THE DEVELOPMENT, USE, AND PRELIMINARY EVALUATION OF A SELF-HELP MANUAL TO GUIDE THE EDUCATIONAL PLANNING OF SECONDARY SCHOOL BUILDINGS

VOLUME I

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

by

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1954

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ACKNOWLEDGEMENTS

Many individuals contributed to the successful completion of this study. To each of them the writer is grateful. He is especially thankful to his major advisers, Dr. Dan H. Eikenberry and Dr. John H. Herrick, for their encouragement, assistance, and constructive criticism; to the third member of the advisory committee, Dr. L. W. Harding, for his pertinent suggestions; and to Dr. M. J. Conrad for his technical advice and practical suggestions throughout the development of this entire project. The writer also is obliged to Dr. Herrick for proposing this study and for making the facilities of the Survey Division of The Bureau of Educational Research at The Ohio State University available to him.

Sincere appreciation is expressed to others, including graduate students, local-school staff members, school administrators, subject area consultants, and architects who analysed the planning manual in the various stages of development or used it in educational plant planning projects. The writer appreciates the help of secretaries in connection with the preparation of the planning manual and this document.

Last, but certainly not least, recognition is due the writer's wife, Lois, for her aid and encouragement and his two children, Janet and Robert, for their patience and understanding throughout the development of this project.

A. E. W.
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CHAPTER 1

ORIENTATION TO THE PROBLEM

The necessity for school buildings is recognized in considering provisions for a community's educational program. Unfortunately, school plant needs are not always determined upon the basis of all the criteria that should be employed in determining the plant facilities needed for any given educational program. Within the past quarter century there has been increasing acceptance of two principles in school building planning. One is that the school building should be planned in accord with the educational needs of the community. The other is that those who use a building are likely to know how to lay it out to function effectively.

Experiences of the writer as a member of the staff of the Survey Division, The Bureau of Educational Research, The Ohio State University, indicated that educational planning which involves local personnel would be facilitated if there were instruments to guide the planning. The writer proposed to analyze the plant planning process, determine the pertinent information regarding the educational program and physical characteristics of building facilities which the architect needs to facilitate architectural planning, and develop a self-help manual to guide the educational planning of a secondary school building. The manual was submitted to school plant architects.
school administrators, and school staff personnel for their judgments of the degree to which it would aid in the process of educational planning. It was also used in building planning projects to determine its effectiveness in these situations.

**Need for the Study**

In America a marked transition has taken place from the educational program of the early colonial days to the educational program of today. It has shifted from a very elementary program stressing reading, writing, and arithmetic to a broad program encompassing the major areas of modern living. School plant facilities have also changed markedly from the simple structure on a small site where a small group of pupils and a teacher carried on a simple educational program to the large, modern plant on a large site where hundreds of pupils and a score or more of teachers carry on extensive educational and recreational programs and are provided with many auxiliary services.

As alterations took place in the educational program, some modifications in school plant design developed. These changes in building, however, have not always resulted from changes in program. On the other hand, the school plant facilities have determined the nature of the program in too many instances.

Although the principle that a school building should be designed to house a given community's educational program is now commonly accepted by most authorities in the school plant field, it was not
until the last quarter century that more than cursory attention was given to such planning. (2:13, 59:9-13, 61:21-38) In spite of this concept of planning, there have been many instances in the not too distant past in which the architect was instructed by the local board of education to design a building similar to the one in another district or similar to the photograph of a building in a periodical. As recently as the past year, the writer learned of a secondary school building for which architectural planning was based in large measure upon the architect's individual knowledge of activities that are carried on in a high school.

Fortunately, an increasing number of administrators and school board members have become aware of the need to plan buildings on the basis of the educational programs to be housed. Many have assumed responsibility for developing educational specifications as guides to help architects to plan more functional buildings. Since there is an increasing acceptance on the part of building planners of the principle that those who use a school plant regularly should share in the determination of the rooms and spaces, the staff and the community are being involved in planning to a greater extent than was true two decades ago. (2:31-33, 27:8, 59:3)

As a result, educational plant planning in recent years has become more of a co-operative venture. The planning for some buildings has been executed almost entirely by local staff members. Others have been planned by school staff and community members participating and planning together. In still other situations, outside consultants have been
engaged to assist the local staff or the staff and the community with the educational planning.

Although recognition on the part of school administrators of the need for educational plant planning and acceptance of the principle that the staff should participate in the planning are steps in the right direction, additional factors influence the situation. One of the factors is that few school administrators are trained or have had experience in educational plant planning. A second factor is the limited number of educational consultants available to assist in educational plant planning. A third factor is the magnitude of the school planning problem which faces the nation's secondary schools.

In the 30 years from 1919 to 1949, the number of 14 to 17 year old youth in our population increased approximately 9 percent while the number of this age group attending public and private secondary schools increased nearly 300 percent. (63:226) The increase in enrollment has resulted primarily from the demands of modern society for a broader educational background and from the increased holding power of our secondary schools. (48:332) The increased holding power has developed to such a degree that Oxtoby, Wugge, and Wolfe stated: "We are rapidly approaching the time when high-school attendance will be nearly universal." (63:227)

Although improved and expanded educational programs have been instrumental in improving the holding power of the secondary school, much remains to be accomplished. The first progress report of the Office of Education survey of school facilities showed "... clearly that too large a portion of existing high schools... are unable to
provide certain facilities essential to today's acceptable educational program.*(69:56) Table 1 shows the percentage of high schools not providing certain essential facilities and reflects one aspect of the school plant problem which confronts the schools of our nation.(87:69-70) According to these data more secondary schools lack facilities for art and health services than for any other type of facility. In the classification of combined elementary-secondary schools, over 50 percent of the schools lack facilities for art, health services, music, and business education.

Another aspect of the school plant problem which our secondary schools face is the bulge in enrollments which is "forcing" its way up through the elementary schools and is just beginning to influence secondary school enrollments. Oxtoby, Mugge, and Wolfle concluded that:

With a steadily increasing percentage of the appropriate age group in high school and with the size of the age group increasing, high-school enrollments (public and private) can be expected to go up sharply, from seven million in 1951-52 to nearly 10 million in 1959-60 and to about 13 million in 1965-66. Not until 1961 will the full impact of the very high birth rates of 1947 and succeeding years be felt by the high schools.(63:228)

A third facet of the problem is the need to replace obsolescent school buildings. At the national level, the Office of Education estimated in 1951 that 150,000 new classrooms were needed for replacement for grades 1 through 12.*(69:56) Although the need to replace obsolescent classrooms is ever present, it has been greater during recent years because of building restrictions during World War II.
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Thus, the American secondary school is faced with the multiple problem of improving existing facilities to accommodate a modern educational program, replacing obsolescent classrooms, and providing additional facilities to accommodate increasing enrollments.

Whenever a community faces a school housing problem, it should ascertain accurately its school plant needs. Basically, these needs are quantitative and qualitative in nature. The number of teaching stations and auxiliary rooms required to house the future enrollment comprises the quantitative aspect of needs. The characteristics of the various facilities which are required to accommodate the educational program constitute the qualitative aspect of needs.

The determination of school plant needs resolves itself to finding the most feasible answers to the following questions:

1. What are the school plant needs as indicated by a study of the present and projected future educational program?

2. What are the school plant needs as revealed by an analysis of population and enrollment trends and probable future enrollments?

3. To what degree and in what manner can the existing school plant satisfy the requirements revealed by questions 1 and 2 and what additional facilities are needed?

4. What are the financial resources available to the board of education for undertaking a program of school plant improvement and expansion?

5. In light of the answers to the foregoing questions, what remodeling and new construction should be undertaken? (43)
Answers to these questions are usually determined by means of a survey of school plant needs.

There are several methods of making a survey. The following methods are illustrative of techniques used:

1. A self-survey conducted by local school personnel. The form the self-survey takes will depend upon the local scene. One possibility is for the superintendent to conduct the survey with active staff participation. Another possibility is for a member of the local administrative staff to conduct the survey with varying amounts of participation on the part of the teaching and non-teaching staffs. Another possibility is the citizens school survey.(83:1-209)

2. A survey conducted by educational and school plant specialists.

3. A co-operative survey conducted by local school personnel and educational and school plant specialists.(27:6-7)

Since each of these methods has certain advantages and limitations, it is necessary for a given community to study the survey techniques carefully in order to determine which is most likely to serve the community best.

When a community has determined through a survey what remodeling and new construction are needed, the necessary facilities must be carefully planned. Regardless of how carefully the educational needs are analysed, unless the school plant improvement program produces a plant which enhances the educational program, maximum benefits from the community's investment in its educational plant will not accrue.
When school plants are constructed without adequate attention being given to educational planning, unfortunate consequences develop. A school plant which has limited shop facilities is likely to force an academic-type program on too many youth. A plant which is designed to house large class groups in relatively small classrooms will hinder the development of an activity-type program. A plant which lacks flexibility of design makes it difficult to maintain a functional relationship among spaces as the program changes. Among other consequences which are likely to result when educational planning is slighted are the following:

1. Total building capacity is too great or too small.

2. Various subject area capacities are not related to the percentage of the total pupil population usually enrolled in these subject areas resulting in excess capacity in certain areas and insufficient capacity in other areas.

3. Auxiliary facilities in connection with teaching stations are poorly located or poorly planned on the basis of activities to be carried on.

4. Storage is inadequate in amount or improperly designed to protect materials to be stored.

5. Chalkboard or tackboard are improperly located or area of each is not related to anticipated use.

Although the architect frequently is blamed for these inadequacies in buildings, more judicious consideration of them will reveal, in many instances, that it is the educator rather than the architect who was at fault. (42:33)
The planning of a school plant is a process which requires cooperation on the part of the educators and the architects. It is the responsibility of the educator to do detailed educational planning, and it is the job of the architect "to arrange spaces and to enclose and to equip spaces to facilitate the desired educational activities." (42:33)

In the vast amount of educational literature there is an extremely large number of articles, books, and reports of studies dealing with school plant planning. Numerous items describe educational plant planning procedures used in connection with particular building projects. Of these procedures very few are of such a nature that general application can be made of the technique or instrument. The Information Blank on Proposed High School Building for the Town of Newton, Sussex County, New Jersey, described by Van Nuys in the American School and University is an example of an instrument designed to give the architect for the new Newton school some of the background data needed to guide the architectural planning. (88:139-142) Since the instrument was designed for a specific project, it does not lend itself readily to other projects. Two manuals which were developed by the New York State Department of Education to enhance community participation in educational planning of school buildings are: (1) An Educational Program for Our School, A Manual for Community Participation in Educational Planning, and (2) Room to Learn, A Guide for Community Participation in Planning for School Building Needs. These manuals were designed to provide considerable background information
of a philosophical and attitudinal nature. They provide, however, only limited information on anticipated educational activities in which pupils, teachers, and other staff members will be engaged.

Many of the guides on planning building areas use the "patent medicine approach." This approach is characterized by planning building areas upon the basis of status studies of the relation of subject area and total school enrollments with very little consideration being given to needs as reflected by the community's educational program. Such guides are valuable when they are used judiciously and adaptations are made to the local scene.

While there is widespread acceptance of the need for educational planning and an increasing acceptance of planning by local school personnel, there is a lack of instruments to aid planning at the local level.

**Purpose and Scope**

In the preceding section the writer showed that the secondary schools of the nation are faced with a sizable school building problem, stressed the need for educational planning, emphasized the need for local school personnel to participate in the planning, and indicated the virtual absence of instruments to aid local school personnel in educational plant planning. The problem of this study is to develop a manual of the self-help type to assist local school personnel in educational plant planning of secondary school buildings.
The ultimate evaluation of the manual as an aid to guide educational plant planning will be manifested in the degree to which widespread use is made of it in planning secondary school buildings and the degree to which buildings which are planned in accord with the procedures outlined in the manual are positive educational forces. By the very nature of these two items, it is clear that they must await time. Consequently, the final evaluation is beyond the scope of this study.

A preliminary evaluation, however, was a part of this study. For any appraisal of the manual to be significant, it should have a setting involving a building planning situation. Such a preliminary evaluation was accomplished in connection with building planning projects by analyzing the process which was involved in the use of the manual and by analyzing the judgments of the instrument offered by the educators and the architects involved in the projects. Another indication of the worth of the manual was achieved through an analysis of the judgments of the instrument offered by school administrators and staff members who have recently been involved in the educational planning of secondary schools without the aid of an instrument such as the planning manual developed in this study. A third indication of the value of the manual was achieved through an analysis of the judgments of the instrument made by architects who have planned secondary school buildings. Because of the magnitude of the task of analyzing the instrument, the writer anticipated difficulty in securing individuals in the last two categories mentioned above who would
be willing to make the analyses. Still another indication of the potential value of the manual was gained by an analysis of the reactions concerning the manual made by members of a school plant planning class.

**Plan of Attack and Sources of Data**

In this study the plan of attack in developing and applying the educational plant planning manual included the following major steps:

1. **Survey of significant literature related to planning secondary school plants.**
2. **Analysis of factors related to school plant planning.**
3. **Development of criteria for educational planning.**
4. **Development of a manual based on the factors related to school plant planning and the criteria referred to above.**
5. **Use of the manual in the educational planning of a secondary school plant and the submission of the manual to a limited number of school administrators, school staff personnel, and architects.**
6. **Preliminary evaluation of the manual in the light of its use in a plant planning situation and judgments of the manual by individuals involved in planning secondary schools.**

The sources of information for the development of the manual were a survey of the literature in the school plant field and the writer's experiences in the Survey Division of The Bureau of Educational Research of The Ohio State University in working with architects, school personnel, members of boards of education, and educational
consultants in educational plant planning. In the preliminary evaluation of the manual, two general sources of information were used. First, a limited number of school staff personnel, school administrators, and architects who have been involved in planning secondary school buildings were requested to examine all or a portion of the manual and respond to a questionnaire. The other source of data was associated with the use of the manual in the planning of two secondary school buildings. School staff members and the architects were requested at the conclusion of the planning process to respond to a questionnaire concerning the manual. The writer had a log of experiences relating to one of these projects since he served as the educational consultant. It was also possible in this instance to make a comparison between a preliminary plan that was prepared before any educational planning was done and the plans that were developed after the educational planning for the building was completed.

A Preview of the Chapters

Chapter 2 is a brief historical development of educational plant planning and a review of the recent related literature. Chapter 3 relates how the manual was developed and gives a brief description of it. Chapter 4 is a description of the use of the manual in a building planning project and Chapter 5 is a preliminary evaluation of the proposed plant planning manual. The summary and conclusions are stated in Chapter 6.
CHAPTER 2

HISTORICAL DEVELOPMENT OF EDUCATIONAL PLANT PLANNING AND REVIEW OF RECENT RELATED LITERATURE

Brief Historical Development

In spite of the fact that education was considered highly essential by our forefathers, they provided little in terms of school facilities. Viewed from this day and age it is difficult to reconcile the features which characterized the homes, meeting houses, and town halls of our forefathers with the apparent lack of interest in adequate school facilities. Many of the early schoolhouses were cast off log houses or meeting places.

Although school building planning, as we know it today, did not exist until early in the twentieth century, writings and early reports of state commissioners of education, city superintendents, and a limited number of architects showed a sensitiveness to many factors considered in present day planning. In the 100 years preceding World War I, considerable progress was made in school planning. In that century the school plant changed from the log schoolhouse located on a desolate spot with no playground space to the fireproof building placed on a site adequate for the needs of that period. (44:16)

The school plant planning movement may have had its inception in 1831 in Alcott's prize essay on the "Construction of School-Houses." (1) Alcott like so many other early writers in the field placed
major emphasis on the location of schoolhouses and the need for school playgrounds. He said:

The school house should stand on an elevated spot of firm soil, at a moderate distance from any other buildings, or any public road. A few shade trees should be near, and if convenient fruit trees. A piece of ground, consisting of from a quarter to half an acre, should be devoted to the purpose of the school, and enclosed by a fence or a wall in such a manner as to prevent, at the pleasure of the instructors, any communication from without. (1:243)

Alcott also discussed overcrowded conditions in schoolhouses and the inadequate facilities for heating and ventilating.

In a pamphlet written by Reverend G. B. Berry in 1833 "the too generally defective construction and arrangement of schoolhouses was severely condemned and the resultant evils exposed." (36:82) This pamphlet attracted widespread attention and resulted in improvements in schoolhouse planning and construction.

In Horace Mann's report to the State Board of Education in Massachusetts in 1838, he discussed locations of schoolhouses and the need for playground space. He stated that not less than a quarter of an acre should be considered for a school playground and that it should be enclosed from the public highway to protect the children from the cattle. (56:290) His second annual report stressed the effect of poorly located schoolhouses on the health of pupils; his fourth annual report emphasized the close relationship between schoolhouses and the cheerfulness and health of pupils. This report also emphasized the importance of schoolhouse architecture in the building and planning of
Holly indicated that many reports of state superintendents and state boards of education published before 1850 contained sections dealing with the following topics bearing on school planning: "... location of schools, playground size, environment, hazards for safe travel of school children, and the architecture of school buildings." (44:21)

"Henry Barnard was, no doubt, the first to give expression to the thought that school buildings, to serve their purpose adequately, must be characteristically designed." (32:295) Barnard's book, School Architecture, which appeared in 1848, was the first American work of its kind. He reported the extremely bad conditions which prevailed and offered suggestions for their betterment. He emphasized location, size, light, heat, ventilation, interior arrangements, and general good taste. (16)

An indication of the interest in schoolhouse construction that developed in the latter half of the nineteenth century is revealed in part by the following publications which appeared during that period.


1874 — *School Architecture*, by E. R. Robson, Fellow of the Royal Institute of British Architects and architect for the London School Board.

1886 — *The Hygiene of the Eye in Schools*, by Dr. Hermann Cohen, of the University of Breslau.

1897 — *School Hygiene*, by Dr. S. D. Risley, of Philadelphia.


Johonnot's *Country School-Houses* was one of the early efforts to apply the principles of architectural science to the construction of schoolhouses. Cohen gave great impetus to the study of school hygiene and his researches in this field led the way to reform in schoolhouse design by basing the designing of buildings on scientific principles. He recommended improved school hygiene to check, if possible, the grave danger of myopia among school children. Risley confirmed Cohen's findings and showed the relationship between poor lighting and ventilation and the increasing percentage of myopia. He also stressed the need to avoid extensive close work for young children to reduce eye fatigue and possible permanent injury. (26:7-11)

Comparing Johonnot's book with Wheelwright's treatise gives striking evidence, according to Engelhardt, of the changes in schoolhouse architecture and design which took place in the last part of the nineteenth century. (34:173) According to Folts, the first real impetus that American school architecture received came in the City of Boston in the 1890's where Edmund M. Wheelwright was city architect.
Wheelwright was an accomplished architect to whom credit belongs for arousing public interest "in the schoolhouse as a civic asset in embracing hygienic principles and possessing architectural merit in its design." (36:82)

In spite of the fact that significant changes in school plant design in the last 50 years of the nineteenth century were noted by Engelhardt, it can be said that the schoolhouses built during this period reflected a lack of significant educational planning. For instance, schoolhouses constructed in urban areas were identical with those previously planned for a rural population and, therefore, were not well designed to meet the needs of children living in the cities. The lack of significant planning, no doubt, was associated with an accelerated need for buildings because of urbanization, enactment of compulsory attendance laws, and the high school movement. The latter gained impetus because of the favorable decision in the Kalamazoo case.

Shortly after the turn of the century there was increased evidence that planning was preceding school plant construction. According to Foltz one of the important factors responsible for the advances in school architecture at this time was the changed attitude toward the subject. (36:83) As architects for school buildings began to be selected on merit rather than upon competition, political pull, and reduction of fees, leaders in the architectural profession entered the school plant field and a general improvement in planning of buildings resulted.
Another indication of greater interest in planning that developed in this period was the inclusion of a section on school buildings in general surveys of school systems. One of the first survey reports to include such a section was C. N. Kendall's survey of the Boise, Idaho, school system in 1910. (44:26)

Engelhardt compared the advances that took place in school architecture in the period from 1850 to 1920 in the following manner:

. . . . school architecture advanced from the low point of complete neglect to a high point of monumentalism. School buildings changed from small, shabby units to large, beautiful edifices, glorifying the people's devotion to education. The interior planning, however, expressed little change in educational method except, perhaps in those elements of the schooling process associated with larger pupil population. The perfection of administrative techniques for handling large schools was an important factor influencing interior planning. . . . (34:174)

Engelhardt's statement also revealed that only limited attention was given to planning buildings to house the community's educational program.

A study reported by Bentley in 1922 shows that junior high-school buildings were less elaborate than the senior high-school buildings of that day, classrooms were slightly larger than senior high-school classrooms, and science laboratories were generally large rooms with simple equipment. (18:400-404) A second study reported by Terry showed that buildings which were designed as junior high schools were in all cases more adequate for the junior high-school program.
than were remodeled buildings. (84:13-26) Both of these studies reflected the need to plan or rehabilitate buildings on the basis of the educational program to be accommodated.

As late as the 1920's there was no clear comprehension of the contribution which educators and architects should make to the planning of school buildings. Indications are that all too frequently the educators did not assume or were not given the opportunity to assume their full share of the responsibility. Kingsley, a registered architect, reflected the need for a close working relationship between architects and educators when he said:

I am more than ever convinced that the procedure in planning school buildings would be simplified, costs reduced, and greater returns for the money secured if the relations between the architectural and the educational factors were more closely understood. . . . (64:43)

Kingsley suggested three major steps to follow in relating architectural and educational planning. They were:

The first should consist in working out a scientific and specific schedule of rooms.

The second step . . . consists in developing layouts, or floor plans, for the various types of rooms adapted to the educational needs in the particular school.

The third step . . . consists in analysing the educational considerations affecting the location of rooms and departments. (64:43-44)
Although educational planning may have had its inception in Alcott's essay published in 1831, modern educational planning is generally regarded as having made its first strides following World War I. In the 1920's there developed a greater concern for wise planning of school buildings and several significant studies were made by Packer, Anderson, Wilson, and the National Education Association Committee on School House Planning. (11, 61, 64, 95) The National Council on Schoolhouse Construction which had its origin in an Atlantic City hotel room on March 2, 1921, has had a marked influence on schoolhouse construction. Since 1930 the Council has published guide materials on the planning of school buildings. (59:v)

Numerous other organizations have been active in this field and several periodicals such as the American School and University, the American School Board Journal, the School Executive, and the Nation's Schools contain articles dealing with school buildings. The first periodical has been a very influential publication in this field. The rapidly increasing enrollments following World War II have resulted in increased emphasis on the planning of school plants.

Review of the Recent Literature Related to Educational Planning of Secondary School Buildings

This section of the chapter includes a review of the recent literature in the school plant field. It is limited to a brief overview, a review of techniques for determining housing requirements, and a review of significant procedures for determining educational specifications for secondary school buildings.
Overview of the Literature

An extremely large number of articles, books, and reports dealing with the many facets of the school plant field have been written. The extensiveness of the literature in this general field is illustrated by the following published bibliographies:

1. The bibliographies on school buildings, grounds, and equipment compiled by Smith and others list more than 7,000 publications dated prior to January 1, 1937. (30, 45, 74, 75, 76, 77, 78, 79)

2. In the summary of research in the school plant field reported in the Encyclopedia of Educational Research, the writers have listed 120 of the most significant studies and articles in the school plant field. (30, 45:1119-1121)

3. The eight summaries of research in the school plant field reported in the Review of Educational Research between 1932 and 1952 contain approximately 3,700 items. (3, 4, 5, 6, 7, 8, 9, 10, 30, 45)

4. A selected bibliography of 1,250 current and significant business and plant references for the school administrator published in 1953 contains a section on school plant planning and design and a section on educational facilities, equipment, supplies, and materials. There are 391 references in these two sections. (53)

Of the approximately 2,000 items listed in the Smith and Chamberlain bibliography published in 1929, it is interesting to note that only 42 items were classified as pertaining to adaptations of buildings to specific educational needs. (74:64-66) Table 2 shows the years in which these items were published and reflects that little
consideration was given to planning for specific educational needs prior to 1920.

### Table 2

**NUMBER AND OCCURRENCE OF PUBLICATIONS ON ADAPTATIONS OF BUILDINGS TO SPECIFIC EDUCATIONAL NEEDS**

<table>
<thead>
<tr>
<th>Years of publication</th>
<th>Number* of items</th>
<th>Years of publication</th>
<th>Number* of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1908-09</td>
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<td>1918-19</td>
<td>5</td>
</tr>
<tr>
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<tr>
<td>1916-17</td>
<td>2</td>
<td>1926-27</td>
<td>2</td>
</tr>
</tbody>
</table>

*Excludes one undated item.

### Studies on Housing Requirements

Six studies in the school plant field which deal with housing requirements calculations are discussed in this section.

1. Packer Study

The purpose of the Packer study was to provide a means for designing secondary school buildings on the basis of the programs they are to house. The first formula for determining the housing requirements of a high school grew out of this study which was published in 1924. Packer related four elements -- registered number of students
in the subject, average number of daily periods devoted to the subject, average size of class, and the number of periods in the day—to determine the number of rooms needed.

According to Packer the impracticability of scheduling interchangeable or non-specialized rooms every period of the day makes it necessary to correct the results obtained by this formula. For specialized rooms no correction for program making is necessary other than rounding off every fractional part of a room as a whole room. There seems to be no justification for a correction in one instance and no correction in the second.

2. Study of the N. E. A. Committee on School House Planning

In one chapter of a comprehensive treatise on schoolhouse planning and construction published in 1925 by the Committee on School House Planning and Construction of the National Education Association there were discussed five techniques for determining the schedule of rooms for modern junior, senior, and six-year high schools. (61:25-38) Two of these five techniques were designated as incorrect and three as correct methods.

The first of the two incorrect methods assumed that the capacity of a school is based on the number of seats in classrooms. (61:26) Schools designed on this basis seldom provide the proper number and kinds of classrooms to house the desired program because the proper relationship between specialized and non-specialized rooms is usually not achieved.
In the second incorrect method, the capacity of the building was expressed by the total capacity of the rooms that could be used as homerooms. (61: 26-27) This method overestimates building capacity since most rooms can be used as homerooms and the formula makes no allowance for variance in class size.

The first correct method consisted of making a schedule of classes for the new high school. (61: 27-31) The schedule had to be developed so it was suitable for use when the school reached its maximum capacity. This approach seems to be the first attempt to plan a school building to accommodate a given program of class activities.

The second correct method was based on the number of pupils in each subject. (61: 31-34) In essence, this approach was synonymous with the one which Packer used, except that a chart to be used in calculating the room requirements was substituted for the formula. Scheduling problems were discussed but not resolved.

The third correct method was based upon the average number of periods per week the pupils would spend in classroom instruction, gymnasium, and study and assumed for a particular educational program the average distribution of pupils in these areas would remain constant as the total enrollment varies. (61: 35-36) This method was the first attempt to relate the amount of time spent in three types of activities but failed to recognize other specialized needs such as industrial arts or home economics.
3. Anderson Study

In 1926, Anderson reported the results of a study of 27 junior high schools ranging in enrollment from 359 to 1,800. On the basis of the data gathered, he developed two formulas: one for determining the number of rooms and a second for ascertaining the average capacity of regular and special classrooms.

The Anderson and Packer formulas differed in that the former was based on a weekly schedule and the latter was based on a daily schedule. The two formulas also differed in the approach used to allow for scheduling of special and regular classrooms. Since Packer and Anderson used different approaches to the correction needed for scheduling, it is likely that neither one had a thorough understanding of the problem involved and was merely reflecting current practice.

For a number of years the Survey Division of The Bureau of Educational Research of The Ohio State University used a slightly modified form of the Anderson formula in determining the room requirements for secondary schools. Utilization factors determined by Bureau studies were substituted for the factor suggested by Anderson. A factor was applied in the calculations for regular and special classrooms.

4. Wilson Study

In 1933, Wilson completed a study of the educational programs of 345 high schools in the State of New York having enrollments ranging between 50 and 400 pupils. From an analysis of the relationships
between the number of classes and the enrollments, the author developed formulas for determining the housing requirements for enrollments between 50 and 400 pupils.

The author set up a series of charts for determining the number of special rooms needed for subjects such as chemistry or home economics and the study hall capacity required for any enrollment within the range of 50 to 400 pupils.

In 1936, Wilson reported similar formulas for determining the housing requirements for enrollments between 400 and 3,000 pupils. (95:31-37)

Since the Wilson formulas developed out of status studies, buildings planned in accord with them will be totally satisfactory only to those communities which require an educational program akin to that of the mythical average school within each population group.

These formulas have been used "for a number of years by the Division of School Buildings and Grounds in the University of the State of New York." (30:29)

5. Conrad Study

The Conrad study developed out of the need for a more accurate method of determining the capacity of existing secondary school buildings so that communities can assess accurately their school building needs. (30) This study was reported in 1951.

In the development of a formula for determining secondary school building capacity, the author related the following factors to building capacity.
1. Number and type of teaching stations
2. Desirable average class size
3. Room assignment policies
4. Nature of the educational program
5. Length and number of periods
6. Staggered schedules
7. Multiple sessions
8. Specialization of rooms

The formula is applied to each subject area separately so that a capacity figure for each area is determined. This process determines the total school enrollment which can be accommodated in the various subject areas of the building. The lowest pupil capacity limit determined for any given subject area represents the maximum number of pupils the building can accommodate without modifications in the structure or in the educational program. (30:180) Work sheets were developed to facilitate the use of this capacity determining technique.

Since this capacity formula relates capacity to educational program and policies, it can also be used in the planning of new secondary school buildings. This technique is superior to other methods for determining housing requirements for the following reasons:
1. It involves a more realistic correction for the impracticability of scheduling every room and every pupil station of a secondary-school building every period of the week. This is due largely to a more complete understanding of this factor — its cause as well as its effect.

2. The technique is very useful in projecting future expansion in the original planning of secondary-school buildings. Due to the difference between fractional and whole room requirements, some areas will not need to be expanded unless extreme increases in enrollment come about while other areas will be used to capacity by the planned enrollment and should be located where they easily can be expanded without destroying the functional relationship of the various areas of the building. (30:97-98)

The Conrad approach is somewhat complicated for the novice or for the one who wants an easy answer to the housing requirement question. On the other hand, it is complete; it takes into consideration all factors involved in room requirement calculations for regularly scheduled classes and study; and it includes detailed instructions.

This technique has been used in recent years in the Survey Division, The Bureau of Educational Research, The Ohio State University.

6. Castaldi Study

One of the publications of the New England School Development Council which appeared in 1953 was the Castaldi Homogram. (23) This publication is a tool to aid the administrator in translating the educational program of a secondary school into the necessary number of instructional spaces or classrooms. In this pamphlet, Castaldi re-emphasized the importance of planning the educational program well in advance of the construction of the building.
The Castaldi Nomogram consists of three specially designed charts or nomograms for determining the number of teaching stations or rooms required to house any given enrollment in any subject if three factors -- number of teaching periods per week in the school program, the proposed class size, and the number of periods each pupil attends that subject per week -- are known.

The author in the development of his formula assumed that a pupil station utilization of 80 percent must be allowed in all areas in calculating the housing requirements. By the use of the nomogram it is also possible to determine class sizes, to discover the adequacy of proposed multi-purpose rooms, and to compute the fraction of a school day rooms will be used for any given subject when certain enrollment and other related data are known.

The Castaldi approach to the determination of housing requirements proposes no procedure to assist the school plant planners in determining the anticipated enrollments in the various subject areas. No provision is included by the author for calculating housing requirements for study purposes for any pupils who are not enrolled in class activities every period of the school week.

Techniques for Developing Educational Specifications

As was indicated in Chapter 1, there are very few techniques which have been developed to assist local school personnel in determining the educational specifications for secondary school buildings. Four techniques are described in the following paragraphs:
1. Van Nuys Information Blank

To assist in gathering the necessary information which the architect, Jay C. Van Nuys, needed to design a high school building at Newton, New Jersey, he developed a 33 page information blank. Among the items included in this document are:

- School enrollment data
- Functions of the Newton High School
- Information on graduates
- Bus loading and unloading
- Furniture
- Window shades
- Drinking fountains
- Schedule of space requirements and description of classroom features
- Study halls
- Student lockers
- Showers
- Multiple purpose rooms
- Teachers' offices and lounges
- Communications and audio-visual equipment
- Pictures and exhibit space
- Instructional supplies
- Service entrances, parking, and outside entrance units
- School grounds
- Corridors
- Future additions to proposed building(89:2)
In commenting on the need for such basic information, the author said:

The architect, the school staff, and the people of the community have a part to play in shaping the new school building. The highest level of co-operation is necessary to plan a building, which is functional, durable, and suitable for the purpose of the program. The architect's design cannot rise above his knowledge and understanding of the community in which the school is being built.

An architect can no more guess the form of a building than a tailor can guess the size and shape of a man. Both must make careful detailed measurements and work within the limits of those measurements. Architect, school staff, and laymen should work together to collect, analyse and interpret this information.

Since this information blank was developed specifically for the Newton High School, its application is limited. The information requested gives the architect very little data concerning the nature of the activities in which school staff, pupils, and others will be involved. The author did suggest, however, that the architect should consider information requested in the blank as only the beginning in understanding the community and its schools.

2. The Ohio State University Technique

For a number of years The Ohio State University has made available to boards of education the services of an educational consultant to assist them in the planning of school buildings. This technique is based upon the following basic principles:
1. A school plant should be designed in terms of specific educational specifications developed by educators.

2. People who will use the new building should share in the planning of it.

3. The original planning should be on an idealistic basis, even though it is known that available funds will force some curtailment. (42:37)

The procedure involved in this planning process has consisted of the following steps:

1. Development of the initial planning procedures and techniques in terms of local conditions.

2. Organization and work of local planning committees.

3. Analysis of data and formulation of building requirements.

4. Preparation of program of requirements.

5. Analysis and modification of program of requirements.

6. Approval of program of requirements by board of education and transmission of program of requirements to architect.

7. Preparation and evaluation of architect's plans. (92:103)

General instructions for committee organization and suggested procedures for committees have been presented in mimeographed form and detailed instructions have been provided through a memorandum to the superintendent and through joint meetings of the superintendent, staff committees, and consultants.

When this technique was initiated, two reports were developed for the use of the board of education, the school administrator, and
the architect. The first report, the quantitative room and space requirements report, included certain basic data as grades to be housed, program of studies, student activities, and anticipated enrollments; the calculated classroom requirements; and the non-classroom requirements. The second report, the program of requirements, contained descriptions of the various facilities to be provided.

Some modifications in this procedure were developed in recent years. One modification was the development of a series of educational planning forms, XP forms, on which the local school staff members can indicate to the educational consultant certain salient characteristics concerning the classroom and non-classroom spaces. The second modification was the substitution of a single report which combined the essential features of the two earlier reports.

3. Memorandum of the Association of School Business Officials

Recently the research committee on schoolhouse planning and construction of the Association of School Business Officials published a memorandum to "suggest to the school administrator and the board of education a broad outline of the information that should be transmitted to the architect," to serve as a guide in the development of architectural plans. (22:iv)

The outline suggested that information such as the following should be provided for the architect: money available; description of the site; features of the elementary school such as philosophy, organization, pupil population, and type of building; and similar information concerning the secondary school.
In 1944, the State Education Department of New York published a manual on problems confronting boards of education which bore the subtitle, *A Manual for Community Participation in Educational Planning*. Following rather extensive use, the manual was revised and supplementary manuals were developed.

One of the supplementary manuals, *Room to Learn: A Guide for Community Participation in Planning for School Building Needs*, had a section designed to guide the processes involved in seeking a solution to the problem, "What kind of buildings will meet our educational needs?" (86:7) This section, Part III, suggested steps for the board of education to follow in determining the kinds of buildings that will meet the educational needs revealed by the study suggested in Parts I and II.
CHAPTER 3
THE DEVELOPMENT OF THE MANUAL

Chapter 1 indicated the magnitude of the school plant planning problem which confronts our secondary schools and the need to do educational plant planning prior to the construction of school plants. Chapter 1 also indicated the dearth of materials of a self-help nature that is available to guide educational plant planning. In this chapter, the process of developing an instrument of a self-help type to guide the educational plant planning process is explained.

Out of the writer's experiences in school plant planning projects in the Survey Division of The Bureau of Educational Research of The Ohio State University, there developed an awareness of the need on the part of educators for an instrument to serve as a guide in developing the educational specifications needed in the architectural planning of school buildings. It was also evident that the architects with whom the writer worked definitely wanted certain basic information to assist them in the development of preliminary or basic architectural plans. As one architect stated recently: "Certain critical problems arise as I plan a mortuary one week and start to plan a school building the next week if I do not have educational specifications for the school building."

- 37 -
In addition to these experiences, the writer found in the literature in the school plant field numerous articles written by educators and architects alike which emphasized the need for educational plant planning. (2, 42, 49, 59, 88, 92)

**Guiding Principles for Educational Plant Planning**

As a result of a study of the literature dealing with the planning of school plants and the writer's experiences in assisting with the planning of school plants, certain guiding principles for educational plant planning emerged. These principles were developed to serve as guides in developing the manual. Although no attempt has been made to determine the degree of acceptance of the principles by authorities in the school plant field or to validate them by submission to a panel of school plant experts, there is little doubt, as the following discussion will show, that they represent current thinking of authorities in this field. These principles are presented by the writer in full recognition that changes in educational or architectural practice may render some of them invalid in the years ahead.

The principles are:

1. The development of a modern educational program necessitates that planning involve all aspects of building and site in their functional relationships to the educational needs of youth and the adults of the community.

2. Representative personnel who will use a school building should participate in the planning of the various facilities.
3. The plan of the school plant should be such that teachers can function effectively in the multiple roles of guide, counselor, and planner.

4. Individuals who participate in planning school plants should study literature related to the growth and development of youth and to the planning of school plants, visit select old buildings to study changes which have been made to maintain functional plants, and visit select new buildings to study promising new features.

5. The educational plant should be designed for economical and efficient adaptation to changes in pupil enrollment, to changes in the amount and nature of curricular experiences, and to changes in teaching techniques in all instructional areas.

**Elaboration and Interpretation of Principles**

In this section the principles are elaborated and references made to the literature which substantiates the concepts which are developed.

**Principle 1:** The development of a modern educational program necessitates that planning involve all aspects of building and site in their functional relationships to the educational needs of the youth and the adults of the community.

This principle suggests there are certain educational needs which are unique to each community. It also suggests planning the educational plant to facilitate the educational work to be done to meet these needs. (39: 202, 72: 22) There is almost universal agreement on the concept that a school plant should be planned on the basis of the educational program that is to be accommodated. (2:13, 80:202-213, 59:1-16, 61:26-38, 65:411-412) Unfortunately there are
a "few people who would still defend the proposition that a school building should be designed with first attention to external, aesthetic considerations."(42:33)

In spite of general agreement on this principle there are still evidences that school buildings are being planned on the basis of central tendencies, i.e., basing the number of teaching stations required for a given enrollment on the mean number of teaching stations found in existing buildings housing the given enrollment. For example, when an architect was asked recently how he determined the number and kind of teaching stations he proposed for a four-year high school to accommodate 350 pupils, he said: "We provided the same number and kind of rooms that we always provide for 350 pupils." Another example is a recent business education publication which specified the business education facilities which should be provided for certain enrollment groups without suggesting that consideration be given to local needs in this field.(22)

Bursch suggested that central tendencies and existing classroom standards should merely serve as the starting point for the development of educational plants.(20:67)

Principle 2: Representative personnel who will use a school building should participate in planning the various facilities to be provided.

Undergirding this principle is the concept that those who use the various facilities in an educational plant will have considerable
understanding about planning them to serve effectively as tools to enhance the educational program. (2:31-33, 19:352-353, 27:8, 59:3, 73:280) In this principle, the writer does not intend to imply that the staff of any given school could effectively plan a school building without some guide to planning or without some assistance at some crucial spots depending upon the nature of the project and the qualifications and abilities of the staff. Furthermore, the principle does not imply that a sound practice would be to plan a building by “adding together all of the requests and suggestions of any staff.” (42:36) It does imply, however, that the staff, pupils, and others who will use the building have unique contributions to make toward planning since they have the best understanding of how various features will function educationally. Because of their wide experience architects and educational consultants are in a position to suggest to the staff many workable features. (54:346, 88:142)

In commenting on postwar classrooms, Bursch said, among other things, that if postwar classrooms are “any better than those of prewar days, it will be because more intelligent and rational planning procedures are adopted. . .” (20:67)

Principle 3: The plan of the school plant should be such that teachers can function effectively in the multiple roles of guide, counselor, and planner.

Modern concepts of learning suggest that a variety of teaching techniques are required so that maximum educational benefits will
accrue to all youth. (29) To enhance the operation of the educational program, the various facilities which constitute the school plant must be so designed that it will be possible for the teachers and pupils to carry on the types of activities which will enable the learners to achieve maximum benefits from the school experiences. (35: 39-40, 40:52-57) The building must permit the teachers and pupils to operate in a variety of different patterns. Unless adequate consideration is given to the activities of the teacher working with the pupils, the facilities are likely to dictate the nature of program. (42:34)

Principle 4: Individuals who participate in planning school plants should study literature related to the growth and development of youth and to the planning of school buildings, visit select old buildings to study changes which have been made to maintain functional plants, and visit select new buildings to study promising new features.

Once the general nature of the educational program has been determined considerable attention must be given to planning the building facilities. (42:34-35, 73:281-284) School buildings should not be visited with the purpose in mind of getting ready-made layouts. On the other hand, visiting such buildings affords an opportunity to learn how plant facilities are enhancing or not enhancing the educational programs they are housing. These visitations can provide the staff with an abundance of ideas which can help them in their own planning. This procedure will also help them to envision facility layouts which are likely to be effective for years to come.
This step in the planning process is crucial and requires the staff members and others who are assisting in the planning to be on guard against permitting purely individual desires or undesirable past experiences to have too marked an influence on the planning. Two examples which developed in the early planning stages of a sizable addition to a senior high school will illustrate this point.

In early planning, a teacher of vocal music wanted benches on risers in the vocal music studio because movable chairs which had been used in the past were a source of confusion and seemed to create a housekeeping problem. After visiting music facilities in some old and some new buildings none of which had benches and noticing that the literature on vocal music studios did not recommend bench-type seating, the teacher of vocal music began to check the sources of past difficulties. The major problem of confusion arose from the fact that the existing risers were so narrow that it was difficult for pupils to stand without upsetting the chairs. Furthermore, the teacher realized that benches could not be moved readily, could not be stored, and would tend to freeze the pattern of operation. He also found that the housekeeping problem resulted from the difficulty the custodians had in finding time to work in the studio.

The second example deals with the planning of a chemistry laboratory. Since the teacher placed a premium on individual work, his original plans provided a fixed laboratory set-up which made it practically impossible for pupils to work together. After visiting some laboratories which were recently planned, reviewing literature on science layouts,
and discussing the planning with a science consultant and the school superintendent, this teacher seriously questioned the validity of the early planning. In each of these cases, later layouts reflected planning in terms of a variety of potential uses.

A study of select old buildings which have been modified to meet changing educational needs should indicate factors deserving of consideration in planning -- what facilities teachers and others are using, what facilities do not work well, and what reasons prompted changes to be made.\(^{(24)}\)

In the study of new plants, it is essential to understand why new features were added and what their relationships were to the educational program.\(^{(24)}\) No facility old or new should ever be reproduced unless it will enhance the community's educational program. Features which restrict the program ought to be ferreted out and avoided.

**Principle 5:** The educational plant should be designed for economical and efficient adaptation to changes in pupil enrollments, to changes in the amount and nature of curricular experiences, and to changes in teaching techniques in all instructional areas.

The task of suggesting to the architect which phases of the educational program are likely to change in the years ahead rightfully remains with the educator although the fulfillment of such a task may well require the foresight of a prophet.\(^{(8:9-14, 81:280-284)}\) The educators should also be able to suggest to the architect which areas of the building are likely to show the first signs of overcrowding as the
enrollment begins to exceed the planned capacity of the building so additions can be made without destroying the functional relationship of spaces. (37:59, 39:203) For instance, the nature of certain sociological problems in an Ohio city precludes the possibility of offering distributive education as a part of the present business education program. Since there were definite signs that distributive education would possibly be a future offering, preliminary planning included a room which can be converted to this use in the future but which can be used to house classes in the existing program. In a second instance where a new district was recently formed, indications were that consideration should be given both to agriculture and to industrial arts as possible subject offerings. Whether either one or both of them would be needed was not clearly evident. A poll of the boys in the district showed approximately equal interest in these two areas. For the present a combination industrial arts-agriculture shop was planned. Regardless of the direction the program may take in the future this single facility can be readily converted to either use. The proposed location of this facility is such that as the enrollments exceed the planned capacity of the building a second shop and a related classroom can be added.

In a discussion of trends in education which are significant for school building planning, Smith said:

The one conclusion is this: The perfectly planned building does not and cannot exist. A finished product represents at best a static situation, hence necessarily a situation bordering
on the edge of disintegration and decay, both physically and functionally. Our best hope is for a struggle for as nearly perfect and comprehensive goals or educational purposes as possible, recognizing the inevitable pressures for change that must be expected of every growing organism or institution. The school plant, with its equipment, is constantly under the necessity of modification and improvement. Change is imperative, and our search for adequacy and flexibility of structure and function is continuous.(80:35)

Criteria for the Development of a Manual to Guide Educational Plant Planning

In this section, criteria for the development of an educational plant planning manual are listed and discussed. These criteria, like the principles enumerated in the preceding section of this chapter, developed from two sources — the writer's work experiences in educational plant planning in the Bureau of Educational Research and a study of pertinent literature in this field. These criteria were not validated by any formal process. They were tested, however, as the writer discussed the manual with school personnel, school plant consultants and architects throughout the development of the various pamphlets.

