AN EQUESTRIUM

FOR

VIRGINIA POLYTECHNIC INSTITUTE

By

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AN EQUESTRIUM FOR U.P.
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INTRODUCTION

The purpose of this thesis is the presentation of a design for an Equestrium for the Virginia Polytechnic Institute.

This design differs in comparison with former theses, in that the author was confronted with a practical solution rather than an assumed or theoretical problem. The author felt that the development of a problem of this practical nature would be of infinitely more value to himself than the development of a highly imaginative one, and would, at the same time, materially aid Professor R. E. Hunt of the Animal Husbandry Department, for whom this building was designed.

Professor Hunt is very much interested in obtaining a new building to house the Animal Husbandry Department. This department is now cramped for both office and classroom space. The proposed building also incorporates an equestrium, or covered riding ring, with stables. This portion of the building is to provide a place for winter riding, riding during inclement weather, and also to serve for other purposes of this department.
Part I of this thesis is the presentation of a rendered drawing showing the building as finally conceived.

Part II of this thesis is the presentation of preliminary working drawings of the design, prepared in order that an approximate estimate of cost can be determined.

Part III, in the form of this manuscript, is herewith submitted for the purpose of explaining the design, and of tying together in a complete and unified entity the different phases of this thesis.
INVESTIGATION

The investigation has taken two forms: first, the study of all available written material obtainable from the libraries of the Virginia Polytechnic Institute; and secondly, the personal inspections of several buildings which the writer selected to aid him in his design. Namely: The Fort Meyer Cavalry School Equestrium, Fort Meyer, Maryland; The Grays' Armory, Richmond, Virginia; The Blues' Armory, Richmond, Virginia; and the Equestrium at Arlington Hall, near Washington, D. C.

There seems to be a dearth of written material on this particular subject, giving the author little or no precedent to follow. Some aid in formulating this design was obtained, however, from a study of the new Field House at Swarthmore College, Pennsylvania.

SCOPE

The aim of the author was to design an Equestrium to conform to requirements outlined by Professor R. E. Hunt, and which would fulfill the present and possibly the future needs of the Animal Husbandry Department.

This is a specific problem, one such as an architect encounters in actual practice, and based on
actuality of site and existing needs.

SIZE

The economical aspect of the design was one of the main considerations in determining the size of the building. It was absolutely essential that the cost be kept as low as possible, so this factor has been kept in mind at all times as a major point in determining the building design.

SITE

After due consideration had been given to available ground in the vicinity of the Agricultural Buildings, the logical location for the Equestrium was found to be on the hillside north of the present Outdoor Show Ring. This hillside, which is fairly steep, rising seventeen feet in the building's width of 140 feet, was at first thought by the author to be detrimental to the economical aspect of the design, apparently entailing too much excavation and fill. However, the final parti settled upon has utilized the site to such advantage that it is an aid to the design rather than a hindrance.

The map herein presented shows the site of the building in relation to the Outdoor Ring, and also shows the proposed road which will provide access to the main
entrance for students and faculty, and a service entrance to the Meats Laboratory. This new road begins just east of the present Agricultural Extension building and extends up the hill along a natural grade.

The building is ideally orientated, having the classrooms and offices on the north, overlooking the Campus, and the stables on the south, providing necessary sunny exposure and protection from prevailing winter winds.

The classroom and office wing is the only part of the building which is to be heated, therefore the location of this wing on the north side is ideal as it is nearer the heat supply.

The building, being located as it is, places the stables on the side toward the existing show ring and in close proximity to it, giving excellent access to the outdoor ring.

The horses stabled in this building would, at present, have to be led across the road, south of the Outdoor Show Ring, to pasture, but this could eventually be eliminated by the construction of an underpass beneath the road.

THE PROGRAM

At the beginning of the study of this thesis a program of the necessary requirements was furnished
the writer by Professor Hunt. As the plans herein presented portray these requirements, a further presentation of the Program is unnecessary.

SELECTION OF PARTI

The problem next before the author was the selection of parti.

To do this, the author analyzed, as closely as possible, all the required units and divided them into two groups, as can be seen by a study of the plan.

The classroom and offices are separated as far as possible from the stables by the Riding Ring. The classrooms and offices needed two stories for their required area, therefore they were placed on the lower side of the hill. The stables, requiring only a single story, were placed on the upper side of the hill. A study of the section will show that the building has been designed to take advantage of the hillside site with a minimum amount of excavation and fill.

