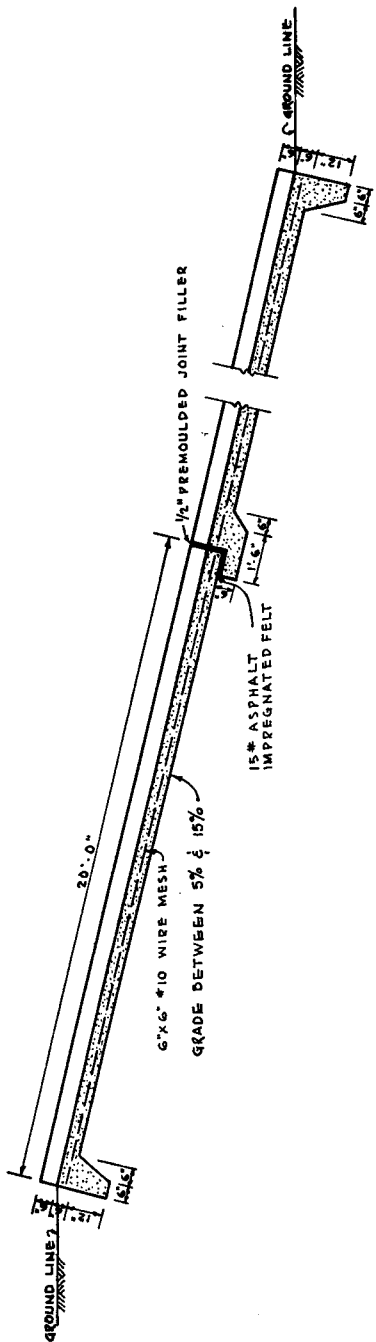
Solid concrete ramps often are installed in locations where extremely heavy use is anticipated. Such ramps are usually poured in 20' sections, 15' wide, 6" deep, with 6" curbs, and reinforced with 6x6 No. 10 welded wire mesh (Figure 3). Reinforcement is provided in the top of each curb by two No. 4 steel rods. Expansion joints are filled with $\frac{1}{2}$ " pre-moulded joint filler. Cut-off walls, not less than 2' deep measured from the top of the curbs, are included at the head and toe of the ramp.

Serviceable boat launching ramps can be constructed of gravel (Figure 4). This type, like the poured concrete ramp, should be constructed only during placed in a bay or cut or otherwise protected from strong cross-currents of placed with fresh, dry material, well compacted. A minimum of 6" of gravel is used, uniformly graded from coarse to fine, to fill the voids. In preparing plans and specifications for this type ramp, it is wise to consult the State Highway Department's standard specifications for graded, coarse aggregate sub-base. Ramps should be constructed having a minimum width of ten feet. One important consideration for the location of a gravel ramp is that it be placed in a bay, cut or otherwise protected from strong cross-currents of water. This ramp is economical and if proper care is taken in its preparation, will prove satisfactory. Soft spots occasionally appear near the water line which may require periodic maintenance.

If at all possible, locations chosen for each of the described ramps should have grades between 9% and 12%. This range may be expanded to a minimum and maximum of 5%-15% respectively. However, as grades approach these latter figures, ramps become more difficult to use.

Boat launching ramps are occasionally observed constructed with stone, asphalt, metal or wood. Labor costs for hand-laying stone ramps are usually prohibitive. Asphalt ramps likewise are not recommended due to the exorbitant costs necessary to prepare a base sufficiently stable to prevent softening and breaking of the surfacing. In some locations, on rivers in particular, metal ramps are quite efficient. However, deterioration, in the form of rust resulting from fluctuating water levels, is so rapid and replacement costs so high, they are not recommended. Wooden ramps, usually constructed from 2"x8" boards, placed at right angles to the prepared base with 4" intervals, are successfully used in many places. The spaces between boards should be well compacted with base material to within $1\frac{1}{2}$ " of the surface. This type ramp is generally limited to areas with steep slopes requiring only short ramps. If prepared for use in fresh water, the wood should be treated with creosote to a minimum 10 pounds retention, and if in salt water, treatment should be to a minimum retention of 12 pounds. Other non-water-soluble preservatives, such as penta, may serve equally well, however, may be more expensive than creosote.