The criteria are:

1. The manual should be readily understandable to all who use it.
2. The manual should be relatively easy to use.
3. The manual should be easily administered.
4. The manual should facilitate a co-operative approach to planning.
5. The manual should provide for the architect the essential information concerning the desired educational program, the required rooms and spaces, and outdoor facilities.

6. The manual should present the necessary basic data to the architect in such a form that undue restrictions are not placed on his initiative and creativeness.

7. The manual should be so designed that a minimum of additional processing of the basic data is needed to prepare the manual for transmittal to the architect.

8. The manual should be applicable to the planning of secondary school buildings in general.

9. The manual should place on the educator the resolution of decisions regarding educational policy.

Elaboration and Interpretation of the Criteria

Criterion 1: The manual should be readily understandable to all who will use it.

It is obvious that any manual which is to be of value as a guide in planning a secondary school plant must be understandable to the people who will use it. Among those who may participate in the use of a manual such as this are school administrators, certified and non-certified staff personnel, pupils, board members, laymen, architects, educational consultants, and engineers. The extent to which representatives of each of these groups will participate naturally will vary from project to project. Nevertheless, in developing the manual all of these personnel must be considered as potential users.
Criterion 2: The manual should be relatively easy to use.

The ease with which any instrument can be used is an important determinant in the decision to use it. Within limits it can be said that the use which is made of an instrument is directly proportional to the ease with which it can be used.

There are two difficult problems which are faced in planning a school building. First, by its very nature the planning of a secondary school building is a difficult and time-consuming process. Second, most local school personnel will seldom assist with the planning of more than a single building. The instrument which guides the planning process must be developed so that it minimizes as much as possible the arduousness of the planning task for the staff members, school administrators, and any others who may be involved in the planning process. It must make it feasible for those involved in planning to translate their concepts of functional school plant facilities into understandable educational specifications for the ultimate use of the architect.

Criterion 3: The manual should be easily administered.

Much which was said under criterion 2 is equally applicable to this criterion. Specifically, this criterion has reference to the ease with which the school administrator or the building planning director can set up the program of educational planning. The manual should indicate: (1) a suggested committee structure, (2) what groups
are to use the various portions of the manual, (3) for whom each
portion of the manual is to be completed, and (4) how each individual
or group is to use each portion of the manual.

Criterion 4: The manual should facilitate a co-operative approach to planning.

One of the guiding principles established earlier in this chapter
proposed that representative personnel who will use a school building
should participate in the planning of the various facilities. Since
there is increasing acceptance of this principle among personnel in
the school plant field, educational plant planning in recent years
has become more of a co-operative venture. (2:31-33, 27:8, 59:3, 54:346-
552) The manual, therefore, must lend itself to a co-operative approach
to planning.

It must be developed so that committees representing the various
facets of the community’s educational program can work effectively in
the development of the educational specifications for each type of
room or facility. The technique should permit committees to work in-
dependently as much as possible and also to make provision for inter-
committee work. Certainly in planning auditorium facilities repre-
sentatives of groups such as music, speech, dramatics, and possibly
others who will use the auditorium should be included.

The manual must include provisions for rectifying any inconsist-
encies which may result from numerous groups working independently
with various phases of the manual.
Criterion 5: The manual should provide for the architect the essential information concerning the desired educational program, the required rooms and spaces, and outdoor facilities.

Any instrument which is to be of value to the architect in developing plans for a school building should provide the architect with the basic information needed for this purpose. In commenting on information which is needed in planning school buildings, Bursch said:

Classroom space planning may well take a leaf from the book on playground development procedures. Square feet per child served was found to be a totally inadequate way to size a playground. . .

. . . Before the planner can interpret educational activities into space activities, he must know what types of furniture, fixtures, equipment, exhibits, and supplies are to be used, as well as the number of pupils involved. He must know intimately the storage requirements for instructional supplies and equipment, and for the personal effects and projects of students. (20:16)

Information concerning outdoor facilities is also needed by the architect since planning of indoor and outdoor facilities must be carefully related for maximum efficiency of use and safety. (39:202-203)

An article by Perkins in a symposium on the role of the architect and the educational consultant suggested that the architect wants to know what is to be accomplished by the building, how many groups of such and such age will require how much space to carry on such and
such activities, the sum total of these spaces, and the relationships among them. (65:35)

Criterion 6: The manual should present the necessary basic data to the architect in such a form that undue restrictions are not placed on his initiative and creativeness.

The job of the architect is primarily to design spaces that will economically and safely house the desired educational program and anticipated enrollments. In doing this he must plan a structure that facilitates most and hinders least the activities that educators and other staff and lay personnel envision will occur in the building. (39:202-203) To design such a structure will require creative imagination and technical skills on the part of the architect. (41:34)

Although the architect needs a vast amount of data to plan an economical and efficient school plant, the educational specifications should not be of such a nature that his creativeness and initiative are hampered. Educator and architect alike should understand that each is not to carry on the other's role; on the other hand, each will have many suggestions to offer to the other. The manual should establish clearly that the information, sketches, and other data or illustrations are primarily to suggest to the architect certain desirable features. Any suggestions the architect uses in the solution of his problem should consist of those for which he will assume final and complete responsibility.
Criterion 7: The manual should be so designed that a minimum of additional processing of the basic data is needed to prepare the manual for transmittal to the architect.

The process as developed in the manual should be of such a nature that the information presented to the architect can be used by him with a minimum of additional processing. This phase of the task has two aspects. First, the information should be in such a form that the individual or groups responsible for the educational planning can transmit the information to the architect with a minimum amount of processing. Second, the architect should be able to use the information with a minimum amount of effort on his part.

The first step is somewhat complicated because, as was suggested previously, early planning should be on a rather idealistic basis. Since certain inconsistencies are likely to develop when more than one group is involved in educational planning, the manual should make provisions to summarize the basic data into a reasonably consistent statement of needs and desires. The extent to which the local staff will be able to develop a summary which describes facilities which are within budgetary limitations will depend upon the availability of personnel competent to estimate costs. In any event, the architect ought to have the opportunity to use his skill in providing a reasonably satisfactory amount of space in which to house the activities likely to occur in the school plant.

Obviously if the architect has to devote an undue amount of time to process the information for his use, he is likely to seek his
information elsewhere. When he does this, the school plant which he
designs may not be designed for the educational program it is to house.

Criterion 8: The manual should be applicable to the
planning of secondary school buildings
in general.

It is doubtful whether any one instrument can be developed which
has universal application to the complete gamut of buildings that can
conceivably come under the classification of secondary school plants.
Nevertheless, the manual should be so designed that it can be used in
planning a wide range of secondary school buildings regardless of the
age or grade levels to be housed or the nature of the program to be
offered.

A corollary of this criterion of general application is that the
manual should not force a preconceived building pattern upon those
who are doing the educational or architectural planning.

Criterion 9: The manual should place on the educator
the resolution of decisions regarding
educational policy.

After such information as the age, grade, or other groups; the
future enrollments; and the nature of the educational program to be
housed have been determined, certain other major policy decisions
which must be resolved in the planning of a secondary school building
include the following:

1. Average number of pupils to be accommodated each
   period in the various instructional rooms.
2. Room assignment policies.

3. Number and length of class periods in the school day and the school week for which classrooms will be available for instructional purposes.

4. Facilities which must be planned for multiple uses.
   a. Determination of degree of specialization for which rooms are to be planned -- special versus interchangeable teaching stations.
   b. Determination of teaching stations which will be available in the time schedule for multiple uses.
   c. Analysis of activities in various phases of the program which can be accommodated in multiple-use facilities.

Since these as well as other items which may develop in an individual project are matters which should be decided by the educator, the manual should make provisions for the educator to provide this information for the architect. (42:34, 37) Obviously, as the planning progresses there may be need for many conferences between the architect and the educator to determine the most feasible compromises on many problems.

The Nature of the Manual and Its Development

As was stated in an earlier chapter, the major purpose of this study has been the development of a manual to assist local school personnel with the educational plant planning process. The statement was also stated earlier that the manual has been designed specifically to guide those phases of the planning process in which the number and the
characteristics of the various facilities are determined. The nature
of the manual and its development are discussed in the paragraphs
which follow. The manual contains four major parts:

1. A suggested procedure to use in educational plant
planning.

2. A technique for determining the number of rooms or
teaching stations needed for regularly scheduled
class activities.

3. A procedure for specifying detailed characteristics
of the various facilities needed in the new plant.

4. A procedure for summarizing the number and charac-
teristics of the facilities required in the new
plant.

In developing the manual the writer assumed that the educational
planning is to be done by individuals or groups who will use the new
building or by representatives of those groups. Each of those individ-
uals or groups should participate in the planning only to the extent to
which each is in a position to make a contribution to the planning pro-
cess. The manual is designed to facilitate the co-operative approach
to planning.

Procedures for Educational Plant Planning

Suggested procedures for doing co-operative planning are provided
in the manual. This approach was adopted since a basic assumption un-
derlying this study was that better schools will be planned and better
use will be made of them if the co-operative approach to planning is
used in lieu of other methods. These procedures are included in the
Housing Requirements for Regularly Scheduled Class Activities

One of the first tasks in the development of the manual was to select or develop a technique to determine the necessary number of teaching stations required for regularly scheduled class activities. The writer analyzed the Packer, Anderson, Wilson, and Conrad techniques for determining secondary school housing requirements. The Packer, Anderson, and Conrad techniques were based upon the educational program and pattern of pupil electives. The Wilson technique was developed from a statistical study of hundreds of school programs and assumed a uniform educational program. Another technique developed by Castaldi which uses an approach akin to that of Packer, Anderson, and Conrad, was reported in Chapter 2, but was not available at the time the writer made the selection referred to in this section.(23)

Of these techniques for determining the housing requirements, the writer selected the Conrad capacity formula as the basic approach to the problem. This formula is:

\[
(1) \quad i = \frac{a \cdot d \cdot e \cdot i_1}{P_1}
\]
in which "i" is the total building capacity which could be accommodated by existing facilities in each subject area; "a" is the number of teaching stations in a given subject area; "d" is the desirable average class size for the particular subject area; "e" is the total number of periods of instruction per week; "i_1" is the average total school enrollment for a given period, and "p_1" is the average total number of pupil periods of instruction in the given subject area for the same period of time. (30:179)

For the development of this formula, the reader is referred to the original study by Conrad. (30:56-61)

An illustration will help to show the application of the Conrad formula. The total building capacity which can be accommodated by existing facilities in the science area can be computed from the following information:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of science teaching stations</td>
<td>6</td>
</tr>
<tr>
<td>Desirable average size of science classes</td>
<td>25</td>
</tr>
<tr>
<td>Total number of periods of instruction per week</td>
<td>40</td>
</tr>
<tr>
<td>Average total school enrollment for a five year period</td>
<td>1,200</td>
</tr>
<tr>
<td>Average total number of pupil periods of instruction in the science area during the five year period</td>
<td>4,500</td>
</tr>
</tbody>
</table>

Substituting these data in the Conrad formula, equation (1), gives:

\[ i = \frac{6 \times 25 \times 40 \times 1200}{4500} = 1,600 \]
That is, 1,600 represents the total school enrollment out of which a sufficiently large number of pupils will elect science subjects to require six teaching stations for science. Therefore, 1,600 is the total building capacity which can be accommodated in the science facilities. After a similar calculation is made for each subject area, the operating capacity of the building is regarded as being the capacity of that subject area which has the lowest total building capacity. (30: 60-61)

Since the writer is concerned with calculating the number of teaching stations required for any given future enrollment and any given educational program, certain adaptations of this basic formula were made. Solving equation (1) for \( a \), the number of teaching stations, gives:

\[
(2) \quad a = \frac{p_1}{d \cdot e \cdot i_1}
\]

If \( f \), future enrollment, is substituted for \( i \), building capacity, equation (2) becomes:

\[
(3) \quad a = \frac{p_1 \cdot f}{d \cdot e \cdot i_1}
\]

This form expresses the equation in terms of future enrollment which is a commonly accepted factor upon which building planning is based.

If in equation (3), \( a \) is assumed to be equal to one and the symbol \( c_1 \) is substituted for \( f \), the equation becomes:
Solving the equation for \( c_1 \) gives:

\[
(5) \quad c_1 = \frac{d \cdot e \cdot i_1}{P_1}
\]

in which \( c_1 \) represents the capacity of a single teaching station for any given subject area. That is, \( c_1 \) represents that total school enrollment out of which enough pupils will be enrolled in any given subject area to utilize one teaching station full time. The symbol \( c_1 \) is defined as the "teaching station capacity index." (30: 94)

An illustration will help to clarify the determination of the teaching station capacity index for a given subject area. To make this calculation the following data are necessary: (1) the average class size, (2) the total number of periods of instruction per week, (3) the average total school enrollment for a given period, and (4) the average number of pupil periods of instruction in the subject area. For this illustration, if the subject area is mathematics and the following data are substituted in equation (5):

- \( d \) -- average class size \[ 30 \]
- \( e \) -- total number of periods of instruction per week \[ 40 \]
- \( i_1 \) -- average total school enrollment for a five year period \[ 1,200 \]
- \( P_1 \) -- average total number of pupil periods of instruction in mathematics for the five year period \[ 4,000 \]
then equation (5) becomes:

\[ c_1 = \frac{30 \times 40 \times 1200}{4000} = 360 \]

Therefore, the teaching station capacity index for mathematics, "c₁," is 360.

If equation (3) is written as:

\[ a = f \frac{P_l}{d \cdot e \cdot i_1} \] (6)

and equation (5) is written as:

\[ \frac{1}{c_1} = \frac{P_l}{d \cdot e \cdot i_1} \] (7)

then, \( \frac{1}{c_1} \) from equation (7) can be substituted for the factor \( \frac{P_l}{d \cdot e \cdot i_1} \) in equation (6) resulting in the following equation:

\[ a = f \frac{1}{c_1} \] (8)

or:

\[ a = \frac{f}{c_1} \] (9)

If "TS₁" is substituted for "a," the number of teaching stations, and "FE" is substituted for "f," the future enrollment, equation (9) becomes:

\[ TS_1 = \frac{FE}{c_1} \] (10)
Therefore, to determine the requisite number of teaching stations for each different subject area to be accommodated in the new building, the anticipated future total school enrollment is to be divided by the teaching station capacity index for each subject area.

The following calculations will illustrate the determination of the number of teaching stations needed for mathematics when the capacity index is 360 and a future enrollment of 1,600 is to be accommodated. Substituting these data in equation (10) gives:

\[
TS_1 = \frac{1600}{360} = 4.5 \text{ or } 5
\]

Accordingly, the number of teaching stations needed for mathematics is 5.

The total number of teaching stations is equal to the sum of the number of teaching stations for each subject area or:

\[
(11) \quad TS = TS_1 + TS_2 + TS_3 + \ldots + TS_n
\]

in which "TS" is the total number of teaching stations required to house any given future total school enrollment and any given educational program.

The writer selected the Conrad technique for the following reasons:

1. The technique relates housing requirements to the educational program and includes such factors as:
   a. Desirable average class size.
b. Room assignment policies.

c. Length and number of periods of instruction per day.

d. Specialization of rooms or teaching stations.

e. Complexity of the pattern of subject elections.

(30:178-179)

2. The technique makes a more realistic correction for the impracticability of scheduling every room and every pupil station of a secondary school building every period of the week than the other techniques referred to above.(30:97)

3. The technique makes provision for the complete process of determining housing requirements from the initial collection of data to the final calculations.

4. The technique makes it possible for the school administrator to make program changes, schedule changes, and adjustments in anticipated class enrollments, with current data -- data with which the administrator is most familiar.

5. The technique makes provision for determining housing requirements for study purposes as well as for regularly scheduled class activities.

Conrad developed work sheets and detailed instructions to simplify the process of calculating building capacity.(30:82-95) For purposes of calculating teaching station requirements for regularly scheduled class activities, the writer made certain modifications in the Conrad forms. The alterations in the forms were made for a more direct approach to the determination of the number of teaching stations required for any anticipated future enrollment as well as the number of additional teaching stations which may be needed in future expansion. The modified forms and detailed instructions for their use are contained in Pamphlets B-1 and B-2 in Appendix A.
Characteristics of the Educational Plant Facilities

The third part of the manual was developed for the purpose of assisting those involved in educational planning to gather the essential data needed by the architect in developing building plans. In this portion of the study, it was necessary to determine what basic information the architect needed in the development of architectural plans and how those who are likely to use the building can provide the information for the architect.

To determine the basic information needed by the architect, the writer:

1. Analyzed a series of educational planning forms developed at The Ohio State University to secure certain basic information from school personnel to be used in the development of programs of requirements.

2. Analyzed information provided in programs of requirements for numerous Ohio secondary schools which were developed for the use of architects by the Survey Division, The Bureau of Educational Research, The College of Education, The Ohio State University.

3. Analyzed a program of requirements for a junior high school in a western city which was developed for the use of the architect by a nationally known team of educational consultants.

4. Analyzed an information blank which was prepared for a specific building situation by an architect with the assistance of school plant consultants to obtain certain basic information about the community and the school population to be served and certain basic information about building facilities desired.

5. Analyzed a memorandum prepared by the Association of School Business Officials to suggest information which the board of education should furnish the architect.
6. Analyzed other related literature, especially articles in periodicals, which discussed information which should be furnished to the architect.

7. Discussed with school administrators, teachers, school plant consultants, and architects the essential information needed by the architect in the planning of school buildings.

From these sources and from the writer's experiences in assisting with the educational planning of several secondary school buildings in the Bureau of Educational Research, the writer concluded that the architect generally needs the following basic information:

1. The number and type of teaching stations, non-class facilities, auxiliary rooms, or service facilities.

2. The nature and extent of the major activities which will occur in each facility or the nature and extent of the uses which will be made of each facility.

3. The location of each facility in relation to building and outdoor facilities.

4. The amounts and locations of chalkboard and tackboard.

5. The kinds and amounts of furniture and equipment.

6. The kinds and locations of utilities.

7. The types, dimensions, and quantities of materials to be stored.

8. The auxiliary facilities needed in connection with each teaching station, major non-classroom facility, or service facility.

9. The capacity of each facility.

10. The suggested floor area needed for each facility to accommodate projected activities or uses.
11. Other activities which may be accommodated in each facility.

The items in this list reveal who will use each facility, what those individuals or groups will do in each facility, where the activities will occur, and how much space is needed to carry on the activities. When the architect has this information, he can compute how much space he needs to enclose and can determine where the space should be located in relation to other facilities or other activities which are likely to occur in the plant.

The list of basic information was discussed with architects and school plant consultants for completeness. It was also discussed with school administrators who had recently been involved in school building programs to determine whether there was any information not included in this list that they felt the architect should know. Although there was basic agreement with this list, the final evaluation of the worth of the information and the comprehensiveness of the list will come only through the use of the manual in numerous school plant planning situations.

Since modern school plants generally consist of numerous rooms housing different types of activities, the development of the manual was related to this concept of building design. Consequently, a separate portion of the manual is devoted to each of the major types of activities which occur in the modern secondary school. This decision rests wholly on the commonly accepted principle that it is best "to start where people are."
The Development of the Format of the C and D Pamphlets

The format of the pamphlets, especially that of the pamphlets in the C-series, underwent numerous revisions prior to the adoption of the form shown in Appendix A. At this point some of the major factors which had a bearing on the development of the format are discussed briefly.

The technique of educational plant planning as developed in the manual had its roots in work which was done in the Survey Division of The Bureau of Educational Research at The Ohio State University, by Whitehead shortly after World War II. (42:33–38, 92:102–108)

The approach used in the Survey Division at that time included the following phases:

1. Collection of essential data — course of study, subject enrollments, pupil activities, changes in program, and periods of instruction per week — which are needed to do educational planning.

2. Involvement of local school staff committees in the achievement of the following functions:
   a. Evaluating the existing secondary-school purposes and program.
   b. Recommending changes in the existing purposes and program for secondary schools.
   c. Preparing a statement of educational and building requirements for each area of the secondary school involved in the building program. (92:104)

3. Development of room and space requirements.
4. Development of a program of requirements based on room and space requirements and coordinated committee reports of educational and building requirements for each area to be contained in the proposed secondary school building.

5. Evaluation of architectural plans in terms of their conformity to the educational specifications.

In this approach the educational consultant carried the responsibility for the major phase of the educational planning. Local school authorities directed the activities of the various committees after the consultant assisted in setting up the committee procedures.

Since Survey Division staff members were of the opinion that many building features of a qualitative nature could be treated in a general way in a single document that might have application to elementary school buildings, Whitehead and others developed a guide for planning elementary school buildings. (93) Extensive use was made of the guide and it served to simplify the development of educational specifications for elementary school buildings. It soon became evident that the document was no longer serving the purpose of suggesting "desirable objectives for the architect to achieve." (93:108) Unfortunately many of the suggestions in the guide became standards. Because of this standardizing influence of the guide, the plans of the Survey Division staff to publish a similar guide for planning secondary school buildings were abandoned.

Although it was very effective for school staffs to go through the entire planning process which was outlined above, Survey Division
staff members recognized the need to simplify the process. The need for modification developed from two sources — the need to reduce the time required to do educational planning and the desire on the part of the Survey Division staff to meet increasing demands from the field for assistance in planning school buildings. The first step in the simplification resulted in the development of a series of so-called educational planning forms, EP forms, for gathering essential data from the school authorities and staff concerning the proposed school plant. In general, each of these forms contained numerous questions to be answered by the staff members.

To acquaint the reader with the nature of these forms, excerpts from two of them are included here.

**EP-13**

**Library and Study Hall**

1. What groups will regularly use the library facilities?

2. Is the library to be used for a homeroom, study hall, or any other use besides regular library use? If so, what?

11. Summarize the conditions under which pupils are permitted to go to the library.

14. How many study halls will a pupil have on the average each week? _______

16. Describe the needed library and study facilities as you see them.
1. Characterize briefly the principal activities to be carried on in this room. Give enough detail to enable architect to realize building needs. For example, in describing a kindergarten room mention might be made of the fact that children sit on the floor in a semi-circle to have a story read to them.

2. State briefly any educational point of view or purpose which you think it might be advisable to mention to support your later suggestions regarding facilities to be provided in this room. Your comments here might make your later suggestions clearer to those who plan the building.

6. List the major items of equipment needed, including movable furniture, cupboards and built-in equipment, and large pieces of apparatus.

8. Indicate by appropriate comments your suggestions regarding the following:
   a. Heating and ventilating
   b. Lighting
   c. Plumbing
   d. Floors
   e. Acoustical treatment
   f. Chalkboard
   g. Bulletin board
   h. Other features
The titles of the forms in the complete series are as follows:

EP - 1 Anticipated Enrollment by Grade
EP - 2 Anticipated Enrollment by Subjects
EP - 3 Student Activities
EP - 4 Staff Personnel
EP - 5 Daily and Weekly Schedule
EP - 6 Pupil Transportation
EP - 7 Community Use of Building
EP - 8 Site Information
EP - 9 Financial Information
EP -10 Lunchroom
EP -11 Health Service
EP -12 Audio-Visual Aids
EP -13 Library and Study Hall
EP -14 Auditorium
EP -15 Building Service Facilities
EP -16 Staff Suggestions Regarding ________ Facilities

At the time this study was initiated, the EP forms were on file in the Survey Division, The Bureau of Educational Research, The Ohio State University.

From the data on these forms and certain other supplementary data obtained from the school authorities in conferences, the Survey Division staff members prepared two documents — the quantitative
room and space requirements report and the program of requirements. The former indicated the number of rooms of the various types needed to house the program and the latter, the characteristics of the rooms. In recent years only one document — a program of requirements — which combined the essential data from the two reports has been prepared.

As the EP forms were used it became evident that certain of the forms, especially the one dealing with the characteristics of the teaching stations, were not adequate. The skilled educational consultant could use them to secure from the local school staff and the school administrator the essential information about the local school system and its educational program to develop a program of requirements to guide architectural planning. The forms were not designed, however, to assist the local school staff in the development of educational specifications for the use of the architect.

It was at this stage that the writer became interested in the possibility of developing an instrument which could serve as a guide to local school personnel in developing educational specifications. In the remaining pages of this section, select phases of the development of the pamphlets in the C-series are related to illustrate the process. Throughout the discussion references are made to various pamphlets.

The first illustration deals with the development of a technique to relate information to the architect on the nature of activities likely to occur in the new plant. For an architect to develop a
school building for a given community's educational program, he needs information on the philosophy and the program of the school. Whitehead and Featherstone suggested that one step in educational planning is for the staff members to evaluate and revise the secondary school purposes and program. Seager suggested that the first three steps in the development of educational specifications are the preparation of the following statements:

1. Philosophy of the community.
2. Philosophy of the school.
3. The aims and objectives of each department.

The value of evaluating and revising the school's statement of philosophy by the school staff cannot be denied. After careful consideration of the value of a statement of philosophy as a part of the educational specifications for a secondary school and the use which an architect can make of such a statement, the writer concluded that an indication of the nature and extent of activities that are likely to occur in the various portions of the contemplated school plant would be more meaningful to the architect than a statement of philosophy. School administrators, school plant specialists, and architects with whom the writer conferred were in considerable agreement on such a procedure.

Experiences with the XP forms suggested that merely requesting various committees to list activities that would be carried on in the various facilities was not sufficient since statements were usually too general. In one instance the staff committee suggested that
grammar, English and American literature, and speech classes were the principal activities to be carried on in a language arts room. Information such as the following would have been more meaningful to the educational consultants:

1. Carry on panel discussions.
2. Do research using materials stored in the classroom.
3. Display materials on bulletin boards.
4. Display small scale models of scenes from plays in enclosed display cases which are visible from corridor and classroom.
5. Write on chalkboards only on occasions.

The next question which the writer faced was the degree to which suggestions should be made to local-school planning-committee members. After the writer used the EP forms, he was of the opinion that the manual should contain a good many suggestions. Therefore, the first versions of the manual contained numerous suggestions for staff members to consider. Numerous interviews were held with school teachers and administrators in an attempt to develop rather comprehensive lists of activities. Some consideration was also given to submitting lists of activities which are likely to occur in various rooms to juries to test the lists for completeness. This procedure was abandoned since any list that might have been developed for any given building area would have to be exceedingly lengthy and could not possibly be all-inclusive. Also the main purpose for including suggestions in the manual was to provoke consideration on the part of staff members of
the suggestions as well as others. To indicate any other types of activities which are likely to be carried on in any given room, space was provided in the pamphlets in which to list them, e.g., see page 3, Pamphlet C-4.

Early in the development of the manual, the writer was of the opinion that some means should be provided for the educational planners to express the degree to which certain items in the manual are important or the degree to which certain plant facilities will be used. The need for this became evident after the use of an early version of the manual in a planning situation. In this version check lists were used to indicate preferences for items. The manner in which these check lists were used made it obvious that checking was too easy -- only a small number of items were not checked. One of the staff members from the supervisory staff in the county where this high school is located suggested that he did not want to omit a single item. He wanted a good school and if the item was in the list it ought to be of some value. This was done in spite of the fact that some items represented divergent points of view.

To ameliorate this situation, techniques by which to rate items were developed. Consideration was given to various rating techniques, such as:

1. Numbering items in a given list on the basis of priority -- "1" as highest, "2" as next highest, and so forth.

2. Rating items on a four or five point scale.

3. Indicating whether or not items are acceptable.
The second and third techniques are used throughout the various pamphlets. Examples of these and the explanations of the rating scales are contained in Pamphlet C-1, pages 3 to 5.

The degree to which suggestions should be made was a problem throughout the development of the entire manual. After reading one rather extensive list on suggested facilities for the auditorium, an educational consultant made the comment: "Would you like a million dollars?"

In discussing the suggestions the writer included on audio-visual education facilities, this consultant wondered whether the manual should lead the staff members to recognize desirable features, such as having audio-visual aids available in the classroom ready for use at the time they will fit into the instructional program best. In another instance, listing the supply room and the health suite in the pamphlet on administrative facilities raised the issue of suggestions freezing the pattern of school plant design. That is, does the approach force these two facilities to be included in the administrative suite?

As a result of these and similar comments, the writer developed those sections of the pamphlets where suggestions were included primarily as a means to indicate to the committees the nature of the features to be considered. Every attempt was made to avoid making suggestions which would tend to predetermine the building design. As these suggestions were developed, they were discussed with teachers to discover sections where there was a tendency to set a pattern and
where revision was needed. The number of suggestions was also cut down to reduce the length of the document. For more flexibility, provisions for free responses were included.

The first pamphlets were developed with detailed directions incorporated into each section. Although this procedure was convenient for the staff committees, the resulting pamphlets were exceedingly long. Such an arrangement forced the architect to go through many paragraphs of directions as he used the various pamphlets. To alleviate this, a separate pamphlet of directions, Pamphlet C-1, was developed.

Two common items which are included in most classrooms are chalkboard and tackboard. As one means of portraying to the architect the amounts and desired locations of each, simple sketches representing the three interior walls of any given room were included in early editions of the pamphlets along with directions for completing the sketch. One of the sketches and the accompanying directions were as follows:

On the sketch below indicate the desired amount and location of chalkboard and tackboard needed in this room. Consideration should be given to uses which will be made of chalkboard and tackboard and to the amount needed to carry on the desired program. In addition to the length of each desired, consideration should also be given to the desired height of the base of the boards above the floor.

It is desirable to experiment with the suggested locations and dimensions to see if it is possible to accommodate the types of materials to be mounted on tackboards or to use such aids
as metersticks on the available vertical width of chalkboard. Heights at which pupils and teachers will work while using the chalkboard should be determined.

Doors, storage spaces, work counters, and other items along available wall spaces should be considered and should be included on the diagrams. Since these items reduce or eliminate the use of the walls for chalkboard and tackboard purposes, it is necessary that the planners give consideration to a utilization of spaces which is consistent with the educational program. Some wall spaces over work counters, for instance, may be available for tackboards but their use would be limited and, therefore, are not too desirable.

Suggested legend: chalkboard ///// tackboard ———
Teachers and administrators who attempted to use these diagrams found them difficult to use and architects, as well as educational consultants, were of the opinion that the educator was doing the planning for the architect. They were of the opinion that suggesting the desired amounts and locations for those items was sufficient. Those experiences dictated the approach used in the pamphlets, e.g., see pages 3 and 4 of Pamphlet C-4. The pamphlet of directions suggests how committee members can determine how much of each of these items is needed (see pages 8 and 9 of Pamphlet C-1).

When the writer attempted to determine what types of information should be included on furniture and equipment, he encountered wide diversity of opinion. There were those who deemed it necessary to specify in each of the pamphlets sufficient information about each item of furniture and equipment so that specifications for bidding purposes could be developed from them. Others claimed that only information which is needed by the architect in planning facilities should be included. There is merit in providing a single list that can be used for both purposes. However, making specific designations of all equipment at the educational planning stage definitely tends to tie the architect's hands and does not permit him to use his ingenuity in planning. Specific data on certain types of furniture and equipment may have to be included at the educational planning stages but these are exceedingly limited. For instance, in planning a greenhouse in connection with a biology laboratory for one school, the staff wanted a specific type of aquarium because of certain
unique characteristics. At that time no equivalent was available on the market. Without a doubt, specific information should be included in such a case.

As can be seen by reference to any of the pamphlets, such as pages 4 and 5 of Pamphlet C-4, the writer is including only those items which the architect needs to know to develop plans. In most pamphlets desk and seating facilities are treated separately from other items since they represent items which are included in most teaching stations. A separate listing of other items of furniture and equipment is included so that the staff committees can indicate to the architect the extent to which the items will be used. The ratings enable him to tell which items must be given first consideration in planning. Provision is also made to list other items of furniture and equipment.

Reference is made to furniture and equipment on page 7 of the pamphlet on directions, Pamphlet C-1. These directions include the suggestions made by one school plant consultant and confirmed by an architect that two desirable techniques for portraying types of furniture and equipment desired are to make references by number to furniture and equipment catalogs and to include properly labeled photographs.

Storage was another item about which the writer found considerable controversy. Some claimed that it was necessary to specify exactly the storage facilities needed and others claimed that the data to be provided for the architect were the kinds, amounts, and
dimensions of items to be stored. When problems have arisen over storage facilities in new buildings, and there have been many, they can be attributed to the educator as frequently as they can be to the architect. At first the writer gave consideration to providing information on all storage facilities in a single pamphlet. When he discussed such an arrangement with architects, teachers, and school administrators, their first reactions were nearly always favorable. The arrangement seemed to attract attention because it would be possible to check to see if all storage needs were being met. However, when consideration was given to the method for gathering information and the manner in which it would be used by the architect, such an arrangement lost its appeal. Nearly all were inclined toward including all information on any one facility in the same pamphlet.

Following the principle that the planning of the building facilities is an architectural problem, the writer developed the sections of the pamphlets dealing with storage so that the educator can indicate the extent to which certain storage facilities will be used and what materials are to be stored. The items in these lists were developed as a result of a study of school plant literature and building plans, visits to school buildings, and conferences with school staff members.

Programs of requirements developed for the use of the architect usually contain suggested floor areas to guide the architect in developing preliminary architectural plans. These floor areas are usually determined under the guidance of educational consultants or architects.
If the development of educational specifications is being done by the local staff, as this manual suggests, the services of an educational consultant may not be available. Whether the teacher, the school administrator, the educational consultant, or the project architect should determine the space needed to conduct a band rehearsal or a social studies class has not been clearly defined. Ideally the architect should ascertain the area needed from data which the educator furnishes on activities likely to occur in the rooms. When the architect determines the area, the question arises as to whether the educator should accept the architect's decision or make his own analysis of the area needed as a check on the architect's proposal.

Seagers proposed that the staff members should suggest the space needed but that:

... it will take some screening, because if we give the teachers all the space they want we may get a building three times as large as we need. It is going to take some such authority as an administrator not the architect, perhaps in consultation with others, to arrive at realistic space allotments. (71:36)

The writer has taken the point of view that the educator should suggest the floor area needed for each room or should suggest specific data to help determine the area. Directions to help the educators determine the area needed are included on pages 9 and 10 of Pamphlet C-1. The architect should not accept this area unless he is convinced that it is proper. With the suggested floor area as a guide, the educator can readily evaluate the areas suggested in architectural plans.
To achieve highest utilization of spaces and to meet financial limitations, it is frequently necessary or desirable to make dual uses of certain facilities. In keeping with the point of view that those who use facilities ought to participate in the planning of them, the proposal is made in the various pamphlets, as is shown on page 7 of Pamphlet C-4, that the staff members suggest what activities are likely to function well in the various rooms as well as those that are least likely to function well. When the architect finds it necessary to make multiple uses of the various facilities, he has information to suggest to him what activities can be housed in the same rooms.

An early edition of the language arts pamphlet contained one section on teaching stations and another section on auxiliary rooms. Since the single section on teaching stations was predicated on the need for only one type of language arts classroom in any building, one educational consultant suggested the need for a section to show modifications from this pattern should the educational program in a given school require one or more language arts teaching stations designed to meet particular aspects of the language arts program.

The addition of this section in language arts created a chain reaction which influenced the design of most other pamphlets. This change necessitated that references be made to regular and special teaching stations for most subject areas. A regular teaching station in these situations was defined as one which could serve nearly all the needs of a particular subject area regardless of whether it
could also accommodate a variety of subject areas.

This change dictated a need for additional changes in many subject area pamphlets. For example, in the pamphlet on music facilities, Pamphlet C-10, a section is included on vocal, instrumental, and combination vocal and instrumental teaching stations. For other subject areas, school plant and subject area consultants were opposed to any such classification because it would tend to set the pattern of subject offerings. To provide for greater flexibility in subject offerings within subject areas, certain pamphlets were developed so that the local-staff planning committees have to designate the type of teaching station to be planned. This approach is illustrated in section E, pages 11 to 29 of Pamphlet C-7, INDUSTRIAL ARTS, and in the same section of Pamphlet C-12, SCIENCE.

One industrial arts consultant insisted that the designation of the types of teaching stations should not be left to the local staff. He said that the only desirable approach is to state precisely in the manual what offerings should be included in the industrial arts program for any given enrollment. To include standards such as he suggested would violate the basic principle upon which the planning manual was based. The needs of the local community rather than the number of pupils enrolled should determine the facilities to be provided in the educational plant.

A similar arrangement for designating information on certain auxiliary rooms is used in several pamphlets, e.g., section G on pages 34 to 40 of the science pamphlet. Because of the variety of
teaching stations and auxiliary rooms which may be necessary for a
given vocational education program, the entire pamphlet, C-14, is set
up on this basis. Pamphlet C-15, on administrative facilities, as well
as others, was developed in a similar manner.

After the major activity and service facilities were included in
separate pamphlets, the other plant features such as health service
facilities, homerooms, special activity or service facilities for
pupils and staff, toilets, and community use facilities had to be con­
considered. Logically each of these could and were treated in separate
pamphlets in one of the early forms of the manual. Primarily on the
basis of sheer numbers of pamphlets, these items were later included
in a single pamphlet, C-19, MISCELLANEOUS FACILITIES. Inclusion of
these in a single pamphlet is, no doubt, a greater convenience for
the architect in using the pamphlet than it is for the staff members
in filling it out. The members of the staff committee on miscellane­
eous facilities in one project found it to their advantage to separate
the sections of this pamphlet while they worked on them. Later
the sections were re-stapled for the architect.

From the first, the writer recognized the need for a summary of
the data contained in the various pamphlets. At this stage the sum­
mary appeared to be one which would list in tabular form certain data
about the various facilities. An early form of the table included
such items as: name of the unit (classrooms or non-classroom facili­
ties), maximum number to be accommodated, number of rooms of this
type in original construction, additional rooms to be added at a
later date, floor area, and proposed location. Although a list of the various rooms to be provided in new construction is desirable, this type of summary was not sufficient.

One attempt to provide a means for making modifications in the data presented in the various pamphlets to eliminate inconsistencies was to include in one version of the summary pamphlet a section entitled Revisions. Such a procedure was soon discarded since the pamphlets would state one thing and the data in the section on revisions another. Such an arrangement would force the architect to study the section on revisions first since he could not be sure that the data in each pamphlet were not revised. This technique also tended to place a premium on revisions when the purpose of a summary ought to be co-ordination.

The need for a different type of summary was also recognized by the administrator of school C in Situation B. He proposed that the staff-planning-committee chairmen for music and physical education write brief statements summarizing the salient characteristics detailed in their pamphlets and that they compare their summaries and make necessary revisions so that the data presented would be in agreement on common elements. His thought was that the architect would grasp major ideas from the summaries and go to the individual pamphlets for details. He also reasoned that if the two summaries were in accord on common items, the architect would be able to develop plans which showed a higher degree of conformity with the educational specifications for this building.
Shortly after these co-ordinated summaries were presented to the writer, an educational consultant also suggested that a procedure be developed whereby the data could be summarized, and screened and co-ordinated if need be.

Pamphlet D-1 contains two types of summaries. The first of these consists of tables in which the general committee is to list the building and outdoor facilities to be provided. The second consists of suggested forms which the general committee can use to summarize and co-ordinate the salient information contained in the various pamphlets. These summaries are contained on pages 3 to 12 of Pamphlet D-1.

Page 12 of this pamphlet is Form 6. This form, according to the directions on page 8 of Pamphlet D-1, is for listing miscellaneous suggestions which have not been covered in other portions of the manual, such as:

1. Special groupings of rooms to achieve a particular purpose.
2. Suggested wall finishes, floor surfaces, wainscotting, and similar features.
3. Special considerations to be given to lighting, ventilation, acoustics, and factors dealing with health, safety, and sanitation.
4. Undesirable building features to be avoided.

In this section a brief review of the major steps which were followed in the development of the format of some of the pamphlets has been presented. In the next section a typical pamphlet in the C-series is discussed.
A Typical Pamphlet in the C-series

A discussion of a typical pamphlet in the C-series will acquaint the reader with the general organisation of the pamphlets. Pamphlet C-4, BUSINESS EDUCATION, which is contained in Appendix A, is typical. The first page of this pamphlet shows that provisions are made to provide information on several types of business education teaching stations and auxiliary rooms. On the second page provisions are made to indicate the number of business education teaching stations required in the new building and the subject offerings in the business education area. This information is obtained from Pamphlet B-2 and is to be included in Pamphlet C-4 so those planning the business education facilities will know how many teaching stations are to be planned.

Section D, pages 2 to 3½ of this pamphlet, makes provisions for those involved in planning to provide information about any or all of the teaching stations listed below.

Regular business education teaching stations
Bookkeeping teaching stations
Typing teaching stations
Combination business education teaching stations
Distributive education teaching stations
Other special teaching stations

Included under the heading Typing Teaching Stations, pages 12 to 16, are the following items:
1. Number of teaching stations to be planned
2. Extent to which activities are likely to occur in the teaching stations
3. Amount of chalkboard and tackboard needed and other special considerations the architect should know
4. Furniture and equipment
5. Storage facilities
6. Suggested floor area
7. Additional information which architect should know
8. Other uses which can be made of this type of teaching station

Sections E and F, pages 24 to 27, make provision for indicating the auxiliary rooms which are needed in connection with the teaching stations. Information requested about the auxiliary rooms is similar to that requested about the teaching stations suggested in the paragraph above.

The next section, Section G, page 28 of this pamphlet, suggests that the planners provide for the use of the architect any additional information not previously included as well as schematic diagrams or pictures to portray desirable features to the architect. Factors which the architect should take into consideration when determining the location of the business education rooms are to be listed in Section I, page 28. The final section of the pamphlet, page 29, is to be used for summarizing the rooms to be provided for the business education area.
Detailed Instructions for the Use of the Pamphlets in the C-series

Detailed instructions to follow in using the pamphlets in the C-series are included in Pamphlet C-1. Specific directions for filling out the pamphlets are included on pages 2 to 7 of this pamphlet. This section includes the following items:

1. Pamphlets to be used
2. Techniques to indicate information
3. Identification of teaching stations and auxiliary rooms
4. Summary
5. Number of copies of each completed pamphlet to be prepared

Although these items are self-explanatory, the first two will be discussed briefly at this point. For any given school plant planning project, it is not likely that all portions of all the pamphlets, C-2 through C-19, will be needed. Those involved in the planning will of necessity have to select those pamphlets and those portions of each pamphlet which pertain to the program to be housed. For instance, if no vocational program which involves a major portion of a pupil's time in training for a specific trade is to be included in the contemplated program, Pamphlet C-14 on vocational education will not be used. Likewise, if only one business education teaching station is to be provided, only the section entitled Combination Business Education Teaching Stations in Pamphlet C-4, BUSINESS EDUCATION, should be filled out. The other sections on teaching stations should be left blank.
Although several kinds of teaching stations are suggested in many pamphlets and any given subject area committee may desire to have a separate teaching station for each activity or subject or a separate teaching station for each staff member, the results of the calculations made in Pamphlet B-2 will indicate the number and kind of teaching stations required for each subject area. Obviously as the staff members are involved in planning and continuous analysis of the educational program takes place, some modification in the number of teaching stations may prove to be desirable.

From the summary contained on the last page of each pamphlet, the architect will be able to tell which sections of the pamphlet have been completed.

One of the major problems faced by the writer was the extent to which suggestions could be made to those engaged in planning without fixing the building pattern with regard to such items as room sizes, activities which should be housed, and locations of units. To keep structuring at a minimum, the writer has included with each listing of suggestions an opportunity for those doing the planning to suggest other factors which the architect should know. Another technique which is used in the pamphlets to urge those who use the manual to be somewhat discriminate about the information presented is the use of rating scales. These scales are explained on pages 4 and 5 of Pamphlet C-1.

Additional suggestions for guidance in completing the pamphlets in this series and a glossary of terms are included in the final
section of Pamphlet 3-1. In this part pertains to the determination of
the floor area needed for the various facilities. If the architect
knows that activities are likely to occur in a given facility, he can
determine the exact space to enclose. Nevertheless, it is desirable
to suggest to the user the educator conceives as a desirable amount
of floor area. The directions suggest that the educator determine
the amount of area needed by experimenting in a large floor area or
with scale models. A similar proposal is made for determining the
amount of equipment and material needed.

Although it can generally be said that most efficient use of a
room is likely when it is planned for a specific activity, such use
is not always economically possible or feasible. Therefore, consid-
eration must be given to multipurpose use of facilities. In accord with
a principle stated in Chapter 1 that those who use school plant facili-
ties should participate in the planning of them, provisions are made
in the pamphlets for the educators to indicate desirable multipure-
poses which can be made of facilities.

In connection with each proposed facility, the educators are
asked to indicate what other types of activities are "the most likely
to function well in this type of room, and "the least likely to function
well in this type of room.

Summary of Facilities

A natural result of different groups working more or less inde-
dependently is developing educational specifications for the various facili-
ties in a certain degree of inconsistency in specifications. The
section of Pamphlet C-1. One part pertains to the determination of the floor area needed for the various facilities. If the architect knows what activities are likely to occur in a given facility, he can determine how much space to enclose. Nevertheless, it is desirable to suggest to him what the educator conceives as a desirable amount of floor area. The directions suggest that the educator determine the amount of area needed by experimenting on a large floor area or with scale models. A similar proposal is made for determining the amount of chalkboard and tackboard needed.

Although it can generally be said that most efficient use of a room is likely when it is planned for a specific activity, such use is not always economically possible or desirable. Therefore, consideration must be given to multiple-uses of facilities. In accord with a principle stated in Chapter 1 that those who use school plant facilities should participate in the planning of them, provisions are made in the pamphlets for the educators to indicate desirable multiple-uses which can be made of facilities.

