

FEASIBILITY STUDY FOR MOVEABLE SHELVING
IN RECORDS STORAGE FACILITY

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18-70, Directive No. 1, 27 August 1969, authorizes the preparation of the subject study.

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The record drawings for the existing building have been reviewed and it was determined that the original design for the floor slabs was based on a live load of 250#/ft². The moveable shelving is based on the storage of boxes 10" high x 12" wide x 15" deep with an average weight of 30#/box. Approximately 1'-2" x 1'-4" shall be allowed for the storage of each box. The boxes will be stacked 10 shelves high. It is proposed that the area between each column line be developed for the moveable shelving with fixed shelving placed at the column line and five sections of moveable sections be placed in the space between. Each section will be approximately 32 inches deep to permit placement of storage boxes back to back. For each group of shelving, consisting of five moveable racks, it will be necessary to provide an aisle space of approximately three feet. Thus; the effective average loading of each bay will be approximately 80 percent of the loading on each individual shelf. Based on each box occupying 1'-2" x 1'-4" and stacked 10 boxes high, the effective loading will be approximately 160 pounds per square foot. In addition to this live load it will be desirable to fill the space between tracks for the shelving with concrete. This would be approximately 3 inches of concrete fill and if lightweight concrete is used, the dead load weight will be approximately 20#/sq. ft. An average of 40 pounds can be placed in each box without overloading the existing floor system. The forklift, which weighs approximately 2000 pounds and carries loads up to 1000 pounds will operate in the corridors and will not constitute as severe loading as the 250#/ft² used for design.

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Representatives from two of the companies were present during the inspection and were very helpful in furnishing information concerning possible modifications to their standard shelving to suit our needs at

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manufactures a laminated wood product and the other two are metal. There was some concern as to whether wood would be acceptable because it is combustable. However, Fire Insurance Underwriters indicate that insurance

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rates are the same whether materials are stored on wood or steel shelving. The general concensus is that the wood shelving would not be any greater fire hazard for the type of material stored at [REDACTED] than the metal shelving. All three manufacturers mount their shelving on carriages which travel on steel tracks. These tracks are carefully aligned so that minimum effort is required to move the files or moveable shelves along these tracks. Their standard products are about 2' wide x 8' high x 20' long; however, they indicated that the height could be increased by using the wider shelf required for the [REDACTED] facility and the length increased to fit into the area. The building is approximately 78 feet wide and this will be divided into two storage areas of approximately 35 feet separated by an 8 foot corridor. The suppliers indicated that they could build 35 feet long moveable shelving by placing two synchronized motor drives on each shelf, one near each end of the shelving in lieu of single drives used for shelving up to approximately 20 feet in length. An alternate to the long shelf would be to provide two sections of shelving with a 3 foot aisle between; however, this would reduce the storage space considerably.

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The mechanism for moving the shelving varies with each of the manufacturers but each of the systems is relatively simple and should involve a minimum of maintenance. There are several means of providing the necessary safety features to prevent someone from getting crushed between shelves. It is proposed to permit the contractor the option of any one of several suitable systems, since several are acceptable and this will preclude restrictive procurement. Actually, there is no great danger of serious injury as the shelving is moved by small motors.

One of the above manufacturers has given a tentative cost figure for furnishing and installing shelving in the Records Storage Building at [REDACTED] Center. The estimated cost is \$850,000 including the installation of a decking on the floor flush with the top of the tracks and the lighting system which will be attached to the shelving. Consideration will be given to providing a lighting system not connected to the shelving but it appears that a more satisfactory system can be included with the shelving without increasing the cost appreciably. In addition to the above costs, there will be some additional costs for the necessary removal of existing lights, modification of the air conditioning and alarm systems, and to providing a few additional circuits to serve the motors which operate the shelving. Major modifications to the power source are not anticipated. A separate contract is proposed to accomplish these items of work. The scope of this work will not be known until a detail survey is made of the building and the extent of the required modifications determined.

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Consideration will be given to modifying the large work area at the entrance to the storage area to provide a configuration that will permit more efficient utilization of the storage area.

It is proposed to prepare a performance type specification for the moveable shelving. Prospective bidders will be furnished copies of the floor plan of the building, data on the type of storage involved, minimum acceptance standards for materials and equipment. Also, the bidders will be given a list of restrictions which will be imposed on them while installing the shelving. Included in these restrictions will be an indication of the areas that the contractor will be permitted to work at any time. It is anticipated that these restrictions may limit the contractor considerably during the first weeks of the contract but will permit him access to larger areas as the Using Service moves material into the completed shelving.

The bidders will furnish proposals indicating the proposed layout, the materials to be used, manner of installation and the contract cost. The volume of storage, the acceptability of details of construction, and the contract cost will all be considered in evaluating the proposals.

It appears that the cost for installing the shelving and making the necessary modifications to the existing structure will be in excess of \$900,000. This is based on using the cost figures of one of the suppliers for the moveable shelving. In order to provide the same amount of storage space using conventional fixed shelving, it would be necessary to construct a building addition half as large as the area used for storage in the existing building. There are approximately 40,000 sq. ft. of storage area in the existing building. Thus, it would be necessary to construct about 20,000 sq. ft. of new area to provide the same increase in storage space. The cost for such a new building including the cost of the alarm and air conditioning systems would be about \$350,000. The same type of fixed shelving as that used in the existing space would cost about \$75,000. Thus, it appears that the cost of moveable shelving would be considerably greater than the cost for constructing a building addition and installing fixed shelving. The above estimate for moveable shelving appears to be exceptionally high for the scope of work involved and it may not be representative of the actual bid price which the company may give with competitive bidding. It is suggested that the Using Service check with one of the other suppliers to determine if the one estimate is realistic. This district has complied with the request that no direct contact be made with prospective suppliers concerning the project. There will be approximately 7,500 linear feet of moveable shelving and 1,100 feet of fixed shelving in the building if the tentative plan for installing moveable shelving is followed. On this basis, the cost of the moveable shelving including the decking and lights would be in excess of \$100 per foot. This seems to be unreasonable and it is suggested that the Using Service check with the industry on the cost before the use of moveable shelving is ruled out. There would be some advantage in the operation and maintenance within the existing building with moveable shelving. There would be some slight savings in heating and air conditioning costs and there may be some savings in operations within the more compact facility. The moveable shelves can be moved in less than five seconds and this operation will not slow down the retrieval of material.