It is difficult to provide cost figures since they vary for all locations. Gravel ramps are the least expensive, and can be expected to run 35%-40% under concrete log ramps on contract work. The costs for constructing either concrete

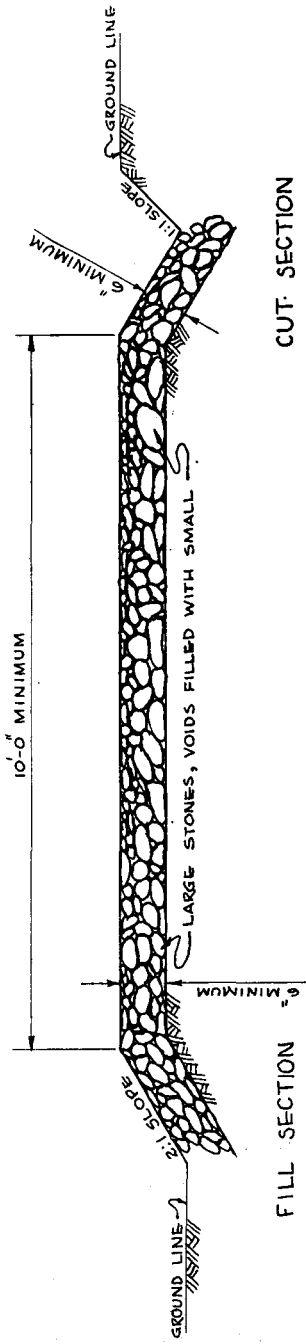


PROFILE

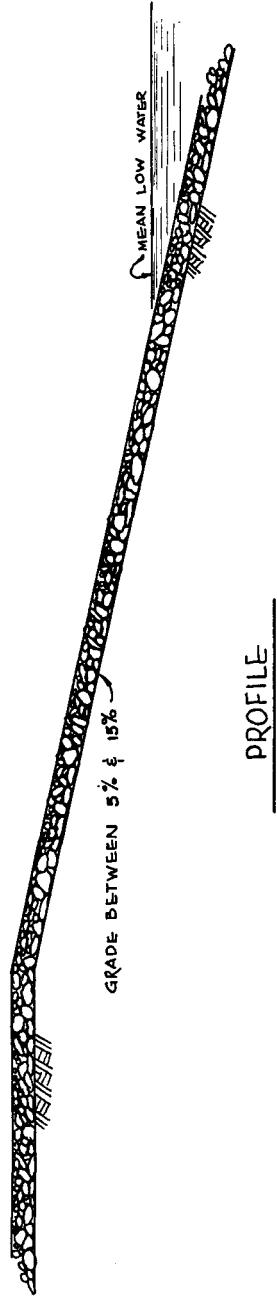


TYPICAL SECTION
CONCRETE RAMP

Figure 3. An example of plans for a solid concrete boat launching ramp. The recommended grade is between 9% - 12%.



TYPICAL SECTION
GRAVEL RAMP



PROFILE

Figure 4. An example of plans for a gravel boat launching ramp. The recommended grade is between 9% - 12%.

or concrete log ramps vary to such a degree in each location, it is extremely difficult to make comparisons between them. This variance is due in part to the amount of preparation necessary for the base, distance from fabrication plant or available concrete and length of ramp desired. Generally, however, the concrete log ramp proves the most expensive by a narrow margin. In suitable locations, either should be installed for between \$1500-\$2500. Concrete logs should be available for prices ranging between \$7.50-\$20.00, delivered, per log, depending on transportation charges.

Programs providing access and boat launching ramps on public fishing waters have been popularly received in areas where they have been initiated. Suitable ramps can be designed and constructed at a relatively low cost. The three types described in this paper provide usable facilities for several years, with a minimum of maintenance.

The ideas and specifications listed are not presented as detailed plans. They should prove sufficient to provide information from which detailed plans and specifications can be prepared. Modifications can and should be made to take advantage of local conditions best understood following individual site inspections.

COOPERATION OF THE ALABAMA STATE DEPARTMENTS OF CONSERVATION AND HIGHWAYS IN THE CONSTRUCTION OF ACCESS AREAS

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INTRODUCTION

The Alabama Departments of Conservation and Highways have had a cooperative agreement since 1957 for the purpose of developing public access areas. This agreement was made because both Departments recognized the tremendous need for public access development and wanted to construct as many of these areas as possible with the monies available for this purpose from the Department of Conservation's Game and Fish Fund. During these past three years, 44 public access areas have been approved for construction under this cooperative agreement at an estimated cost of \$269,000.00. Most of these areas have been completed while the others are presently under construction. Under the agreement, the access areas are selected, planned and designed by the Conservation Department. The Highway Department provides labor, materials, and equipment for the construction and bills the Conservation Department for actual costs. Typical views of access areas that have been developed under this agreement are shown in Figures 1, 2, 3, and 4.

SELECTION OF ACCESS SITES

Alabama's Public Access Areas have been constructed on State-owned lands, on areas under licenses from the Corps of Engineers and the Tennessee Valley Authority, and on lands acquired from local sportsmen's groups through fee-simple titles or long term leases (at least 20-year renewable). No Department funds are expended for the lands on which the access developments are made. All deeds or leases for sites acquired are furnished to the Department free of charge by local interests. Areas selected for development had existing access roads or such roads were constructed by local county, city, sportsmen or civic interests without cost to the Department of Conservation. The Highway Department also provided access roads not exceeding one-half mile free of cost to the Department of Conservation. The size of the areas developed ranged from 2 to 15 acres, with the average size being approximately 5 acres. Final selection