In connection with each proposed facility, the educators are asked to indicate what other types of activities are: (1) most likely to function well in this type of room, and (2) least likely to function well in this type of room.

**Summary of Facilities**

A natural result of different groups working more or less independently to develop educational specifications for the various facilities is a certain degree of inconsistency in specifications. The
amount of inconsistency will depend upon the degree to which communication is maintained among groups. To eliminate possible inconsistencies and to summarize the data contained in the pamphlets in the C-series, Pamphlet D-1 is included as a portion of the manual.

In those planning situations where available funds for new construction are limited and the local school personnel have available the services of school plant or architectural consultants, the process of adjusting the proposed school plant to come within budgetary limitations may be done in part in the development of the summary of school plant facilities.

In essence these pamphlets in the C and D series are the vehicles to assist those involved in educational planning to develop the educational specifications needed to guide architectural planning. Each is the outline for the development of a pattern to guide the planning of an educational mosaic. When each mosaic is planned according to specifications and related to the other mosaics, an educational plant designed for a given community's educational program results.

**The Total Manual**

The total manual which consists of 23 pamphlets is included in Appendix A. The titles of the pamphlets are as follows:

A-1  **GENERAL PROCEDURES IN EDUCATIONAL PLANT PLANNING**

B-1  **A TECHNIQUE FOR THE DETERMINATION OF THE TEACHING STATION REQUIREMENTS FOR REGULARLY SCHEDULED CLASS ACTIVITIES**
<table>
<thead>
<tr>
<th>B-2</th>
<th>Forms for the Determination of Teaching Station Requirements for Regularly Scheduled Class Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>Directions for Use of the Pamphlets in the C-Series</td>
</tr>
<tr>
<td>C-2</td>
<td>Agriculture</td>
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<tr>
<td>C-3</td>
<td>Art</td>
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<tr>
<td>C-4</td>
<td>Business Education</td>
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<td>C-6</td>
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<td>C-7</td>
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<tr>
<td>C-8</td>
<td>Language Arts</td>
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<tr>
<td>C-9</td>
<td>Mathematics</td>
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<tr>
<td>C-10</td>
<td>Music</td>
</tr>
<tr>
<td>C-11</td>
<td>Physical and Health Education, Athletics, and Recreation</td>
</tr>
<tr>
<td>C-12</td>
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<tr>
<td>C-13</td>
<td>Social Science</td>
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<td>C-17</td>
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<td>C-18</td>
<td>Library</td>
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<tr>
<td>C-19</td>
<td>Miscellaneous Facilities</td>
</tr>
<tr>
<td>D-1</td>
<td>Summary</td>
</tr>
</tbody>
</table>
The topic of the preceding chapter was the development of the manual for planning secondary school buildings. In Chapter 4 the uses which have been made of it are discussed. The manual has been used in a planning project in a school plant planning course and in the development of educational specifications for two secondary school buildings.

The selection of the planning situations in which to use the manual was based entirely upon the projects which developed at the time that the manual was ready for use. The manual was used in situations which developed in the normal operation of the Survey Division of The Bureau of Educational Research at The Ohio State University. In the one situation which is referred to later in the chapter as Situation A, a school district reorganization study was conducted by the Survey Division prior to the initiation of the building planning project. In the report on district reorganization, the survey staff recommended that educational planning precede architectural planning of any new buildings. In the second project which is referred to later as Situation B, the architect solicited materials from the Survey Division that he could use in the planning of a secondary school building.
Use of the Manual in a School Plant Planning Course

One portion of a school plant planning course at The Ohio State University in the Summer of 1953 was devoted to procedures involved in planning secondary school buildings. To acquaint the 19 members of the class with the planning technique suggested in the manual developed in this study, the members of the class as individuals or as members of committees of their own selection worked through Pamphlet C-9, MATHEMATICS, and one other pamphlet in the C-series. In each instance the individual or group selected an enrollment and an educational program with which they were familiar -- in most cases it corresponded to the school situation in which they had worked most recently.

Two-thirds of the members of this class were engaged in administrative positions, four were high school teachers, two were elementary school teachers, and two were members of college staffs. Approximately 40 percent of the members of this class were facing a school plant problem in the near future. At the conclusion of this planning project, the students were requested to appraise the planning procedure and the pamphlets they used. The questionnaire used for this purpose is Form A in Appendix B. The results of this appraisal are reported in Chapter 5.
Use of the Manual in a Plant Planning Project

Situation A

Description of the School District and Its Educational Needs

The first school district in which the manual was used in the process of developing educational specifications is located in a central Ohio county. It is in a predominantly rural area with three rather definite community centers. These three communities were the school centers for three separate school districts maintaining separate schools housing pupils in grades 1 through 12. After a thorough study of educational and school plant needs, these three districts consolidated in 1953. Following this consolidation, arrangements were made for The Bureau of Educational Research at The Ohio State University to assist in developing educational specifications for a new secondary school building to serve the pupils in this newly consolidated school district. As a result of an extensive study of school plant needs based on a study of the educational program and enrollment trends, the board of education under the guidance of the county superintendent concluded that a secondary school building to house 350 pupils in grades 9 through 12 would meet their immediate secondary school plant needs.

Within existing statutory limitations, the total amount of the bonding capacity available to the district was $590,000. Of this amount $565,000 was allocated to this project.
Although each of the existing schools in this new district has a school head, for the duration of this project there was no school executive for the total district. It became the responsibility of the county superintendent of schools to co-ordinate the project with the writer serving as educational consultant.

Late in 1953, after several preliminary meetings, the writer met with the three school heads, the county superintendent of schools, and the architect's field representative to explain the process of educational plant planning, the nature of the planning manual, and how to use it in the planning project. A portion of this meeting was also devoted to a discussion of the educational program to be offered in the new school. The staffs of the three schools and the board of education under the leadership of the county superintendent also spent considerable time discussing the educational program -- subjects to be offered, desirable average class sizes, room assignment policies, non-class activities which will occur in connection with the school plant, pupil and teacher services to be provided, and community use to be made of the total plant.

One indication of the extensiveness of this study was a conference the school leaders had with a representative of the State Department of Vocational Education and the writer on how to determine the vocational education and industrial arts needs of the district. As a result, a survey was made of the interests of the boys in vocational agriculture and industrial arts. Figure 1 is a facsimile of the questionnaire used for this purpose. Pupils in grades 7 through 11 were
SURVEY OF INTEREST IN VOCATIONAL AGRICULTURE AND INDUSTRIAL ARTS

Directions: Provide the information requested in each item or check the items which apply.

Name

1. Grade in school _____

2. Do you live on a farm?
   ___ Yes, size of farm, _____ acres
   ___ No

3. Status of parents (check the items which apply):
   ___ a. Farm is owned by parents
   ___ b. Farm is rented by parents
   ___ c. Father is employed on farm for wages
   ___ d. Full-time farmer
   ___ e. Part-time farmer

4. If industrial arts and vocational agriculture were offered in your high school, check the one you would elect.
   ___ a. Industrial arts
   ___ b. Vocational agriculture
   ___ c. Neither

FIGURE 1

FASSIMILE OF FORM USED IN SITUATION "A" TO DETERMINE INTEREST AMONG CERTAIN HIGH SCHOOL BOYS IN VOCATIONAL AGRICULTURE AND INDUSTRIAL ARTS
included in the survey. The interests of the boys in grades 7 through 10 were analyzed because these boys are likely to be among the first pupils to occupy the new high school. Pupils in grade 11 were also studied for comparison purposes. In the discussion of interests in agriculture and industrial arts, these schools are referred to as schools A, B, and C.

The results of the survey of the interests of boys in grades 7 through 10 in two of the schools are shown in Table 3. It is obvious from the data shown in this table that interest in these two areas is equally divided. It can be seen that interest in agriculture is high in school A where agriculture is now being taught and interest in industrial arts is high in school B where industrial arts is now offered. The data also show that the number of boys living on farms owned by parents is much greater than those living on farms where the father works for wages. The high percentage of boys living on farms owned by their parents suggests that those who desire to elect agriculture will be in a position to maintain agricultural projects. A corresponding interest was discovered among the boys in the 1953-54 eleventh-year class.

Since data from the third school were not available and since neither industrial arts nor vocational agriculture was offered in this school, the three school heads and the county superintendent estimated the interests in this school to be in the same ratio to total school enrollment as existed in schools A and B combined. Table 3 also shows the estimates for school C and the total for the entire district.
<table>
<thead>
<tr>
<th>Item</th>
<th>School A (Actual)</th>
<th>School B (Actual)</th>
<th>School C (Estimated)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of boys living on farms</td>
<td>18</td>
<td>9</td>
<td>15</td>
<td>42</td>
</tr>
<tr>
<td>2. Status of parents:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Farm owned by parents</td>
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<td>5</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td>b. Farm rented by parents</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>c. Father employed on farm for wages</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>d. Father full-time farmer</td>
<td>13</td>
<td>6</td>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td>e. Father part-time farmer</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>3. Number of boys who would elect:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Vocational agriculture</td>
<td>24</td>
<td>8</td>
<td>18</td>
<td>50</td>
</tr>
<tr>
<td>b. Industrial arts</td>
<td>14</td>
<td>19</td>
<td>19</td>
<td>52</td>
</tr>
<tr>
<td>c. Neither</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>
These data indicate clearly that both vocational agriculture and industrial arts should be included in the program. Analyses of needs were also undertaken in other areas of the educational program.

The projected subject offerings and certain related data upon which the planning for this new high school was based are indicated in Table 4.

<table>
<thead>
<tr>
<th>Subject areas</th>
<th>Number of subjects in area</th>
<th>Average class size</th>
<th>Periods of instruction in subject per week</th>
</tr>
</thead>
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<td>25</td>
<td>5</td>
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<td>Social Studies</td>
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<td>25</td>
<td>5</td>
</tr>
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<td>Science</td>
<td>4</td>
<td>24-25</td>
<td>5-7</td>
</tr>
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<td>Languages</td>
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</tr>
<tr>
<td>Driver Education</td>
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<td>24-25</td>
<td>5</td>
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<td>10</td>
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<td>Industrial Arts</td>
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<td>Music</td>
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<tr>
<td>Physical Education</td>
<td>4</td>
<td>30</td>
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</tr>
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</table>
Determination of Housing Requirements for Regularly Scheduled Class Activities

Concurrently with this study of the educational program, the three school heads and the county superintendent of schools gathered the essential data necessary for determining the teaching station requirements for regularly scheduled class activities. The county superintendent assumed responsibility for making the actual calculations. The three school heads and the writer reviewed his study of needs. The technique outlined in Pamphlet B-1 was used for this purpose.

In this instance, grade and subject enrollment data from each of the three schools for the past five years were collected and consolidated.

Table 5 was completed in accordance with the directions on pages 3 and 11 of Pamphlet B-1 in Appendix A. This table shows the enrollment pattern in grades 9 through 12 for the five-year period, 1949-50 to 1953-54. Except for one year, the total enrollment has decreased during the period. In general the grade enrollments reflect this pattern, too. The ninth grade enrollment for the 1949-50 school year is much higher than for the other years. The enrollment for this group remained relatively high as the group progressed through high school.

The grade enrollments, total enrollments, and average total enrollments were compared with subject enrollments in Table 6. The average total enrollment is also recorded as Item 2 in Table 7.
TABLE 5
TOTAL ENROLLMENT DATA

(1) School District ___________________ (2) Building ___________________

<table>
<thead>
<tr>
<th>Grade</th>
<th>Enrollments for past five years</th>
<th>Average</th>
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<tr>
<td>9</td>
<td>73</td>
<td>58</td>
</tr>
<tr>
<td>10</td>
<td>51</td>
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<tr>
<td>11</td>
<td>48</td>
<td>49</td>
</tr>
<tr>
<td>12</td>
<td>58</td>
<td>41</td>
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</tbody>
</table>

TOTAL 230 215 223 219 203 218

### Table 6

#### Subject Enrollment Data

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<thead>
<tr>
<th>Subject area (e.g., science)</th>
<th>Subject (e.g., biology, chemistry, physics)</th>
<th>Grade placement (i)</th>
<th>Periods per week of subject (ii)</th>
<th>Subject enrollments for past five years (iii)</th>
<th>Adj. avg. subject enrollment (iv)</th>
<th>Adj. periods per week of subject (v)</th>
<th>Adj. pupil periods per week (vi)</th>
<th>Total adj. pupil periods per week by subject area (vii)</th>
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</thead>
<tbody>
<tr>
<td>(1)</td>
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<td>(3)</td>
<td>(4)</td>
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<td>(9)</td>
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(continued)
### TABLE 6 (continued)

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<th>Subject area (e.g., science)</th>
<th>Subject (e.g., biology, chemistry, physics)</th>
<th>Grade placement</th>
<th>Periods per week of subject</th>
<th>Subject enrollments for past five years (5)</th>
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(continued)
### TABLE 6 (concluded)

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<th>Grades placement</th>
<th>Periods per week of subject</th>
<th>Subject enrollments for past five years</th>
<th>Adj. ave. subject enrollment</th>
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<th>Adj. pupil periods per week</th>
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</thead>
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</tbody>
</table>

*Ibid., p. 84.*
(1) Effective periods per week \[40\]

(2) Average total enrollment for five year period \[215\]

(3) Product of Items 1 and 2 \[9,720\]

![Table 7](image)

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Desirable average class size</th>
<th>Pupil period enrollment</th>
<th>Adjusted pupil periods</th>
<th>Teaching station capacity index</th>
<th>Teaching station requirements for indicated projected enrollment</th>
<th>Additional ST needed for future enrollment of 450</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
<td>(F)</td>
</tr>
<tr>
<td>Language Arts</td>
<td>25</td>
<td>218,000</td>
<td>1,190</td>
<td>183</td>
<td>1.9-2</td>
<td>2.2-3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>25</td>
<td>218,000</td>
<td>515</td>
<td>423</td>
<td>0.9-1</td>
<td>1.0-1</td>
</tr>
<tr>
<td>Social Studies</td>
<td>25</td>
<td>218,000</td>
<td>765</td>
<td>285</td>
<td>1.3-2</td>
<td>1.4-2</td>
</tr>
<tr>
<td>Business Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typing</td>
<td>24</td>
<td>209,280</td>
<td>355</td>
<td>590</td>
<td>0.6-1</td>
<td>0.7-1</td>
</tr>
<tr>
<td>Other Bus. Educa.</td>
<td>25</td>
<td>218,000</td>
<td>455</td>
<td>480</td>
<td>0.7-1</td>
<td>0.8-1</td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive Laboratory</td>
<td>24</td>
<td>209,280</td>
<td>176</td>
<td>1,189</td>
<td>0.3-1</td>
<td>0.4-1</td>
</tr>
<tr>
<td>Other Science</td>
<td>25</td>
<td>218,000</td>
<td>420</td>
<td>519</td>
<td>0.7-1</td>
<td>0.8-1</td>
</tr>
<tr>
<td>Industrial Arts</td>
<td>24</td>
<td>209,280</td>
<td>470</td>
<td>445</td>
<td>0.0-1</td>
<td>0.9-1</td>
</tr>
<tr>
<td>Voc. Agriculture</td>
<td>24</td>
<td>209,280</td>
<td>430</td>
<td>487</td>
<td>0.7-1</td>
<td>0.8-1</td>
</tr>
</tbody>
</table>

\(a\) Since only one business education teaching station was planned in original construction, one additional business education teaching station will be needed to accommodate 450 pupils.

\(b\) Since only one shop and a related classroom were planned in original construction, one additional teaching station will be needed to accommodate 450 pupils.
<table>
<thead>
<tr>
<th>Subject area</th>
<th>Desirable average class size (4)</th>
<th>Pupil period enrollment (5)</th>
<th>Adjusted pupil periods (6)</th>
<th>Teaching station capacity index (7)</th>
<th>Teaching station requirements for indicated projected enrollments</th>
<th>Additional TS needed for future enrollment of 450 (10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TS 250 400 450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Economics</td>
<td>20</td>
<td>174,400</td>
<td>790</td>
<td>221</td>
<td>1.6-2 1.8-2 2.0-2</td>
<td>0</td>
</tr>
<tr>
<td>Music</td>
<td>60</td>
<td>523,200</td>
<td>805</td>
<td>650</td>
<td>0.6-1 0.6-1 0.7-1</td>
<td>0</td>
</tr>
<tr>
<td>Physical Education</td>
<td>30</td>
<td>261,600</td>
<td>545</td>
<td>480</td>
<td>0.7-1 0.8-1 0.9-1</td>
<td>0</td>
</tr>
<tr>
<td>Driver Education</td>
<td>24</td>
<td>209,280</td>
<td>99</td>
<td>2,113</td>
<td>0.2-1 0.2-1 0.3-1</td>
<td>0</td>
</tr>
<tr>
<td>Study</td>
<td>100</td>
<td>872,000</td>
<td>1,730</td>
<td>504</td>
<td>-60 -70a -80a</td>
<td>20</td>
</tr>
</tbody>
</table>

*Average number of pupils to be accommodated each period for study purposes.

Table 6 shows for the three schools the combined enrollments by individual subjects for the five-year period, 1949-50 through 1953-54. The subjects are grouped in the table by subject areas. Enrollments for certain similar subjects such as American government and problems of democracy which were offered in the different schools were combined under a single subject title to simplify the calculations. This table was filled out in accordance with the directions for completing Form 2 on pages 4 to 7 of Pamphlet B-1 in Appendix A.

In some subject areas such as business education and science certain subjects within the subject area are treated individually. Typing (Table 6) has been separated from the other business education subjects because it cannot be taught in a regular classroom. On the other hand, if a typing classroom is equipped with dual-purpose typewriter desks, this room can be used for other business education subjects. A similar arrangement can be noted in the science area (Table 6) where chemistry and physics were treated separately from the other subjects. Again, if a science teaching station is properly designed, it can accommodate extensive laboratory-type activities as well as other class activities. In both of these examples, a one-way interchangeable use of the facilities is possible, e.g., other science can be taught in the teaching station planned for extensive laboratory-type activities but the reverse of this is not true. Obviously any reasonable combination of uses which can be made of facilities reduces the total number of teaching stations needed to house any given anticipated enrollment.
In addition to the subject enrollment data, Table 6 includes the total number of pupil periods of instruction per week in each subject area adjusted in accordance with projected changes in program offerings or pupil elections of subjects. Column 4 shows the periods per week of instruction scheduled for each pupil in each subject.

In general, variances in the subject enrollments shown in Column 5 correspond to variations in total school enrollments. Certain exceptions are present in the subject enrollment data, however. For instance, when one school offered the same subject in alternate years, the total subject enrollments are much higher in those alternate years. American history in Table 6 is an example. Algebra I in this same table shows an increase in enrollment in 1952-53 because general mathematics was not offered that year. These variations that occur within a given area that can be reconciled and that do not reflect a general trend of increased or decreased enrollments in the subject area do not create a problem in the teaching station requirements calculations and no adjustments are required.

In the business education area, certain subject enrollments which do not maintain a constant ratio of change with total school enrollments can be noted. Shorthand I has generally increased while total enrollments have decreased and, in 1953-54, a demand for a second year of that subject developed. In spite of the fact that commercial law showed a rapid increase in enrollment, no adjustment upward was made because school authorities attributed this to the
fact that this subject had gained the reputation of being "an easy credit" and anticipated personnel changes would alter the enrollment pattern. Latin I was offered each year, Latin II was offered in alternate years, and two-year sequences of French and Spanish were offered. The school personnel suggested, however, that if French and Spanish were offered regularly, the enrollments in a modern language would increase and possibly at the expense of Latin.

On the basis of the study of needs for industrial arts and vocational agriculture mentioned earlier, school authorities agreed that enrollments in these subjects no doubt would increase. School personnel expressed doubt that strong departments in each area can be maintained in the immediate future. Since driver education was offered in only one school, those concerned with the planning of facilities were of the opinion that the demand for this training would increase. Members of the board of education of the consolidated district were especially concerned that consideration be given to potential expanded enrollments in these three subject areas.

Pupils are expected to participate in some aspect of the physical education program two and one-half periods per week. In the language arts area, the existing four-year requirement in English is to be rescinded and a three-year requirement substituted. Journalism is to be offered as an elective. Since this new offering will require a teaching station similar to that which can be used for English, journalism was included in the English area. The reader will note that the enrollment in English 4 was adjusted downward and the anticipated
enrollment in journalism was included. English was adjusted downward more than the anticipated enrollment in journalism justified since the educational planners expected that some pupils would elect sub-
jects outside this area.

These projected changes in average enrollments are shown in Column 6, Table 6. The reader will note that some subject enrollments were adjusted upward and others were adjusted downward. Except for such subject areas as physical education and possibly driver education, as enrollments in some subjects increase equivalent decreases in enrollments should develop in other subjects unless the number of sub-
jects which each pupil elects is changed.

Column 7 in Table 6 contains the actual or adjusted periods per week of instruction for each subject. Adjustments in the periods per week of the subject were necessary only in case the number of periods of instruction per week for any given subject is not an integral fac-
tor of the total number of periods of instruction per week (see direc-
tions in Pamphlet B-l in Appendix A). Adjustments were necessary in the cases of chemistry, physics, and driver education. For chemistry and physics, it was possible in a 40-period week to schedule only five classes — the largest whole number of times that seven will divide into 40. The quotient of 40 and five is eight — the adjusted number of periods per week for chemistry and physics. For driver edu-
cation, it was possible to schedule only 13 classes — the largest whole number of times that three will divide into 40. The quotient of 40 and 13 is three and one-tenth — the adjusted number of periods per week for driver education.
For subject area teaching station calculations where it was necessary to make these adjustments, study accommodations had to be provided for the differential between the number of actual pupil periods scheduled and the number of adjusted pupil periods resulting from the adjustments which were made in Column 7.

Column 8 shows the adjusted pupil periods of instruction for each subject and Column 9 the total adjusted pupil periods of instruction per week for each subject area. In science and business education, certain subjects were treated separately because of unique needs.

In the initial planning stages, the following factors concerning the length of the school day and the number of periods classrooms would be available for class instruction were considered:

1. The influence of the length of the school day for high school pupils on the length of the day for the elementary school pupils. (This consideration was necessary since it is likely that buses loaded with pupils will be routed to the existing buildings in the morning where elementary school pupils will be discharged and then on to the new high school building. In the evening, the routing will be reversed causing the school day for the younger pupils to be longer than that for the older pupils.)

2. The need for teachers to have their classrooms available for conferences and for preparation during their non-teaching periods.

3. The length of the class period.

4. The number of periods in the school day.

5. The number and the length of the lunch periods.
After due consideration of all these factors and the calculation of teaching station requirements for both the 35- and 40-period week, school authorities agreed that planning should be done on the basis of the 40-period week.

Table 7 represents the form which was used to calculate the teaching station requirements for regularly scheduled class activities for 40 effective periods. This table was filled out and the calculations made in conformity with the directions for Form 3, pages 7 to 9, in Pamphlet B-1 in Appendix A. In Table 7, the data from Tables 5 and 6 are summarized and additional data introduced. The subject areas listed in Column 4, Table 7, were taken from Column 1 of Table 6. Column 5, Table 7, contains the desirable average class sizes for the various subject areas as proposed by the school authorities. The numbers in Column 6 represent the products of Item 3 and each entry in Column 5. The figures in Column 7 are the adjusted pupil periods taken from Column 9 of Table 6. The teaching station capacity indexes in Column 8, Table 7, represent the total school enrollments which can be accommodated by a single teaching station, i.e., a teaching station capacity index of 183 for language arts indicates that out of a total enrollment of 183 a sufficiently large number of pupils will take language arts subjects to utilize one teaching station full time. Column 9 shows the number of teaching stations rounded up to the next higher whole number required for projected enrollments of 350, 400, and 450. Column 10 represents the additional teaching stations which will be needed in future expansion
to increase the capacity of the building from 350 to 450. Study hall requirements are shown in this table on the basis of the average number of pupils to be accommodated each period. The requirements were calculated by subtracting the total number of pupil periods in all subject areas from the number of pupil periods in a 40-period week for an average enrollment of 218. The total number of pupil periods per week in subjects is the sum of the entries in Column 9 of Table 7, minus the adjustments made to accommodate the pupils from driver education the equivalent of one-tenth of a period per week and from extensive laboratory science (chemistry and physics) one period per week. These adjustments were necessary because the number of periods each of these subjects is to be scheduled per week is not an integral factor of 40. The number of adjusted pupil periods for extensive laboratory science, Column 7, Table 7, was 176 and the actual number of pupil periods in laboratory science was 154. For driver education, the number of adjusted pupil periods was 99 and the actual number of periods was 96.

From the data shown in Column 9, Table 7, the school authorities concluded that the following teaching stations would be required to house 350 pupils with 40 effective periods per week:

2 Language Arts
1 Mathematics
2 Social Studies, Related Business Education
1 Chemistry, Physics, Driver Education
1 Biology, General Science
1 Typing, Related Business Education
1 Combination Vocational Agriculture and Industrial Arts (shop and related classroom)
2 Home Economics
1 Music
1 Physical Education

Study capacity for an average of 69 pupils each period will be required also. When this list is compared with Column 9, Table 7, the reader can note that room requirements for business education which are in excess of one are to be accommodated in one of the social studies classrooms, that driver education is to be accommodated in the one science laboratory, and that industrial arts and vocational agriculture are to be accommodated in the same shop and related classroom.

Column 10 in this table indicates the need for the following additional teaching stations to increase the capacity of the building by 100 pupils over the planned capacity of 350:

1 Language Arts
1 Mathematics
1 Business Education
1 Agriculture Shop — conversion of the combination agriculture and industrial arts shop to an industrial arts shop and planning room

Facilities to accommodate an additional 20 pupils for study purposes will also be needed.
The Educational Specifications

After the housing requirements for the new school plant were determined, the next step was the determination of the educational specifications. The pamphlets in the C-series were used as guides in this portion of the study with the combined staffs of the three schools participating in the planning. At a meeting of the staff members of the three schools, the county superintendent of schools, and the field representative of the architect, the writer explained the steps in educational plant planning, the organization of the manual, and the procedures to follow in completing the pamphlets. The suggested procedures are those outlined in Pamphlets A-1 and C-1 in Appendix A. Committees consisting of two to four staff members each were formed with teachers voluntarily selecting to work with the planning of those facilities which represented their major teaching areas. Some teachers worked on more than one committee. An example is the music director who served on the music and auditorium committees. Committees were created to develop educational specifications for the following facilities:

- Agriculture
- Business Education
- Home Economics
- Industrial Arts
- Language Arts
- Mathematics
- Music
Physical Education
Science
Social Science
Administration
Auditorium and Stage
Food Service Facilities
Library
Miscellaneous Facilities

During the discussion with the staff members regarding: (1) committee meetings, (2) study of planning literature, (3) conferences with the school plant consultants and State Department of Education representatives, and (4) visits to some new school buildings, the field representative of the architect proposed that the staff members complete the work on the pamphlets in two weeks. This situation represents one of the problems associated with the planning of school buildings -- the desire on the part of some architects to short cut or to avoid educational planning. The staff members were in unanimous agreement that adequate time should be taken to plan the building since the district is spending one-half million dollars on a structure which will be in use for over one-half century.

Approximately five weeks were devoted to staff activity in: (1) discussing many aspects of the educational program, (2) studying school plant needs, (3) visiting new buildings, (4) conferring with curricular and school plant consultants, and (5) filling out the
pamphlets in the C-series. Since no girls' physical education instructor was serving in the district, the members of the physical education committee secured help from instructors of this subject in surrounding communities and nearby colleges. The services of the county board of health were secured in the planning of the health service facilities. Representatives of community organizations such as parent groups, agricultural organizations, and service clubs were consulted in the planning of community-use facilities.

The county superintendent of schools assumed the responsibility for reviewing the data in the pamphlets for inconsistencies, and screening and revising if necessary. He conferred with the writer concerning some of the staff suggestions and proposed alternate plans to some committees for their consideration.

Since the pamphlets which the staff members prepared for the architect were given to him as a portion of the educational specification for the new building, they are not available for inclusion in this document. However, to give the reader an indication of the information the various committees provided for the architect, excerpts from one of the pamphlets are included at this point. The writer has selected excerpts from Pamphlet C-10, MUSIC, to exhibit data provided for the architect.

Pamphlet C-10 was selected by the writer because it is representative of other pamphlets in this series. This pamphlet includes information on a suite of rooms, demonstrates considerations given to the affinity of spaces, and includes a schematic diagram of the facilities desired.
Sections of this pamphlet from which the excerpts were taken are referred to by pamphlet page number. For the reader to orient himself to the total setting from which the excerpts have been taken, the writer suggests that the reader refer to Pamphlet C-10 in Appendix A.

The excerpts from the pamphlet the staff filled out were as follows:

Page 2:

Number of teaching stations __________

(Since only one teaching station will be needed to house the anticipated instrumental and vocal music program, according to the data contained in Table 7, the committee went directly to page 15 to provide information on a combination instrumental and vocal studio)

Pages 15 and 16:

Combination Instrumental and Vocal Music Studios

1. Number to be planned ______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station and suggest activities not listed.

   a. Conduct vocal music rehearsals involving school groups 1 2 3 N

   c. Conduct music rehearsals involving community groups 1 2 3 N

   g. Store robes 1 2 3 N

   o. View slides, films, and other projected materials 1 2 3 N
Comments:

The studio should also be planned to serve as an area where performing groups who are using the stage can assemble and not have to use the corridors.

Page 17:

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed . . .

Chalkboard, 6 linear feet; tackboard, 6 linear feet

Suggest any special considerations . . .

Chalkboard on front center wall with three feet of tackboard at each end of chalkboard; chalkboard should be etched with staff lines.

5. Indicate the degree of preference . . .

a. Level floor with movable seating  P  A  MA
d. Terraced floor with movable seating  P  A  2

Pages 18 and 19:

7. Indicate the extent to which the following types of storage facilities will be used and suggest . . .

d. Storage for instruments  1  2  3  W

Built-in lockers for small instruments such as clarinets, flutes, piccolos, etc. and larger spaces for trombones, baritones, etc.

Page 21:

8. Suggest floor area. . ., 1200 square feet . . .

9. Indicate any additional information . . .
The studio should have an outside entrance for easy access to the athletic field for marching rehearsals.

If stage and studio are at same elevation, a piano can be moved from one to the other easily.

Wide doors should be provided for easy movement of large instruments.

Pages 30 and 31:

Instrument Storage Rooms

1. Number to be planned 1

2. Indicate activities or uses . . .

   Store large musical instruments; store instrumental and vocal music; sort music; store radio, record player, and tape recorder.

3. Suggest desired location . . . or factors which should determine the location.

   Directly accessible from studio; in a location so a walk-through arrangement is possible; convenient to building corridor.

4. Indicate types, dimensions, and quantity of materials to be stored and the type of storage desired.

   6 to 8 basses
   5 or 6 string basses
   bass drum
   tympani
   2 four-drawer legal-size filing cabinets for sheet music
   cabinets or shelving for record player, radio, and tape recorder
Page 33:

F. ... indicate any additional information ... or schematic diagrams ... to suggest desirable features to the architect.

(Figure 2 is a copy of the schematic diagram submitted by the music committee)

G. Indicate factors the architect should take into consideration when planning the location of the music suite.

The music room should be isolated from areas of the building requiring quietness such as the library and academic classrooms, accessible to an outside rehearsal area without disturbing remainder of school and conveniently or directly accessible to the auditorium stage and at the same floor level for convenient movement of a piano from stage to studio or vice versa.

Page 34:

H. Summarize rooms and spaces ... 

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Floor area (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching stations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Music studio</td>
<td>1</td>
<td>1200</td>
</tr>
<tr>
<td>2. Auxiliary rooms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Instructors' offices</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>b. Uniform and robe storage room</td>
<td>1</td>
<td>65</td>
</tr>
<tr>
<td>c. Instrument storage</td>
<td>1</td>
<td>200</td>
</tr>
</tbody>
</table>
FIGURE 2
PROPOSED MUSIC SUITE AND DESIRED AFFINITY WITH OTHER FACILITIES
In the absence of a local school head to direct the development of a final summary, the county superintendent of schools requested the writer to develop a program of requirements from the data presented by the staff members. The county school head contended that a summary developed by an outside agency should be prepared to guide the board of education in its deliberations on the proposed building as well as the architect in developing architectural plans. The writer does not agree with this point of view in its entirety. Although the writer would have preferred that the local school personnel develop a summary of the educational specifications, under the circumstances in this planning situation, he agreed to develop such a document for them.

Copies of a tentative program of requirements were submitted to the county superintendent, the staff members, and the board of education for editing. The county school head forwarded a copy of the tentative draft to the architect for a preliminary cost estimate. Since the estimated cost exceeded the amount of funds available to the board of education for new construction, certain revisions were made in the program of requirements. The architect proposed a reduction in room sizes. Since staff members had carefully analyzed activities they envisioned would occur in the rooms, they opposed any reduction in instructional spaces. At this point, the revised program of requirements and the completed pamphlets in the C-series were transmitted to the architect.
From these data the architect developed preliminary architectural plans. The school heads, committee chairmen, board members, and the writer assisted in the evaluation of the preliminary plans. Four sets of plans were developed in addition to a plan which was submitted to state agencies at the time permission to submit a bond issue was requested. Facsimiles of the original and final sets of preliminary plans are included in the chapter which follows. At the time of this writing the working drawings and specifications are being developed.

The various members of the three school staffs who served actively on the building planning committees, the county superintendent, and the architect were requested to respond to inquiries about the planning procedure and the structure of the various pamphlets. These data are analyzed in Chapter 5.

Use of the Manual in a Second School Plant Planning Project

Situation B

In addition to the use of the manual in planning a secondary school building which has been explained in detail in the preceding pages, the manual was used in another secondary school planning situation. This project is referred to as Situation B. Situation B involves a school district in northwestern Ohio. The district is adjacent to a medium sized city; it is predominantly rural although there
is one large industrial plant located within its boundaries; the residents are employed in this plant or in the nearby city or maintain farms.

In this instance, the architect secured the manual from the writer and requested the school staff to fill out the various pamphlets for his use. Both the architect and the superintendent of schools have corresponded with the writer about the effectiveness of the manual in this project. The correspondence is discussed in the chapter which follows.
A true evaluation of any school building can be achieved only by analyzing the extent to which the building has been an educational force throughout a period of years. By the same token the ultimate evaluation of any technique which was used in the development of the building cannot be made for a number of years. Partial analyses of the effectiveness of the building or any of the methods employed in its development can be made at any time and are highly desirable.

As was stated earlier, the writer contends that school buildings will be planned better and used more effectively than has been true in all too many instances in the past if those who use them share in the planning. The manual developed in this study was designed to facilitate staff participation in the planning of secondary school buildings. The test of the worth of the manual to guide educational plant planning of secondary school buildings, will depend upon the extent to which those who use it are able to plan buildings better and make more effective use of them than has resulted when other methods were used.

A preliminary evaluation of the manual is within the scope of this study. Such an evaluation can be based upon analyses of the judgments of the effectiveness of the manual as expressed by:
1. Members of a school plant planning class.

2. Architects, school administrators, and staff members who were involved in two secondary school plant planning projects.

3. Administrators and staff members who were involved in the development of educational specifications for a secondary school plant where no instrument such as this manual was available to guide the process.

4. Other architects and superintendents.

In Chapter 4, the uses of the manual in two school plant planning projects were described. This chapter presents a preliminary evaluation of the manual based upon the analyses mentioned above.

Judgments of Members of a School Plant Planning Class

As a portion of the activities in a school plant planning class, the professor proposed that the members develop educational specifications using pamphlets of the manual that were completed at that time and which were areas of major interest to them. The writer was invited to brief the class on the use of the manual. Since the pamphlet on directions was not completed, the directions for the use of the various pamphlets were given orally.

After all class members had completed the pamphlets, the students were requested to respond to an inquiry concerning the pamphlets and the proposed planning procedure. A copy of the inquiry, Form A, is

1 M. J. Conrad, Education 860. The Ohio State University, Summer, 1953.
included in Appendix B. All 19 members of the class responded to the inquiry. The completed pamphlets were returned to the writer for analysis.

The pattern to be followed in presenting the judgments of the class members to the planning manual includes a statement of each of the questions included in the inquiry and a summary of the replies. In some instances typical replies of the students are quoted.

The items in the inquiry and summaries of the responses which the students made were as follows:

**Item 1:** What advantage do you see in having a staff participate in the planning of a school building?

There was unanimous agreement among the respondents that it is advantageous to have staff participation in planning school buildings. The replies suggested that school facilities will be planned better, there will be greater pride in facilities, facilities will be used more effectively, and there will be an improved relationship between staff members and the administrator when this method is used. The fact that no one gave consideration to the architect planning the facilities without the assistance of educators is worthy of note. Typical responses were:

1. Increased understanding of the educational program.
2. Increased emphasis on specific local needs.
3. Increased mutual respect -- administrator/staff.

Cooperative planning will bring out more ideas and usually better ideas . . .
They (staff members) are actually resource personnel in their various fields...

Maintenance staff can make recommendations that may avoid problems later...

Item 2: What disadvantages do you see in such a procedure?

One disadvantage of staff participation in planning school facilities that was expressed by 50 percent of the group is the danger of a given teacher planning a unit with facilities that few if any other teachers would want. This response was prompted by a class visitation to a new building where a speech and language teacher had requested a stage and considerable tackboard in her classroom. When the teacher moved on, her successor had no use for such equipment. In this case there apparently had been very little co-operative planning; it was really a plan developed by one person. Many students pointed out problems which are inherent in any staff participation program. One respondent stressed the need to approach the planning process with a proper understanding on the part of all when he said: "It must be understood that any suggestion from the staff must be considered but with practical and technical limitations." Another suggested that there may be "over-emphasis of one department at the expense of another." On the contrary, less over-emphasis of any one department is likely to result when all staff members are involved in the planning.
Item 3: Would this type of instrument help you as a school administrator to do the educational planning for a secondary school building?

Comment:

a. What difficulties do you envision that the staff will have in using an instrument of this type?

b. What difficulties do you envision that the administrator will have using an instrument of this type?

Every respondent replied in the affirmative and many emphasized their agreement by such comments as:

It (the manual) can be used to inspire their (staff) confidence and welcome their (staff) participation.

It would at least be a tool for gathering the ideas of the staff . . .

This instrument helps to rule out guess tactics and trial and error procedures which may be costly . . .

. . . leads to reflective thinking of the whole program plus the hopes and desires of the years ahead.

The respondents anticipated that a staff would have very little difficulty in using the instrument. Twenty-five percent of them envisioned that staff members may be inclined to suggest facilities which will exceed budgetary limitations. This situation is to be expected since the planners are urged in the manual to be somewhat idealistic in their approach to the development of educational specifications. On the contrary, one of the group was of the opinion that instead of teachers being too idealistic, they are likely to be "too
conservative in their wants and too self-satisfied." Some students anticipated that staff members would have difficulty determining areas, linear feet of shelving, and similar items. One anticipated that problems are likely to arise but suggested that the problems "would be a good opportunity to perform some in-service training."

Forty-two percent of the members of this class group anticipated that the school administrator's major problem in using the instrument would be associated with monetary limitations because "staff members will not be able to get all they requested." Two individuals were of the opinion that the task would be very time consuming and one of these indicated that the manual "is bulky." Since educational plant planning is a time-consuming task, some adjustments in staff load or some provisions for committees to work on the building planning project may be necessary. One person anticipated the administrator "would have a great deal of difficulty working with it (the manual) without the help of a specialist, but would be able to do a better job (of planning) using it than without it." Nevertheless, over 50 percent of the replies indicated without qualifications that a competent administrator who works cooperatively with his staff would have few difficulties in using the manual.

**Item 4:** In what ways did this instrument give too much direction or emphasis or too many suggestions?

Seventeen out of the 19 students indicated that the manual did not err in providing too many suggestions or too much direction.
One respondent indicated that "the suggestions on storage facilities seem overweighted in relation to their value." Another stated that "after a description of the things to be stored, the architect is more qualified to figure the floor area needed." With the latter statement the writer agrees. However, the educator must give consideration to floor area needed in order to appraise adequately the conclusion reached by the architect. The architect should not accept the educators' statement of area needed without an accurate study of space needs. If experience indicates that architects rely too much on the "suggested floor area," this item should be omitted from future revisions of the manual.

One-fourth of the group indicated that inadequacies of the instrument centered around the need for a pamphlet of directions and examples. The fact that directions were not available at that time was pointed out earlier in this section. Since then such a pamphlet has been developed as an integral part of the manual.

In the statement: "The instrument is no better than the people who use it, though that is no fault of the instrument," one student implied that a planning manual alone was not sufficient to plan a building. With this implication, the writer agrees. He wishes to emphasize, however, that the approach suggested in the manual will tend to strengthen the planning process because the various staff members will supplement each other.

One student expressed a point of view which is in opposition to the approach suggested in the manual when he said: "Instead of
allowing complete choice in planning the area, it would be better to limit the space to a certain amount and plan the installation to fit the area. Situations may develop where such an approach is necessary, but as a general practice space allocations should be determined on the basis of activities to be housed rather than by an arm chair approach in which areas are determined in an administrative or architectural office without analysing the spaces needed to house the activities which probably will occur in the rooms.

Another suggested that references be provided at strategic locations so that the "uniformed and untrained could seek further information to help them arrive at a reasonable answer." Consideration was given to the inclusion of bibliographical references in the various pamphlets. School plant planning literature, in general, tends to fall into two patterns. The first consists of well illustrated descriptions of buildings with little detail on the nature of the original problem and the method by which the solution was achieved. The second consists of descriptions of facilities for various subject areas for certain enrollments. The latter approach suggests that all schools throughout the nation with a given enrollment should have a given number of teaching stations for each subject area regardless of the educational needs as reflected by the total community.

Since most of the literature in this field falls within these two categories, one of the major principles upon which the planning manual was developed is violated. That is, each community has educational needs which are unique to it. A solution tailored to meet
those needs is required. Although Community A has educational needs similar to Community B, this fact does not warrant that Community A accept in toto Community B's school plant as the solution to its educational needs.

The writer recently analysed a set of preliminary plans for a senior high school in which the architect proposed an administrative suite similar to that shown in a recent issue of a periodical. He knew why the proposed suite was good and how it might be used. He did not know, however, how it would work in the situation for which the planning was being done. Some factors which were not given thorough consideration were: (1) the relationship of guidance to the entire school, (2) the need for the secretary to have direct or convenient access to the clinic, supply and workroom, deans' offices, and the principal's office, and (3) the relationship between the number of community members and teachers and pupils who are likely to come to the general office during any given period of time. This example is typical of results which accrue when adaptations are made without a careful analysis of needs.

Over 50 percent of the respondents either indicated that they found no inadequacies or made no comment in response to Item 5. Of those who found no inadequacies, one stated: "It is a good detailed instrument. The information supplied can be easily checked, summarized, interpreted, and evaluated."

Before summarizing the judgments of the members of this school plant planning class, the following facts should be stressed:
not all of them had been involved in the planning of a school building. (2) only two out of five faced a school building problem in the near future, and (3) two out of three were school administrators. Naturally their evaluation of the manual and the planning procedure must be considered in the light of their limited school plant planning experiences. On the basis of the judgments expressed by the 19 members of this class group, the manual should be an effective instrument to aid in the educational planning of secondary schools. These students generally agreed that the pamphlets which they used were complete, that they did not provide too many suggestions, and that neither the administrator nor the staff would find the instrument difficult to use.

**Judgments of the Staff Members, School Administrator, and Architect in Situation A**

After the board of education in Situation A approved the data contained in the pamphlets and the program of requirements discussed in Chapter 4, these documents were transmitted to the architect to guide the development of preliminary architectural plans. Immediately after the architect submitted his fourth set of preliminary plans for staff and board of education study and approval, the writer submitted an inquiry to each of the staff members to determine each one's judgment of the effectiveness of the manual in this planning project. Inquiries were also submitted to the administrator and the architect.
The Judgments of the Staff Members

The items in the inquiry submitted to the staff members were based upon the criteria developed in Chapter 3. The inquiry was designed to secure ratings on a three-point scale to show the degree to which the various pamphlets in the manual were effective in this planning project. The ratings were supplemented by free-response statements on many of the inquiries. The responses to each item are presented in this section in tabular form followed by a summary of the free responses. A copy of the inquiry, Form B, is included in Appendix B.

Thirty-four inquiries were sent to staff members. Twenty-five, or 74 percent of them, responded. The nine persons who did not complete the questionnaires served on more than one committee. In essence, they were subject area consultants and as such did not work as closely with the individual pamphlets. For this reason these nine persons thought their responses would not be significant. Unfortunately since one of these was the chairman of the committee on auditorium and stage facilities, no return was received concerning Pamphlet C-16, AUDITORIUM AND STAGE. Only the chairman of the committees dealing with Pamphlets C-17, C-18, and C-19 were requested to respond although other staff, other professional, and community members were consulted in the completion of the pamphlets and the inquiries.

A comparison of the number of inquiries sent and returned in connection with Situation A is shown in Table 8. This table also
shows that Pamphlets C-3, C-5, and C-14 representing ART, DRIVER EDUCATION, and VOCATIONAL EDUCATION, respectively, were not used in this situation. Art and vocational education were not included in the contemplated educational program. Although driver education was a part of both the present and the contemplated future program, school authorities were of the opinion that special facilities should not be provided for this subject. The writer questioned the advisability of omitting driver education in the planning program but did not press the point since evidence indicated that financial limitations would force certain curtailments in construction.