This final Parti was selected only after several others had been tried and discarded, and the author believes that the one presented will fulfill the
requirements in a most economical and compact manner.

THE MODEL

After selecting the final parti, and studying the various elevations, a clay model at one-sixteenth inch scale was prepared of the building and site, showing one foot contours. This was done to study the mass of the building and its relation to the selected site.

In a building of this size and nature, with the factor of cost always in mind, mass has to be depended upon for a pleasing architectural effect, rather than detail or decoration. Therefore the model was of great value in helping the author visualize the problem.

The following two pages contain photographs of this model.
A. Choice of Material

The material chosen for foundations, structural walls, floors and flat roof slabs is reinforced concrete, with the exterior walls colored a light buff by the introduction of integral coloring in the concrete. This coloring is desirable to give warmth and life to the structure by eliminating the drab gray of the natural concrete. This choice of material may seem strange in view of the fact that the majority of the campus buildings are of native stone, but the following reasons justify the author in choosing reinforced concrete:

First, the size and nature of the Equestrian, and the modern, functional design adapts itself to reinforced concrete in its execution.

Second, from the economical point of view, reinforced concrete offers many advantages, in both cost and ease of construction, over brick or stone masonry.

Third, this building is somewhat isolated from the present campus group. It is nearer the present farm buildings of the college, and will add aesthetically to this group.
For the interior non-structural walls, cinder block has been chosen. It is a strong, durable and economical material, and can be attractively and economically treated by painting a white or buff color.

The windows specified are Fenestra, horizontally pivoted, factory sash.

B. The Classroom and Office Wing

The ground floor is the first story of the classroom and office wing. It contains a large entrance lobby, the meats laboratory, cold storage and curing room, four small offices, one large office, men's and women's toilets and one large lecture room.

The meats laboratory has been placed on the eastern end of the wing so that it obtains an east and north exposure, and is also near to the proposed road, facilitating service. The cold storage and curing room is directly behind the meats laboratory and underneath the riding ring, lending itself readily to insulation.

The large lecture room is on the western end of the wing, having west and north exposures. The entrance lobby is in the center of the wing with two broad stairways leading to the second floor lobby. The toilets are adjoining the lobby with entrances from
the corridor. The offices extend on either side of the lobby.

The second floor of this wing is more or less a repetition of the ground floor, having a large lobby in the center which contains the spectators' entrance to the riding ring which is located on this level because of the hillside site. There are two large lecture rooms at the ends of the corridor, having double exposures. Entering from the corridors, between the lecture rooms and the lobby, are eight offices, two large and six small.

The roof of this wing is flat slab construction of reinforced concrete, properly waterproofed.

C. The Riding Ring

The riding ring, which is the dominating feature of this design, is eighty feet wide and two hundred and fifty feet long, with a vaulted roof, rounded at each end. The ring has a packed clay floor, and a concrete platform, six feet wide, and eighteen inches above the clay floor. The platform extends around the perimeter of the ring, and is for the use of spectators.

The roof of the ring presented one of the major
problems the author had to contend with. It was solved by using a system which lends itself ideally to structures of this nature. This system is patented by the Arch Roof Construction Company of New York City. The roof is built of long span steel arches made with short, straight lengths of stock I-beams and eliminating the necessity of using chord members. This gives an unobstructed floor space with maximum overhead clearance, light and ventilation. The use of this construction permits keeping the side wall heights to a minimum. Light is provided by two long skylights on either side of the arch and by windows in the semicircular end-walls. Ventilation is provided by these windows and also by large monitors on the roof. Steel purlins give lateral bracing to the arches and support the roof sheathing and covering. The roof for this building was designed, for the author, by the Arch Roof Construction Company, and details are shown on the included drawings.

D. The Stable Wing

The stable wing is one story high and on the upper side of the hill. There is a large breeding and general purpose room in the center of the wing,
with twenty stalls adjoining.

Convenient to the stalls and next to the breeding room are the harness, locker, and feed rooms which have cinder block partitions. The stalls are partitioned off with wood extending three quarters of the distance from floor to ceiling, and are equipped with sliding wood doors.

Over the end sections of this wing are the hay storage spaces. Steps provide access to these spaces.

CONCLUSION

Primarily this building has been designed functionally. Each unit of the plan is worked out so as to efficiently and economically accomplish its desired function. The cost factor has been kept in mind, and economy effected wherever possible.

The following pages contain drawings from which a fairly accurate estimate of cost may be obtained.