Table 9 shows the responses of the staff members on a three-point scale — little, some, much — to Item 1 of the inquiry. A study of the general distribution of the ratings shows that 20 respondents agreed that the pamphlets they used enabled them to provide for the architect to "much" extent the information which they thought he should know about the educational program while five respondents indicated
### TABLE 9

**RESPONSES OF STAFF MEMBERS IN SITUATION A TO ITEM 1 OF AN INQUIRY ON A MANUAL FOR PLANNING A SECONDARY SCHOOL BUILDING**

**Item 1:** To what extent does the pamphlet you used enable you to provide for the architect the information which you think he should know about the educational program?

<table>
<thead>
<tr>
<th>Response</th>
<th>Pamphlets in C-series and Number of Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2  4  6  7  8  9 10 11 12 13 15 16 17 18 19</td>
<td>Total</td>
</tr>
<tr>
<td>Little</td>
<td>0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0</td>
<td>0</td>
</tr>
<tr>
<td>Some</td>
<td>1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0</td>
<td>5</td>
</tr>
<tr>
<td>Much</td>
<td>0  0  2  1  3  1  2  3  2  2  1  0  1  1  1</td>
<td>20</td>
</tr>
<tr>
<td>No reply</td>
<td>0  2  0  2  1  0  0  0  0  1  0  3  0  0  0</td>
<td>9</td>
</tr>
</tbody>
</table>

that the pamphlets made this provision possible only to "some" extent.

None checked the scale item "little."

Free-response statements to this item on the inquiry varied considerably. These responses classified by pamphlets were:

**Pamphlet C-4, BUSINESS EDUCATION**

It was too general. The information at hand was inadequate.

**Pamphlet C-9, MATHEMATICS**

... I have come to the conclusion, after being chairman of this committee, that the pamphlet is most adequate -- that it serves very well the purposes for which it has been designed.

**Pamphlet C-12, SCIENCE**

Very complete -- I could include everything (additional information) in the comments.
Pamphlet C-19. ADMINISTRATION

Those who helped me (custodians, county nurse and doctor, special education staff members, and community members) felt it was quite inclusive.

Approximately two-thirds of the staff members agreed that the instructions in the pamphlets and the accompanying pamphlet of directions were "easy to understand." The remaining one-third of them had "some difficulty in understanding" the directions. Table 10 shows these data. It also shows that the directions with which they had "some difficulty" are contained in Pamphlets C-4, C-7, C-10, C-11, C-12, C-17, and C-18. A contributing factor to the difficulty encountered with the directions was the fact that only a limited number of copies of the directions, Pamphlet C-1, were available to the staff members. In the light of experiences in this situation Pamphlet C-1, DIRECTIONS, has been revised.

Three teachers indicated that the pamphlets with which they worked — C-4, C-6, and C-9 — were somewhat repetitious. No doubt this comment reflects a misunderstanding of the structure of the pamphlets. The directions in Pamphlet C-1 state that only those portions of each pamphlet which pertain to the educational program to be housed should be completed. Although these three pamphlets were filled out properly by the committee members, the fact that quite similar information is requested about more than one teaching station or room apparently led to some confusion. For instance, five different types of teaching stations are included in Pamphlet C-4 on business education facilities.
TABLE 10

RESPONSES OF STAFF MEMBERS IN SITUATION A TO ITEM 2 OF AN INQUIRY ON A MANUAL FOR PLANNING A SECONDARY SCHOOL BUILDING

Item 2: Indicate the extent to which the instructions in the pamphlet you used and the accompanying pamphlet of directions were easily understood.

<table>
<thead>
<tr>
<th>Response</th>
<th>Pamphlets in C-series and Number of Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to understand</td>
<td>1 0 3 0 3 2 2 1 0 2 1 0 0 0 1</td>
<td>16</td>
</tr>
<tr>
<td>Some difficulty</td>
<td>0 1 0 1 0 0 1 2 2 0 0 0 1 1 0</td>
<td>9</td>
</tr>
<tr>
<td>in understanding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficult to understand</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>0</td>
</tr>
<tr>
<td>No reply</td>
<td>0 2 0 2 1 0 0 0 0 1 0 3 0 0 0</td>
<td>9</td>
</tr>
</tbody>
</table>

One respondent indicated that he had "some difficulty understanding the procedure for the various sections" of Pamphlets C-11 and C-12. The chairman of the committee in each case, however, reflected that he found the directions "easy to understand."

When the writer considered the magnitude of the task of planning a school building, he was somewhat surprised that 22 out of 25, or 88 percent of the teachers, found the pamphlets "easy to use." Three inquiries showed that the persons who used Pamphlets C-10, C-13, and C-17 found them "difficult to use." These data are shown in Table 11.

One of this group stated: "The fact that a person could circle 1 2 3 4 made the work easy." Two of the three individuals who
worked with Pamphlet C-6 on home economics and checked the response
"easy to use" related that "it (the pamphlet) was quite long" and that
"several meetings and quite a number of hours were required to complete
the pamphlets." One of these added, parenthetically: "But, there are
so many phases to cover."

In commenting on Item 2 of the inquiry, one respondent stated that
"there was some repetition" in the pamphlet on mathematics. On the
other hand, he stated in response to Item 3 that "by listing divisions,
it was easier." Unless the writer errs in his interpretation of the
significance of the term "divisions," he is of the opinion that the
repetition referred to in Item 2 was a result of "listing divisions."
A physical education teacher indicated indirectly that the pamphlets were somewhat imposing at first sight when he said: "Once you become familiar with this pamphlet (C-ll), it becomes very easy to understand." "Abundant space for comments" and "separate descriptions of each room" were stressed by a science teacher as desirable features of the format of the pamphlet for science facilities.

Table 12 contains data on the responses to Item 4 on the extent to which the pamphlets listed or made provisions for listing the plant facilities needed. Eighteen teachers checked the item "much," seven checked the item "some," and none checked the item "little."

Only two respondents who checked the item "some" added comments to their inquiries. They stated:

Type of flooring and backboards.

Possible storage areas, chalkboard location, location of doors and entrances, etc. would be affected by the location of rooms.

With the possible exception of backboards, these comments refer to items which are architectural in nature. Provision is included for backboards on page 4 of Pamphlet C-ll. The interest of the respondent in type of flooring, no doubt, reflects what seems to be a general agreement among coaches that asphalt or rubber tile laid over concrete is not satisfactory as a basketball playing floor. An item such as this could have been included under Item 7 on page 5 of Pamphlet C-ll. The physical education committee in this situation actually indicated a preference for maple flooring under this item.
TABLE 12

RESPONSES OF STAFF MEMBERS IN SITUATION A TO ITEM 4 OF AN INQUIRY ON A MANUAL FOR PLANNING A SECONDARY SCHOOL BUILDING

Item 4: To what extent does the pamphlet you used list or make provision for listing the facilities needed to conduct the contemplated educational program or to carry on the necessary services?

<table>
<thead>
<tr>
<th>Response</th>
<th>Pamphlets in C-series and Number of Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>0</td>
</tr>
<tr>
<td>Some</td>
<td>0 0 1 0 1 1 0 1 2 1 0 0 0 0 0 0 0 0 0</td>
<td>7</td>
</tr>
<tr>
<td>Much</td>
<td>1 1 2 1 2 1 3 2 0 1 1 0 1 1 1</td>
<td>18</td>
</tr>
<tr>
<td>No reply</td>
<td>0 2 0 2 1 0 0 0 0 1 0 3 0 0 0</td>
<td>9</td>
</tr>
</tbody>
</table>

In the early stages of planning when educational specifications are being developed, the educator should not be concerned about how much space will be available for items such as storage and chalkboard. He should be concerned with the items to be stored and how much chalkboard will be used. He should also suggest where the facilities ought to be located to function best. It is the responsibility of the architect to determine how much space can be obtained within financial limitations and where the space will have to be located in order to meet best all the specifications for the building and site. Naturally, there must be compromises. After the amount of space and the possible locations are determined, more detailed planning will be necessary.

How much the educator will assist with this phase of the planning will
depend upon the architect. The writer assisted with two projects
where the architectural approaches were diametrically opposed. After
space allocations were defined, the one architect drew all room lay­
outs directly from information contained in the pamphlets. In the
second case, the architect urged the teachers to suggest layouts and
worked closely with the staff members as they developed them.

The agriculture teacher included as part of his comment to Item 4:

I don't believe enough was given to the items
needed after the building is completed. This
would be more true of agriculture than other
subjects because of its very nature.

Certainly all "items needed after the building is completed" must
be considered. On the other hand, since the manual is designed for
the use of the architect, he needs to know only that information which
has implications for space allocations. He needs to know information
such as 50 linear feet of bookshelving or sufficient shelving for 400
volumes rather than the titles of the books. It is not the intention
of the writer that the pamphlets contain a complete list from which
furniture and equipment specifications can be made in preparation for
bidding.

The chairman of the home economics committee suggested:

No space is provided for a rough drawing of rooms
showing the suggested locations for large equipment
such as unit kitchens, etc. However, we suggested
a plan and attached it.
On the basis of conferences with architects and educational consultants, the writer concluded that space for drawings should not be included in the pamphlets. The general impression of these people was that emphasizing the development of drawings would be encroaching upon architectural planning. The pamphlets do suggest, however, that schematic diagrams and other illustrative materials can be attached to the pamphlets to suggest desirable features to the architect. (See page 26, Pamphlet C-6 and page 5, Pamphlet C-1 in Appendix A.)

Teacher responses to Item 5 on the inquiry are shown in Table 13. Over 75 percent of them checked "much" in response to the item on the extent to which opportunity was provided in the pamphlets to indicate to the architect the importance which they attached to the various aspects of planning and the remainder of them checked "some" in response to this item. Two of those who checked "much" added these comments:

At least as much as the printed word can.

It does in most cases.

Two teachers made general comments on their inquiries. A social studies teacher, the committee chairman, said: "I discovered this pamphlet (C-13) to be very helpful to me. It was very easy to understand in every respect. I only hope that some of our suggestions will be accepted." The other comment was made by the agriculture teacher. He said:
The plan as outlined by the pamphlet (0-2) is all right in as far as my information is concerned, yet it would seem that careful analysis would be necessary from the financial angle.

It perhaps makes asking too easy without enough thought given to other parts or facilities of the school. Being selfish seems natural without being made extra easy. My interest should be agriculture yet I'd be poorly satisfied with an excellent agriculture department at the expense of the entire school.

These comments by the agriculture teacher reflected a very great concern in building planning. Nevertheless, in the early stages, educational planning should be done on somewhat of an idealistic basis so that all possibilities are explored. In many instances seemingly costly facilities may be obtained by intelligent planning with very little additional expense. The planning should not be looked at as a process of padding as is sometimes done in budget making. The process should be considered as one of stating needs and, if necessary, of validating them. One shop teacher who was recently involved in educational planning purposely set his needs very high because he anticipated some cutbacks. When the administrator and the architect became aware of this, they doubted his every request and as a result his area experienced greater cutbacks than any other. Unfortunately the resulting shop area is too crowded for effective operation.

In the writer's experience in planning he has found, however, that the large majority of teachers are rather conservative. Occasionally the opposite is true. If the co-operative approach to planning as outlined in Pamphlets A-1 and C-1 is used there will be little opportunity
for certain subject areas to be awarded spaces which are excessive in size in comparison with the remainder of the school.

Furthermore, to curb the over-zealous staff members, an additional step has been added to the planning procedure. It is the development of summaries of the plant facilities. A suggested guide for the development of the summaries is included as Forms 4 and 5 in Pamphlet D-1.

The directions for the use of the manual contained in Pamphlets A-1 and C-1 suggest that the general committee be responsible for summarizing and co-ordinating the information contained in the various pamphlets. In this step any attempt on the part of certain staff groups to be over-zealous should be detected and rectified.
The Judgment of the School Administrator

A similar inquiry based upon the criteria in Chapter 3 was submitted to the administrator — the county superintendent of schools. This inquiry, a copy of which is included as Form C in Appendix B, consisted entirely of free-response items. Each item and the administrator's responses are presented. They were:

Item 1: What advantages did you see in having the staff participate in the planning of the high school building?

1. Contributions which all could make — a large reservoir of knowledges and experiences.
2. Participation breeds support and understanding.
3. Participation encourages evaluation of on-going activities and thinking and gives perspective.

Item 2: What disadvantages did you see in having the staff participate?

None — slow, yes, but that may well be good.

Item 3: Did this instrument help you as a school administrator to do the educational planning for the building?

Comments:
Immeasurably.

Item 3a: What difficulties did you find that the staff had in using this instrument?

Some difficulty in discovering their function in relationship to the whole process. Spend more time getting the staff ready to work.
Item 3b: What difficulties did you have as an administrator in using the instrument?

None, although I did have the services of a skilled operator at crucial spots.

Item 4: In what ways did this instrument give too much direction or emphasis or too many suggestions?

(Comments on this item were restricted to Pamphlet B-1)

This pamphlet would be much more difficult to use without skilled guidance. It could be done. Form 3 is complex. A busy school administrator might not have the patience.

Item 5: In what ways was this instrument inadequate in providing a proper amount and kind of directions or suggestions?

I think the instrument is adequate.

Item 6: List any other comments which you care to make about the manual or the proposed planning procedure.

(Comments under this item were restricted to specific pamphlets dealing primarily with administrative aspects.)

B-1 -- With no local head this was difficult to use and required help.

A-1 -- Clear and well set up.

C-1 -- Satisfactory.

D-1 -- Good, quite comprehensive.

As was stated previously, since there was no school head and since the county superintendent felt that he should not usurp too much of the function of the local school head, the writer served as
consultant in the project. As such, he saw first hand the difficulties that staff members had in the project. The major problem centered around teaching station calculations. The writer is convinced that if a local school head had been available on this project, the difficulties with Pamphlet B-1 referred to above would have been minimized.

The busy school administrator poses one of the problems in educational plant planning. Obviously, if planning is to be well done, considerable time and effort are required. School administrators and boards of education must become aware of the need to do educational planning and must realize that this requires concerted effort on the part of certain personnel. Fortunately, as was noted in Chapter 1, there is an increasing interest on the part of educators to participate in the educational planning phase.

The Judgment of the Architect

The architect in Situation A responded to the items on Form D. A copy of this form is included in Appendix B. The items on the inquiry and the responses of the architect were as follows:

Item 1: How helpful is the information that is requested in the pamphlets in the C-series to you as an architect in planning a secondary school building for a given enrollment and a given educational program?

The C-series pamphlets, if followed, furnish the architect with a very substantial part of the material he needs for planning the secondary school. This should always be furnished him as completely and as quickly as possible by the educational authorities.
In Chapter 4, the reader's attention was directed to the fact that the representative of this architect requested that the educational planning for this project be completed in two weeks. If a thorough job of educational planning is to be done, it is unlikely that the planning can be completed in that span of time.

Item 2: Do these pamphlets cover the important information which you as an architect need in planning secondary school buildings?

The pamphlets cover the information necessary to plan the building.

If not, what additional information do you need that is not covered in these pamphlets?

The architect must have additional information from the owner in regard to site: availability of water, gas, sewers, and electricity and topography.

Item 3: Did the rating scales help you to determine the degree of importance that the staff attaches to the various items?

The rating scales help develop the degree of importance attached to various items.

Item 4: Did the types of information which are requested in the pamphlets make it difficult for you to plan the building? Would they tend to tie your hands?

The types of information requested in the pamphlets are very helpful to the architect in planning the building. Some of the information might be simplified in some way but it seems to cover very well.
Item 5: What difficulties did you have in using these pamphlets after they were filled out by the staff and turned over to you?

I believe the pamphlets are clear in their intent and I had no difficulty in understanding or using them.

Item 6: List any other comments which you care to make about the manual or the proposed educational planning procedure.

It might be that after the pamphlets are filled out that there might be some way of getting a summary of the information to the architects in one concise pamphlet.

It must be remembered in submitting the data that the architect only has so much money for each project and that the requirements should be boiled down in the beginning so that the client does not get the idea that he can get a great deal more for his money than he really can.

Since the county superintendent of schools requested the educational consultant to prepare a program of requirements from the data contained in the various pamphlets, the architect did not have the opportunity to use the summaries. In a project where the total manual is used, the general committee would prepare summaries for the use of the architect in accordance with directions contained in Pamphlet D-1.

The second comment made under Item 6 tends to suggest that this architect did not really believe in the staff being involved in planning. Indications are that he believed he should show the client the
plant that could be obtained for the money rather than analyzing the educational needs of the community and attempting to meet those needs. Architecturally his approach is more simple; educationally it is not sound.

A Comparison of Architectural Preliminary Plans for Situation A

In order to comply with certain statutory regulations on bonded indebtedness for school building purposes, boards of education in Ohio school districts must secure permission from State tax and educational agencies to exceed the 4 percent debt limitation. These agencies require that a sketch of the proposed building be included as one of the exhibits when filing an application for permission to exceed the limitation. The board of education in Situation A requested the architect to prepare a preliminary plan for a high school to house 350 pupils in grades 9 through 12 which could be constructed for $450,000 exclusive of site, equipment, fees and contingencies. Figure 3 is a copy of this preliminary plan. This plan included the following facilities:

7 Recitation rooms
1 Science room
1 Commercial room
1 Machine room
1 Cooking and sewing laboratory
1 Homemaking room
1 Agriculture shop and auxiliary room
Because of certain salient characteristics of this plan, the county superintendent proposed that more extensive educational planning should be done. Following the educational planning which was described in Chapter 4, the architect developed additional sets of preliminary plans which were presented to school authorities, staff members, the board of education, and the educational consultant for analysis. The basis upon which the analyses were made was the information contained in the several pamphlets and summarized in the program of requirements.
FIGURE 3

PRELIMINARY PLAN FOR SITUATION 'A' DEVELOPED PRIOR TO EDUCATIONAL PLANNING
Figure 4 is a copy of the preliminary plan which represented the greatest conformity to the educational specifications outlined in the pamphlets.

In addition to the plan shown in Figure 4, the architect developed a plot plan showing the location of the building to be provided in immediate construction and the proposed location of future construction. It also showed outdoor facilities such as the physical education, athletic, and recreation areas, traffic patterns for vehicles and pedestrians, bus loading area, and parking areas for bicycles and automobiles.

The proposed building as shown in Figure 4 will contain the following facilities:

5 Regular classrooms for language arts, mathematics, and social studies
1 Business education classroom
1 Machine room
2 Science classrooms and auxiliary rooms
2 Home economics laboratories
1 Combination agriculture and industrial arts shop and auxiliary room
1 Vocational agriculture classroom and industrial arts planning room
1 Music studio and auxiliary rooms
1 Combination auditorium-gymnasium and auxiliary rooms
1 Cafeteria kitchen and auxiliary rooms
1 Lunch room and study hall
Figure 4 also shows the proposed locations for additions to the building when the enrollment exceeds 350. Although it would be possible to expand the plant shown in Figure 3, it would be exceedingly difficult to maintain a functional relationship among the rooms. For instance, according to Table 7 in Chapter 4, the following additional teaching stations will be needed to increase the capacity of the proposed building from 350 to 450:

- Language arts
- Mathematics
- Business education
- Vocational agriculture shop (The existing shop is to become an industrial arts shop and planning room.)

Study facilities for an additional 20 pupils each period will also be needed.

Figure 3 includes only one science and one business education room. It is impossible to locate a second business education room with direct access to the machine bay and a second science room with direct access to the science storage room. The plan in Figure 4 which was developed
Preliminary plan for situation "A" developed after educational planning.
according to the educational specifications contained in the manual has two science rooms and permits a room adjacent to the machine bay to be converted to use for business education classes. Figure 4 also shows the proposed location of the second shop, an auditorium, and additional regular classrooms. Other facilities such as the cafeteria kitchen and dining room, the music suite, the home economics suite, the library, and the gymnasium are adequate to accommodate an enrollment of 450.

Quantitatively the two plans differ as follows:

1. The first plan has two more regular classrooms and one more shop.

2. The second plan has one more science room and a music studio.

Indications are that the first plan was not designed to house either the educational program that was envisioned for this community or the projected subject enrollments. Of course in the first plan, if one regular classroom were used for music and the second regular classroom were used for science, the room schedules would be almost identical. Room areas, however, would not be suitable and none of the regular classrooms would provide a desirable location for a music room.

One has to agree with the comment made by one member of the board of education in Situation A, that it is desirable to have an additional classroom or two in a building. However, when one analyses the suggested room areas shown in Figure 3, it is apparent that the additional rooms were obtained, in part, by providing rooms that are below
commonly suggested minimum standards for academic-type classrooms housing 28 to 30 pupils.

During the course of this project the writer learned that the music studio was eliminated from the first preliminary plan in order to save space. Such a procedure is highly acceptable provided the amputation causes minimum curtailment of the educational program and it is possible economically to add the facility at a later date. The plan shown in Figure 3 does not indicate where a future music studio could be added.

Ideally the proposed combination shop shown in Figure 4 is not the best arrangement. The arrangement does permit both the agriculture and the industrial arts programs to operate during the years immediately ahead. As enrollments in these two areas increase and a second shop is needed, the proposed arrangement permits the second shop to be added and the conversion of the combination shop into an industrial arts shop and planning room. The proposed arrangement will provide a shop and a related classroom for each area, each of which will be more adequate in size than the proposed facilities in Figure 3.

The administrator in Situation B indicated after completing the teaching station calculations according to directions in Pamphlet B-1 that it was doubtful that he would have discovered the poor relationships among spaces if the exact future needs had not been calculated on Form 3 in Pamphlet B-2 and locations of facilities had not been stressed in the various pamphlets. He also indicated that if
consideration had not been given to room areas in the pamphlets that it is unlikely that they would have been aware that the proposed regular classrooms were so small. Although Figure 3 does not include a music studio, it is likely that this deficiency would have been discovered whether or not a definite program of educational planning had been consummated.

These two plans very clearly illustrate a problem that is frequently encountered in the planning of school buildings. That is, once some architects have developed a basic plan they are inclined to maintain that general pattern in spite of certain basic weaknesses in the plan. For example, in Figure 3 the library and study hall are located adjacent to the gymnasium where there will be considerable activity and noise. In spite of the fact that the educational specifications suggested that the library and study hall should be located in a quiet area of the building and readily accessible from the social studies and language arts classrooms, no attempt was made to improve the location of these facilities. Of course, the gymnasium is near the cafeteria kitchen so large banquets can be served readily. The location of facilities in a school building ought to be determined on the basis of educational benefits to be achieved rather than on other benefits. This situation stresses the need to do educational planning prior to any architectural planning.

This example also reflects the disadvantage of the present Ohio regulation which requires a sketch of a proposed building to be included with an application to state education and taxation agencies
for permission to exceed the 4 percent statutory limitation on bonded indebtedness. Unfortunately most districts do not do any educational planning prior to the passage of a bond issue. Furthermore, if a board of education requests an architect to develop a sketch for it on the understanding that he will be employed as the architect if the bond issue passes, he will hesitate to start on a new set of plans for monetary reasons if not for professional reasons when he is legally employed as the project architect. A board of education ought to employ an architect on a per diem basis to develop sketches to be submitted to state agencies. A similar arrangement ought to be followed when developing sketches for public relations or campaign purposes.

Judgments of the School Administrator and the Architect in Situation B

In this planning situation, the architect requested the pamphlets in the C-series from the writer to serve as guides in the planning of a secondary school.

The writer was involved in this project only to the extent of supplying the planning manual and corresponding with the executive head of the school and the project architect. A resume of this correspondence is reported at this point.
Judgment of the School Administrator

The administrator based his comments on the items contained in Form C, a copy of which is included in Appendix B. The items in the inquiry and the comments which the administrator made concerning all except one of the items were as follows:

Item 1: What advantages did you see in having the staff participate in the planning of the high school building?

We had heads of departments work with the administration and architect in planning their needs as they see them. This is not to get final plans.

Although the manual was secured from the writer so that staff members could be involved in the planning, it is obvious from the comment on this item that only limited participation took place. Since the question is not answered directly, the writer assumed that the executive head of this school did not feel that involvement of the total staff in the planning of the facilities was desirable. He stressed, too, that department heads were used only in the preliminary phases of the planning.

Item 2: What disadvantages did you see in having the staff participate?

Each is apt to think his department is most important. He is apt to overdraw or oversize it.

Item 3: Did this instrument help you as a school administrator to do the educational planning for the building?
Yes. However, this procedure was supplemented by visits to newly constructed schools. Also texts and magazines were used.

It is anticipated that those who use the manual should visit school buildings and should make considerable use of reference materials in developing the educational specifications.

Item 3a: What difficulties did you find that the staff had in using this instrument?

No response

The fact that no response was given to this item attests to the writer's statement in connection with Item 1 that staff members were involved in the planning of the new structure only to a limited degree.

Item 3b: What difficulties did you have as an administrator in using the instrument?

Had more building planned for than our money would pay for.

In the early planning stages, the sights should be set high so that the possibilities of overlooking desirable features are reduced. Few school districts are financially able to provide all the building facilities that are needed for an ideal school plant.

Item 4: In what ways did this instrument give too much direction or emphasis or too many suggestions?

No response.
Item 5: In what ways was this instrument inadequate in providing a proper amount and kind of directions or suggestions?

Does not tend to correlate the various departments. Should be only the beginning part of the planning and finally an end-check.

The intention of the writer was that the various pamphlets in the C-series be used in the beginning stages of the planning process as was suggested by this respondent. Obviously it can also serve as a guide in analyzing architectural plans. Without a doubt an instrument is needed that local school personnel can use in the evaluation of the architectural plans. Since the time that this administrator used the planning manual, a summary, Pamphlet D-1, has been developed. The summary makes it possible to co-ordinate the "various departments" as suggested by this respondent. The summary is also designed to make it possible to eliminate any inconsistencies which may develop as a result of numerous staff committees working independently on the individual pamphlets.

Item 6: List any other comments which you care to make about the manual or the proposed planning procedure.

No response.

The use of the planning manual in this situation apparently was limited to use by the department heads and the school administrator. As such this situation was not one of the best tests of its worth as a guide in planning secondary school facilities. The procedure used
in this planning project violated, in part, the principle that those
who are likely to use a school plant should be involved in the plan-
ing of it.

The Judgment of the Architect

The architect in Situation B responded to inquiries on the man-
ual on two different occasions — when the project was initiated and
after the preliminary drawings were completed. The statements in the
inquiry and the comments which he made about the manual at the time
the project was initiated are listed below. Form E in Appendix B is
a copy of the inquiry used in this instance.

Item 1: How helpful would information of the type that
is requested in these pamphlets be to you as
an architect who is planning a secondary school
building for a given enrollment and a given
educational program?

The information requested in the plan-
ing manual would certainly be welcome
in our office. One of the great weaknesses
in the past has been the inability to draw
out of the faculty and school administrators
the vast amount of information needed to de-
sign a high school. After the building is
up, they can see the mistakes. I believe
such pamphlets as these would help them to
grasp what is needed and therefore help the
architect.

Item 2: Do these pamphlets cover the important informa-
tion which you as an architect need?

The pamphlets seem to be very complete.
Our first job with this method would
reveal any additional information needed.
If not, what additional information do you need that is not covered in these pamphlets?

No response.

**Item 3:** Will the rating scales help you to determine the degree of importance that the staff attached to the various items?

Yes. This is another method of helping the architect realize what is desired.

**Item 4:** Would the types of information which are requested in the pamphlets make it difficult for you to plan a building? Would they tend to tie your hands?

I don't think so. Generally the architect can revise minor requirements to fit the building.

**Item 5:** What difficulties do you envision that you would have in using pamphlets of this type?

The pamphlets are quite long and would no doubt require considerable time on the part of the architect to help execute the form. However, it would be worth it.

At the conclusion of the planning process the architect responded to a similar inquiry. Form D in Appendix B is a copy of it. The comments he made at that time and the inquiry items are listed below.

**Item 1:** How helpful is the information that is requested in the pamphlets in the C-series to you as an architect in planning a secondary school building for a given enrollment and a given educational program?
We found the completion of the pamphlets by the administration very useful in our office. It certainly helped us in planning what was desired.

Item 2: Do these pamphlets cover the important information which you as an architect need in planning school buildings?

Pamphlets appear to be very complete. At least they were complete for our project.

If not, what additional information do you need that is not covered in these pamphlets?

No response.

Item 3: Did the rating scales help you to determine the degree of importance that the staff attaches to the various items?

The scale was used in evaluating the importance of the item in question. This was very helpful. It gave us a key as to the comparative value.

They helped when we had to make modifications to come within budgetary limitations.

Item 4: Did the types of information which are requested in the pamphlets make it difficult for you to plan the building? Would they tend to tie your hands?

No. If items asked for did not meet with our approval, we took the pamphlet to the superintendent and the instructor and asked for a discussion. This item is very minor.

Item 5: What difficulties did you have in using these pamphlets after they were filled out by the staff and turned over to you?

The main problem was to take time to digest the comprehensive report.
Item 6: List any other comments which you care to make about the manual or the proposed educational planning procedure.

Personally, we think the idea is a good one. A very weak link in the past has been the haphazard method of securing the building requirements from the school officials. They think this is the architect's job. There is a psychological advantage in your program, too. The architect can say, "It was in the original requirements." This is an item worthy of remembering.

The similarity between comments made before and after the use of the manual in a planning project is interesting to note. Although the architect found that considerable time was required to study the total document after the staff members had completed it, he found the time well spent. He featured the fact that he had definite information upon which to base his planning and upon which to discuss various phases of the proposed building with staff members.

Judgments of the Staff Members, School Administrators, and Architects in Situation C

In Situation C, the writer was invited to serve as educational consultant on a building planning project in a city in the northeastern part of the state where a sizable addition to a senior high school was being planned. He entered the project after the educational planning had been started and the architects were working on the second revision of preliminary plans. As the writer worked with
staff members, administrators, and the architects, he became aware of the extreme difficulties they had experienced in setting up the planning program and in the development of educational specifications. As one indication of the potential effectiveness of the planning manual developed in this study, the writer requested the school administrators, the chairman of the building planning committees, and the architects to study the total manual or portions of it as the case may be to see whether the instrument would have been of value to them in the planning of the addition to this building.

The Judgments of the Building Planning Committee Chairmen

The inquiry submitted to the staff members in Situation C was similar to the one used in Situation A. A copy of the inquiry, Form F, is included in Appendix B.

In Situation C, building planning committees for the following facilities were included:

- Art
- Business Education
- Driver Education
- Home Economics
- Industrial Arts
- Language Arts
- Mathematics
- Music
- Physical Education
Inquiries were submitted to each of the chairman of these 15 planning committees and responses were received from 93 percent of them. The chairman of the group planning music facilities failed to respond. The responses to the inquiries will be presented in much the same manner as used in the discussion pertaining to Situation A.

The responses of the committee chairmen to Item 1 of the inquiry are shown in Table 14. On the three-point scale -- "little," "some," "much," -- twelve chairmen indicated that the pamphlets they studied provided "much" opportunity for suggesting to the architect the essential information which he should know about the educational program; one person was of the impression that this provision was made to "some" extent; and another person felt that this was possible only to "little" extent. Free-response statements to this item included:

... a definite pattern for helpful guidance.

... a good check list to assure full coverage.

Helps to check and organize materials.
TABLE 14

RESPONSES OF CERTAIN STAFF MEMBERS IN SITUATION C TO ITEM 1 OF AN INQUIRY ON A MANUAL FOR PLANNING A SECONDARY SCHOOL BUILDING

<table>
<thead>
<tr>
<th>Response</th>
<th>Pamphlets in C-series and Distribution of Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little</td>
<td>0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0</td>
<td>1</td>
</tr>
<tr>
<td>Some</td>
<td>0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>1</td>
</tr>
<tr>
<td>Much</td>
<td>1 1 0 1 1 0 1 0 1 1 1 1 1 1 1 1</td>
<td>12</td>
</tr>
<tr>
<td>No reply</td>
<td>0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 15 shows that there was unanimous agreement among the committee chairmen that the instructions in the pamphlets and the accompanying pamphlet of directions were "easy to understand."
TABLE 15

RESPONSES OF CERTAIN STAFF MEMBERS IN SITUATION C TO ITEM 2
OF AN INQUIRY ON A MANUAL FOR PLANNING A
SECONDARY SCHOOL BUILDING

<table>
<thead>
<tr>
<th>Item 2: Indicate the extent to which the instructions in the pamphlet you studied and the accompanying pamphlet of directions were easily understood.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Easy to understand</td>
</tr>
<tr>
<td>Some difficulty in understanding</td>
</tr>
<tr>
<td>Difficult to understand</td>
</tr>
<tr>
<td>No reply</td>
</tr>
</tbody>
</table>

There was considerable agreement among the chairmen that the pamphlets they studied would be "easy to use." Table 16 reveals that one of the group checked the response "difficult to use" while all the others checked the response "easy to use." One person underlined "time to use" in this item and added: "Five minutes or five months depending on how good a job one wants to do!" Another teacher indicated that two factors which made the pamphlet he studied "easy to use" were: "Ease of reading," and "Outline well organized."
TABLE 16
RESPONSES OF CERTAIN STAFF MEMBERS IN SITUATION C TO ITEM 3
OF AN INQUIRY ON A MANUAL FOR PLANNING A SECONDARY SCHOOL BUILDING

Item 3: To what extent is the pamphlet you studied easy to use (i.e., time to complete the pamphlet, ease with which responses can be made, etc.)?

<table>
<thead>
<tr>
<th>Response</th>
<th>Pamphlets in C-series and Distribution of Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 4 5 6 7 8 9 10 11 12 13 14 15 17 18</td>
<td></td>
</tr>
<tr>
<td>Easy to use</td>
<td>1 1 1 1 1 0 1 0 1 1 1 1 1 1 1</td>
<td>13</td>
</tr>
<tr>
<td>Difficult to use</td>
<td>0 0 0 0 0 0 1 0 0 0 0 0 0 0 0</td>
<td>1</td>
</tr>
<tr>
<td>Extremely difficult to use</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>0</td>
</tr>
<tr>
<td>No reply</td>
<td>0 0 0 0 0 0 0 1 0 0 0 0 0 0 0</td>
<td>1</td>
</tr>
</tbody>
</table>

According to Table 17, 13, or 93 percent of the respondents, agreed that the pamphlets they studied listed or made provisions for listing to "much" extent the facilities needed to conduct a secondary school educational program or to carry on the necessary services. One member of the planning group checked the response "some" to Item 4.

Free-response statements which were added to this item by the staff members who completed the inquiries concerning Pamphlets C-7 and C-14 stressed the need for storage for tools as major items and filing cabinets and bookshelving as less necessary facilities.
Table 17

RESPONSES OF CERTAIN STAFF MEMBERS IN SITUATION C TO ITEM 4
OF AN INQUIRY ON A MANUAL FOR PLANNING A
SECONDARY SCHOOL BUILDING

Item 4: To what extent does the pamphlet that you studied list or make
provision for listing the facilities needed to conduct a
secondary school educational program or to carry on the
necessary services?

<table>
<thead>
<tr>
<th>Response</th>
<th>Pamphlets in C-series and Distribution of Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>0</td>
</tr>
<tr>
<td>Some</td>
<td>0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>1</td>
</tr>
<tr>
<td>Much</td>
<td>1 1 1 1 1 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td>
<td>13</td>
</tr>
<tr>
<td>No reply</td>
<td>0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>1</td>
</tr>
</tbody>
</table>

The staff members in Situation C showed greater divergence of
opinion on Item 5 than on any other item in the inquiry form. Table
18 shows the distribution of responses to this item, the degree to
which the pamphlets provided opportunity for staff members to indicate
to the architect the importance which they attached to the various
aspects of planning. According to this table, 11 checked "much," two
checked "some," and one checked "little."
TABLE 18
RESPONSES OF CERTAIN STAFF MEMBERS IN SITUATION C TO ITEM 5 OF AN INQUIRY ON A MANUAL FOR PLANNING A SECONDARY SCHOOL BUILDING

Item 5: Does the pamphlet you studied provide opportunity for indicating to the architect the importance which you attach to the various aspects of planning (i.e., teaching methods, location of facilities, physical features of rooms, etc.)?

<table>
<thead>
<tr>
<th>Response</th>
<th>Pamphlets in C-series and Distribution of Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little</td>
<td>0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1</td>
<td>1</td>
</tr>
<tr>
<td>Some</td>
<td>0 0 1 0 0 0 0 0 0 1 0 0 0 0 0 2</td>
<td>2</td>
</tr>
<tr>
<td>Much</td>
<td>1 1 0 1 1 0 1 0 1 0 1 0 1 1 1 1 11</td>
<td>11</td>
</tr>
<tr>
<td>No reply</td>
<td>0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 1</td>
<td>1</td>
</tr>
</tbody>
</table>

In addition to studying Pamphlet C-14, the chairman of the committee on vocational education facilities requested the opportunity to study the entire manual. In a letter addressed to the writer after a study of the entire manual, he said: "The more I study the manual which you developed the more I believe that it is a . . . valuable contribution."

The relatively small number of free-response statements made by the respondents in Situation C as compared with those in Situation A is, no doubt, an indication of the validity of the statement the writer made earlier in this chapter that the true evaluation of the manual must be made by those who use the manual in actual planning situations.
The Judgments of the School Administrators

In Situation C the four administrative officers -- superintendent, assistant superintendent, high school principal, and assistant principal -- who were involved in the planning program were requested by the writer to analyze the planning manual to determine whether it would have been of value to them had they had the use of it in this planning project. They were asked to formulate their reactions to the planning procedure and to the manual on an inquiry form consisting entirely of free-response items. A copy of this inquiry, Form C, is contained in Appendix B. Each item in the inquiry and the administrators' responses are presented at this point.

Item 1: What advantages do you see in having the staff participate in the planning of a school building?

Administrator A:

... to gain the results of the feeling of belonging that people develop in working on such projects. Personnel are more apt to plan and to use facilities of which they are a part.

Administrator B:

The staff can make significant suggestions because of day to day contact with both facilities and educational program. The facilities planned should assist the development of a desirable educational program based upon the philosophy of the entire staff.

Administrator C:

Involving the staff in such planning ... recreates members of the staff -- some of ours recovered zest and enthusiasm not
evident for some time -- a sort of identification of self with project. Of course, the teacher is aware of favorable specifications.

Administrator D:

They (the staff) should know more intimately some of their needs than we (the administrators) do. Too, when anyone is a part of a program, he tends to support it and to make it his own [italics mine].

On the basis of building planning and subsequent utilization of the plant, two comments were especially significant. The first pertained to the need to plan buildings in terms of the educational program and the second suggested that staff members who are involved in planning are apt to use more effectively those facilities which they helped plan.

Item 2: What disadvantages do you see in such a procedure?

Administrator A:

The chief disadvantage to the procedure is the time consuming nature of such a project, as well as the meticulous planning necessary to precede such an operation.

Administrator B:

The staff may have limited experience in planning and tend to get involved in technical suggestions that might better be expressed by the architect. Staff should be reminded to plan within dollars available after initial over-all planning has been made for a breadth of ideas.
Administrator C:
None.

Administrator D:
Few, if we remember to lend a critical eye to over-asking. Some teachers tend to ask for more than they expect or hope to get, thinking that is a smart method to employ.

The planning of a building which probably will be in use for one-half century or more naturally will be a time-consuming task under any circumstances if an attempt is made to develop a structure which best meets the school housing needs of the community. The danger referred to by one respondent that staff members may tend to become involved in technical aspects of planning is very real. Unfortunately no clear-cut demarcation between educational planning and architectural planning has been established. In fact, a zone exists between the two of them where considerable overlapping exists. The educator and the architect need to complement each other in many aspects of planning.

Item 3: Would this instrument help you as a school administrator to do the educational planning for a secondary school building?

Administrator A:
The instrument would definitely help an administrator to plan a school building. I feel I could have done a much better job had I had these materials available about two years ago when we started our planning.

Administrator B:
Would tend to reduce oversights.
Administrator C:

Undoubtedly. If we had had it (the manual) we would have saved time and energy spent in groping around. This scheme routes materials and ideas to a central path which becomes the final plan. Most of us have this experience of building planning but once so that first effort should be directed mechanically.

Administrator D:

Yes, especially if one had no previous experience. It serves as an aid to check for omissions and organization of data.

Item 3a: What difficulties do you envision that the staff will have in using this instrument?

Administrator A:

The difficulties that a staff will have in using this instrument will be that of organizing information so that it becomes a meaningful whole. This may be more of a problem for administration than the teaching staff because I believe the individual (pamphlets) would be very helpful to each committee.

Administrator B:

Tendency to stimulate discussion beyond time permitted by growing population.

Administrator C:

Very little. However a staff should be warned that this is time consuming. Of course time will be consumed in any case -- probably less this way than otherwise.

Administrator D:

Very little if they use the opportunity to add information where space is provided, to adjust for any unusual conditions they may have.
Item 3b: What difficulties do you envision that the administrator will have in using this instrument?

Administrator A:

The chief difficulty that an administrator will encounter will be that of organization and to be far enough ahead of the problem to be effective.

Administrator B:

None.

Administrator C:

Again very little. Yet I suppose one would need to go through the routine before being capable of safe judgment. Nevertheless, I think we would have benefited greatly if we had had this system at the start.

Administrator D:

Some (administrators) are so busy they may not take time to study instructions for using (the manual). Some may not have fundamental data essential to the use of the instrument such as subject enrollments for the past five years.

As was pointed out previously, the busy school administrator poses a real problem in educational planning. Educational planning will be effective only to the extent to which those who are doing it are willing to consummate the planning project. Similarly an instrument designed to facilitate planning will be effective only if the instrument is used properly.
Item 4: In what way does this instrument give too much direction or emphasis or too many suggestions?

Administrator A:

My only comment about the directions would be to simplify them in such a way as to help administrators and teachers grasp the wholeness of the problem on one single page, with the details to follow later in the document.

Administrator B:

General reaction — quite satisfactory.

Administrator C:

Since most groups will be inexperienced in building planning, I doubt whether it is possible that the forms contain too many directions and suggestions. It is fortunate to find such material where it will be used rather than be compelled to search through publications for that which applies.

Administrator D:

I find no place in which too much aid is given.

In the development of the manual, the writer attempted to avoid a document which by its nature might force a particular kind or design of building upon the staff or architect. The administrators in Situation C apparently did not feel that the manual would force a predetermined design or type of school plant upon the planners.
Item 5: In what ways is the instrument inadequate in providing a proper amount and kind of directions or suggestions?

Administrator A:

I do not feel that the instrument is inadequate at all. I believe this kind of instrument would, indeed, meet a great need in the field today.

Administrator B:

None observed.

Administrator C:

Even in the face of lack of general acceptance of many building specifications, as square footage desirable for specific areas, I yet think a page or two of such information in the manual would be valuable.

Administrator D:

No response.

The writer does not share the opinion expressed by the one administrator who suggested that a section be included in the manual on "square footage desirable for specific areas." In the final analysis, calculating the floor space required for various activities is an architectural problem, i.e., after the educator indicates to the architect the number of pupils to be accommodated and the kinds of activities that are likely to occur in each facility, the architect should be able to determine space needs. Although the determination of the floor area needed is primarily an architectural problem, this does not relieve the educator of the responsibility of analyzing
space needs so he can appraise the architectural plans. In preliminary planning, the educator can very well suggest the amount of floor area desired provided he has given adequate consideration to this need. Neither the educator nor the architect should consider this suggestion as final. Provision is included in the pamphlets to indicate the desired floor area or factors which should be considered to determine the floor area needed, e.g., see page 7, Pamphlet C-2 in Appendix A. Suggestions for determining the area needed are included on pages 9 and 10 of Pamphlet C-1 in Appendix A.

Item 6: What difficulties do you envision that the architect may have in using the information which the staff would provide in the various pamphlets?

Administrator A:

The chief difficulty that an architect will have is to co-operate with the staff from beginning to end in order to grasp the vision of the staff so as to express it in the school building. Most architects are not used to this kind of staff work. The planning manual should be exceedingly helpful to accomplish this.

I believe the architect should be a consultant from the very beginning of educational planning until preliminary plans and educational specifications are approved by the board of education. Then the architect should assume the major role of planner, with the educational staff committee chairmen as consultants. In other words, the building planners (the architects) and the educational planners (staff members and educational consultants) should work hand in hand from the beginning of the problem until its conclusion in the form of the building, with changing emphasis in the leadership roles.
Administrator B:

Architects may need a sketch or two for interpretation of some details in pamphlets.

Administrator C:

By the very nature of the forms (pamphlets) the materials required by the architects would be classified for convenient use.

Administrator D:

No response.

In response to Item 6, one administrator discussed the leadership roles of the architect and the educator and how they change from one phase of planning to another. The writer agrees that the architect should be involved as a consultant early in the educational planning phase; however, the architect should be more than a consultant in the development of the preliminary plans. One could assume that the respondent was suggesting that preliminary plans developed for board of education evaluation and approval should be developed by the educator. He also suggested that educational specifications and preliminary plans be submitted concurrently for board of education approval. The writer, on the other hand, proposes that the educators develop the educational specifications with the architect serving as consultant. When the specifications are approved by the board of education, the architect with the assistance of the educational consultants should develop the preliminary architectural plans. This suggestion places the architect in a leadership role as soon as
educational specifications are developed rather than after the preliminary plans are completed. By this procedure the architect is able to draw upon his creative ability in the development of plans for a functional building. From the standpoint of planning a functional school plant, the development of preliminary architectural plans is a more important phase of the architect's work than the development of working drawings and specifications.

The statement of the second administrator emphasised the need for sketches to interpret some of the information to the architect. Provision is made in the pamphlets to include visual materials to help convey to the architect certain basic information. Visual materials which are used to portray information which can be presented visually better than verbally are very desirable. Visual materials such as drawings should not be included that are likely to "tie the hands of the architect." Furthermore, the educator must remember that architects are human beings. Since the architect may assume that a sketch represents what the educator wants, the architect may not attempt to alter it. Fundamentally the architect is employed for his creative ability. For educators to provide the architect with sketches of facilities prior to preliminary architectural planning does not permit the school district to reap maximum benefits from the expenditure of funds for architectural services. The architect, on the other hand, should not feel forced to use plans or diagrams submitted by the educator unless he is convinced that there is no better solution.
The role of the educator is clearly one of portraying to the architect the activities that probably will occur in the rooms as well as indicating the facilities such as storage and equipment that are needed to carry on the desired educational program. The role of the architect is to plan a room of adequate size and arrangement so that the program will be enhanced by the physical structure. In the process, the architect and the educator will have to engage in numerous conferences to enhance the planning.

Three of the respondents included additional remarks on their inquiries. Their remarks were:

Administrator A:

I would suggest that a manual be developed which synchronizes the following steps in the planning process: original city survey (city planning commission survey), the building needs survey, the educational planning, and the development of architectural specifications.2

2 The statement included in the first paragraph of the additional comments made by the first administrator referred to a concern which the writer had in determining the scope of this study. School building planning does cover the complete gamut from community planning to the evaluation of the occupied building. Since the problem was so large, the writer, as was stated in Chapter 1, limited the scope of the present study to the development of a manual to aid local school personnel in compiling educational specifications for secondary school buildings. The writer agrees with the respondent that there is a need to develop additional instruments as guides to the other aspects of building planning, such as guides to assist: (1) in the analysis of the community's educational needs from nursery school to the community college, (2) in the analysis of school population to be housed, (3) in the analysis of school building needs to accommodate the desired educational program and the anticipated future enrollments, and (4) in the analysis or evaluation of architectural plans.
... in the ideal situation, there should be a section calling for a definite outline of the program to be placed in the new structure. This has been inferred by drawing of educational specifications; however, I am referring to the program itself. In other words, buildings that get a "new look" should have a program that has a "new look," so that when a staff and pupils move into a new building they also carry new insights for the educational program.

Administrator B:

1. I would feel better able to react to the planning manual if I had used the materials in the actual process of planning a building.

2. How can I obtain a complete manual?

Administrator C:

Checking through the materials once more, I am wondering why such a system was so long "aborning."

Even though there is no intention to develop certain facilities about which questions are raised in the pamphlets, it is well that they be brought to the attention of the staff and considered in the early planning stages rather than being considered as an afterthought.

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3 The second paragraph quoted from the first administrator's response suggested the inclusion in the manual of a "section calling for a definite outline of the program to be placed in the new structure." In order to make the computations discussed in Pamphlet B-1 (see Appendix A), those involved in planning must calculate the required number of teaching stations on the basis of the anticipated future educational program. Other than this need for knowledge of the anticipated future educational program, the writer limited the scope of this study to the development of an instrument to guide educational planning. The writer is not adverse to this suggestion of the respondent, however.
Ideally in any given educational system, the study of the educational needs of the community should be a continuous process. Therefore, whenever the need for a new building develops, the nature of the desired educational program will be well known. In some instances, it may be known also that certain program changes should be instituted when new facilities are constructed. Obviously, alterations in any aspect of the program are apt to have influences of varying degrees on other aspects of the total program. For instance, the addition to the secondary school building in Situation C will have eight vocational shops instead of two. It is anticipated that the addition of these shops will influence many areas of the present educational program. Modifications in other areas are also anticipated. In fact, changes in program emerged before final drawings for the enlarged building were developed. The "new look" to which Administrator A referred is already in evidence.

It would be unfortunate if pupils and staff moved into a new building without "new insights for the educational program." If educational planning is done properly, the staff is certain to have a new vision of the program. Even in a school system where constant study and revision of the educational program takes place, modifications in building facilities undoubtedly will influence the program and provide new insights.

The second administrator emphasized in his comments what others have said, namely, that the best evaluation of the manual will come through use of it in actual building planning situations. The fact
that he wanted to know how to obtain a copy of the manual attested to his impression of it. Since responding to the inquiry, this respondent has changed to a new position in a city where additional buildings are sorely needed. He has sought out the writer to determine whether the manual will be available for use in the new situation. He has also inquired about a similar instrument to guide the planning of elementary school buildings.

On the basis of the judgments which these school administrators gave on the six items of the inquiry, there is little doubt that the manual for planning a secondary school building which was developed in this study was considered by them as an effective instrument to aid in the planning of secondary school buildings. Since these administrators were involved in an extensive building program and recognized the multiplicity of problems involved, their appraisal of the manual was significant.

The Judgment of the Architect

Although two representatives of the architectural firm employed by the board of education in Situation C worked on this project, only the senior member of the firm responded to the inquiry. A copy of the inquiry is Form E in Appendix B. The responses of the architect to each item of the inquiry were as follows:

Item 1: How helpful would information of the type that is requested in the pamphlets in the C-series be to you as an architect who is planning a secondary school building for a given enrollment and a given program?
We find the pamphlets extremely useful in that they are a check list as well as a means of receiving information from the source. We have discussed these pamphlets with the superintendent of schools in another planning project [italics mine] and find that he, too, feels that the pamphlets would be extremely useful.

Item 2: Do these pamphlets cover the important information which you as an architect need in planning school buildings?

We need all the detailed information we can get relative to each department before we complete our preliminary layout. We feel that these pamphlets serve that purpose.

If not, what additional information do you need that is not covered in these pamphlets?

No response.

Item 3: Will the rating scales help you to determine the degree of importance which the staff attaches to the various items?

The rating scales will certainly help us in determining the importance of items especially if our budget is limited and we are forced to cut costs.

Item 4: Would the types of information which are requested in the pamphlets make it difficult for you to plan a building? Would they tend to tie your hands?

We do not believe the information would restrict our thinking in planning the building because each project presents a different problem and suggestions of needs made in the pamphlets are related to one problem.
Item 5: What difficulties do you envision that you would have in using these pamphlets after they have been filled out by the staff and turned over to you?

We do not anticipate any difficulties if the pamphlets are given serious thought by the staff members and are not filled out haphazardly.

To make a complete report on the appeal that the planning manual had to these two members of this architectural firm would have required an audio-visual recording of their comments and actions as they studied it. They were just starting the planning of a senior high school to accommodate 750 pupils in grades 10 through 12 for another city in northeastern Ohio. Apparently they had received little data from the school authorities.

After a study of the manual, both architects were eager to learn what arrangements could be made to use the manual in this new project. Arrangements were soon made with the superintendent of schools to involve the staff in the planning of the new building and to use the manual as a guide in the development of the educational specifications.

That the architects wanted the staff to use the manual was significant on at least two counts. First, such a fact attested to the value of staff participation in educational plant planning, and second, it denoted that the architects found in the manual a reputable instrument for collecting in a usable form the essential data which they needed to develop architectural plans.
The general tenor of the judgments of the building committee chairmen, the school administrators, and the architects involved in planning Situation C signified that these persons found in the manual an instrument which should be exceedingly useful in planning secondary school buildings. The respondents in this situation were of the opinion that staff participation in planning is very desirable and that the manual will enhance such participation. Many of the respondents also stressed that buildings should be planned better and used more effectively if staff members are involved in educational plant planning than would be true otherwise.

Judgments of Others

Early in the process of developing the manual, the writer requested two architects and a superintendent of schools to criticize the manual. One architect and the superintendent responded to inquiries immediately. The other architect conferred with the writer about the manual at that time and requested permission to respond to the total manual when it was completed.

The selection of these individuals was based upon finding individuals who would give serious consideration to the manual and would be very critical of it. The nature of the comments that each made to the inquiry and the statements contained in the accompanying letters from two of them and the comments made by the one architect in conference indicated that careful consideration was given.
The superintendent of schools was requested to respond to the same inquiry, Form A, that was submitted to the school plant planning class. A copy of it is included in Appendix B. The items in the inquiry and the responses of the administrator were as follows:

Item 1: What advantages do you see in having a staff participate in the planning of a school building?

It is a democratic procedure. It helps teachers interpret their educational philosophies in terms of a physical plant to help produce the kind of educative experiences children need. It gives the staff "some say" and a feeling of contributing worthwhile things on the basis of their experiences over the years.

Item 2: What disadvantages do you see in such a procedure?

It takes a lot of time — reading, collecting items of interest, sketching plans, revising, defending their stand. Teachers are not as willing as they were several years ago — before the days of local teachers' associations — to spend time in committee meetings outside of school hours.

Item 3: Would this type of instrument help you as a school administrator to do the educational planning for a secondary school building?

Yes, very much — unless it is dragged out over too many weeks and months.

Item 3a: What difficulties do you envision that the staff will have in using an instrument of this type?

They will not have trouble using the instrument. They will have trouble finding time to meet to work on it.
Item 3b: What difficulties do you envision that the administrator will have in using an instrument of this type?

The time element in analyzing the report and interpreting it to the architect is the only draw-back that I see.

Item 4: In what ways did this instrument give too much direction or emphasis or too many suggestions? Reference to a particular section would be helpful.

No response.

Item 5: In what ways is this instrument inadequate in providing a proper amount and kind of directions or suggestions?

I feel that provision for a more detailed report on types of furniture and equipment to be provided than the space for writing indicated is necessary if equipment orders are to be made from these lists. If the information is primarily for the architect in planning the facilities, then the provision in the pamphlets seem adequate.

In addition to the responses to the items in the inquiry, the superintendent commented on the manual in an accompanying letter.

His comments were as follows:

... I wish that we had had something like this when we started to build two and one-half years ago. The forms seem very fundamental. The technique of checking items and adding sentences here and there would not consume too much time for staff participation.

The only question that I have about any of the items in the pamphlets is the one that re-occurs several times in each of the booklets, such as Item 6 on page 9 in Pamphlet C-8. These all
concern furniture and equipment for certain rooms of the building. I am wondering in how much detail these are to be answered. If these are to help the architect to determine placement of the equipment, number of electrical outlets, etc., I believe the question is satisfactory as it stands. However, if these are to be used to list the equipment which should be specified for bidding purposes, the model number, the bid price, etc., -- going into it this thoroughly in order to save the 6 percent that the architect would charge if he had to do it, then I believe the question should be stated differently and a number of items listed under it so that details for each type of equipment could be worked out.

Item 4 on page 14 of Pamphlet C-4 is what is needed for all types of equipment -- big and small -- if the teachers are to visualize something concrete for the classroom. Otherwise, there would be no agreement among them and what would be turned in would just be a "hodge-podge" -- at least that is what I ran into here.

As for storage space, book shelves, the number of square feet per pupil station, the number of linear feet for chalkboard and tackboards, the teachers know all of these and can tell you definitely what is needed. As to different types of equipment and furniture, they will have to read, see demonstrations, check salesman samples, and visit schools where the equipment is actually used before they can tell what kind of equipment that they want. At least, that was our experience.

I believe that your pamphlets will certainly cut down the amount of time necessary for teachers to meet in committees. This should expedite the whole planning process... . .

Since the intent of the manual is to serve the architect in the planning of facilities rather than preparing furniture and equipment specifications for bidding purposes, no alterations were made in the pamphlets to accommodate additional information on these items.
The inquiry submitted to the architects was similar to that used in Situations B and C. A copy of it, Form B, is included in Appendix B. The architect who responded to the inquiry immediately did so in letter form and included enough of each inquiry item in his comments to identify them readily. The inquiry items are not repeated here.

Comments in his letter which pertained to the manual were as follows:

I think a wonderful idea has been started and one which seems to me to be a very feasible method in which to present the program of requirements for a particular building. In answer to your specific questions, my reactions are as follows:

1. I would say that this type of information would be most helpful to the architect, for it would give him a very complete idea as to the thinking and the philosophy of the educational planning behind the program. While I recognize and appreciate that a number of items listed, and this is meant in a general way, would not particularly interest the architect in planning; nevertheless, it does give him an idea of the thinking and the function of the component parts of each particular division in the school plant. Many of the items will serve as a very adequate and complete check list for the architect in order that he may ascertain whether or not he has complied in all respects with the educational program of requirements. While I assume that you are thinking of the architect in respect to the actual planning of the building, I also would like to comment that this will be extremely helpful to the architect in the selection of movable equipment and furniture. We are often requested to write specifications on this particular phase of the work in which the school administrator is rather lost and frankly from our standpoint we have to anticipate more or less the needs. However in such a program as you have proposed here, this very definitely sets forth exactly what is to be provided. It is an excellent way in which a great amount of detail can be placed in a specific manner in which all concerned should have no doubt
as to use, function or necessity on any specific item in the planning. I think that the possibilities for expansion and flexibility in such a pamphlet would be unlimited. This also gives the architect an opportunity to question various phases or units in the planning and thereby clarify not only his own thinking, but it may be helpful from the standpoint of the school administrator or even in your case as the educational consultant to, shall we say, create a situation of check and balance. Needless to say I am most enthusiastic with the ideas that have been presented.

2. I think that from the information given in the three sample pamphlets, that you have very adequately covered information which too often the architect has to rely upon his own experience and judgment in order to answer. I would like to suggest, however, that space be provided in which comments could be made upon the preference at least of the school administration for certain types of floor finish, wall finish, lighting, etc. My thinking is that this gives the architect a full opportunity to discuss this particular phase of the planning in its initial stages rather than wait until the planning is into the so-called working drawing stage. I think it would be helpful both from the architect’s standpoint and the administration to know beforehand what is anticipated.

3. The rating scales certainly would be helpful to the architect to this extent, that it gives him an opportunity to judge the necessity of certain units and the desirability of certain units. In other words, it gives him a chance to evaluate in his own thinking the importance or desirability of certain phases in the planning. This I think would be extremely helpful to the architect.

4. I cannot see that the information given would necessarily tie the hands of the architect in planning. Personally, I would treat this as a guide and while we conscientiously try to adhere as close as possible to a particular program of educational requirements, there are sometimes when deviations from a specific item must be made due to certain ramifications of the planning.
program. However, I can see nothing in this type of programming which would tie or limit the architect in his thinking. As a matter of fact, it seems to me that it would be most helpful to the architect to clarify his thinking.

5. Very frankly, the only difficulty that I can anticipate in using a pamphlet of this type would be the possibility that the architect would not give the necessary full attention to each and every item as it should be given. In other words, architects are human; and a volume such as this might be considered too weighty to mull through. However, as a general rule, architects are usually pretty conscientious people and I believe sincerely that the detailed information that is set forth in the pamphlets would be found most helpful and that most architects would welcome this detail.

The second of these two architects conferred with the writer about the pamphlets he studied but did not fill out the inquiry until he had the opportunity to study the entire pamphlet. His judgment of the manual was also indicated on Form X, a copy of which is contained in Appendix B. He responded to the items as follows:

Item 1: How helpful would information of the type that is requested in these pamphlets be to you as an architect who is planning a secondary school building for a given enrollment and a given educational program?

Exceedingly helpful.

Item 2: Do these pamphlets cover the important information which you as an architect need?

Yes.
If not, what additional information do you need that is not covered in pamphlets of this type?

So far I see no additional information except a general question of "What percentage of enrollment would use school busses?" as this would help to determine location and size of loading areas.

Item 3: Will the rating scales help you to determine the degree of importance that the staff attached to the various items?

Definitely.

Item 4: Would the types of information which are requested in the pamphlets make it difficult for you to plan a building? Would they tend to tie your hands?

No, on the contrary they would be very helpful.

Item 5: What difficulties do you envision that you would have in using pamphlets of this type?

None at present, except that the school board would have to understand them thoroughly as they would be working with the architect.

In the letter of transmittal this architect added:

If educators will use the manual, then pass it on to the board of education who in turn will give it to the architect, the architect's job would be much easier and the board of education would get a much better job.

This architect was requested to analyze the planning manual shortly after he had completed the planning of a secondary school in
a district where there was no local school head and high school pupils were accommodated in schools in surrounding districts on a tuition basis. Although the county superintendent and educational consultants were involved in this project, the architects had to confer frequently with the board of education. This experience undoubtedly influenced his comments concerning the role of the board of education.

The item on bus loading has since been included in Pamphlet C-19, page 37.

The one difficulty referred to under Item 5 — "thorough understanding on the part of the board of education" — is significant. However, if the staff does the educational planning suggested in the manual and board members are kept informed of progress being made in the planning project and are involved in some aspects of planning, the members of the board of education will certainly have an understanding of the nature of the building being planned. It is also conceivable that copies of summaries proposed in Pamphlet D-1 should be prepared for the membership of the board of education.

Another architect who at the time of this writing is making a thorough analysis of the manual in anticipation of using it in connection with his next secondary school planning project, had this to say after his first overview of it:

You are making it too easy. With this manual any reasonably good architect has the basic information he needs to plan a functional school plant. I had
to learn the hard way what information to secure from the school staff before planning a building. In spite of the fact that it will make it easier for my competitors, I am favorably impressed. Such an instrument is long overdue.

In the report on the reactions to the planning manual made by the architects in Situation C, it was stated that they urged the superintendent of schools in another city to use the manual in connection with a secondary school project in his district. The manual was used and at the time of this writing the superintendent had transmitted the pamphlets and the summaries to the architects for their consideration. The writer attended the conference during which the superintendent presented the pamphlets and the summaries to them. At the conclusion of the conference, one of the architects said: "These pamphlets and the summaries provide us with the information we need. We now have something concrete with which to work."

Since this planning project had just started, and the same type of appraisal that was made in connection with Situation A was not feasible, the writer requested the superintendent to state in a letter his judgment of the manual and his suggestions for improving it. The following excerpts were taken from his letter:

The utilization of the forms for the planning of a secondary school building has been of great assistance in providing an organized and systematic approach to the problem. The opportunity to work with them is greatly appreciated.

The following are suggestions for consideration:
1. Forms C-2 to 19 might be studied in relation to securing more uniformity. Would it be possible to have similar items numbered alike and variations at the end of each form?

2. It should be made more clear that Form 4 is to contain the decisions of the general committee rather than a summary of the teachers' forms.

3. Form 4 might be more effective if it contained more items for decision.

4. Could Form 4 be made to conform more closely with Forms C-2 to 19 in relation to topics and continuity of topics?

5. Certain check lists might help in Form 4. Check lists might well be used in cases of common items such as furniture.

6. Similar forms and plans for procedure are needed in the elementary field.

The comments by the architect and the superintendent indicated clearly that the manual was of considerable help to each. How effectively the architect can use the pamphlets and the data contained therein remains to be observed.

The comments in the letter from the superintendent suggested that the summary form may have to be modified. However, the directions contained on page 8 of Pamphlet D-1 state explicitly that these forms "are to be used by the general committee in summarizing the data contained in the pamphlets in the C-series. . . . As the general committee members prepare these descriptions, they should eliminate any inconsistencies which may appear in the information . . . ." Apparently these directions were not comprehended by this administrator or he might have been guided too much by the brief statement contained in Pamphlet A-1.
The writer does not agree with the administrator that the Form 4's should contain the decisions of the general committee. In the main they should be summaries of data contained in the pamphlets. Some screening and co-ordinating may be necessary. If the data as presented in any pamphlet should be modified appreciably, the special committee concerned, as is suggested in Pamphlet D-1, should be consulted and both special and general committee members be in agreement on the data presented in the summary.

The comment about the need for a similar set of pamphlets adapted for use in the planning of elementary school buildings suggests another phase in a contemplated project of the Survey Division to develop a series of instruments to assist local school personnel in the total educational planning program from the recognition of school building needs to the evaluation of completed buildings.
CHAPTER 6
SUMMARY AND CONCLUSIONS

In its broadest sense educational plant planning includes a wide range of activities from the recognition of school plant needs on the part of school authorities to the evaluation of the completed building. The need for educational planning has been magnified in recent years because of the need to expand the school plant. Increasing enrollments at the elementary school level have forced considerable expansion of the elementary school plant. This bulge of enrollments which is forcing its way up through the elementary schools will soon require expanded secondary school facilities. Changes in the nature and scope of the educational program have also forced modifications in the school plant.

The American school plant has undergone appreciable modification from pioneer days to the present century in order to keep pace with the increasing educational demands of modern society — it has changed from the abandoned log house to the expansive, modern plant.

Along with the changes made in the school plant, significant modifications in school plant planning procedures have emerged. Basically, the planning procedures have undergone changes from the era when a carpenter built a simple building to the present era in which educational and architectural planning precede the construction of buildings.
As the educational program became more complex and building needs expanded, school buildings were planned by architects on the basis of their knowledge of the educational program. In many instances, these buildings were not suited to the educational program. Consequently, educators and school architects began to express the need for basing architectural planning on requirements developed by educators.

As more attention was given to planning buildings to fit the program, educators and architects began to suggest that those who use a school plant are in a position to suggest plant characteristics and arrangements which are likely to function effectively.

The Problem

The involvement of staff members in educational planning resulted in a demand for instruments to guide the planning process. The problem of the present study has been the development of a self-help instrument to guide local school personnel in the educational planning of secondary school buildings. Because of the extensiveness of the total process of educational plant planning, certain arbitrary limits were placed on this study. It was restricted to the development of an instrument to guide two aspects of educational plant planning — the calculation of the number of teaching stations needed to house a given enrollment and program and the development of educational specifications to guide architectural planning.
Review of Literature

As a part of this study, the writer included a brief historical development of the planning of school buildings in the United States from the seventeenth century to the early part of the present century and an overview of the recent literature in the school plant field. The historical development showed the major changes which took place in school plant design and the evolution of the educational plant planning process. The overview of the literature included a discussion of six techniques for calculating quantitative room requirements and a review of the literature dealing with the development of educational specifications to guide architectural planning. The review of the literature on the development of educational specifications revealed virtually no instruments of a self-help type to guide educational plant planning. A small number of reports of techniques used in specific planning situations and several statements of information which boards of education should furnish architects were found. Numerous reports were also found which suggested school facilities needed to house any given total enrollment or any given subject area enrollment. Unfortunately these reports gave little consideration to local educational needs.

Development of the Manual

The first step in the development of the manual was the formulation of a frame of reference. The frame of reference consisted of a
series of guiding principles which are applicable to plant planning and a set of criteria which was used as a guide in the development of the pamphlets.

The guiding principles which were developed are as follows:

1. The development of a modern educational program necessitates that planning involve all aspects of building and site in their functional relationships to the educational needs of youth and the adults of the community.

2. Representative personnel who will use a school building should participate in the planning of the various facilities.

3. The plan of the school plant should be such that teachers can function effectively in the multiple roles of guide, counselor, and planner.

4. Individuals who participate in planning school plants should study literature related to the growth and development of youth and to the planning of school plants, visit select old buildings to study changes which have been made to maintain functional plants, and visit select new buildings to study promising new features.

5. The educational plant should be designed for economical and efficient adaptation to changes in pupil enrollment, to changes in the amount and nature of curricular experiences, and to changes in teaching techniques in all instructional areas.

The criteria which were developed are as follows:

1. The manual should be readily understandable to all who use it.

2. The manual should be relatively easy to use.

3. The manual should be easily administered.

4. The manual should facilitate a co-operative approach to planning.
5. The manual should provide for the architect the essential information concerning the desired educational program, the required rooms and spaces, and outdoor facilities.

6. The manual should present the necessary basic data to the architect in such a form that undue restrictions are not placed on his initiative and creativeness.

7. The manual should be so designed that a minimum of additional processing of the basic data is needed to prepare the manual for transmittal to the architect.

8. The manual should be applicable to the planning of secondary school buildings in general.

9. The manual should place on the educator the resolution of decisions regarding educational policy.

The planning manual contains four parts each of which includes one or more separate pamphlets. The four parts are:

Part 1: General procedures in educational planning. — This part of the manual, Pamphlet A-1, suggests procedures to follow when local school personnel are involved in educational plant planning.

Part 2: Room requirements calculations. — This part of the manual consists of two pamphlets. Pamphlet B-1 consists of directions to follow in making the room requirements calculations. Pamphlet B-2 includes the work forms needed to make the calculations.

Part 3: Suggested characteristics of the rooms and outdoor facilities. — This part of the manual consists of 18 individual pamphlets in which staff members can indicate the activities to be carried on in the various facilities needed to enhance the program. One pamphlet is included for each major activity and one for miscellaneous facilities. In general, each pamphlet makes provisions for specifying the following information:
1. The number and type of teaching stations, non-class facilities, auxiliary rooms, or service facilities.

2. The nature and the extent of the major activities which will occur in each facility or the nature and the extent of the uses which will be made of each facility.

3. The location of each facility in relation to building and outdoor facilities.

4. The amounts and locations of chalkboard and tackerboard.

5. The kinds and amounts of furniture and equipment.

6. The kinds and locations of utilities.

7. The types, dimensions, and quantities of materials to be stored.

8. The auxiliary facilities needed in connection with each teaching station, major non-classroom facility, or service facility.

9. The capacity of each facility.

10. The suggested floor area needed for each facility to accommodate the projected activities or uses.

11. Other activities which may be accommodated in each facility.

An additional pamphlet, Pamphlet C-1, contains the directions to follow in using the other pamphlets in this series. These 19 pamphlets constitute the so-called C-series pamphlets.

Part 4: Summary. — This part of the manual, Pamphlet D-1, contains suggested forms on which to summarise pertinent data contained in the pamphlets in the C-series. The summaries and the C-series pamphlets in essence constitute the educational specifications which are to be transmitted to the project architect.

Part 4
The Uses of the Manual

The uses of the manual have been limited to situations which developed in the normal course of operation of the Survey Division, The Bureau of Educational Research, The Ohio State University, where the writer was an educational consultant. The manual has been used in two building planning projects as a guide in the development of educational specifications and in connection with a class project in a building planning course.

Preliminary Evaluation

An evaluation of an instrument of this type may be based upon the degree to which it is an effective guide in the building planning process. Such an evaluation may be centered around questions such as:

1. Can the manual be used effectively as a guide for the staff to follow in developing educational specifications?

2. Can the architect use the instrument effectively after it is filled out by the staff as a guide in architectural planning?

3. Are buildings planned better when the procedures as outlined in the manual are followed than they are when other methods are used?

4. Are the buildings which are planned in accord with the method proposed in this study utilised more effectively than other buildings?

5. Do the buildings planned in accord with the procedures outlined in this instrument enhance the educational program to be carried on?
Since answers to many of these questions must await time, such an evaluation was beyond the scope of this study.

A preliminary evaluation was made, however. This evaluation consisted of analyses of the judgments school staff members, school administrators, and architects made about the manual. The experiences these individuals had with it were in the following situations:

1. Each of the members of a school plant planning class used pamphlets as guides in the development of educational specifications for two secondary school facilities.

2. The staff members in two school districts used the pamphlets in the development of the educational specifications for new buildings. The data in the completed pamphlets were used by the architects as the bases for architectural planning.

3. After the school administrators and staff members developed the educational specifications for a high school without the benefit of a planning manual, they studied the manual to determine whether it would have been of value to them had they had it as a guide in planning. The architects in this project also studied the manual to determine whether the instrument would have been of value from their point of view.

4. Select architects and school administrators who had school building planning experience studied the manual on the basis of the potential value it may have for each of them in future planning projects.

The judgments of these individuals were obtained through inquiries and conferences.

The reactions of these individuals revealed certain strengths and weaknesses of the instrument. In the following summary the
strengths and weaknesses as revealed by the aforesaid staff members, school administrators, and architects are reported separately. The judgments of the members of the school plant planning class mentioned above are summarized with those of the administrators.

The strengths which the staff members reported were:

1. The manual included the information which the respondents believed that the architect needed to know about the educational program.

2. The manual listed or made provisions for listing all the facilities needed to conduct the educational program desired.

3. The rating scales made it possible for the staff members to indicate to the architect the relative importance which they attached to certain items.

4. The use of the manual from the beginning of the planning process made it possible for the staff to evaluate architectural plans more intelligently.

5. The manual was relatively easy to use.

6. The directions contained in the pamphlets were easy to understand.

7. The manual made provisions for giving consideration to the total educational program.

The strengths which were reported by the administrators were:

1. Staff involvement in planning should result in school plants which are planned better and utilized more effectively than usually results when other planning procedures are employed.

2. Improved staff-administrator relationships should develop as a result of staff involvement in planning.

3. The staff members will have an improved understanding of the total educational program.
4. The manual provided an organized approach to the development of educational specifications.

5. The instrument did not force a particular pattern of school plant design upon the district.

The strengths as expressed by architects were:

1. The pamphlets contained a very substantial part of the information needed to plan a secondary school building.

2. The rating scales showed the degree of importance which the planning committee members attached to the items and made it possible to determine which items should be given first priority. The ratings were helpful when modifications had to be made to come within budgetary limitations.

3. An abundance of information was presented in such a manner that it does not tie the hands of the architect.

4. The information listed in the completed pamphlets provided a definite point of reference which administrator, staff members, and architect could follow during conferences on the proposed plant.

The weaknesses in the planning manual as revealed by staff members were:

1. The total planning manual was lengthy.

2. The educational plant planning process as outlined in the manual was time consuming.

3. To ascertain the amount of floor area needed was difficult to do.

4. The manual did not contain adequate space in which to make drawings of proposed room layouts.
The weaknesses in the planning manual as reported by administrators were:

1. The proposed planning procedure was time consuming.

2. The staff may get involved in technical suggestions which are better left to the architect.

3. To work co-operatively with school staffs would be a problem for some architects since they are not used to such working procedures.

4. The manual did not include a definite outline of the educational program to be placed in the new structure.

5. The technique for calculating the number of teaching stations needed was somewhat complicated.

The weaknesses in the planning manual as expressed by architects were:

1. The total number of pages in the manual was large.

2. The manual did not provide information on availability of gas, water, electricity, and sewers and the topography of the site.

3. The manual did not contain such information as wall finishes and type of flooring desired.

4. Some of the information was somewhat complicated.

5. The staff members may get the idea after filling out the manual that they can get a more elaborate building than is possible under the financial limitations.
**Major Conclusions**

Three major conclusions are warranted by this study. First, a planning manual was needed to serve as a guide in the co-operative approach to educational plant planning — to systematize the planning process and to make effective use of the wealth of human resources available in any given school system for educational planning. Second, on the basis of the uses which were made of the planning manual in this study, the instrument proved to be an effective aid in the co-operative approach to planning. Furthermore, as a result of the participation of staff and others in educational planning, certain other benefits probably will accrue. Among these are: improved staff-administrator relations, widespread understanding of the total educational program, a working knowledge of the vast differences in facilities which are needed to house the educational activities, and a realization of the factors which were considered in the resolution of compromises affecting the school plant.

**A Further Look**

As this study was in progress, certain problems requiring further study were re-emphasized or were introduced. Among them were the following:

1. How to develop a better working relationship between architectural and educational aspects of planning than has been true in many instances in the past.
Although many architects recognize the value of educational planning and work effectively in relating educational and architectural planning, some of them prefer to plan buildings solely on their general knowledge of activities which are likely to occur in a school building. In part, this condition has resulted because the educator has neglected to provide the architect with the necessary information. Planning an educationally effective school plant requires co-operation among many people.

2. How to develop on the part of educators and members of boards of education an increased awareness of the need for educational planning to precede architectural planning.

Although it was reported earlier that an increasing amount of educational planning has been done in recent years, members of boards of education, educators, and architects need to develop a greater realization of the benefits which may accrue when sound educational planning procedures are pursued.

3. How to simplify the procedures for calculating the number of teaching stations needed to house any given educational program and any given enrollment.

The Conrad formula, adapted for use in the manual, is the best technique the writer found in the literature for determining capacity since it takes into consideration all factors related to capacity. (30:179) Although the formula and the accompanying worksheets were modified, a limited number of educators who worked with Pamphlet B-2 reported some difficulty in using it.
4. How to reorganize certain portions of the pamphlets in the C-series so as to simplify them without the loss of valuable elements.

Since some educators and architects indicated that certain pamphlets were lengthy and that portions of the planning process were time consuming, certain phases of the manual may have to be simplified. The problem is one of studying further to determine whether the needed decisions regarding educational planning can be made by using some simpler materials than those included in the present form of the manual. Reduction in length should not be at the expense of valuable elements.

5. How to determine the optimal amount of floor space needed for various educational and recreational activities for any given enrollment.

The school plant literature contains many statements indicating the number of square feet per pupil needed for specific activities. In attempting to relate these standards to classroom activities, many problems arise which cannot be resolved readily. When these factors are clearly understood, the task of assessing the merits of such procedures as the following can be accomplished. For example, when an architect found that his preliminary estimate of costs for a proposed building exceeded funds available, he proposed that the floor area per classroom be reduced. On the basis of financial considerations his proposal had merit; on the basis of educational considerations his proposal may have created impingements on the educational program.
In addition to the afore-mentioned items associated with building planning which require additional research, some of those who used the planning manual have suggested the need for a similar instrument to guide the development of educational specifications for elementary school buildings.

Although some educators envisioned general use of the planning manual in the evaluation of architectural plans, the writer contends that another instrument consisting of a checklist of items to observe in evaluating plans would be more apropos.
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A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

GENERAL PROCEDURES IN EDUCATIONAL PLANT PLANNING

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet A-1

GENERAL PROCEDURES IN EDUCATIONAL PLANT PLANNING

Contents

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Purpose of the Manual

In recent years educational plant planners have been accepting with increasing favor the principle that school staff, pupils, and the public should participate in the planning of a school building. This approach to planning is based on the premise that those who use a room repeatedly are more likely to know how to lay it out to function effectively as an educational tool than is the board of education, the administrator, or the architect. It follows that those who use the building should share in determining the nature of the facilities and space relationships.

Among those who use a secondary school building are: pupils; administrative, teaching, and non-teaching staff members; and citizens. Members of each of these groups should be involved to a degree consistent with the contributions which they can make toward the planning of the various facilities needed in the school plant. In addition to those who use the building, it is profitable to involve educational consultants, school plant specialists, representatives of state or other educational agencies, architects, and engineers in the planning.

Wider participation in school plant planning generally results in a number of worthy outcomes among which are:

1. A greater understanding on the part of the teaching staff and the public of the nature of the total educational program.

2. School buildings which are more functional since they are designed from inside out on the basis of the educational needs of the community rather than on the basis of a symbolic exterior design.

3. Greater interest and pride in the building on the part of the staff, the pupils, and the community since they participated in the planning.

Educational plant planning is a process which has its inception in recognizing the need for new educational plant facilities and extends through the evaluation of final working drawings and specifications. For each school building program there are distinct steps which will meet the school building problems of a particular community. It is important that the board of education assisted by its administrative officer determine a planning schedule which will provide ample time for careful planning and workable methods for involving laymen and consultants in the planning. The major steps in educational planning are:

1. Recognition and evaluation of the school plant needs.

2. Declaration of policy on educational program and the means by which the program is to be achieved.

3. Determination of the quantitative room and space requirements and outdoor facilities needed to accommodate the
proposed educational program and anticipated enrollments.

4. Formulation of educational specifications for the various school plant facilities to guide the architectural planning.

5. Preparation and evaluation of architect's preliminary plans.

6. Preparation and evaluation of architect's working drawings and specifications.

The purpose of this manual is to assist local school personnel in determining the quantitative school plant needs and the formulation of the educational specifications — Steps 3 and 4 as outlined above.

Organization of the Manual

This pamphlet is one of 23 pamphlets which constitute A Manual for Planning a Secondary School Building. The purposes of the various pamphlets are explained in the following paragraphs.

1. Pamphlet A-1 — This pamphlet is primarily for the school administrator or the director of the building planning program. It outlines suggested procedures to follow in planning a building.

2. Pamphlets B-1 and B-2 — Pamphlet B-1 consists of a technique for determining the number of teaching stations required for regularly scheduled class activities. Pamphlet B-2 contains forms for use by the administrative staff in determining the number of teaching stations. When the nature of the educational program has been ascertained, the administrative staff should calculate the number of teaching stations required to accommodate the anticipated enrollments.

3. Pamphlets in C-series — These pamphlets deal with the instructional and non-classroom areas of the building and the outdoor facilities. They are designed to guide the local school staff in the formulation of educational specifications for the new building. Suggested procedures to follow in using the pamphlets are outlined in Pamphlet C-1.

4. Pamphlet D-1 — Pamphlet D-1 is a summary. In the first two sections of this pamphlet lists are to be made of the various rooms and outdoor facilities to be provided. The final section contains suggested forms for describing the salient features of the facilities needed in the new plant. This in effect constitutes the educational specifications and serves as the basis for architectural planning.
5. **Titles of Pamphlets** — The titles of the pamphlets included in the manual are as follows:

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>GENERAL PROCEDURES IN EDUCATIONAL PLANT PLANNING</td>
</tr>
<tr>
<td>B-1</td>
<td>A TECHNIQUE FOR THE DETERMINATION OF THE TEACHING STATION REQUIREMENTS FOR REGULARLY SCHEDULED CLASS ACTIVITIES</td>
</tr>
<tr>
<td>B-2</td>
<td>FORMS FOR THE DETERMINATION OF TEACHING STATION REQUIREMENTS FOR REGULARLY SCHEDULED CLASS ACTIVITIES</td>
</tr>
<tr>
<td>C-1</td>
<td>DIRECTIONS FOR USE OF THE PAMPHLETS IN THE C-SERIES</td>
</tr>
<tr>
<td>C-2</td>
<td>AGRICULTURE</td>
</tr>
<tr>
<td>C-3</td>
<td>ART</td>
</tr>
<tr>
<td>C-4</td>
<td>BUSINESS EDUCATION</td>
</tr>
<tr>
<td>C-5</td>
<td>DRIVER EDUCATION</td>
</tr>
<tr>
<td>C-6</td>
<td>HOME ECONOMICS</td>
</tr>
<tr>
<td>C-7</td>
<td>INDUSTRIAL ARTS</td>
</tr>
<tr>
<td>C-8</td>
<td>LANGUAGE ARTS</td>
</tr>
<tr>
<td>C-9</td>
<td>MATHEMATICS</td>
</tr>
<tr>
<td>C-10</td>
<td>MUSIC</td>
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<tr>
<td>C-11</td>
<td>PHYSICAL AND HEALTH EDUCATION, ATHLETICS, AND RECREATION</td>
</tr>
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<td>C-12</td>
<td>SCIENCE</td>
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<tr>
<td>C-13</td>
<td>SOCIAL SCIENCE</td>
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<td>C-14</td>
<td>VOCATIONAL EDUCATION</td>
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<td>C-15</td>
<td>ADMINISTRATION</td>
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<tr>
<td>C-16</td>
<td>AUDITORIUM AND STAGE</td>
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<tr>
<td>C-17</td>
<td>FOOD SERVICE FACILITIES</td>
</tr>
<tr>
<td>C-18</td>
<td>LIBRARY</td>
</tr>
<tr>
<td>C-19</td>
<td>MISCELLANEOUS FACILITIES</td>
</tr>
<tr>
<td>D-1</td>
<td>SUMMARY</td>
</tr>
</tbody>
</table>
How to Use the Manual

The character of the general procedures to be followed in any educational plant planning project will depend to a great extent upon the values held by the persons developing the procedures. This manual has been developed on the assumption that educational plant planning is a complex undertaking and that a wide range of human resources should be used in the process.

The computations which are required in connection with Pamphlets B-1 and B-2 can be done most readily by individuals who are thoroughly familiar with the total secondary school program.

Pamphlets C-2 through C-19 dealing with the various facilities which may be needed in a secondary school plant are designed so that the committee approach may be used. It is suggested that a general committee and several special committees be appointed. The function of the general committee is to establish the over-all planning procedures, collect necessary information for the special committees, and coordinate the activities and reports of the special committees. It is suggested that a special committee be appointed to deal with each pamphlet in the C-series that represents facilities to be provided in the new plant. For instance, if it is decided that home economics is to be included in the educational program to be offered, a special committee of individuals who will use these facilities should be appointed to complete Pamphlet C-6, HOME ECONOMICS; if cafeteria services are to be provided, a special committee comprised of the cafeteria manager and cafeteria workers should be appointed to complete Pamphlet C-17, FOOD SERVICE FACILITIES.

Other members of the school staff, community leaders, board of education members, and pupils who are in a position to contribute to the work of the various committees should be considered for membership on the committees or should be included in an advisory capacity.

The summaries and the descriptions of the rooms and facilities in Pamphlet D-1 should be prepared by the general committee from data contained in the pamphlets in the C-series. After the summaries and the descriptions of the rooms and outdoor facilities are completed, they should be reviewed by the special committees and the data in the C and D pamphlets reconciled.

After approval by the board of education, all the pamphlets in the C-series representing facilities to be provided in new construction and Pamphlet D-1 are to be given to the architect to serve as the basis for architectural planning.
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet B-1

A TECHNIQUE FOR THE DETERMINATION
OF THE TEACHING STATION REQUIREMENTS
FOR REGULARLY SCHEDULED CLASS ACTIVITIES

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet B-1

A TECHNIQUE FOR THE DETERMINATION OF THE TEACHING STATION REQUIREMENTS FOR REGULARLY SCHEDULED CLASS ACTIVITIES

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To carry on an educational program, spaces are needed for various types of activities. This part of the manual is concerned with the determination of the number of spaces or teaching stations needed for regularly scheduled class activities. A teaching station may be defined as any location in the building which is designed to be used by one teacher conducting a regularly scheduled group learning process. In general, the total number of teaching stations will be the number of rooms. Exceptions may be found in certain areas, however. For instance, one large shop or gymnasium may provide two teaching stations if it is large enough and so arranged to be used by two class groups at the same time. On the other hand, two rooms may constitute only one teaching station when both are required for the normal activities of one class. This may be true in the science area where a chemistry laboratory is to be designed for laboratory purposes only. Since a second room will have to be available for other types of class activities, these two rooms will have to be considered as a single teaching station.

The determination of teaching station requirements for a secondary school plant should take into consideration the following factors:

1. The nature and the extent of the contemplated educational program
2. The number of pupils to be housed
3. Administrative policies related to the educational program
   a. Desirable average class size
   b. Room assignment policies
   c. Length and number of class periods per week
   d. Degree of specialization of rooms
   e. Type of schedule
4. The impracticality of 100 percent room and pupil station utilization

In addition to these factors consideration must also be given to the extent to which the school plant will be used by community groups.

It is assumed in this manual that the nature of the contemplated educational program and the number of pupils to be housed have been determined. A base for determining the number of pupils and the extent to which pupils will participate in various aspects of the educational program can be found by analyzing for recent years the pattern of subjects elected by pupils.

This analysis needs to include only those grades that are to be housed in the new plant. It is important that the records of all pupils be included.

Adjustments will need to be made to allow for changes in the educational program. Provisions for these adjustments are included in the technique for calculating teaching station needs.

Forms and Detailed Instructions for the Determination of Quantitative Teaching Station Requirements

In view of the fact that the formula for determining teaching station requirements contains many factors which are multiple in nature and not readily available to the secondary school principal, forms for collecting and processing the raw data have been developed. Three such forms are included in this manual. After a brief general discussion of the data to be collected on each form, detailed instructions are given for each item or column on each form. These instructions define the step by step process of determining the teaching station needs for a secondary school building for specified enrollments and a given educational program. An illustration is included in this pamphlet to demonstrate the technique. Pamphlet B-2 contains the necessary forms for the determination of the number of teaching stations.

Types of Data to be Collected on Each Form

Total enrollment data

Enrollment data are probably the simplest and easiest to obtain. Although the formula calls only for the five year average total enrollment, it is necessary to collect enrollment data by grades for a five year period in order to check the constancy of the relationship of subject enrollments to total enrollments, and to assist in making adjustments when this relationship is clearly not a constant. Form 1, see page 11, is used for this purpose.

Subject enrollment data

Probably the most time consuming task involved in determining the quantitative teaching station requirements is the translation of the educational program into pupil periods of instruction in the various subject areas of the curriculum. The task is that of listing all required and elective subjects by areas of specialization, recording enrollments, and calculating pupil periods of instruction. Each subject in the curriculum which requires differentiated equipment and facilities must be treated separately. It should be noted here that the greater the degree of specialization the greater the room requirements.

The so-called academic subjects which require very little specialized equipment may be considered as one subject area if the rooms for these subjects are to be interchangeable or may be treated separately as mathematics, social studies, and language arts areas. Likewise, if the rooms to be used for business education are to be equipped with drop-head desks or other combination
facilities so that typing, shorthand, and other business education subjects can be taught in the same room, all business education subjects may be grouped under one area. However, if the typing room is to be so arranged that it could not be used for other business education subjects, it should be treated as a separate area. Form 2, see page 12, is used for collecting and processing these subject enrollment data.

Teaching station requirements calculations

The first two forms contain the raw data which must be processed before determining the number of teaching stations. Form 3, see page 17, is used to summarize these data and collect additional raw data which need no such processing. These data appear on Form 3 in such a way that the various steps in the determination of the number of teaching stations are simple processes of arithmetic.

**Detailed Instructions for the Determination of the Teaching Station Requirements**

**Instructions to Accompany Form 1, Total Enrollment Data**

- **Item 1 - School district** — Record the name of the school district so that the study may be easily identified.
- **Item 2 - Building** — Record the name of the new building so that the study may be easily identified.
- **Column 3 - Grade** — Include only those grades which are to be housed in the new building.
- **Column 4 - Enrollment for the past five years** — Record enrollments by grades for each of the past five years. Use comparable data on Forms 1 and 2. For example, if October 1 subject enrollment data are used on Form 2, then October 1 total enrollment data should be used here.
- **Column 5 - Average** — Calculate averages for each grade and the total enrollment. Averages should be rounded off to the nearest whole number.

**Instructions to Accompany Form 2, Subject Enrollment Data**

- **Column 1 - Subject area** —
- **Column 2 - Subject** —

Columns 1 and 2 can be most readily filled out at the same time. On the first line of Column 1, record one of the subject areas for which differentiated equipment and facilities will be needed, e.g., science, home economics, fine arts, or academic subjects. If facilities are to be specialised within such subject areas and will not be suitable for other subjects, a further sub-grouping is necessary, e.g., foods and clothing in the home economics area.
In Column 2, opposite the subject area recorded in Column 1, list all the different subjects offered in this subject area in any one year of the five year period. List only the subjects offered during the semester for which enrollment data on Form 1 are reported; e.g., if enrollments for a date in the first semester are used, list first semester subjects, if enrollments for a date in the second semester are used, list second semester subjects.

After recording in Column 2 the various subjects included in the first subject area, skip a space and record in Column 1 the next subject area to be considered. Continue this procedure until all subject areas and corresponding subjects are included.

NOTE: Be certain that the various subject areas listed in this form include all subjects to be included in the contemplated educational program.

Column 3 - Grade placement -- If the subject is required, indicate the grade level at which it is required; otherwise, indicate the grade level of the majority of pupils who elect the subject.

Column 4 - Periods per week of subject -- Indicate the number of periods of class instruction per week for any one section of the subject. If the periods vary from one week to the next, indicate the average number of periods per week.

Column 5 - Subject enrollments for past five years -- Record enrollments by subjects for each of the past five years, and then determine the average subject enrollment for the five year period. Round off averages to nearest whole number. Be sure that subject enrollment data are for the same date each year as the total enrollment data reported on Form 1.

NOTE: The average is for a five year period; therefore, the sum of the enrollments in a given subject must be divided by five even though the subject was offered only two or three times in the five year period. This will give the proper weight to subjects offered on an alternate year basis.

Column 6 - Adjusted average subject enrollments -- When enrollments have maintained a relatively constant relationship to total school enrollments, no adjustment is necessary and this fact should be noted by recording the average subject enrollment (Column 5) in the appropriate blank space in Column 6. When it is clear that the subject enrollments have not maintained a relatively constant relationship to total school enrollments, the average subject enrollment must be adjusted in the light of the best information which is available. When such is the case, the person responsible for this form should record here the subject enrollment which, in his judgment, is most likely to result from a total enrollment equal to the average total enrollment of the five year period. Form 1 contains the average total enrollments by grades and for the entire school.
Several illustrations will help clarify this adjustment process as well as to point out the types of situations where adjustments are necessary. A subject which has become required for all pupils at a given grade level should be adjusted to the average total enrollment of that grade for the five year period. If the enrollments in a given elective subject show a trend, either upward or downward, which is different from changes in total enrollment, the average subject enrollment should be adjusted to reflect this trend. A subject which has been added to the curriculum recently so that five years of enrollment data are not available will need to be adjusted in the light of the meager data which are available. If the data show a steady increase, the adjustment should reflect this trend. On the other hand, if the enrollment during the first year in which the subject was offered was higher than the following years, it might be attributed to newness of the subject and the adjustment should reflect this. Average enrollments in subjects which have been dropped from the curriculum should be adjusted to zero.

Column 7 - Adjusted periods per week of subject — Certain classes which will meet other than five periods per week per section impose certain scheduling problems. For example, if each section of chemistry will meet seven periods per week, it will be impossible to schedule classes in a chemistry room for every period of the week when the school operates on a nine period day. Therefore, some adjustment will have to be made in order to determine the teaching station needs in such subject areas.

To determine the adjusted periods per week of a subject, divide the number of periods per week in the operating schedule of classes by the periods per week of the subject. If the quotient is a whole number, no adjustment is necessary; therefore, record the actual periods per week of the subject from Column 4. If the quotient is not a whole number, divide the whole number part into the number of periods per week in the operating schedule and carry to the nearest tenth to determine the adjusted periods per week. Example: chemistry meets seven periods per week on a nine periods per day or 45 periods per week schedule of classes. Dividing 45 by 7 gives a quotient of 6-3/7 which is not a whole number. Therefore, divide 45 by 6, the whole number part of 6-3/7, which gives a quotient of 7.5 for the adjusted periods per week. Operating schedule of classes refers to the number of periods per week during which regularly scheduled classes will meet. It would exclude the activity period but would include the periods of a staggered lunch program if some pupils are in classes while others are in the cafeteria.

Column 8 - Adjusted pupil periods per week — To determine the adjusted pupil periods per week of each subject, multiply the adjusted average subject enrollment (Column 6) by the adjusted periods per week of each subject (Column 7).
Item 9 - Total adjusted pupil periods per week -- Record here the sum of the adjusted pupil periods per week for all subjects in each subject area.

Instructions to Accompany Form 3, Teaching Station Requirements Calculations

Item 1 - Effective periods per week -- Record here the total number of periods in the weekly schedule which a pupil may use for classroom activities. Exclude homeroom or activity periods during which the regular class schedule is suspended. If pupils eat lunch on a staggered schedule while others are having regular classes, five periods per week should be deducted from the total number of regular class periods per week since all facilities could not be used maximally during the lunch periods.

If the administrative policy on room assignments and teaching load is such as to limit the use of a room to an individual teacher so that the room is available for conference and planning during the teacher's non-teaching periods, then the effective periods per week should be adjusted to the average number of teaching periods per week per staff member. It should be noted that such a room assignment policy causes considerable increase in the number of rooms required and therefore is costly in terms of needed school plant facilities.

Item 2 - Average total enrollment for five year period -- Record here the average total enrollment for all grades from Column 5 of Form 1.

Item 3 - Products of Items 1 and 2 -- Record here the product of Items 1 and 2. This is the average total effective pupil periods per week for the five year period.

Column 4 - Subject area -- Copy the various subject areas from Column 1 of Form 2. In some cases such as academic or music areas, it is desirable to list the subjects, too. Although not a subject in the usual sense, study should be added to this list since the need for study hall facilities will vary according to the educational program and it will be necessary to determine the amount of space needed for this purpose.

Column 5 - Desirable average class size -- Record here the desirable average class size for each subject area. Generally, the desirable average class size varies from one subject area to another depending primarily upon the type of activities carried on in the classroom. For example, class size in physical education may be larger than class size in shop or fine arts where more individual attention is necessary. Note that this column calls for desirable average class size and not desirable maximum class size. In order to have an average class size of 25, some classes may be as large as 30 pupils while others may be only 10 or 15. This difference is due to the pattern of pupil electives and to scheduling difficulties at the secondary-school level.
If study halls are to be limited to regular class size or to some other specific size, they may be treated as any other subject area. However, if study halls will vary considerably in size, it will be easier to make the teaching station calculation in terms of units of 100 in average class size. Then the number of teaching stations required for study can easily be converted to average total capacity by simply moving the decimal point two places to the right.

Column 6 - Pupil period enrollment -- Record here the product of Item 3 and Column 5.

Column 7 - Adjusted pupil periods -- Record here the total adjusted pupil periods per week for each subject area from Column 9 of Form 2. Since study hall enrollments are often difficult if not impossible to obtain for past years, the resulting study hall load may be calculated from other enrollment data. To determine the number of pupil periods for study purposes, subtract the sum of the pupil periods of instruction in all subject areas from Item 3.

Column 8 - Teaching station capacity index -- Record here the quotient of Column 6 divided by Column 7 for each subject area. This figure represents the total school enrollment which can be accommodated by one teaching station in each subject area. The capacity index does not mean that the total school enrollment can be accommodated in a given subject area teaching station. It is a figure which shows how changes in total school enrollments will influence the teaching station requirements. If the teaching station index for academic subjects is 68, one academic subject teaching station is needed for every 68 pupils or fraction thereof in the total school enrollment. If the index for art is 1506, one teaching station is needed for every 1506 pupils or fraction thereof in the total school enrollment.

Column 9 - Teaching station requirements for indicated projected enrollments -- Although school buildings are usually constructed for a given projected enrollment, there is considerable merit in developing a building program which permits adjustments to increasing enrollments. It is relatively easy to make planned additions to a school plant, but exceedingly difficult if not impossible to correct for over-building. A procedure which permits adjustments to increasing enrollments would provide a building adequate to house a minimum projected enrollment with provisions made for systematically expanding the building as enrollments increase. Teaching station needs should be calculated for the minimum projected enrollment as well as for other projected enrollments which may have to be accommodated.

To facilitate these calculations, Column 9 is divided into four sub-columns. Record in the spaces at the top of the sub-columns, possible future enrollments for which the building should be planned with the minimum projected enrollment in the space at the top of the first sub-column. To find the teaching station
requirements, TS, for each subject area for the projected enrollment recorded at the top of the first sub-column, divide this enrollment figure by the teaching station capacity index for each subject area, round the quotients off to the next higher tenth and record them in the left half of the first sub-column under TS opposite the respective subject areas. Record the number of teaching stations to the next higher whole number in the right half of the first sub-column. Teaching station requirements are recorded in tenths and in whole numbers to facilitate the determination of teaching stations which may have to be planned for multiple uses. In the same manner as indicated for the first sub-column, the teaching station requirements, TS, may be determined for each subject area for each projected enrollment.

If the desirable average class size for study, Column 5, has been stated in terms of units of 100, the number of teaching stations required for study can easily be converted to average enrollment to be accommodated in teaching stations for study by multiplying by 100 or simply by moving the decimal two places to the right.

By comparing teaching station requirements in the second, third, and fourth sub-columns with those in the first sub-column, the planners will be able to determine what types and how many additional teaching stations will be required to accommodate the projected enrollments recorded in these sub-columns.

**Column 10 — Additional TS needed for future enrollment of**

This column enables the planners to record the additional teaching stations, TS, needed for some future enrollment. Careful analysis of the needs for the various projected enrollments will reveal that it is possible to select certain enrollments beyond the minimum projected enrollment which can be accommodated with a minimum of additional facilities. Further analysis will reveal that the optimum enrollments on the basis of teaching station needs will be multiples of the teaching station capacity indexes recorded in Column 8 and not necessarily one of the projected enrollments recorded in Column 9.

Select the future enrollment for which the building is to be planned and record it at the top of Column 10.

Determine the number of additional teaching stations needed for each subject area by subtracting the requirements for the minimum projected enrollment from those required for the future enrollment. Record these numbers in Column 10 opposite the appropriate subject area.

The additional teaching stations which are most likely to be needed in the future should be included in the preliminary plans for the new building so that the functional relationship of spaces is not destroyed as additions are made.
An Illustration of the Determination of Teaching Station Requirements

An illustration of the use of the technique for determining the teaching station requirements for regularly scheduled class activities is included to clarify the various steps in the application of the technique. The illustration involves a school district in a suburban area where a new secondary school is needed. The building is to be planned to house 1400 pupils in grades 7 through 12 with provisions for future expansion to house an ultimate enrollment of approximately 1750. The data in the various forms reflect conditions as they have prevailed in the past five years and the anticipated changes in program. In this illustration all data were taken from October records of each year.

The daily schedule will include nine periods one of which will be an activity period. There will be staggered lunch periods encompassing the fourth and fifth periods with some pupils in the cafeteria while others are in classes. Although the operating schedule of classes will have 40 periods per week, the number of effective periods per week will be 35 because of the staggered lunch periods.

The comments which follow are limited in most cases to steps where problems in applying this technique are likely to arise.

Form 1 contains the enrollment data for the past five years for the grades to be housed in the new building.

Form 2 includes the subject enrollment data and the contemplated changes in program. In 1952-53, social studies in grade 9, global geography, and French I were added. For social studies 9 and global geography, the average subject enrollments were adjusted to figures which are more representative of the portion of the total enrollment which can be expected to be involved in these subjects. The French I enrollment was adjusted to 20 since it is anticipated that a smaller number of seniors will be enrolled in this subject in the future. Since some pupils enrolling in these subjects probably will not select other subjects, adjustments downward were made in the average enrollments in subjects such as general business, economic geography, and Spanish.

Subjects to be added to the program include French II, home economics 7 and 8, and industrial arts 7 and 8. Bookkeeping II has been dropped from the program.

Several adjustments are shown in Column 7 for subjects which meet other than five periods per week. Home economics 8 is an example.
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<td>7</td>
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<td>22 38 50 45 46 40</td>
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<td>8</td>
<td>5</td>
<td>20 15 31 45 40 30</td>
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<td>50 90 120 131 147 108</td>
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<td>540</td>
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</table>
Form 3 contains the data summarized from Forms 1 and 2 and other data needed to determine the number of teaching stations required for various total school enrollments. The additional data needed are the effective pupil periods per week recorded as Item 1 and the desirable average class sizes recorded in Column 5. For English as an example, the pupil period enrollment recorded in Column 6 is the product of 42,210, recorded as Item 3, and the desirable average class size of 30, recorded in Column 5. The teaching station capacity index as recorded in Column 8 is the quotient of the pupil period enrollment recorded in Column 6 divided by the adjusted pupil periods recorded in Column 7.

The various enrollments, 1400, 1600, 1800, and 2000, for which the teaching station requirements are to be determined are recorded in Column 9. Dividing each of these enrollments by the teaching station capacity indexes recorded in Column 8 gives the teaching station requirements recorded in Column 9. For an enrollment of 1400, the number of teaching stations required for English is six and nine-tenths to the next higher tenth and seven to the next higher whole number.

In Column 10, the additional teaching stations required for a future enrollment of 1800 are recorded. Two additional teaching stations recorded for English are determined by subtracting seven, the number of teaching stations needed for 1400, from nine, the number of teaching stations needed for 1800.

An analysis of the TS requirements for 1800 shows that for several subject areas the requirements are only one-tenth over whole numbers of teaching stations. This suggests the possibility of planning an addition for future enrollments of slightly less than 1800. According to the teaching station capacity indexes, one teaching station for social studies will accommodate a total enrollment of 255, seven will accommodate 1755; for other business education, two will accommodate 1790; for art, two will accommodate 1750; for automotive, two will accommodate 1775; for physical education, four will accommodate 1792. In this case, the most advantageous enrollment on the basis of the number of teaching stations is 1750 rather than 1800.

Study requirements for the various enrollments are shown as the last item in Form 3 on page 18. As suggested on pages 8 and 9, a desirable class size of 100 is used. This does not imply that 100 is suggested as the desirable average class size for study purposes. The requirements for this use are indicated as seating capacity or pupil stations needed for study purposes rather than as teaching stations.
Form 3
TEACHING STATION REQUIREMENTS CALCULATIONS

(1) Effective periods per week 35
(2) Average total enrollment for five year period (Form 1) 1206
(3) Product of Items 1 and 2 42210

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Desirable average class size</th>
<th>Pupil period enrollment</th>
<th>Adjusted pupil periods</th>
<th>Teaching station capacity index</th>
<th>Teaching station requirements for indicated project enrolments</th>
<th>Additional TS needed for future enrollment of 1800</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4)</td>
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<td>(7)</td>
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Form 3
TEACHING STATION REQUIREMENTS CALCULATIONS

(1) Effective periods per week
(2) Average total enrollment for five year period (Form 1)
(3) Product of Items 1 and 2

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Desirable average class size</th>
<th>Pupil period enrollment</th>
<th>Adjusted pupil periods</th>
<th>Teaching station capacity index</th>
<th>Teaching station requirements for indicated projected enrollments</th>
<th>Additional TS needed for future enrollment of 1800</th>
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<tbody>
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<td>(9)</td>
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</table>

* Indicates additional teaching station capacity required.
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet E-2

FORMS FOR THE DETERMINATION OF
TEACHING STATION REQUIREMENTS FOR
REGULARLY SCHEDULED CLASS ACTIVITIES

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet B-2

FORMS FOR THE DETERMINATION OF
TEACHING STATION REQUIREMENTS FOR
REGULARLY SCHEDULED CLASS ACTIVITIES

Pamphlet B-1 contains the instructions for the determination of the quantitative teaching station requirements and an illustration of the technique. This pamphlet contains the necessary forms on which the computations can be made to determine the number of teaching stations required to accommodate a given educational program and certain projected enrollments.
Form 1  
TOTAL ENROLLMENT DATA

(1) School district __________________________ (2) Building __________________

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<th>19__</th>
<th>19__</th>
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<td>TOTAL</td>
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</table>

Enrollments for past five years
<table>
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<tr>
<th>Subject area (e.g. biology, chemistry, physics)</th>
<th>Grades placement</th>
<th>Periods per week of subject</th>
<th>Subject enrollments for past five years</th>
<th>Adj. av. subject enrolments</th>
<th>Adj. periods per week of subject</th>
<th>Adj. pupil periods per week</th>
<th>Total adj. pupil periods per week</th>
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<td>(3)</td>
<td>(4)</td>
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<td>(8)</td>
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</table>
Form 2
SUBJECT ENROLLMENT DATA

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<th>Subject area (e.g. science)</th>
<th>Subjects (e.g. biology, chemistry, physics)</th>
<th>Grade placement</th>
<th>Periods per week of subject</th>
<th>Subject enrollments for past five years</th>
<th>Adj. av. subject enrollments</th>
<th>Adj. periods per week of subject</th>
<th>Adj. pupil periods per week</th>
<th>Total adj. pupil periods per week by subject</th>
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<tbody>
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</tbody>
</table>
Form 3

TEACHING STATION REQUIREMENTS CALCULATIONS

(1) Effective periods per week  

(2) Average total enrollment for five year period (Form 1)  

(3) Product of Items 1 and 2

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<thead>
<tr>
<th>Subject area</th>
<th>Desired average class size</th>
<th>Pupil period enrollment</th>
<th>Adjusted pupil periods</th>
<th>Teaching station capacity index</th>
<th>Teaching station requirements for indicated projected enrollments (9)</th>
<th>Additional 1S needed for future enrollment of</th>
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</tbody>
</table>
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-1

DIRECTIONS FOR USE OF THE PAMPHLETS IN THE C-SERIES

Contents

Major steps to follow in using the pamphlets in the C-series 2
Directions for filling out the pamphlets 2
Pamphlets to be used 2
Techniques to indicate information 3
Identification of teaching stations and auxiliary rooms 6
Summary 6
Number of copies of each completed pamphlet to be prepared 7

General Information 7
Furniture and equipment 7
Location of rooms 7
Chalkboard and tackboard 8
Storage facilities 9
Floor areas 9
Multiple uses of facilities 10
Definition of terms 11
The purpose of the pamphlets in the C-series is to provide a means whereby the educators can compile essential data needed by the architect to plan a functional school plant. It is assumed that a careful study has been made of the present and anticipated future educational needs of the community and that at least tentative policies have been set up in regard to type of vertical organization; immediate and ultimate enrollment to be housed in the building; geographical area the school is to serve; special educational features; provisions for atypical children; auxiliary services such as cafeteria, health, and guidance; and extent of community use. It is also assumed that the number of teaching stations required for regularly scheduled class activities has been computed.

**Major Steps to Follow in Using the Pamphlets in the C-series**

Pamphlets in the C-series are designed for use by committees. It is suggested that a general committee be appointed to provide over-all direction to the planning process and special committees be appointed to plan the various facilities. The major steps in planning are as follows:

1. Special committees ascertain from the general committee the number of teaching stations required for regularly scheduled class activities and the capacity to be provided in such facilities as the auditorium, gymnasium, and cafeteria.

2. Special committees fill out the appropriate pamphlets in the C-series.

3. General committee prepares Pamphlet D-1 from data contained in the pamphlets completed by the special committees and makes necessary revisions to eliminate inconsistencies.

4. Special committees review data summarized in Pamphlet D-1 and reconcile inconsistencies among pamphlets.

5. General committee presents pamphlets to superintendent of schools.

6. Board of education evaluates and approves data contained in pamphlets.

7. Board of education transmits the pamphlets to the architect.

**Directions for Filling Out the Pamphlets**

1. Pamphlets to be used

   Only those pamphlets which deal with the program to be housed should be completed. For instance, if vocational industrial education is not to be a part of the contemplated
program, that pamphlet should not be used. Similarly, do not complete those portions of any pamphlet which pertain to facilities not needed to house the contemplated enrollment and educational program.

There is a trend in secondary school curriculum planning to include a so-called core program which encompasses two or more subject areas or is based upon some concept of adolescent or societal needs. Although no specific pamphlet is provided for this type of program, it is contemplated that these facilities can be planned in connection with the pamphlets for language arts, social studies, or science -- whichever one is related to the contemplated program.

2. Techniques to indicate information

Several methods are used in the pamphlets to obtain information about the desired educational program and plant. The techniques are:

a. Checking -- Choices among items are to be indicated by checking the appropriate items. For example, in the pamphlet on music facilities, the following items appear:

1. Check the activities or uses for which this room should be planned.

___ a. Store all types of instructional aids
___ b. Store printed music
___ c. Sort music
___ d. Store reference materials for music classes
___ e. Serve as a reading and study center
___ f. Other ________________________________

In this example, if the music library is to be planned to accommodate items a, b, and c, these should be checked in the appropriate spaces at the left.

b. Indicating extent of use of facilities or extent to which activities will be carried on -- The extent of use of certain facilities or the extent to which certain activities will be carried on is to be indicated on a four-point scale. This scale is:

If facilities are to be used extensively or activities are to be carried on extensively, encircle the symbol . . . . . . . . . . . . . . . . . . "1"
If frequently, encircle the symbol ........... "2"

If seldom, encircle the symbol ............... "3"

If not needed or never carried on, encircle the symbol ........................................ "N"

For example, in the pamphlet on physical education facilities, the following items are listed:

1. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. Conduct classes in swimming and diving  1 2 3 N
   b. Conduct classes in life saving  1 2 3 N
   c. Conduct interscholastic swimming events  1 2 3 N

If the swimming pool is to be used primarily for swimming and diving classes, encircle the symbol "1" opposite Item a; if life saving classes will be provided only for a small number of pupils, encircle the symbol "3" opposite Item b; and if the pool will not be used for interscholastic events, encircle the symbol "N" opposite Item c.

The purpose for this rating scale is to convey to the architect a complete picture of the importance which the educators attach to the various items. The architect should plan the building so that a maximum number of items given a rating of "1" are provided for and also as many as possible of the other items with lesser priority ratings. Educators as well as others involved in planning the building should be exceedingly discriminating when these items are analyzed and rated. All items should be rated.

c. Indicating degree of preference — the degree of preference for certain items is to be indicated on a three-point scale. The scale is:

   If an item is preferred, encircle the symbol "P"

   If an item is acceptable but not preferred, encircle the symbol ........................................ "A"

   If an item is not acceptable, encircle the symbol ........................................ "NA"
For example, in the pamphlet on music facilities, the following items are listed:

5. Indicate the degree of preference for each of the following types of floor and seating arrangements.

a. Level floor with movable chairs P A NA
b. Level floor with fixed theater type seating P A NA
c. Terraced floor with movable chairs P A NA
d. Terraced floor with fixed theater type seating P A NA

If a terraced floor with fixed theater type seating is preferred, encircle the symbol "3" opposite Item d; if a terraced floor with movable chairs and level floor with movable chairs each are acceptable, encircle the symbol "A" opposite Items a and c; and if the other seating and floor arrangement is not acceptable, encircle the symbol "NA" opposite Item b. All items should be marked.

d. Commenting -- In connection with some items, space is provided for additional information or comments which may be of value to the architect in developing plans. It is desirable to provide the architect with as much information as possible concerning the facilities desired. If the space provided is inadequate, the reverse side of the opposite page can be used or additional pages may be added to the pamphlet.

e. Submitting visual materials -- Schematic diagrams, clippings, pictures, and other visual materials are other techniques for suggesting desirable features to the architect. Visual materials should be presented to the architect as suggestions rather than as the last word in facilities to be provided. School equipment catalogs and periodicals are excellent sources for pictures of school facilities. Photographs of salient features of existing buildings are another source.

The most effective development of diagrams results when the desired facilities are laid out full scale in a large area such as a gymnasium and various arrangements tried out. Experimenting with scale drawings and models is also desirable.
3. Identification of teaching stations and auxiliary rooms

In certain pamphlets, the planners are requested to identify the facilities to be planned as well as to supply basic data concerning these facilities. The identification is to be made on the basis of the types of rooms needed or the uses to be made of the rooms. For example, in the pamphlet on science facilities, the following section appears:

E. For each of the different types of teaching stations needed for the science program, provide the information requested below . . . Identify each type by indicating the uses for which it is to be designed. For instance, if a teaching station is to be used for general science and biology, record . . . general science and biology on the line which follows the item, "Type of teaching stations to be planned."

1. Type of teaching station to be planned ____________

In this example, record "general science and biology" in the blank associated with Item 1.

Where teaching stations are to be identified provisions are made for several different types of teaching stations. This is not to imply that more than one type of teaching station should be provided in which to teach the subject nor does it imply that the number of different types is to be limited to the number for which space is provided. If only one type of teaching station is needed, use only one section to describe it. If the number of sections is insufficient for the number of different rooms needed, attach additional pages to the pamphlet.

In many pamphlets, reference is made to the identification of auxiliary rooms needed. The auxiliary rooms are to be treated in a manner similar to that suggested for teaching stations.

4. Summary

The concluding page of each pamphlet is a summary of the facilities needed. The summaries are provided for easy reference for the general committee and for the architect. The page number requested in the last column of the summary should be that of the initial page of the section in which the facility is described.
5. Number of copies of each completed pamphlet to be prepared

The number of copies of each pamphlet to be prepared will depend upon the uses to be made of the completed pamphlets. Since the pamphlets in this series and Pamphlet D-1 are to be given directly to the architect for his use in preparing plans, sufficient additional copies of each pamphlet should be prepared so that at least each committee can retain a copy of the pamphlet it prepared.

General Information

In the early planning stages, committees should not be concerned with limitations. Proposals should be made without consideration for costs since it may be possible to secure certain seemingly expensive features through intelligent planning. Nevertheless, as the various sections of the pamphlets are studied, it is necessary to be very discriminating in making choices so that the architect has a good indication of the importance which the educators attach to each feature.

The general information in the following pages includes additional suggestions for completing the pamphlets.

1. Furniture and equipment

The primary purpose for including furniture and equipment in the pamphlets is to indicate to the architect the types and quantities of these items which will have to be accommodated. One desirable method of identifying furniture and equipment is to make references to equipment catalogs. A second method of identification is to attach properly labelled pictures to the pamphlets. It should be understood in the planning stages that references to specific items of equipment ought to be regarded as suggestive rather than final specifications.

2. Locations of rooms

Among factors which should be considered in determining the location of rooms are:

a. Location of facilities such as music, physical education, driver education, and agriculture so they are accessible to related out-of-door areas.

b. Location of such facilities as shops and music studios so that noises emanating from them are shielded or isolated from other areas such as the library, academic classrooms, and administrative offices.
c. Orientation of the auditorium so that program participants have access to the stage without going through the lobby or the body of the auditorium.

d. Location of facilities such as the auditorium and library so the regular school program is not interrupted by community groups using the facilities during the school day.

e. Location of facilities such as the auditorium, gymnasium, library, and cafeteria so that they can be shut off from the remainder of the building and have toilets, drinking fountains, heating, and other essential services available when they are used during out-of-school hours.

f. Location of general storage and supply facilities so they are accessible from service dock or entrance.

g. Orientation of facilities such as the auditorium and gymnasium so that a common lobby can be utilized.

h. Location of facilities such as home economics, laboratories, industrial arts shops, music studios, auditorium stage, and art studios to facilitate carrying on cooperative projects.

i. Orientation of physical education dressing-locker rooms so they can be used as dressing rooms by stage participants.

j. Location of social studies teaching stations and possibly others so library reading room is accessible.

k. Orientation of publications staff room and language arts classroom to permit easy supervision of publications activities if a language arts teacher is to serve part-time as publications adviser.

l. Orientation of pupil and vehicular traffic arteries to provide greatest degree of safety.

m. Location of facilities housing programs likely to be expanded so additional rooms can be obtained through new construction or conversion of existing spaces.

3. Chalkboard and tackboard

   Chalkboard and tackboard should be planned so that the pupils and teachers can use them conveniently. For instance, chalkboard which is mounted low may be difficult
for teachers and the taller pupils to use if the board does not have sufficient vertical width. Tackboard which is mounted too high may not be usable since it may be too difficult to read materials mounted on it.

In determining the number of linear feet of chalkboard and tackboard needed, it is best to make measurements in existing rooms where it is possible to experiment with potential layouts to determine the amounts of chalkboard and tackboard needed. Other uses to be made of available wall spaces such as for doors, windows, storage, and heating and ventilating facilities must be analyzed also when determining the amount of chalkboard and tackboard to be provided. Compromises may be necessary in the final analysis.

4. Storage facilities

A very common complaint registered by teachers who have recently occupied a new building concerns storage facilities. All too frequently the storage spaces are not adequate in size, not accessible to the people who need to use them, not designed to accommodate the materials to be stored, or not designed to protect adequately the materials to be stored.

Very careful consideration needs to be given to the types, quantities, and dimensions of materials to be stored. While storage should be planned for the materials to be stored, it is essential also that the facilities be planned to permit flexibility of use. The need for flexibility of arrangements in various rooms throughout the school plant tends to question the validity of providing all storage spaces in built-in facilities.

5. Floor areas

The literature in the school plant field is replete with recommendations for areas needed for all types of rooms in a school building. These recommendations should be used with caution and should never be substituted for a study of spaces needed to house a given educational program. Adequate space must be provided to house the programs as outlined by the newer concepts of education and to insure flexibility of use.

The amount of floor area needed for any type of room in a school plant can be expressed directly by indicating a specific number of square feet or indirectly by suggesting factors which should determine the area. The amount of floor area necessary for most rooms can be determined by experimenting with layouts on some large floor such as in a gymnasium, by measuring some existing facility which is known to house a phase of an educational program similar to that
for which planning is being done, or by experimenting with scale models.

6. Multiple uses of facilities

Since some teaching stations are likely to be occupied only part time for a specific use, it is desirable to consider what other activities are likely to function well in each teaching station. Equally important is a consideration of activities which will not function well in each teaching station. Financial limitations frequently force the planning of certain facilities for multiple uses.

The calculations in Pamphlet B-2 will indicate which subject areas require fractional teaching stations. With this information at hand, those who use the school plant should suggest to the architect the multiple uses which can be made of the various facilities. For example, if agriculture and industrial arts shop activities each have fractional teaching station requirements, they could be carried on in the same shop room when properly planned.

An opposite aspect to consider is other teaching stations in which a given activity could be carried on. For instance, if driver education requires a teaching station for only one period of the day it would be impracticable to provide a separate teaching station if it cannot be used for other activities. In this instance it would be advisable to house driver education in another teaching station which is planned to house both activities. Again the educators ought to determine which teaching station should be designed to accommodate this additional activity. In other instances, planning a special teaching station for driver education and using it only one period would be practicable if it can be planned to house other activities the remainder of the day.

It is clearly not a simple problem of putting together subject areas which have fractional room requirements. It is one in which the educational planners determine what spaces could be planned to accommodate certain related activities. If this has been clearly determined in the initial planning stages, it is usually possible to plan more wisely. When considering activities which could be carried on in other areas, it is essential that the personnel who are affected be involved in planning. For example, if it seems advisable to conduct a single driver education class in a room used for physics classes, the staff representing each of these subjects ought to consider the possibility of such multiple use and cooperatively plan the multiple-use facility.
In planning facilities for the so-called academic subject areas such as social studies, language arts, mathematics, etc. it may be feasible to plan all the teaching stations for interchangeable use. This is especially desirable where a small number of teaching stations is needed. It also provides for greater flexibility of use. It is suggested, therefore, that the staff members representing the various subject areas which could utilize regular or inter-changeable teaching stations complete the various individual pamphlets first, and then the combined groups make the necessary modifications in a single pamphlet. This pamphlet should be clearly labeled to show the subject areas to which the educational specifications apply.

7. Definition of terms

Academic teaching station — a teaching station which requires little or no specialized equipment and is, for the most part, equally usable for a number of different subjects such as social studies, mathematics, or language arts.

Auxiliary room — a room in the building such as a storage room, instructor’s office, or conference room which is needed to supplement a teaching station or other room and which is generally located near or adjacent to the main room.

Center — a space within a given room or teaching station which is planned to accommodate specific activities such as the laundry center in a home economics laboratory.

Desk and seating facilities:

Chair desk — a chair with a desk surface approximately 24 inches wide attached to one side of the chair and extending completely across the front of the chair.

Desk-chair — a combination desk and chair with individual pedestals that are joined to provide a single unit which can be readily moved and which has space for storage of pupil paraphernalia either under the desk top or under the seat.

Tablet arm chair — a chair equipped with an arm approximately 12 inches wide attached to one side of the chair in such a position that it can serve as a narrow work surface.
Regular teaching station — (1) a teaching station which can accommodate a variety of subject areas — commonly called an academic, academic-type, or interchangeable teaching station; (2) a teaching station which can serve nearly all the needs of a particular subject area.

Special teaching station — a teaching station for a subject such as chemistry or home economics which requires specialized equipment.

Suite — facilities for a given activity or subject which are grouped in one portion of the building, such as the facilities for music or home economics.
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-2
AGRICULTURE

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-2

AGRICULTURE

Rooms and Spaces Included in This Pamphlet

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<tr>
<th>Room Type</th>
<th>Pages</th>
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<td>Classroom</td>
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<td>Shop</td>
<td>8</td>
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<tr>
<td>Auxiliary rooms</td>
<td>2, 14</td>
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<tr>
<td>Summary of rooms and spaces</td>
<td>19</td>
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</tbody>
</table>

-1-
A. The number of teaching stations required for the agriculture program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for the agriculture program for the enrollment to be housed in the new building.

Number of teaching stations

Comments:

B. The agriculture rooms should be planned in relation to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the agriculture program. In each teaching station there will be spaces needed for various types of activities. Early in the planning process, it will be necessary to determine whether these spaces are to be separate rooms or whether rooms are to be planned to accommodate numerous activities. For instance, space for testing of soils or agricultural products may be provided in a separate laboratory or it may be provided in an area at one end of the classroom.

C. Indicate the extent to which the following types of rooms or facilities will be used in each agriculture teaching station.

1. Classroom

2. Shop

3. Auxiliary rooms
   a. Testing laboratory
   b. Conference room
   c. Instructor's office
   d. Storage rooms
   e. Toilet

Suggest other types of rooms or spaces needed.

Comments:
D. For each of the different types of rooms needed for the agriculture program, provide the information requested below.

Classroom

1. Indicate the extent to which the following activities will be carried on in this type of room.
   
   a. View slides, films, or other projected materials 1 2 3 N
   b. Listen to recordings or broadcasts 1 2 3 N
   c. Write or draw on chalkboard 1 2 3 N
   d. Write or draw at tables or desks 1 2 3 N
   e. Small groups of pupils carry on conferences at conference tables 1 2 3 N
   f. Teacher carry on conferences with individual pupils 1 2 3 N
   g. Teacher confer with individual pupils and parents 1 2 3 N
   h. Carry on research using materials stored in the classroom 1 2 3 N
   i. Demonstrate experiments and projects 1 2 3 N
   j. Test soil, agricultural products, etc. 1 2 3 N
   k. Carry on panel discussions 1 2 3 N
   l. Display pupil projects or work 1 2 3 N
   m. Store partially completed pupil projects 1 2 3 N
   n. Store equipment such as projectors or record players 1 2 3 N
   o. Store instructional aids and supplies 1 2 3 N
   p. Store pupils' personal belongings 1 2 3 N
   q. Store instructor's personal belongings 1 2 3 N

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.
2. Suggest a desired location for the agriculture classroom or suggest factors which should determine its location.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each room of this type (see directions, Pamphlet C-1).

Chalkboard, _______ linear feet; tackboard, _______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment
   a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

   __ 1) Movable combination desk-chairs for pupils
   __ 2) Tables and chairs for pupils, number of pupils to be accommodated at each table, ______ pupils
   __ 3) Demonstration desk, dimensions of desk ________________, desired location __________________________
   __ 4) Instructor's desk
   __ 5) Instructor's table, dimensions of table ________________
   __ 6) Instructor's combination desk and table
   __ 7) Folding chairs to accommodate groups larger than the ordinary class, ______ number of chairs
   __ 8) Other ________________________________

Comments:
b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

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<tbody>
<tr>
<td>1)</td>
<td>Conference tables and chairs</td>
<td>1 2 3 N</td>
<td></td>
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<tr>
<td></td>
<td>Number of tables _____, dimensions of tables _____</td>
<td></td>
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<tr>
<td>2)</td>
<td>Workcounter</td>
<td>1 2 3 N</td>
<td></td>
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<tr>
<td></td>
<td>Dimensions of workcounter ________________________________</td>
<td></td>
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<tr>
<td>3)</td>
<td>Sink with hot and cold running water</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>4)</td>
<td>Display cases</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>5)</td>
<td>Display and map rails attached above chalkboard and tackboard</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>6)</td>
<td>Gas service</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Desired locations ________________________________</td>
<td></td>
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<tr>
<td>7)</td>
<td>Water service</td>
<td>1 2 3 N</td>
<td></td>
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<tr>
<td></td>
<td>Desired locations ________________________________</td>
<td></td>
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<tr>
<td>8)</td>
<td>Electrical outlets</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of outlets _____, desired locations ________________________________</td>
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</table>

Suggest other types of furniture and equipment needed.

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. Filing drawers | 1 2 3 N |
| Number of drawers _____, size of drawers ________________________________ |

Comments:
b. Bookshelving
   Open shelving, ________ linear feet
   Closed shelving, ________ linear feet

   Comments:

c. Storage for pamphlets and periodicals

   Comments:

d. Storage for instructional supplies

   Comments:

e. Storage for teaching aids such as projectors, record
   players, films, or recordings

   Comments:

f. Storage for partially completed pupil projects

   Comments:

g. Storage for pupils' personal belongings

   Comments:
h. Storage for instructors' personal belongings

Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

8. In event this type of room is not needed full time for the agriculture program, what other types of activities are:

a. Most likely to function well in this type of room?
b. Least likely to function well in this type of room?

9. In event it is not feasible to provide a separate agriculture classroom, indicate the degree of preference for the following rooms or spaces where class activities could be carried on.

a. In regular classrooms such as those used for mathematics or social studies which are located near the agriculture shop  \( P \ A \ NA \)
b. In science classrooms which are near the agriculture shop  \( P \ A \ NA \)
c. In an area of the shop where seating facilities and other equipment to carry on classroom activities are provided  \( P \ A \ NA \)

Suggest other rooms or spaces where the classroom activities could be carried on.

Shop

1. Indicate the extent to which the following activities will be carried on in the shop.

a. Construct small buildings and farm equipment  \( 1 \ 2 \ 3 \ N \)
b. Repair farm machinery  \( 1 \ 2 \ 3 \ N \)
c. Weld  \( 1 \ 2 \ 3 \ N \)
d. Store tools  \( 1 \ 2 \ 3 \ N \)
e. Store partially completed pupil projects  \( 1 \ 2 \ 3 \ N \)
f. Store raw materials  \( 1 \ 2 \ 3 \ N \)
g. Use spray painting equipment  \( 1 \ 2 \ 3 \ N \)
h. Paint or finish equipment etc., constructed in shop  \( 1 \ 2 \ 3 \ N \)
i. Draw plans of buildings or other projects  \( 1 \ 2 \ 3 \ N \)
j. Operate power equipment such as lathes, saws, drill presses, etc.  \( 1 \ 2 \ 3 \ N \)
k. Display pupil projects or work  \( 1 \ 2 \ 3 \ N \)
l. Carry on class activities such as listed on page 3  \( 1 \ 2 \ 3 \ N \)
Are there any other activities that the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

2. Suggest a desired location for the agriculture shop or suggest factors which should determine its location.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each room of this type (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Indicate the extent to which the following types of equipment will be used and suggest any special information which the architect should know about the various items.

a. Woodworking benches

b. Metalworking benches

c. Machinist vises
   Number of vises ______

d. Woodworking vises
   Number of vises ______

e. Pipe vises
   Number of vises ______

f. Welding bench

g. Welding table

h. Exhaust fan
1. Welders

   Number of welders ________, types of welders ________

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<thead>
<tr>
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<tbody>
<tr>
<td>j. Anvil</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>k. Forge</td>
<td>1</td>
<td>2</td>
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<td>l. Band saw</td>
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<td>m. Power saw</td>
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<td>n. Jointer</td>
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<td>o. Planer</td>
<td>1</td>
<td>2</td>
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<tr>
<td>p. Spray painter</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>q. Overhead hoists</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>r. Tool grinders</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>s. Sink with hot and cold water</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>t. Drinking fountain</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>u. Handwashing facilities</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>v. Fire extinguishers</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>w. Electric service</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>x. Water service</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>y. Gas service</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>z. Overhead door</td>
<td>1</td>
<td>2</td>
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</table>

Dimensions of door

Suggest other types of equipment needed.

Comments:
5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. Tool boards

Comments:

b. Tool cabinets:

1) Machine tools

Comments:

2) Metalworking tools

Comments:

3) Woodworking tools

Comments:

4) Pipe fitting tools

Comments:

5) Welding equipment

Comments:

c. Storage cabinets for the following materials:

1) Books and pamphlets

Comments:

2) General supplies

Comments:
3) Nails, bolts, and screws
   Comments:

4) Welding supplies
   Comments:

5) Electrical supplies
   Comments:

6) Paint supplies
   Comments:

7. Plumbing supplies
   Comments:

d. Storage for partially completed pupil projects
   Comments:

e. Storage for raw materials such as lumber, pipe, etc.
   Comments:

f. Storage for pupils' personal belongings
   Comments:
Suggest other types of storage needed.

6. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ________

   Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

8. In event this type of room is not needed full time for the agriculture program, what other types of activities are:

   a. Most likely to function well in this type of room?

   b. Least likely to function well in this type of room?
9. In event it is not financially feasible to provide a separate room of this type, indicate other rooms or spaces which could be planned to accommodate the contemplated agriculture shop activities.

E. For each of the auxiliary rooms listed in Item C, page 2, that is needed for the agriculture program, provide the information requested below. Identify each room by indicating the use for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one purpose. If any rooms are to be planned to serve more than one purpose, identify each one by a phrase which suggests the multiple uses for which it is to be planned -- for example, conference room and an instructor's office.

1. Type of room to be planned __________________________________________

   a. Number of this type to be planned ____

   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

2. Type of room to be planned ____________________________________________________________

   a. Number of this type to be planned ______

   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet __________

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

3. Type of room to be planned ________________________________

a. Number of this type to be planned ______

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.
d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet __________

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.
F. In the space provided below, indicate any additional information about any aspect of the agriculture rooms or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

G. Indicate factors which the architect should take into consideration when planning the general location of the agriculture rooms in relation to the other areas of the building and outdoor facilities. Include factors such as accessibility to other portions of the building, isolation of noises, and accessibility to outdoor agriculture areas.
H. Summarize rooms and spaces needed for the agriculture program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq.ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
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<tr>
<td>3. Auxiliary rooms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
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<td>b.</td>
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<td>c.</td>
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<td>d.</td>
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</tbody>
</table>
A MANUAL FOR PLANNING

A SECONDARY SCHOOL BUILDING

Pamphlet C-3

ART

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-3

**ART**

*Rooms and Spaces Included in This Pamphlet*

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Page</th>
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<tbody>
<tr>
<td>General art studios</td>
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<tr>
<td>Art studios</td>
<td>7</td>
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<tr>
<td>Crafts studios</td>
<td>8</td>
</tr>
<tr>
<td>Other special teaching stations</td>
<td>9</td>
</tr>
<tr>
<td>Auxiliary rooms</td>
<td>10</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>15</td>
</tr>
</tbody>
</table>
A. The number of teaching stations required for the art program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for the art program for the enrollment to be housed in the new building.

Number of teaching stations 

Comments:

B. The rooms for the art program should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the art program. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations.

C. For each of the different types of teaching stations that is required for the art program, provide the information requested below.

General Art Studios

1. Number to be planned 

2. Indicate the extent to which the following types of activities will be carried on in this type of teaching station.
   a. View slides, films, or other projected materials
   b. Write or draw on chalkboard
   c. Small groups carry on conferences at conference tables
   d. Carry on research using references in the classroom
   e. Weave textiles
   f. Make rugs
   g. Etch glass and other materials
   h. Bind books
   i. Engrave stationery and other items
   j. Do printing
   k. Perform all steps in photography
   l. Make pottery
m. Do free hand lettering
n. Paint murals
o. Do sculpturing
p. Fashion items from leather
q. Work with glass
r. Work with plastics
s. Design and construct jewelry etc. from metals
t. Sketch and draw with various art media
u. Paint with oils and water colors
v. Display pupil projects or work
w. Store partially completed pupil projects
x. Store instructional supplies
y. Carry on cooperative projects with other areas

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _______ linear feet; tackboard, _______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
4. Indicate the extent to which the following types of furniture and equipment will be used and suggest any information which the architect should know about the various items.

a. Tables
   Number of tables _____, dimensions of tables _____

b. Easels and stools

c. Model stands

d. Shadow boxes

e. Full length mirror

f. Sink with hot and cold running water
   Desired location ________________________________

g. Lavatory with hot and cold running water
   Desired location ________________________________

h. Workcounter
   Dimensions of workcounter _________________________

i. Workbench
   Dimensions of workbench _________________________

ej. Tools for
   1) Leathework
   2) Art metalwork
   3) Woodwork
   4) Work with plastics
   5) Work with glass
   6) Other ________________________________

k. Electric outlets
   Number of outlets _____, desired locations _____

l. Gas service
   Desired location ________________________________

m. Kiln

n. Display cases

o. Display and map rails attached above chalkboard and tackboard
5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. Filing drawers
   Number of drawers _____, size of drawers _________

   Comments:

b. Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet

   Comments:

c. Storage for instructional supplies

   Comments:

d. Storage for instructor's personal belongings

   Comments:
e. Storage for partially completed pupil projects

Comments:

f. Storage cabinets or racks for tools of various types

Comments:

g. Storage for inflammable substances

Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for this type of teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
Art Studios

1. Number to be planned ______

2. Indicate activities or uses for which these studios should be planned.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Indicate the types of furniture and equipment needed in this type of teaching station.

5. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.
6. Suggest floor area needed for each teaching station of this type or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

Crafts Studios

1. Number to be planned ______

2. Indicate activities or uses for which these studios should be planned.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Indicate the types of furniture and equipment to be provided for this type of teaching station.
5. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6. Suggest floor area needed for each teaching station of this type or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

Other Special Teaching Stations

1. If one or more teaching stations in the art suite should be planned with special features not included in the other rooms as outlined above, indicate in the space provided below the special provisions or alterations which should be made for these teaching stations.

D. In event any of the teaching stations are not needed full time for the art program, what other types of activities are:

1. Most likely to function well in these rooms?

2. Least likely to function well in these rooms?
E. Indicate the extent to which each of the following auxiliary rooms will be used in the art program.

1. Storage rooms 1 2 3 N
2. Display rooms 1 2 3 N
3. Photographic studios 1 2 3 N
4. Photographic darkrooms 1 2 3 N
5. Conference rooms 1 2 3 N
6. Instructors' offices 1 2 3 N
7. Other _____________________________ 1 2 3 N

Comments:

F. For each of the auxiliary rooms listed in Item E that is needed for the art program, provide the information requested below. Identify each room by indicating the use for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one purpose. If any rooms are to be planned to serve more than one purpose, identify each one by a phrase which suggests the multiple uses for which it is to be planned—for example, display and conference room.

1. Type of room to be planned _____________________________
   a. Number of this type to be planned _____
   b. Indicate the activities or uses for which these rooms are to be planned.
   c. Suggest desired locations for these rooms in the art suite or suggest factors which should determine their locations.
   d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of room.

2. Type of room to be planned ____________________________

a. Number of this type to be planned ______

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms in the art suite or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of room.

3. Type of room to be planned

   a. Number of this type to be planned

   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms in the art suite or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of room.

4. Type of room to be planned __________________________
   a. Number of this type to be planned ______
   b. Indicate the activities or uses for which these rooms are to be planned.
   c. Suggest desired locations for these rooms in the unit suite or suggest factors which should determine their locations.
   d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of room.

0. In the space provided below, indicate any additional information about any aspect of the art suite or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.
H. Indicate factors which the architect should take into consideration when planning the location of the art rooms. Include factors such as accessibility to other portions of the building and isolation of noises.

I. Summarize rooms and spaces needed for the art program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching stations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
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<td></td>
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<td>b.</td>
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<tr>
<td>c.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. Auxiliary rooms</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>a.</td>
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<td>b.</td>
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<td>d.</td>
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<tr>
<td>e.</td>
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</tbody>
</table>
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-4

BUSINESS EDUCATION

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-\textsuperscript{4}

BUSINESS EDUCATION

<table>
<thead>
<tr>
<th>Rooms and Spaces Included in This Pamphlet</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Regular teaching stations</td>
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<tr>
<td>Bookkeeping teaching stations</td>
<td>7</td>
</tr>
<tr>
<td>Typing teaching stations</td>
<td>12</td>
</tr>
<tr>
<td>Combination business education teaching stations</td>
<td>16</td>
</tr>
<tr>
<td>Distributive education teaching stations</td>
<td>21</td>
</tr>
<tr>
<td>Other special teaching stations</td>
<td>24</td>
</tr>
<tr>
<td>Auxiliary rooms</td>
<td>24</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>29</td>
</tr>
</tbody>
</table>
A. The number of teaching stations required for the business education program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below, the calculated number of teaching stations required for the business education program for the enrollment to be housed in the new building.

Number of teaching stations _______

Comments:

B. The rooms for the business education program should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the business education program. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations. For instance, space for business machines may be planned as a separate machine bay adjacent to a business education teaching station or it may be an area within a teaching station.

C. Check the subjects or offerings in the educational program which the business education teaching stations are to serve.

___ 1. Bookkeeping ___ 5. Sales
___ 2. Distributive Education ___ 6. Secretarial Training
___ 3. General Business ___ 7. Shorthand
___ 4. Law ___ 8. Typing

Suggest other offerings to be provided.

Comments:

D. For each of the different types of teaching stations needed for the business education program, provide the information requested below.
1. Number to be planned ______

2. Indicate extent to which the following activities will be carried on in this type of teaching station.

   a. View slides, films, and other projected materials 1 2 3 N
   b. View telecasts 1 2 3 N
   c. Listen to recordings or broadcasts 1 2 3 "
   d. Write or draw on chalkboard 1 2 3 N
   e. Write or draw at desks or tables 1 2 3 N
   f. Operate office and business machines 1 2 3 N
   g. Small groups of pupils carry on conferences at conference tables 1 2 3 N
   h. Carry on research using reference materials in the classroom 1 2 3 "
   i. Display pupil projects or work 1 2 3 N
   j. Store instructional supplies 1 2 3 N
   k. Store equipment such as record players 1 2 3 N
   l. Store partially completed pupil projects 1 2 3 N
   m. Store pupils' personal belongings 1 2 3 N
   n. Store instructor's personal belongings 1 2 3 N

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to do the planning.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

   Chalkboard, _____ linear feet; tackboard, _____ linear feet
Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

1) Tablet arm chairs for pupils
2) Chair desks for pupils
3) Movable combination desk-chairs for pupils
4) Tables and chairs for pupils, number of pupils to be accommodated at each table
5) Instructor's desk
6) Instructor's table, dimensions of table
7) Instructor's combination desk and table
8) Other

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about the various items.

1) Conference tables and chairs
   Number of tables, dimensions of tables
   1 2 3 N

2) Workcounter
   Dimensions of workcounter
   1 2 3 N

3) Sink with hot and cold water
   Desired location of sink
   1 2 3 N

4) Display cases
   1 2 3 N

5) Display and map rails attached above chalkboard and tackboard
   1 2 3 N
6) Record player

7) Radio

8) Television

9) Electrical outlets
   Number of outlets _____, desired locations _______

Suggest other types of furniture and equipment needed.

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

   a. Filing drawers
      Number of drawers _____, size of drawers ______

      Comments:

   b. Bookshelving
      Open shelving, _____ linear feet
      Closed shelving, _____ linear feet

      Comments:

   c. Storage for recordings
      Number of recordings ______

      Comments:
d. Storage for instructional supplies

Comments:


e. Storage for partially completed pupil projects

Comments:

f. Storage for pupils' personal belongings

Comments:

g. Storage for instructor's personal belongings

Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for each regular teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:
7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

8. In the event this type of teaching station is not needed full time for business education, what other types of activities are:
   a. Most likely to function well in this type of room?
   b. Least likely to function well in this type of room?

**Bookkeeping Teaching Stations**

1. Number to be planned _____

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.
   
   a. View slides, films, and other projected materials 1 2 3 N
   b. Listen to recordings or broadcasts 1 2 3 N
   c. Write or draw on chalkboard 1 2 3 N
   d. Write at desks or tables 1 2 3 N
   e. Operate office or business machines 1 2 3 N
   f. Small groups of pupils carry on conferences at conference tables 1 2 3 N
   g. Teacher carry on conferences with individual pupils 1 2 3 N
   h. Display pupil projects or work 1 2 3 N
   i. Store partially completed pupil projects 1 2 3 N
   j. Store instructional supplies 1 2 3 N
k. Store pupils' personal belongings

l. Store instructor's personal belongings

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc., which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

  ___ 1) Tablet arm chairs for pupils
  ___ 2) Chair desks for pupils
  ___ 3) Movable combination desk-chairs for pupils
  ___ 4) Tables and chairs for pupils, number of pupils to be accommodated at each table ____, dimensions of tables ________________
  ___ 5) Individual desks for pupils
  ___ 6) Drop-head desks for pupils
  ___ 7) Instructor's desk
  ___ 8) Instructor's table, dimensions of table ________________
  ___ 9) Instructor's combination desk and table
  ___ 10) Other _______________________________
b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

1) Conference tables and chairs
   Number of tables _____, dimensions of tables

2) Workcounter
   Dimensions of workcounter

3) Business machine stands or tables
   Number of stands or tables _____, dimensions of
   stands or tables

Comments:

4) Display cases

5) Display and map rails attached above chalkboard and tackboard

6) Record player

7) Radio

8) Television

9) Electrical outlets
   Number of outlets _____, desired locations _____

Suggest other types of furniture and equipment needed.

Comments:
5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. Filing drawers
   Number of drawers ____, size of drawers ________
   Comments:

b. Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

c. Storage for recordings
   Comments:

d. Storage for instructional supplies
   Comments:

e. Storage for partially completed pupil projects
   Comments:

f. Storage for pupils' personal belongings
   Comments:
g. Storage for instructor's personal belongings

Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for each bookkeeping teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

8. In the event this type of teaching station is not needed full time for bookkeeping, what other types of activities are:

   a. Most likely to function well in this type of room?

   b. Least likely to function well in this type of room?
1. Number to be planned _____

2. Indicate the extent to which the following types of activities will be carried on in this type of teaching station.

   a. View slides, films, or other projected materials 1 2 3
   b. Write or draw on chalkboard 1 2 3
   c. Write or draw at desks or tables 1 2 3
   d. Teacher demonstrate typing techniques to the entire class 1 2 3
   e. Operate typewriters 1 2 3
   f. Operate office or business machines other than typewriters. Types of machines __________________________ 1 2 3
   g. Listen to recordings or broadcasts 1 2 3
   h. Carry on research using reference materials in the classroom 1 2 3
   i. Display pupil projects or work 1 2 3
   j. Store partially completed pupil projects 1 2 3
   k. Store instructional supplies 1 2 3
   l. Store equipment such as record players 1 2 3
   m. Store pupils' personal belongings 1 2 3
   n. Store instructor's personal belongings 1 2 3

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tuckboard needed in each teaching station of this type (see directions, Pamphlet C-1).

   Chalkboard, _____ linear feet; tuckboard, _____ linear feet
Suggest any special considerations such as locations, vertical widths, rulings, or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment

a. Check the types of desk and seating facilities desired (See directions, Pamphlet C-1).

1) Tables and chairs for pupils, number of pupils to be accommodated at each table ____ , dimensions of tables ______________________

2) Standard typing tables

3) Combination typing and worktables

4) Individual desk for each pupil, dimensions of desk ______________________

5) Drop-head desks

6) Instructor's desk

7) Instructor's table, dimensions of table ______________________

8) Instructor's combination desk and table

9) Other ______________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about the various items.

1) Work tables

   Number of tables ____ , dimensions of tables ____

2) Workcounter

   Dimensions of workcounter ______________________

3) Business machine stands or tables

   Number of stands or tables ____ , dimensions of stands or tables ______________________
4) Teacher's demonstration stand 123N

5) Display cases 123N

6) Display and map rails attached above chalkboard and tackboard 123N

7) Record player 123N

8) Electrical outlets 123N
   Number of outlets _____, desired locations _______

Suggest other types of furniture and equipment needed.

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

   a. Filing drawers 123N
      Number of drawers _____, size of drawers _______
      Comments:

   b. Bookshelving 123N
      Open shelving, _____ linear feet
      Closed shelving, _____ linear feet
      Comments:
c. Storage for recordings

Comments:

d. Storage for instructional supplies

Comments:

e. Storage for partially completed pupil projects

Comments:

f. Storage for pupils' personal belongings

Comments:

g. Storage for instructor's personal belongings

Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for each teaching station of this type or suggest factors which should determine the floor area needed (see directions, Pamphlet C-1).

Square feet ______________

Comments:
7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

8. In the event this type of teaching station is not needed full time for typing, what other types of activities are:
   a. Most likely to function well in this type of room?
   b. Least likely to function well in this type of room?

### Combination Business Education Teaching Stations

1. Number to be planned __________

2. Indicate the extent to which the following types of activities will be carried on in this type of teaching station.
   a. View slides, films, and other projected materials 1 2 3 N
   b. Listen to recordings and broadcasts 1 2 3 N
   c. Write or draw on chalkboard 1 2 3 N
   d. Write or draw at desks or tables 1 2 3 N
   e. Teacher demonstrate operation of office or business machines 1 2 3 N
   f. Pupils operate office or business machines
      Types of machines ____________________________ 1 2 3 N
   g. Small groups of pupils carry on conferences at conference tables 1 2 3 N
   h. Teacher carry on conferences with individual pupils 1 2 3 N
   i. Carry on research using reference materials in classroom 1 2 3 N
   j. Display pupil projects or work 1 2 3 N
k. Store partially completed pupil projects
l. Store instructional supplies
m. Store pupils' personal belongings
n. Store instructor's personal belongings

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architecture should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

  1) Chair desks for pupils
  2) Movable combination desk-chairs for pupils
  3) Tables and chairs for pupils, number of pupils to be accommodated at each table ______, dimensions of tables ____________
  4) Individual desks for pupils
  5) Drop-head desks for pupils
  6) Combination typing and work tables
b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

1) Conference tables and chairs
   Number of tables _____, dimensions of tables

2) Workcounter
   Dimensions of workcounter

3) Business machine stands or tables
   Number of stands or tables _____, dimensions of
   stands or tables

4) Instructor's demonstration stand

5) Display cases

6) Display and map rails attached above the chalkboard and tackboard

7) Record player

8) Radio

9) Television

10) Electrical outlets
    Number of outlets _____, desired locations

Suggest other types of furniture and equipment needed.
5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. Filing drawers
   Number of drawers _____, size of drawers ____________

   Comments:

b. Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet

   Comments:

c. Storage for recordings

   Comments:

d. Storage for instructional supplies

   Comments:
e. Storage for partially completed pupil projects  1 2 3 N
   Comments:

f. Storage for pupils' personal belongings  1 2 3 N
   Comments:

g. Storage for instructor's personal belongings  1 2 3 N
   Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for each teaching station of this type or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______
   Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
8. In event this type of teaching station is not needed full time for business education, what other types of activities are:

a. Most likely to function well in this type of room?

b. Least likely to function well in this type of room?

Distributive Education Teaching Stations

1. Number to be planned ______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. View slides, films, and other projected materials 1 2 3 N
   b. Listen to recordings or broadcasts 1 2 3 N
   c. View telecasts 1 2 3 N
   d. Write or draw on chalkboard 1 2 3 N
   e. Write or draw at desks, tables, or counters 1 2 3 N
   f. Small groups of pupils carry on conferences at conference tables 1 2 3 N
   g. Teacher carry on conferences with individual pupils 1 2 3 N
   h. Carry on conferences with business representatives 1 2 3 N
   i. Conduct an employment agency 1 2 3 N
   j. Carry on activities which simulate experiences commonly met in the distributive occupations such as:

      1) Displaying merchandise 1 2 3 N
      2) Wrapping merchandise 1 2 3 N
      3) Fitting clothing 1 2 3 N
      4) Operating business machines 1 2 3 N
      5) Storing merchandise 1 2 3 N
Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Suggest desired locations for the distributive education rooms or suggest factors which should determine their locations.

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

5. Indicate types of rooms and spaces needed for the distributive education program.
6. Indicate furniture and equipment needed for the distributive education program.

7. Indicate the types, dimensions, and quantities of materials to be stored and the type of storage desired.

8. Suggest floor area needed for the distributive education rooms or suggest factors which should determine the area needed.

Square feet _____

Comments:
9. Indicate any additional information which the architect should know to aid in planning these facilities.

Other Special Teaching Stations

1. If one or more business education teaching stations should be planned with special features not included in the other teaching stations as outlined above, indicate in the space provided below the special provisions or alterations which should be made for these teaching stations.

E. Indicate the extent to which each of the following auxiliary rooms will be used in the business education program.

1. Office or business machine room
   1 2 3 N
2. Instructors' offices
   1 2 3 N
3. Conference rooms
   1 2 3 N
4. Storage rooms
   1 2 3 N
5. Other
   1 2 3 N

Comments:
F. For each of the auxiliary rooms listed in Item E that is needed for the business education program, provide the information requested below. Identify each room by indicating the use for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one purpose. If any rooms are to be planned to serve more than one purpose, identify each one by a phrase which suggests the multiple uses for which it is to be planned. An example of such a room might be one which is to serve as a storage room and instructor’s office when proper storage cabinets are provided.

1. Type of room to be planned __________________________________________
   a. Number of this type to be planned _______
   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of room.

   e. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

   f. Suggest floor area needed or suggest factors which should determine the floor area needed (see directions, Pamphlet C-1).

   Square feet _______

   Comments:
2. Type of room to be planned

a. Number of this type to be planned ____

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate the type of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ____

Comments:
3. Type of room to be planned ____________________________

   a. Number of this type to be planned _____

   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of room.

   e. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

   f. Suggest floor area needed or suggest factors which should determine the floor area needed (see directions, Pamphlet C-1).

      Square feet _____

   Comments:
G. In the space provided below, indicate any additional information about any aspect of the business education rooms or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

I. Indicate factors which the architect should take into consideration when planning the locations of these rooms. Include such factors as accessibility to other portions of the building and isolation from noises.
J. Summarize rooms and spaces needed for the business education program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq.ft.)</th>
<th>Pages in pamphlet</th>
</tr>
</thead>
</table>

1. Teaching Stations
   a. ____________________________
   b. ____________________________
   c. ____________________________
   d. ____________________________

2. Auxiliary Rooms
   a. ____________________________
   b. ____________________________
   c. ____________________________
   d. ____________________________
   e. ____________________________
   f. ____________________________
   g. ____________________________
A MANUAL FOR PLANNING

A SECONDARY SCHOOL BUILDING

Pamphlet C-5

DRIVER EDUCATION

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-5

DRIVER EDUCATION

Rooms and Spaces Included in This Pamphlet

Teaching stations 2

Auxiliary rooms 6

Summary of rooms and spaces 10
A. The number of teaching stations required for the driver education program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for the driver education program for the enrollment to be housed in the new building.

Number of teaching stations ________

Comments:

B. The rooms for the driver education program should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the program. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations.

C. For the teaching stations required for the driver education program, provide the information requested below.

1. Number to be planned ________

2. Indicate the extent to which the following types of activities will be carried on in this type of teaching station.

   a. View slides, films, or other projected materials   1 2 3 N
   b. Listen to recordings or broadcasts                1 2 3 N
   c. Write or draw on chalkboard                      1 2 3 N
   d. Write or draw at desks or tables                 1 2 3 N
   e. Small groups of pupils carry on conferences at conference tables  1 2 3 N
   f. Teacher carry on conferences with individual pupils  1 2 3 N
   g. Teacher or pupils demonstrate to the class        1 2 3 N
   h. Carry on panel discussions                        1 2 3 N
   i. Store equipment such as projectors, mock-ups, etc. 1 2 3 N
   j. Store instructional supplies                      1 2 3 N
   k. Store pupils' personal belongings                 1 2 3 N
   l. Store instructor's personal belongings            1 2 3 N
Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each room of this type (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet

Suggest any special considerations such as locations, vertical widths, ruling or etchings, special uses, etc., which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

1) Tablet arm chairs for pupils

2) Chair desks for pupils

3) Movable combination desk-chairs for pupils

4) Tables and chairs for pupils, number of pupils to be accommodated at each table, ______ pupils

5) Instructor's desk

6) Instructor's table, dimensions of table ______________________

7) Instructor's combination desk and table

8) Other ____________________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

1) Conference tables and chair

Number of tables _______, dimensions of tables
2) Workcounter
Dimensions of workcounter

3) Display cases

4) Display and map rails attached above chalkboard and tackboard

5) Electrical outlets
Number of outlets _____, desired locations

Suggest other types of furniture and equipment needed.

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. Filing drawers
Number of drawers _____, size of drawers _____

Comments:

b. Bookshelving
Open shelving, _____ linear feet
Closed shelving, _____ linear feet

Comments:
c. Storage for instructional supplies
   Comments:

d. Storage for testing equipment
   Comments:

e. Storage for 'mail' personal belongings
   Comments:

f. Storage for instructor's personal belongings
   Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for this type of teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _____

Comments:
7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

D. In event any of the teaching stations are not needed full time for the driver education program, what other types of activities are:

1. Most likely to function well in these rooms?

2. Least likely to function well in these rooms?

E. Indicate the extent to which each of the following auxiliary rooms will be used in the driver education program.

1. Conference rooms
2. Instructors' offices
3. Laboratory or testing room
4. Other

Comments:

F. For each of the auxiliary rooms listed in Item E that is necessary for the driver education program, provide the information requested below. Identify each room by indicating the use for which it is to be designed.

1. Type of room to be planned

   a. Number of this type to be planned

   b. Indicate the activities or uses for which these rooms are to be planned.
c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

2. Type of room to be planned _______________________________________

a. Number of this type to be planned ______

b. Indicate the activities or uses for which these rooms are to be planned.
c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.
G. In the space provided below, indicate the types of outdoor facilities that will be needed for the driver education program.

H. In the space below, indicate any additional information about any aspect of the driver education rooms or program which the architect should know to aid in planning these facilities. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.
I. Indicate factors which the architect should take into consideration when planning the location of the driver education rooms. Include factors such as accessibility to other portions of the building and to the parking area.

J. Summarize the rooms and spaces needed for the driver education program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
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<td>2. Auxiliary rooms</td>
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<tr>
<td>a.</td>
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<td>b.</td>
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<td>c.</td>
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</table>
THE DEVELOPMENT, USE, AND PRELIMINARY EVALUATION
OF A SELF-HELP MANUAL TO GUIDE THE EDUCATIONAL
PLANNING OF SECONDARY SCHOOL BUILDINGS

VOLUME II

DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree Doctor of Philosophy in the
Graduate School of the Ohio State University

by

ARTHUR E. WOHLERS, B.S. in Educ., M.A.
The Ohio State University
1954
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-6

HOME ECONOMICS

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-6

HOME ECONOMICS

Rooms and Spaces Included in This Pamphlet

Clothing laboratories 1
Food laboratories 7
Homemaking laboratories 15
Combination or multiple use teaching stations 19
Auxiliary rooms 21
Summary of rooms and spaces 27
A. The number of teaching stations required for the home economics program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for home economics for the enrollment to be housed in the new building.

Number of teaching stations _______

B. The home economics suite should be planned in relation to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the home economics program. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations. For instance, space for a laundry center may be provided in a separate room or it may be provided in one area of the foods or clothing laboratory.

C. For each of the different types of teaching stations required for the home economics program, provide the information requested below.

**Clothing Laboratories**

1. Number to be planned _______

2. Indicate the extent to which the following types of activities will be carried on in this type of teaching station.

   a. View slides, films, or other projected materials 1 2 3 N
   b. Listen to recordings 1 2 3 N
   c. Write or draw on chalkboard 1 2 3 N
   d. Write or draw at desks or tables 1 2 3 N
   e. Small groups carry on conferences at conference tables 1 2 3 N
   f. Teacher carry on conferences with individual pupils 1 2 3 N
   g. Teacher carry on conferences with individual pupil and parents 1 2 3 N
   h. Carry on research using reference materials in classroom 1 2 3 N
   i. Display pupil projects or work 1 2 3 N
   j. Teacher demonstrate techniques of clothing design and construction to the class 1 2 3 N
   k. Pupils design clothing 1 2 3 N
1. Pupils construct clothing
2. Pupils fit clothing
3. Pupils design, construct, and fit clothing or costumes for school plays, pageants, or other activities
4. Test fabrics of various types for washability, color fastness, etc.
5. Pupils construct items other than garments from cloth or similar fabrics
6. Launder and iron clothing
7. Pupils operate mechanical equipment such as sewing machines, looms, washers, dryers, and ironers
8. Store partially completed garments
9. Store small items of equipment, cloth, and accessories
10. Store pupils' personal belongings temporarily
11. Store instructional supplies
12. Store instructor's personal belongings
13. Carry on adult classes in clothing design and construction

Are there any other types of activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans to accommodate them.

3. Suggest desired locations for the clothing laboratories in the home economics suite.

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, ____ linear feet; tackboard, ____ linear feet
Suggest special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

5. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

   1) Tablet arm chairs for pupils
   2) Chair desks for pupils
   3) Movable combination desk-chairs for pupils
   4) Tables and chairs for pupils, number of pupils to be accommodated at each table ______
   5) Instructor's desk
   6) Instructor's table, dimensions of table ______
   7) Instructor's combination desk and table
   8) Other ________________________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about the various items.

1) Sewing machines
   Number of machines _____, types of sewing machines ____________________________

2) Combination sewing machine and cutting tables
   Number of pupils to be accommodated at each table _____, number of sewing machines in each table _____
3) Workcounter

4) Sink with hot and cold running water

5) Electric washers
   Number of washers _____, types and capacities of washers ________________

6) Automatic dryers
   Number of dryers _____, types and capacities of dryers ________________

7) Ironers
   Number of ironers _____, types and capacities of ironers ________________

8) Hand iron and ironing board

9) Drop leaf or extension tables
   Number of tables _____, number of pupils to be accommodated at each table ____

10) Fitting cubicles
    Number of cubicles _____, desired locations ________________

11) Electrical outlets
    Number of outlets _____, desired locations ________________

12) Gas service
    Desired locations ________________

13) Display cases

14) Display and map rails attached above chalkboard and tackboard

15) Loom

16) Other ________________

Comments:
6. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of materials to be stored in each.

a. Filing drawers
   Number of drawers _____, size of drawers _____
   Comments:

b. Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

c. Cabinets for tote tray storage
   Number of tote trays _____, dimensions of each tote tray _________________________
   Comments:

d. Storage for partially completed projects and garments
   Comments:

e. Storage for hand irons
   Number of irons _____
   Comments:
f. Storage for small equipment such as tape measures, shears, etc. 

Comments:

g. Temporary storage for pupils' personal belongings

Comments:

h. Storage for instructional supplies

Comments:

i. Storage for instructor's personal belongings

Comments:

Suggest other types of storage desired.

7. Suggest floor area needed for each teaching station of this type, _____ square feet (see directions, Pamphlet C-1).

8. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
9. In event any of these teaching stations are not needed full time as clothing laboratories, what other types of activities are:

a. Most likely to function well in these rooms?

b. Least likely to function well in these rooms?

---

**Food Laboratories**

1. Number to be planned _____

2. Indicate the extent to which the following types of activities will be carried on in this type of teaching station.

a. View films, slides, or other projected materials 1 2 3 N

b. Listen to recordings 1 2 3 N

c. Write or draw on chalkboard 1 2 3 N

d. Write or draw on desks 1 2 3 N

e. Small groups carry on conferences at conference tables 1 2 3 N

f. Teacher carry on conferences with individual pupils 1 2 3 N

g. Teacher carry on conferences with individual pupils and parents 1 2 3 N

h. Carry on research using reference materials in the classroom 1 2 3 N

i. Display pupil projects or work 1 2 3 N

j. Teacher demonstrate preparation and serving of food 1 2 3 N
k. Carry on class discussions

l. Pupils prepare and serve meals

m. Pupils prepare foods for storage

n. Prepare snacks for groups of 10 to 30 pupils or adults

o. Store pupils' personal belongings

p. Store pupils' partially completed projects

q. Store cooking equipment, china, silverware, towels, etc.

r. Store perishable foods under refrigeration

s. Store frozen foods

t. Store staple foods

u. Store instructional supplies

v. Store instructor's personal belongings

w. Carry on adult classes in food preparation

Are there any other types of activities which the classes as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans to accommodate them.

3. To carry on the activities indicated in Item 2, various types of teaching station arrangements may be used. Indicate the preference for the following types of laboratory arrangements or suggest other arrangements.

a. Laboratory with unit kitchens for food preparation and experimentation

   Number of pupils to be accommodated in each unit kitchen ______

b. Laboratory with unit kitchens for food preparation and experimentation and a multi-purpose area for serving meals, class discussion, etc.

   Number of pupils to be accommodated in each unit kitchen ______, number of pupils to be accommodated in the multi-purpose area ______
4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

5. Furniture and equipment

a. Check the type of desk and seating facilities desired (see directions, Pamphlet C-1).

___ 1) Tablet arm chairs for pupils

___ 2) Chair desks for pupils

___ 3) Movable combination desk-chairs for pupils

___ 4) Tables and chairs for pupils, number of pupils to be accommodated at each table _____
5) Extension or drop leaf tables and chairs for pupils, number of pupils to be accommodated at each table ______

6) Instructor's table, dimensions of tables ______

7) Instructor's desk

8) Instructor's combination desk and table

9) Other _____________________________________________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used in the foods laboratories and suggest any special information the architect should know about the various items.

1) Ranges for the preparation of foods
   Number of ranges needed ______, types of ranges desired ____________________________

2) Sinks with hot and cold running water
   Number of sinks needed ______, types of sinks desired ____________________________

3) Disposal units
   Number of disposal units needed ______

4) Workcounters
   Number of linear feet of workcounters needed, ______ feet

5) Refrigerators
   Number of refrigerators needed ______, types and capacities of refrigerators ____________________________

6) Deep freeze cabinets
   Number of cabinets ______, types and capacities of cabinets ____________________________

7) Electric mixers
   Number of mixers ______, types and capacities of mixers ____________________________

8) Dish washers
   Number of washers ______, types and capacities of washers ____________________________
9) Clothes washers
   Number of washers ____, types and capacities of
   washers ______________________________________

10) Ironers
    Number of ironers ____, types and capacities of
    ironers ______________________________________

11) Electrical outlets
    Number of outlets ____, desired locations ________
        ______________________________________

12) Display cases

13) Display shelves

14) Display and map rails attached above chalkboard and
    tackboard ____________________________________

15) Gas service
    Desired locations ______________________________
        ______________________________________

Comments:

Suggest other types or kinds of equipment to be provided and
the quantity of each such as one 33-piece set of plastic dishes
for each unit kitchen.
6. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of materials to be stored in each and suggest desired location for storage to be provided.

a. Filing drawers
   Number of drawers ______, size of drawers ______
   Comments:

b. Bookshelving
   Open shelving, ______ linear feet
   Closed shelving, ______ linear feet
   Comments:

c. Storage for cooking utensils
   Comments:

d. Storage for portable mechanical equipment such as electric mixers
   Comments:

e. Storage for table service -- china, glassware, and silverware
   Comments:
f. Storage for linens, towels, etc.
   Comments:
   
g. Storage for aprons
   Comments:
   
h. Storage for staple foods
   Comments:
   
i. Storage for perishable foods
   Comments:
   

j. Storage for frozen foods
   Comments:
   
k. Storage for pupils' partially completed projects
   Comments:
   

l. Temporary storage for pupils' personal belongings
   Comments:
   
m. Storage for instructional supplies
   Comments:
n. Storage for instructor's personal belongings

Comments:

Suggest other types of storage desired.

7. Suggest floor area needed for each teaching station of this type, _____ square feet (see directions, Pamphlet C-1).

8. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

9. In event any of these teaching stations are not needed full time as foods laboratories, what other types of activities are:

   a. Most likely to function well in these rooms?
b. Least likely to function well in these rooms?

Homemaking Laboratories

1. Number to be planned ______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. View slides, films or other projected materials
   b. Listen to recordings
   c. Write or draw on chalkboard
   d. Small groups carry on conferences at conference tables
   e. Teacher carry on conferences with individual pupils
   f. Teacher carry on conferences with individual pupil and parents
   g. Display pupil projects or work
   h. Carry on research using reference materials in the classroom
   i. Care for children
   j. Pupils operate homemaking equipment such as electric cleaners

   Are there any other types of activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Suggest desired locations for the homemaking laboratories in the home economics suite.
4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc., which the architect should know to aid in planning the space to be used for the chalkboard and tackboard.

5. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about each.

a. Living room furniture and furnishings 1 2 3 N

Comments:

b. Bedroom furniture and furnishings 1 2 3 N

Comments:

c. Dining room furniture and furnishings 1 2 3 N

Comments:
d. Nursery furniture and furnishings

Comments:

- 370 -

1 2 3 N

- 370 -

1 2 3 N

e. Cleaning equipment

Comments:

1 2 3 N

- 370 -

1 2 3 N

f. Display cases

1 2 3 N

g. Display shelves

1 2 3 N

h. Electrical outlets

Number of outlets ______, desired locations ______

1 2 3 N

i. Gas service

Desired locations __________________________________________

1 2 3 N

Suggest any other types or kinds of furniture and equipment needed and the quantity of each to be provided.

1 2 3 N

6. Indicate the extent to which the following types of storage will be used and suggest type, dimensions, and quantity of materials to be stored in each type.

a. Filing drawers

Number of drawers ______, size of drawers ______

1 2 3 N

Comments:

b. Bookshelving

Open shelving, ______ linear feet
Closed shelving, ______ linear feet

1 2 3 N

Comments:
c. Storage for cleaning equipment

Comments:

1 2 3 N

---

d. Storage for bedding

Comments:

1 2 3 N

---

e. Storage for roll-away beds

Comments:

1 2 3 N

---

f. Storage for instructional supplies

Comments:

1 2 3 N

---

Suggest other types of storage desired.

---

7. Suggest floor area needed for each teaching station of this type, _____ square feet (see directions, Pamphlet C-1).

---

8. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
9. In event any of these teaching stations are not needed full time as a homemaking laboratory, what other types of activities are:

a. Most likely to function well in these rooms?

b. Least likely to function well in these rooms?

**Combination or Multiple Use Teaching Stations**

1. If more than one aspect of the home economics program will be housed in the same teaching station, indicate the degree of preference for each of the following combinations.

   a. Foods and clothing

   b. Clothing and homemaking

   c. Other ___________________________________________  

   Comments:

2. Provide the information requested below for the most acceptable combination or multiple use facility indicated in Item 1 above.

   a. Indicate the activities for which this teaching station should be planned.
b. Indicate the approximate number of linear feet of chalkboard and tackboard needed in this teaching station (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

c. Indicate furniture and equipment needed in this teaching station.
d. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

---

e. Suggest floor area needed for this teaching station, ______ square feet (see directions, Pamphlet C-1).

f. Suggest any additional information which the architect should know to aid in planning this teaching station.

D. Indicate the extent to which each of the following auxiliary rooms or facilities will be used in the home economics program.

1. Bedroom
   1 2 3 N
2. Bath
   1 2 3 N
3. Laundry
   1 2 3 N
4. Living room 1 2 3 N
5. Small apartment 1 2 3 N
6. Instructor's office 1 2 3 N
7. Fitting room or cubicle 1 2 3 N
8. Other ________________________________ 1 2 3 N

Comments:

E. For each of the auxiliary rooms or facilities that is necessary for the home economics program (Item D) provide the information requested below.

1. Type of auxiliary room or facility ________________________________
   a. Number to be planned ____
   b. Indicate the activities for which these rooms or facilities should be planned.

   c. Suggest desired locations for these auxiliary rooms or facilities in the home economics suite.

   d. Indicate furniture and equipment needed in these rooms or facilities.

   e. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.
f. Suggest floor area needed for each of this type of auxiliary space, _____ square feet (see directions, Pamphlet C-1).

g. Indicate any additional information which the architect should know to aid in planning these rooms.

2. Type of auxiliary room or facility __________________________
   a. Number to be planned _____
   b. Indicate the activities for which these rooms or facilities should be planned.
   c. Suggest desired locations for these auxiliary rooms or facilities in the home economics suite.
   d. Indicate furniture and equipment needed in these rooms or facilities.
   e. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.
d. Indicate furniture and equipment needed in these rooms or facilities.

e. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

f. Suggest floor area needed for each of this type of auxiliary space, _____ square feet (see directions, Pamphlet C-1).

g. Indicate any additional information which the architect should know to aid in planning these rooms.

3. Type of auxiliary room or facility ___________________________

a. Number to be planned _____

b. Indicate the activities for which these rooms or facilities should be planned.

c. Suggest desired locations for these auxiliary rooms or facilities in the home economics suite.
d. Indicate furniture and equipment needed in these rooms or facilities.

e. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

f. Suggest floor area needed for each of this type of auxiliary space, _____ square feet (see directions, Pamphlet C-1).

g. Indicate any additional information which the architect should know to aid in planning these rooms.

4. Type of auxiliary room or facility ______________________________

   a. Number to be planned _____

   b. Indicate the activities for which these rooms or facilities should be planned.

   c. Suggest desired locations for these auxiliary rooms or facilities in the home economics suite.
d. Indicate furniture and equipment needed in these rooms or facilities.

e. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

f. Suggest floor area needed for each of this type of auxiliary space, _____ square feet (see directions, Pamphlet C-1).

g. Indicate any additional information which the architect should know to aid in planning these rooms.

F. In the space provided below indicate any additional information about any aspect of the home economics suite or program which the architect should know to aid in planning this suite. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.
G. Indicate factors which the architect should take into consideration when planning the location of the home economics suite. Include factors such as accessibility to other portions of the building or isolation of noises.

H. Summarize rooms and spaces needed for the home economics program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching stations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Auxiliary rooms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pamphlet C-6

**INDUSTRIAL ARTS**

**Rooms and Spaces Included in This Pamphlet**

<table>
<thead>
<tr>
<th>Type</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching stations</td>
<td>11</td>
</tr>
<tr>
<td>Auxiliary rooms</td>
<td>29</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>36</td>
</tr>
</tbody>
</table>
A. The number of teaching stations required for the industrial arts program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below, the calculated number of teaching stations required for the industrial arts program for the enrollment to be housed in the new building.

Number of teaching stations ___________________
Comments: ____________________________

B. The rooms for the industrial arts program should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the industrial arts program.

For certain activities, auxiliary spaces are needed. Early in the planning process, it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or spaces within the teaching stations. For instance, space for shop instruction or demonstration may be developed as a separate room which may also be used for planning or it may be a space within the shop where folding chairs or workbenches may be used for seating.

C. In this section, (1) indicate the extent to which experiences should be provided in each of the following industrial areas and (2) indicate the extent to which the activities mentioned in each area will be carried on. It is not necessary to consider activities in any area that is not essential for the industrial arts program to be housed in the new building.

When only limited experiences in some of the areas included on pages 2 through 11 are to be provided, such experiences may be included as a part of some related area. For instance, some arts and crafts activities may be included as a part of the woodworking activities.

1. Drawing and planning
   a. Use and care for drawing instruments
   b. Do lettering and dimensioning
   c. Do sectioning
   d. Read drawings and blueprints
   e. Do free-hand drawing or sectioning
   f. Make orthographic, isometric, and other views
g. Design projects in metal, wood, etc.

h. Do inking and tracing

Suggest other activities.

2. Woodwork

a. Draw plans and develop layouts

b. Layout, measure, and cut general construction pieces

c. Use and care for hand tools

d. Set up and operate woodworking machines such as
   1) Lathe
   2) Circular saw
   3) Band saw
   4) Jointer
   5) Planer
   6) Sander
   7) Shaper
   8) Other

e. Assemble and fasten or glue wooden pieces

f. Prepare for and finish various types of woods

g. Repair wooden objects

Suggest other activities.

3. General metals

a. Machine shop

   1) Draw plans and develop layouts
   2) Use and care for hand tools
b. **Sheet metal**

1) Lay out, measure, cut, and fit simple sheet metal parts

2) Form metals to various shapes with machine and hand tools

3) Repair sheet metal objects through use of riveting, soldering, and fitting

4) Make advanced sheet metal layouts

5) Set up and operate sheet metal working equipment such as
   a) Shears
   b) Brakes
   c) Rotary machines
   d) Former
   e) Other

Suggest other activities.
c. Bench metal

1) Read blue prints
2) Use and care for hand tools
3) Set up and operate metal working equipment such as
   a) Power drills
   b) Taps
   c) Dies
   d) Other ________________________________

Suggest other activities.

d. Forging

1) Cut cold and hot metals
2) Taper and draw hot metals
3) Shape, bend, and form metals
4) Anneal and temper metals
5) Use and care for hand tools
6) Set up and operate equipment such as
   a) Forges
   b) Furnaces
   c) Power hack saws
   d) Grinders
   e) Drill presses
   f) Other ________________________________

Suggest other activities.
e. Foundry

1) Study elements of foundry operation
2) Make patterns
3) Prepare molds for casting
4) Handle molten metals
5) Blast and grind castings

Suggest other activities.

f. Welding

1) Study welding processes
2) Prepare objects for welding and selecting proper equipment and welding supplies
3) Operate oxyacetylene cutting and welding equipment
4) Operate arc-welding equipment

Suggest other activities.

g. Art metal

1) Design art metal objects
2) Use and care for hand tools
3) Set up and operate equipment such as
   a) Lathes
   b) Grinders
   c) Buffers
   d) Drill presses
   e) Other

Suggest other activities.
4) Carry on such operations as
   a) Annealing
   b) Oxidising
   c) Coloring
   d) Soldering
   e) Plating
   f) Sensitizing
   g) Enameling
   h) Other

Suggest other activities.

4. Electrical
   a. Study basic principles of electricity
   b. Install bell wire, cable, conduit, fixtures, switches, etc. on mock-ups
   c. Test, service, and repair simple electrical equipment
   d. Plan, estimate, and carry out electrical installations
   e. Study electronics and operation of electronic equipment

Suggest other activities.

5. Arts and crafts
   a. Design and make objects from various types of metal, wood, plastics, leather, etc.
   b. Use and care for hand tools
   c. Set up and operate equipment such as
      1) Grinders
      2) Jig saws
3) Buffers
4) Drill presses
5) Other

Suggest other activities.

6. Automechanics

a. Study operation of gas and diesel engines and related information

b. Work on engine, ignition, and other mock-ups

c. Service "live cars"

d. Repair "live engines, cars," etc.

e. Do body and fender repair work

Suggest other activities.

7. Communications

a. Study communication equipment such as telephones, radios, television, etc.

b. Carry on experiments with communication equipment

c. Assemble radios and other communications equipment

d. Perform simple maintenance operations

e. Test and repair equipment

Suggest other activities.

8. Graphic arts

a. Set up and operate equipment such as

1) Lever press
2) Proof press
3) Platen press
4) Varitype
5) Linotype
6) Other

b. Do binding of books and other materials
c. Study kinds of type and methods of production
d. Check proof
e. Cut paper
f. Experiment with paper making
g. Do linoleum block printing
h. Do etching
i. Do silk screen printing
j. Do wood engraving
k. Print school newspaper
l. Print school stationery and forms

Suggest other activities.

9. Photography

a. Study operation of photographic equipment
b. Study theory of lighting
c. Use cameras and exposure meters
d. Take pictures
e. Do copy work
f. Mix photographic solutions
g. Develop film
h. Make contact prints
i. Make enlargements
1. Make slides
2. Edit film
3. Plan scenarios

Suggest other activities.

10. Ceramics

a. Design and make ceramic articles
b. Study the processes involved in the production of ceramic products
c. Use potter's wheel
d. Mix clay and other materials
e. Do glazing
f. Fire products in kiln
g. Display pupil projects

Suggest other activities.

11. Plastics

a. Study processes in developing plastics
b. Form, shape, and cast plastic objects
c. Design and construct objects from plastics
d. Operate equipment such as:
   1) Jig saws
   2) Circular saws
   3) Lathes
   4) Sanders
   5) Band saws
   6) Buffers
7) Other

Suggest other activities.

D. Industrial arts shops or laboratories fall into three major classifications:

1. **General shops** which provide for a number of areas of activity in one major room with each activity representing one general industrial operation.

2. **General unit shops** which provide separate facilities for numerous activities within a specific industrial area such as general metals which includes machine shop, sheet metal, foundry, etc.

3. **Unit shops** which provide separate facilities for activities found within a specific phase of a single industrial area such as machine shop, a specific phase of the general metals area.

On the basis of information provided in the preceding sections, indicate the types of shops to be provided, the areas of activity to be accommodated in each shop, and the number of each type of shop to be provided.

<table>
<thead>
<tr>
<th>Type of shop*</th>
<th>Industrial arts areas to be accommodated in each shop</th>
<th>Number of shops</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
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<td></td>
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<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* General, general unit, or unit shop

E. For each of the different types of teaching stations needed for the industrial arts program, provide the information requested below. Provisions have been made for four different types of teaching stations. Complete only those portions of the following sections which pertain to the needs of the contemplated program.
Identify each different type of teaching station needed by indicating the uses for which each is to be designed. For instance, if one teaching station is to be used for general shop and planning activities, record general shop and planning on the line following the item, "Type of teaching station to be planned," in one of the sections which follows; if a second teaching station is to be used for woodworking, record woodworking on the line following the item, "Type of teaching station to be planned," in another section which follows; if a third teaching station is to be used for mechanical drawing, record mechanical drawing on the line following the item, "Type of teaching station to be planned," in another section which follows, etc.

1. Type of teaching station to be planned ________________________________

   a. Indicate the industrial areas to be accommodated in this type of teaching station.

   b. Number of teaching stations of this type to be planned ______

   c. Suggest desired locations for this type of teaching station or suggest factors which should determine the locations.

   d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

      Chalkboard, _____ linear feet; tackboard, _____ linear feet

      Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

   e. Furniture and equipment

      1) List the types of desk and seating facilities desired and the number of each type needed.
2) List the types of furniture and equipment which will be needed and suggest any special information which the architect should know about the various items to aid in planning.

f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers
   Number of drawers _____, size of drawers _____

   Comments:
2) Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

3) Storage for raw materials
   Comments:

4) Storage for tools
   Comments:

5) Storage for instructional supplies
   Comments:

6) Storage for partially completed pupil projects
   Comments:
Comments: (Item 6) continued

7) Storage for pupils' personal belongings

Comments:

8) Storage for instructors' personal belongings

Comments:

Suggest other types of storage needed.

g. Suggest floor area needed for this type of teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:
h. Indicate any additional information which the architect should know to aid in planning this type of facility.

i. In event this type of teaching station is not needed full time for the industrial arts program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?

j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these industrial arts activities.

2. Type of teaching station to be planned

   a. Indicate the industrial areas to be accommodated in this type of teaching station.

   b. Number of teaching stations of this type to be planned

   c. Suggest desired locations for this type of teaching station or suggest factors which should determine the locations.
d. Indicate the approximate number of linear feet of chalkboard and
tackboard needed in each teaching station of this type (see
directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical
widths, rulings or etchings, special uses, etc. which the
architect should know to aid in planning the space to be used
for chalkboard and tackboard.

e. Furniture and equipment

1) List the types of desk and seating facilities desired and
the number of each type needed.

2) List the types of furniture and equipment which will be
needed and suggest any special information which the architect
should know about the various items to aid in planning.
f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers
   Number of drawers _____, size of drawers _____
   Comments:

2) Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

3) Storage for raw materials
   Comments:

4) Storage for tools
   Comments:
5) Storage for instructional supplies

Comments:

6) Storage for partially completed pupil projects

Comments:

7) Storage for pupils' personal belongings

Comments:

8) Storage for instructors' personal belongings

Comments:

Suggest other types of storage needed.
g. Suggest floor area needed for this type of teaching station or suggest factors which should determine the area needed (See directions, Pamphlet C-1).

Square feet ______

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of facility.

i. In event this type of teaching station is not needed full time for the industrial arts program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?

j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these industrial arts activities,
3. Type of teaching station to be planned

a. Indicate the industrial areas to be accommodated in this type of teaching station.

b. Number of teaching stations of this type to be planned

c. Suggest desired locations for this type of teaching station or suggest factors which should determine the locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

   Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

e. Furniture and equipment

   1) List the types of desk and seating facilities desired and the number of each type needed.

   2) List the types of furniture and equipment which will be needed and suggest any special information which the architect should know about the various items to aid in planning.
f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers
   Number of drawers _____, size of drawers _____

   Comments:

2) Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet

   Comments:

3) Storage for raw materials

   Comments:
4) Storage for tools

Comments:

5) Storage for instructional supplies

Comments:

6) Storage for partially completed pupil projects

Comments:

7) Storage for pupils' personal belongings

Comments:
8) Storage for instructors' personal belongings

Comments:

Suggest other types of storage needed.

g. Suggest floor area needed for this type of teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of facility.

i. In event this type of teaching station is not needed full time for the industrial arts program, what other types of activities are:

1) Most likely to function well in this type of teaching station?
2) Least likely to function well in this type of teaching station?

j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these industrial arts activities.

4. Type of teaching station to be planned

a. Indicate the industrial areas to be accommodated in this type of teaching station.

b. Number of teaching stations of this type to be planned

c. Suggest desired locations for this type of teaching station or suggest factors which should determine the locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc., which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
e. Furniture and equipment

1) List the types of desk and seating facilities desired and the number of each type needed.

2) List the types of furniture and equipment which will be needed and suggest any special information which the architect should know about the various items to aid in planning.

f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers
   Number of drawers ______, size of drawers _____
Comments: (Item f, continued)

2) Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet

   Comments:

3) Storage for raw materials

   Comments:

4) Storage for tools

   Comments:

5) Storage for instructional supplies

   Comments:
6) Storage for partially completed pupil projects  
   Comments:

7) Storage for pupils' personal belongings  
   Comments:

8) Storage for instructors' personal belongings  
   Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for this type of teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _____
h. Indicate any additional information which the architect should know to aid in planning this type of facility.

i. In event this type of teaching station is not needed full time for the industrial arts program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?

j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these industrial arts activities.

F. Indicate the extent to which the following types of auxiliary rooms will be used in the industrial arts program.

1. Demonstration rooms
2. Conference rooms
3. Library
4. Instructors' offices
For each of the auxiliary rooms listed in Item F that is needed for the industrial arts program, provide the information requested below. Identify each room by indicating the use for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one purpose. If any rooms are to be planned to serve more than one purpose, identify each one by a phrase which suggests the multiple uses for which it is to be planned—for example, conference room and an instructor's office or finishing and project drying room.

1. Type of use of room to be planned ________________________________

   a. Number of this type to be planned _____

   b. Indicate the activities or uses for which these rooms should be planned.
c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ____

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

2. Type of room to be planned ____________________________

a. Number of this type to be planned _____
b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:
g. Indicate any additional information which the architect should know to aid in planning this type of facility.

3. Type of room to be planned ________________________________

a. Number of this type to be planned _____

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.
f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ____

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

4. Type of room to be planned ________________________________

a. Number of this type to be planned ____

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

h. In the space provided below, indicate any additional information about any aspect of the industrial arts rooms or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.
I. Indicate factors which the architect should take into consideration when planning the general location of the industrial arts rooms in relation to other areas of the building and in relation to outdoor facilities. Include factors such as accessibility to other portions of the building, isolation of noises, and accessibility to service drive.

J. Summarize rooms and spaces needed for the industrial arts program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>l. Teaching Stations</td>
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<td>a.</td>
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<td>d.</td>
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<td>e.</td>
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<tr>
<td>f.</td>
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</tbody>
</table>
2. Auxiliary Rooms

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
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<td>b.</td>
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<td>f.</td>
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</tbody>
</table>
Pamphlet C-8
LANGUAGE ARTS

Rooms and Spaces Included in This Pamphlet

Regular teaching stations 2
Special teaching stations 7
Auxiliary rooms 8
Broadcast or telecast studios 8
Little theaters 10
Speech clinic 13
Library and reading room 14
Small recording room 15
Publications staff rooms 15
Conference rooms 17
Instructors' offices 18
Other auxiliary rooms 19
Summary of rooms and spaces 21
A. The number of teaching stations required for the language arts program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for language arts for the enrollment to be housed in the new building.

Number of teaching stations ______

Comments:

B. The language arts suite should be planned in relation to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the language arts program. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations.

C. Check the subjects or offerings in the educational program which the language arts teaching stations are to house.

1. Core Program  
   2. Dramatics  
   3. English  
   4. Foreign Languages  
   5. Journalism  
   6. Speech

Suggest other offerings

Comments:

D. For each of the different types of teaching stations required for the language arts program, provide the information requested below.

**Regular Teaching Stations**

1. Number to be planned ______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. View slides, films, or other projected materials  
      1 2 3 N
   b. Listen to recordings or broadcasts  
      1 2 3 N
   c. View telecasts  
      1 2 3 N
d. Record voices of individuals or groups of pupils

e. Write or draw on chalkboard

f. Write or draw at desks or tables

g. Small groups of pupils carry on conferences at conference tables

h. Teacher carry on conferences with individual pupils

i. Carry on research using reference materials stored in classroom

j. Display pupil projects or work

k. Store pupils' personal belongings

l. Store partially completed pupil projects

m. Store instructional supplies

n. Store equipment such as record players or recorders

o. Carry on activities requiring raised platforms

p. Practice choral reading

q. Debate

r. Carry on panel discussions

s. Store instructor's personal belongings

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet
Suggest any special considerations such as locations, vertical widths, ruling or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

___ 1) Tablet arm chairs for pupils
___ 2) Chair desks for pupils
___ 3) Movable combination desk-chairs for pupils
___ 4) Tables and chairs for pupils, number of pupils to be accommodated at each table, ____ pupils
___ 5) Instructor's desk
___ 6) Instructor's table, dimensions of table ___________
___ 7) Instructor's combination desk and table
___ 8) Other ________________________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about the various items.

1) Conference tables and chairs
Number of tables ____ , dimensions of tables ____

2) Workcounter
Dimensions of workcounter ___________

3) Sink with hot and cold water
Desired location of sink ___________

4) Display cases

5) Display and map rails attached above chalkboard and tackboard

6) Record player
7) Recorder
8) Radio
9) Television
10) Electrical outlets
   Number of outlets ____, desired locations ______
11) Full length mirror

Suggest other types of furniture and equipment needed.

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.
   a. Filing drawers
      Number of drawers ____, size of drawers ________
      Comments:
   b. Book shelving
      Open shelving, _____ linear feet
      Closed shelving, _____ linear feet
      Comments:
   c. Storage for recordings
      Number of recordings ______
      Comments:
d. Storage for instructional supplies

Comments:

- 425 -

1 2 3 N


e. Storage for costumes and make-up

Comments:

f. Storage for pupils' personal belongings

Comments:

1 2 3 N

1 2 3 N

Suggest other types of storage needed.

6. Suggest floor area needed for each regular teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet

Comments:
7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

Special Teaching Stations

1. If one or more language arts teaching stations should be planned with special features not included in the other teaching stations as outlined above, indicate in the space provided below the special provisions or alterations which should be made for these teaching stations.

E. In event any of the teaching stations are not needed full time for the language arts program, what other types of activities are:

1. Most likely to function well in these rooms?
6. Least likely to function well in these rooms?

F. Indicate the extent to which each of the following auxiliary rooms will be used in the language arts program.

1. Broadcast or telecast studios including program production, control, and listening or viewing rooms 1 2 3 N
2. Little theater 1 2 3 N
3. Speech clinic 1 2 3 N
4. Library and reading room 1 2 3 N
5. Small recording room 1 2 3 N
6. Publications staff rooms 1 2 3 N
7. Conference rooms 1 2 3 N
8. Instructors' offices 1 2 3 N
9. Other ________________________________ 1 2 3 N

Comments:

G. For each of the auxiliary rooms that is necessary for the language arts program (Item F) provide the information requested below.

Broadcast or Telecast Studios

1. Number to be planned ______

2. Indicate the major purpose for which the studios should be planned.
   __ a. As teaching stations for regularly scheduled class activities
   __ b. As auxiliary spaces to be used by different language arts classes as class activities dictate the need for such studios
   __ c. Other ________________________________

Comments:
Note: If these studios are to be teaching stations for regularly scheduled class activities, it will be necessary to calculate these as teaching stations when completing the summary of rooms and spaces in the last section of this pamphlet.

3. Indicate activities or uses for which these studios should be planned.

4. Indicate the extent to which the following spaces will be needed in the studios.
   a. Program production room for broadcasts or telecasts 1 2 3 N
   b. Listening or viewing room 1 2 3 N
   c. Control room or booth 1 2 3 N
   d. Other _____________________________ 1 2 3 N

Comments:

5. Suggest desired locations for the studios in the language arts suite or suggest factors which should determine their locations.

6. Indicate types of furniture and equipment to be provided for each studio.

7. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.
8. Suggest floor area needed for each room in each studio or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   a. Program production room ______ square feet
   b. Listening or viewing room ______ square feet
   c. Control room or booth ______ square feet
   d. Other ____________________________ ______ square feet

Comments:

9. Indicate any additional information which the architect should know to aid in planning these studios.

Little Theaters

1. Number to be planned ______

2. Indicate the major purposes for which the little theaters should be planned.

   a. As teaching stations for regularly scheduled class activities
   b. As auxiliary spaces to be used by different language arts classes as class activities dictate the need for the theater setting
   c. Other ____________________________

Comments:

Note: If these theaters are to be teaching stations for regularly scheduled class activities, it will be necessary to include them as teaching stations when completing the summary of rooms and spaces in the last section of this pamphlet.
3. Indicate activities or uses for which these theaters should be planned.

4. In addition to the main body of the theater and the stage, indicate the extent to which the following rooms or spaces will be needed.

   a. Dressing rooms
      Number of rooms _______

   b. Make-up rooms
      Number of rooms _______

   c. Projection booth
      _______

   d. Stagecraft workshop
      _______

   e. Other ____________________________________________________________
      _______

5. Suggest desired locations for the little theaters or suggest factors which should determine their locations.

6. Check the type of floor and seating arrangements desired.
   ___ a. Level floor with fixed theater type seating
   ___ b. Level floor with fixed theater type seating with folding tablet arms attached
   ___ c. Level floor with folding chairs
   ___ d. Sloping floor with fixed theater type seating
   ___ e. Sloping floor with fixed theater type seating with folding tablet arms attached
   ___ f. Other ___________________________________________________________________

7. Indicate types of furniture and equipment to be provided for each theater.
8. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

9. Indicate the desired seating capacity of each theater needed.

10. Suggest floor area needed for each room or space in each theater or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   a. Stage
   b. Dressing rooms
   c. Make-up rooms
   d. Projection booth
   e. Stagecraft workshop
   f. Other

Comments:

11. Indicate any additional information which the architect should know to aid in planning this type of theater.
1. Indicate the activities or uses for which this room should be planned.

2. Suggest a desired location for the speech clinic in the language arts suite or suggest factors which should determine its location.

3. Indicate types of furniture and equipment to be provided for the clinic.

4. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

5. Suggest floor area needed for the clinic or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

6. Indicate any additional factors which the architect should know to aid in planning this type of room.
1. Indicate activities for which this room should be planned.

2. Suggest a desired location for the library and reading room in the language arts suite or suggest factors which should determine its location.

3. Indicate types of furniture and equipment to be provided for this room.

4. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

5. Suggest floor area needed for this room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

6. Indicate any additional information which the architect should know to aid in planning this type of room.
Small Recording Room

1. Indicate activities for which this room should be planned.

2. Suggest a desired location for the recording room in the language arts suite or suggest factors which should determine its location.

3. Indicate types of equipment to be provided for this room.

4. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

5. Suggest floor area needed for this room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

6. Indicate any additional information which the architect should know to aid in planning this type of room.

Publications Staff Rooms

1. Number to be planned ______.

2. Indicate the activities for which these rooms should be planned.
3. Suggest desired locations for the publications staff rooms in the language arts suite or suggest factors which should determine their locations.

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in the publications staff room (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

5. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about each.

<table>
<thead>
<tr>
<th>Type of Furniture</th>
<th>Number to be Used</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Conference tables and chairs</td>
<td>1 2 3 N</td>
<td>Number of tables _____, number to be accommodated at each table ____</td>
</tr>
<tr>
<td>b. Tablet arm chairs for pupils</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>c. Movable combination desk chairs</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>d. Workcounter</td>
<td>1 2 3 N</td>
<td>Dimensions of workcounter ________</td>
</tr>
<tr>
<td>e. Sink with hot and cold running water</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>f. Electrical outlets</td>
<td>1 2 3 N</td>
<td>Number of outlets _____, desired locations ________</td>
</tr>
<tr>
<td>g. Display cases</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>h. Display and map rails attached above chalkboard and tackboard</td>
<td>1 2 3 N</td>
<td></td>
</tr>
</tbody>
</table>

Suggest other types of furniture and equipment needed.

Comments:
6. Indicate the types, dimensions, and quantities of materials to be stored and the type of storage needed.

7. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

8. Indicate any additional information which the architect should know to aid in planning these rooms.

Conference Rooms

1. Number to be planned ________

2. Indicate the activities for which these rooms should be planned.

3. Suggest desired locations for the conference rooms in the language arts suite or suggest factors which should determine the locations of these rooms.

4. Indicate types of furniture and equipment to be provided for these rooms.
5. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

6. Suggest floor area needed for each room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).
   Square feet _____
   Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Instructors' Offices

1. Number to be planned _____

2. Indicate the activities for which these rooms should be planned.

3. Suggest desired locations for the offices in the language arts suite or suggest factors which should determine the locations of these rooms.

4. Indicate types of furniture and equipment to be provided for these rooms.
5. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

6. Suggest floor area needed for each office or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______
   Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Other Auxiliary Rooms

1. If other auxiliary rooms are needed, in the space below describe the facilities to be provided. Include data similar to that requested in the preceding sections on auxiliary rooms.
H. In the space below indicate any additional information about any aspect of the language arts rooms or program which the architect should know to aid in planning this suite. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

I. Indicate factors which the architect should take into consideration when planning the location of the language arts suite. Include factors such as accessibility to other portions of the building and isolation from noises.
J. Summarize the rooms and spaces needed for the language arts program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggest floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching stations</td>
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<tr>
<td>a.</td>
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<td>b.</td>
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<td>c.</td>
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<tr>
<td>2. Auxiliary rooms</td>
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<td></td>
<td></td>
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<tr>
<td>a.</td>
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<td>b.</td>
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<td>f.</td>
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</tbody>
</table>
A MANUAL FOR PLANNING

A SECONDARY SCHOOL BUILDING

Pamphlet C-9

MATHEMATICS

Bureau of Educational Research
College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-9
MATHEMATICS

Rooms and Spaces Included in This Pamphlet

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
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</thead>
<tbody>
<tr>
<td>Regular teaching stations</td>
<td>1</td>
</tr>
<tr>
<td>Special teaching stations</td>
<td>6</td>
</tr>
<tr>
<td>Auxiliary rooms</td>
<td>7</td>
</tr>
<tr>
<td>Workshop</td>
<td>7</td>
</tr>
<tr>
<td>Conference rooms</td>
<td>8</td>
</tr>
<tr>
<td>Instructors' offices</td>
<td>9</td>
</tr>
<tr>
<td>Other auxiliary rooms</td>
<td>10</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>11</td>
</tr>
</tbody>
</table>
A. The number of teaching stations required for the mathematics program for various projected enrollments has been calculated in accordance with directions in Pamphlet B. Indicate in the space below the calculated number of teaching stations required for mathematics for the projected enrollment for which the building is to be planned.

Number of teaching stations _______

B. The mathematics suite should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the mathematics program. In addition to teaching stations, auxiliary spaces may be needed. It will be necessary to determine early in the planning process whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching station. For instance, space for some types of activities may be provided in a separate room adjacent to the classroom or it may be provided in an alcove at one end of the room.

C. For each of the different types of teaching stations required for the mathematics program provide the information requested below.

Regular Teaching Stations

1. Number to be planned _______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. View slides, films, or other projected materials 1 2 3 N
   b. Listen to recordings 1 2 3 N
   c. Write on chalkboard 1 2 3 N
   d. Draw on chalkboard with the aid of compasses, meter-sticks, etc. 1 2 3 N
   e. Write or draw at desks or tables 1 2 3 N
   f. Small groups carry on conferences at conference tables 1 2 3 N
   g. Teacher carry on conferences with individual pupils 1 2 3 N
   h. Small groups of pupils carry on experiments illustrating mathematical principles or concepts 1 2 3 N
   i. Demonstrate with simple equipment mathematical principles or rules such as operation of the slide rule or volumetric relationships 1 2 3 N
j. Operate calculating machines

k. Carry on research using reference materials in classroom

l. Display pupil projects or work

m. Store pupils' personal belongings

n. Store partially completed pupil projects

o. Store instruments and equipment such as hypsometers and measuring tapes

p. Store simple wood and metalworking tools

q. Store instructional supplies

Are there any other types of activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station for the mathematics program (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
4. Furniture and equipment

a. Check the type of desk and seating facilities desired (see direction, Pamphlet C-1).

_ 1) Tablet arm chairs for pupils
_ 2) Chair desks for pupils
_ 3) Movable combination desk-chairs for pupils
_ 4) Tables and chairs for pupils, number of pupils to be accommodated at each table, _____ pupils
_ 5) Instructor's desk
_ 6) Instructor's table, dimensions of table _______________
_ 7) Instructor's combination desk and table
_ 8) Other ____________________________________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about the various items.

1) Conference tables and chairs
   Number of tables _____, number of pupils to be accommodated at each table, _____ pupils

2) Workcounter
   Dimensions of workcounter _______________

3) Workbench
   Dimensions of workbench _______________

4) Sink with hot and cold running water

5) Simple woodworking tools

6) Simple metalworking tools

7) Electrical outlets
   Number of outlets _____, desired locations

8) Gas service
   Desired location _______________

1 2 3 N
9) Calculating machines  
10) Display cases  
11) Display and map rails attached above chalkboard and bulletin board  
12) Record player  
13) Radio  
14) Television  
15) Other  

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of materials to be stored in each

a. Filing drawers  
   Number of drawers _____, size of drawers _____  
   Comments:

b. Bookshelving  
   Linear feet of open bookshelving, _____ feet  
   Linear feet of closed bookshelving, _____ feet  
   Comments:
c. Cabinets for metal and woodworking tools 1 2 3 N

Comments:

d. Storage for pupils' partially completed projects 1 2 3 N

Comments:

e. Storage for instructional supplies 1 2 3 N

Comments:

f. Storage for instruments and equipment 1 2 3 N

Comments:

g. Storage for instructor's personal belongings 1 2 3 N

Comments:

Suggest other types of storage desired.
6. Suggest floor area needed for each room, _____ square feet (see directions, Pamphlet C-1).

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

Special Teaching Stations

1. If one or more teaching stations in the mathematics suite should be planned with special features not included in the other rooms as outlined above, indicate in the space provided below the special provisions or alterations which should be made for these teaching stations.
D. In event any of the teaching stations are not needed full time for the mathematics program, what other types of activities are:

1. Most likely to function well in these rooms?

2. Least likely to function well in these rooms?

E. Indicate the extent to which each of the following auxiliary rooms will be used in the mathematics program.

1. Workshops
2. Conference rooms
3. Instructor's offices
4. Other

Comments:

F. For each of the auxiliary rooms that is necessary for the mathematics program (Item E) provide the information requested below.

**Workshops**

1. Number of workshops to be planned

2. Indicate the activities for which this room should be planned.

3. Suggest desired locations for the workshops in the mathematics suite.
4. Indicate furniture and equipment desired for the workshop.

5. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

6. Suggest floor area needed for each room, _____ square feet (see directions, Pamphlet C-1).

Conference Rooms

1. Number of conference rooms to be planned _____

2. Indicate the activities for which these rooms should be planned.

3. Suggest desired locations for the conference rooms in the mathematics suite.

4. Indicate furniture and equipment desired for these rooms.
5. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

6. Suggest floor area needed for each room, ____ square feet (see directions, Pamphlet C-1).

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Instructor's Offices

1. Number of instructor's offices to be planned ____

2. Indicate the activities for which these rooms should be planned.

3. Suggest desired locations for the instructor's offices in the mathematics suite.

4. Indicate furniture and equipment desired for these rooms.

5. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

6. Suggest floor area needed for each room, ____ square feet (see directions, Pamphlet C-1).
7. Indicate any additional information which the architect should know to aid in planning this type of room.

Other Auxiliary Rooms

1. If other auxiliary rooms are needed, describe in the space below the facilities to be provided. Include data similar to that requested in preceding sections on auxiliary rooms.

C. In the space provided below indicate any additional information about any aspect of the mathematics suite or program which the architect should know to aid in planning this suite. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.
H. Indicate factors which the architect should take into consideration when planning the location of the mathematics suite. Include factors such as accessibility to other portions of the building and isolation of noises.

I. Summarize rooms and spaces needed for the mathematics program

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching stations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Auxiliary rooms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
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<tr>
<td>c.</td>
<td></td>
<td></td>
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<tr>
<td>d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pamphlet C-10

MUSIC

Rooms and Spaces Included in This Pamphlet

<table>
<thead>
<tr>
<th>Type of Room</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory and related music classrooms</td>
<td>1</td>
</tr>
<tr>
<td>Instrumental music studios</td>
<td>6</td>
</tr>
<tr>
<td>Vocal music studios</td>
<td>11</td>
</tr>
<tr>
<td>Combination instrumental and vocal music studios</td>
<td>15</td>
</tr>
<tr>
<td>Auxiliary rooms</td>
<td></td>
</tr>
<tr>
<td>Music practice rooms</td>
<td>22</td>
</tr>
<tr>
<td>Listening rooms</td>
<td>22</td>
</tr>
<tr>
<td>Combination library and listening rooms</td>
<td>24</td>
</tr>
<tr>
<td>Workshops</td>
<td>26</td>
</tr>
<tr>
<td>Instructors' offices</td>
<td>27</td>
</tr>
<tr>
<td>Uniform storage rooms</td>
<td>28</td>
</tr>
<tr>
<td>Robe storage rooms</td>
<td>29</td>
</tr>
<tr>
<td>Combination uniform and robe storage rooms</td>
<td>30</td>
</tr>
<tr>
<td>Instrument storage rooms</td>
<td>30</td>
</tr>
<tr>
<td>Chair storage rooms</td>
<td>31</td>
</tr>
<tr>
<td>Music stand storage rooms</td>
<td>32</td>
</tr>
<tr>
<td>Other auxiliary rooms</td>
<td>32</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>34</td>
</tr>
</tbody>
</table>
A. The number of teaching stations required for the music program for various projected enrollments has been calculated in accordance with directions in Pamphlet B. Indicate in the space below the calculated number of teaching stations required for music for the enrollment to be housed in the new building.

Number of teaching stations _____

B. The music suite should be planned in relation to the number of teaching stations and the types of activities that will be carried on in the music program. If only one teaching station is required, one space will have to accommodate all the activities and the space will have to be planned accordingly. On the other hand, if two or more stations are required, each space can be planned to accommodate one type of activity such as instrumental music or each space can be planned to house many aspects of the program. Planning spaces of the latter type is advantageous since it permits a greater degree of flexibility of use than is possible with spaces planned for special uses.

In addition to the teaching stations required to accommodate such groups as bands, choirs, or theory classes, certain auxiliary spaces are usually necessary. The auxiliary spaces may be planned as separate rooms closely related to the teaching station or they may be separate areas within the teaching station. For instance, space for instrument storage may be a separate room directly accessible to the instrumental music studio or it may be a cabinet along one wall of the studio. The nature of the auxiliary spaces will have to be determined early in the planning process.

C. For each of the different types of teaching stations that is required for the music program, provide the information requested below.

   **Theory or Related Music Classrooms**

1. Number to be planned. _____

2. Indicate the extent to which the following activities will be carried on in this type of classroom.

   a. Listen to recorded music 1 2 3 N
   b. View slides, films, or other projected materials 1 2 3 N
   c. Conduct demonstrations of various types of musical instruments 1 2 3 N
   d. Conduct experiments with sound producing equipment 1 2 3 N
   e. Write or draw on chalkboard 1 2 3 N
   f. Write at desks or tables 1 2 3 N
g. Display pupil projects or work

Are there any other types of activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the extent to which each of the following suggests a desired location for this type of teaching station.

a. Directly accessible to the music library
b. Near the central school library for easy access to reference materials
c. In an area of the building isolated from areas where quiet is desired
d. Directly accessible to an outside entrance
e. Directly accessible to the music workshop
f. Directly accessible to the science laboratories so equipment can be shared
g. Other ________________________________

Comments:

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard,____ linear feet; tackboard,____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
5. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

1) Tablet arm chairs for pupils
2) Chair desks for pupils
3) Movable combination desk-chairs for pupils
4) Tables and chairs for pupils, number of pupils to be accommodated at each table __________
5) Instructor's desk
6) Instructor's table, dimensions of table________________________
7) Instructor's combination table and desk
8) Other ____________________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about the various items.

1) Conference tables and chairs 1 2 3 N
   Number of tables ______, number of pupils to be accommodated at each table ______

2) Demonstration desk 1 2 3 N

3) Workcounter 1 2 3 N
   Dimensions of workcounter ____________________________

4) Sink with hot and cold running water 1 2 3 N

5) Gas service 1 2 3 N
   Desired locations______________________________

6) Record player 1 2 3 N

7) Radio 1 2 3 N

8) Television 1 2 3 N

9) Recorder 1 2 3 N

10) Piano 1 2 3 N
11) Display cases

12) Electrical outlets
   Number of outlets _____, desired locations__________

13) Drinking fountain

14) Display and map rails attached above chalkboard and tackboard

15) Other______________________________

Comments:

f. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of materials to be stored.

a. Filing drawers
   Number of drawers _____, size of drawers ________________

Comments:

b. Bookshelving
   Open shelving, ____ linear feet
   Closed shelving, ____ linear feet

Comments:

c. Storage for instructor's personal belongings

Comments:
7. Suggest floor area needed for each teaching station, _____square feet (see directions, Pamphlet C-1).

8. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

9. In event any of the theory or related music teaching stations are not needed full time for music classes, what other types of activities are:

   a. Most likely to function well in these rooms?
b. Least likely to function well in these rooms?

Instrumental Music Studios

1. Number to be planned _____

2. Indicate the extent to which the following activities will be carried on in this type of teaching station and suggest activities not listed.

a. Conduct band and orchestra rehearsals involving school groups 1 2 3 N
b. Conduct band and orchestra rehearsals involving community groups 1 2 3 N
c. Conduct sectional rehearsals 1 2 3 N
d. Teach individual music lessons 1 2 3 N
e. Teach theory or related music classes 1 2 3 N
f. Store instruments 1 2 3 N
g. Store uniforms 1 2 3 N
h. Store printed music 1 2 3 N
i. Sort sheet music 1 2 3 N
j. Listen to recorded music 1 2 3 N
k. Store recordings 1 2 3 N
l. Store reference books 1 2 3 N
m. View slides, films, or other projected materials 1 2 3 N
n. Store pupils' personal belongings temporarily 1 2 3 N
o. Store personal belongings temporarily if facility is to be used during out of school hours 1 2 3 N
p. Store instructional supplies 1 2 3 N
q. Display pupil projects or work 1 2 3 N
r. Hold meetings of school groups 1 2 3 N
s. Other ____________________________ 1 2 3 N
3. Indicate the extent to which each of the following suggests a desired location for the instrumental music studio.

a. On the ground floor to avoid carrying heavy instruments up and down stairs. 1 2 3 N

b. With direct access to an outside entrance 1 2 3 N

c. With direct access to the athletic field 1 2 3 N

d. Convenient to the auditorium stage 1 2 3 N

e. In a portion of the building which may be shut off from the remainder of the building 1 2 3 N

f. In an area of the building isolated from areas where quiet is desired 1 2 3 N

Comments:

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard,_____ linear feet; tackboard,_____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
5. Indicate the preference for floor and seating arrangements as well as arrangements which are acceptable such as level floor with movable seating preferred, combination level floor with movable seating and terraced floor with fixed seating acceptable.

6. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information the architect should know about the various items.

a. Piano 1 2 3 N
b. Director's podium 1 2 3 N
c. Recorder 1 2 3 N
d. Record player 1 2 3 N
e. Radio 1 2 3 N
f. Television 1 2 3 N
g. Tables
   Number of tables___, dimensions of tables ________

h. Display cases 1 2 3 N
i. Electrical outlets
   Number of outlets___, desired locations ________

j. Drinking fountain 1 2 3 N
k. Display and map rails attached above chalkboard and tackboard 1 2 3 N
l. Other__________________________ 1 2 3 N

Comments:
7. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of materials to be stored.

a. Filing drawers
   Number of drawers ______, size of drawers ____________
   Comments:

b. Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

c. Storage for instructor's personal belongings
   Comments

d. Storage for instruments
   Comments

e. Storage for printed music
   Comments:
f. Storage for uniforms

Comments:

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1 2 3 N

g. Temporary storage for pupils' personal belongings

Comments:

Suggest other types of storage desired.

8. Suggest floor area needed for this type of teaching station, _____ square feet (see directions, Pamphlet C-1).

9. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
1. Number to be planned ______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station and suggest activities not listed.

<table>
<thead>
<tr>
<th>Activity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Conduct vocal music rehearsals involving school groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Conduct vocal music rehearsals involving community groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Conduct sectional rehearsals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Teach individual music lessons</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Teach theory or related music classes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Store robes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Store printed music</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Sort sheet music</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Listen to recorded music</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Store recordings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Store reference books</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. View slides, films, and other projected materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Store pupils' personal belongings temporarily</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n. Store personal belongings temporarily if facility is to be used during out of school hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o. Store instructional supplies</td>
<td></td>
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<tr>
<td>p. Hold meetings of school groups</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>q. Display pupil projects or work</td>
<td></td>
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<tr>
<td>r. Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments:
3. Indicate the extent to which each of the following suggests a desirable location for the vocal music studios.

a. Convenient to the auditorium stage 1 2 3 N
b. With direct access to an outside entrance for convenience when used by out of school groups 1 2 3 N
c. In a portion of the building which may be shut off from the remainder of the building 1 2 3 N
d. In an area of the building isolated from areas where quiet is desired 1 2 3 N

Comments:

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-l).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc., which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

5. Indicate the degree of preference for each of the following types of floor and seating arrangements.

a. Level floor with movable chairs P A NA
b. Level floor with fixed theater type seating P A NA
c. Terraced floor with movable chairs P A NA
d. Terraced floor with fixed theater type seating P A NA
e. Other __________________________________________________________ P A NA

Comments:
6. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

a. Piano  

b. Director's podium

c. Recorder

d. Record player

e. Radio

f. Television

g. Tables
   Number of tables _____, dimensions ______________,

h. Electrical outlets
   Number of outlets ____, desired locations __________

i. Drinking fountain.

j. Display and map rails attached above chalkboard and tackboard

k. Other ___________________________________________

Comments:

7. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of materials to be stored.

a. Filing drawers
   Number of drawers _____, size of drawers __________

Comments:
b. Bookshelving
   Open shelving, ______ linear feet
   Closed shelving, ______ linear feet

Comments:

c. Storage for instructor's personal belongings

Comments:

d. Storage for printed music

Comments:

e. Storage for robes

Comments:

f. Temporary storage for pupils' personal belongings

Comments:
Suggest other types of storage desired.

8. Suggest floor area needed for each teaching station of this type, ______ square feet (see directions, Pamphlet C-1).

9. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

Combination Instrumental and Vocal Music Studios

1. Number to be planned ______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station and suggest activities not listed.

   a. Conduct vocal music rehearsals involving school groups  1 2 3 N
   b. Conduct instrumental music rehearsals involving school groups  1 2 3 N
   c. Conduct music rehearsals involving community groups  1 2 3 N
d. Conduct sectional rehearsals 1 2 3 N

e. Teach individual music lessons 1 2 3 N

f. Teach theory or related music classes 1 2 3 N
g. Store uniforms 1 2 3 N

h. Store robes 1 2 3 N
i. Store printed music 1 2 3 N

j. Store instruments 1 2 3 N
k. Sort sheet music 1 2 3 N

l. Listen to recorded music 1 2 3 N

m. Store recordings 1 2 3 N

n. Store reference books 1 2 3 N

o. View slides, films, and other projected materials 1 2 3 N

p. Store pupils' personal belongings temporarily 1 2 3 N

q. Store personal belongings temporarily if facility is to be used during out of school hours 1 2 3 N

r. Store instructional supplies 1 2 3 N

s. Hold meetings of school groups 1 2 3 N
t. Other _______________________________________________ 1 2 3 N

Comments:

3. Indicate the extent to which each of the following suggests a desirable location for the combination studios.

a. Convenient to the auditorium stage 1 2 3 N

b. With direct access to an outside entrance for convenience when used by out of school groups 1 2 3 N

c. With direct access to the athletic fields 1 2 3 N

d. In a portion of the building which may be shut off from the remainder of the building 1 2 3 N
e. In an area of the building isolated from areas where quiet is desired

Comments:

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

5. Indicate the degree of preference for each of the following types of floor and seating arrangements.

a. Level floor with movable seating

b. Level floor with portable risers and movable seating

c. Level floor with movable seating for instrumental groups and portable risers and movable seating for vocal groups

d. Terraced floor with movable seating

e. Combination of level floor with movable seating for instrumental groups and terraced floor along one side or end with movable seating for vocal groups

f. Combination of level floor with movable seating for instrumental groups and terraced floor along one side or end with fixed theater type seating for vocal groups

g. Other ____________________________________________________________

Comments:
6. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

a. Piano  
   b. Director's podium  
   c. Recorder  
   d. Record player  
   e. Radio  
   f. Television  
   g. Tables  
      Number of tables _____, dimensions _________  
   h. Electrical outlets  
      Number of outlets _____, desired location _________ 
   i. Display cases  
   j. Drinking fountain  
   k. Display and map rails attached above chalkboard and tackboard 
   l. Other ________________________________  

Comments:

7. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of materials to be stored.

a. Filing drawers  
   Number of drawers _____, size of drawers _________  

Comments:
b. Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet

   Comments:

  c. Storage for instructor's personal belongings

   Comments:

  d. Storage for instruments

   Comments:

  e. Storage for uniforms

   Comments:

  f. Storage for music stands

   Comments:
g. Storage for printed music
Comments:

h. Storage for robes
Comments:

i. Storage for chairs
Comments:

j. Storage for risers
Comments:

k. Temporary storage for pupils' personal belongings
Comments:

Suggest other types of storage desired.
8. Suggest floor area needed for each teaching station of this type, ______ square feet (see directions, Pamphlet C-l).

9. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

D. Indicate the extent to which each of the following types of auxiliary rooms will be used in the music program.

1. Music practice rooms  
   a. Rooms for individual pupils  
   b. Rooms for groups of two to five pupils  
   c. Rooms for groups of six to ten pupils  
2. Music library for printed music, books, and recordings  
3. Listening room in which individuals or small groups may listen to recordings  
4. Combination library and listening room  
5. Workshop for construction and repair of instruments  
6. Instructor's office  
7. Uniform storage room  
8. Robe storage room  
9. Combination uniform and robe storage  
10. Instrument storage room  
11. Chair storage room  
12. Music stand storage room  
13. Other ________________________
E. For each of the auxiliary rooms that is necessary for the music program (Item D) provide the information requested below.

**Music Practice Rooms**

1. Suggest locations for the music practice rooms or factors which should determine their locations.

2. In the space at the right provide the information requested below.

<table>
<thead>
<tr>
<th>Type of practice room</th>
<th>For</th>
<th>For</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>individuals</td>
<td>of 2-5</td>
</tr>
</tbody>
</table>

   a. Check activities for which these rooms should be planned
      1) Instrumental music practice ___________________ __________ __________
      2) Vocal music practice ___________________ __________ __________
      3) Other ___________________ __________ __________

   b. Number of each type to be planned ___________________ __________ __________

   c. Suggest floor area in square feet needed for each room ___________________ __________ __________

3. Suggest furniture and equipment desired in each room.

4. Indicate any additional information which the architect should know to aid in planning these rooms.

**Music Library**

1. Check activities or uses for which this room should be planned.
   __ a. Center for storage of all types of instructional aids
   __ b. Store printed music
   __ c. Sort music
2. Indicate the extent to which each of the following represents a desired location for the music library or suggest factors which should determine its location.

   a. Directly accessible to the instructor's office
   b. Directly accessible to the theory classroom
   c. Other ____________________________________________

   Comments:

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in the music library and suggest any special considerations which the architect should know.

   Chalkboard, _____ linear feet; tackboard, _____ linear feet

4. Indicate furniture and equipment desired.

5. Indicate the extent to which the following types of storage facilities will be used and suggest type, dimensions, and quantity of material to be stored.
a. Filing drawers

Number of drawers _____, size of drawers _____

Comments:

b. Bookshelving

Open shelving, _____ linear feet
Closed shelving, _____ linear feet

Comments:

Suggest other types of storage desired.

6. Suggest floor area needed for this room, _____ square feet
   (see directions, Pamphlet C-1).

7. Indicate any additional information which the architect should
   know to aid in planning this room.

Listening Rooms

1. Number of rooms of this type to be planned _____

2. Check activities or uses for which these rooms should be planned.
   ___a. Individuals listening to recordings
   ___b. Small groups of two to five pupils listening to recordings
   ___c. Other _________________________________
3. Indicate the extent to which each of the following represents a desired location for the listening room or suggest factors which should determine its location.

a. Directly accessible to the instructor's office

b. Directly accessible to the theory classroom

c. Directly accessible to the vocal music studio

d. Directly accessible to the instrumental music studio

e. Other

Comments:

4. Indicate the approximate number of linear feet of chalkboard and tackboard needed in the listening room and suggest any special considerations which the architect should know.

Chalkboard, _____ linear feet; tackboard, _____ linear feet

5. Indicate furniture and equipment desired.

6. Indicate type, dimensions, and quantity of materials to be stored and the type of storage desired.
7. Suggest floor area needed for each room of this type, _____ square feet (see directions, Pamphlet C-1).

8. Indicate any additional information which the architect should know to aid in planning this type of room.

Combination Library and Listening Room

1. Indicate activities or uses for which this room should be planned.

2. Suggest desired locations for this room in the music suite or factors which should determine its location.

3. Indicate furniture and equipment desired for this room.

4. Indicate the type, dimensions, and quantity of material to be stored and the type of storage desired.

5. Suggest floor area needed for a room of this type, _____ square feet (see directions, Pamphlet C-1).

6. Indicate any additional information which the architect should know to aid in planning this type of room.
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Workshops

1. Number to be provided ______

2. Indicate activities or uses for which these rooms should be planned.

3. Suggest a desired location for these rooms in the music suite or factors which should determine their locations.

4. Indicate furniture and equipment desired for these rooms.

5. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

6. Suggest floor area needed for each room of this type, _____ square feet (see directions, Pamphlet C-1).

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Instructors' Offices

1. Number to be provided ______

2. Indicate the activities or uses for which these rooms should be planned.
3. Suggest desired locations for these rooms in the music suite or factors which should determine their locations.

4. Indicate furniture and equipment desired for these rooms.

5. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

6. Suggest floor area needed for each room of this type, _____ square feet (see directions, Pamphlet C-1).

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Uniform Storage Rooms

1. Number to be planned _____

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for these rooms in the music suite or factors which should determine their locations.
4. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

5. Suggest floor area needed for each room of this type, _____ square feet (see directions, Pamphlet C-1).

6. Indicate any additional information which the architect should know to aid in planning these rooms.

Robe Storage Rooms

1. Number to be planned _____

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for these rooms in the music suite or factors which should determine their locations.

4. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

5. Suggest floor area needed for each room of this type, _____ square feet (see directions, Pamphlet C-1).

6. Indicate any additional information which the architect should know to aid in planning these rooms.
Combination Uniform and Robe Storage Rooms

1. Number to be planned ______

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for these rooms in the music suite or factors which should determine their locations.

4. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

5. Suggest floor area needed for each room of this type, ______ square feet (see directions, Pamphlet C-1).

6. Indicate any additional information which the architect should know to aid in planning these rooms.

Instrument Storage Rooms

1. Number to be planned ______

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for these rooms in the music suite or factors which should determine their locations.
4. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

5. Suggest floor area needed for each room of this type, _____ square feet (see directions, Pamphlet C-1).

6. Indicate any additional information which the architect should know to aid in planning these rooms.

---

Chair Storage Rooms

1. Number to be planned _____

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for these rooms in the music suite or factors which should determine their locations.

4. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

5. Suggest floor area needed for each room of this type, _____ square feet (see directions, Pamphlet C-1).

6. Indicate any additional information which the architect should know to aid in planning these rooms.
Music Stand Storage Rooms

1. Number to be planned ____

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for these rooms in the music suite or factors which should determine their locations.

4. Indicate the type, dimensions, and quantity of materials to be stored and the type of storage desired.

5. Suggest floor area needed for each room of this type, ____ square feet (see directions, Pamphlet C-1).

6. Indicate any additional information which the architect should know to aid in planning these rooms.

Other Auxiliary Rooms

1. If other auxiliary rooms are needed, describe in the space below the facilities to be provided. Include data similar to that requested in the preceding sections on auxiliary rooms.
F. In the space below indicate any additional information about any aspect of the music suite or program which the architect should know to aid in planning this suite. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

G. Indicate factors which the architect should take into consideration when planning the location of the music suite. Include factors such as accessibility to other portions of the building or the outside and isolation of noises.
H. Summarize rooms and spaces needed for the music program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching stations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Auxiliary rooms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
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<tr>
<td>b.</td>
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<tr>
<td>c.</td>
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<tr>
<td>d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

PHYSICAL AND HEALTH EDUCATION
ATHLETICS AND RECREATION

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
PHYSICAL AND HEALTH EDUCATION, ATHLETICS, AND RECREATION

Rooms and Spaces Included in This Pamphlet

Physical education teaching stations 2
Swimming pool 6
Other special physical education teaching stations 7
Auxiliary rooms 8
  Gymnasiums for individually adapted or adjusted programs 8
  Athletic equipment storage rooms 9
  Physical education equipment rooms 10
  Boys' dressing-locker room 11
  Boys' shower room 13
  Boys' body drying or toweling room 15
  Girls' dressing-locker room 16
  Girls' body drying or toweling room 19
  Instructors' offices 20
  Lobby of gymnasium 21
  Other auxiliary rooms 21

Health education teaching stations 26
Outdoor facilities 29
Summary of rooms and spaces 34
A. The numbers of teaching stations required for physical and health education for various projected enrollments have been calculated in accordance with directions in Pamphlet B-1. Indicate in the spaces below the calculated numbers of teaching stations required for these programs for the enrollment to be housed in the new building.

Number of teaching stations for physical education ______

Number of teaching stations for health education ______

Comments:

B. The rooms for the physical and health education programs should be planned according to the numbers of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many activities. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process, it will be necessary to determine whether those spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations. For instance, individually adapted or adjusted physical education activities may be carried on in a separate small gymnasium or they may be carried on in one area of the regular gymnasium.

The athletic and recreation programs may be such that auxiliary rooms will be needed to accommodate visiting teams and facilities will be needed to accommodate large crowds. No doubt, outdoor facilities will be needed for physical education, athletics, and recreation.

C. For each of the different types of teaching stations that is required for the physical education program, provide the information requested below.

Physical Education Teaching Stations

1. Number to be planned ______

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. View films, slides, or other projected materials 1 2 3 F

   b. Write or draw on chalkboard 1 2 3 F

   c. Engage in activities such as

      1) Archery 1 2 3 F

      2) Basketball 1 2 3 F
3) Rhythms and dancing
4) Ping pong
5) Golf (driving cages)
6) Badminton
7) High jump
8) Track events
9) Rope climbing
10) Shuffleboard
11) Baseball
12) Tumbling
13) Volleyball
14) Wrestling
15) Active social games

d. Carry on limited or individually adapted activities for physically handicapped pupils

e. Hold meetings or assemblies involving large groups

f. Carry on interscholastic games

g. Carry on intramural programs

h. Hold dances or parties involving school groups

i. Carry on noon hour recreation program

Are there any other activities which the class as a whole, small groups of five or six pupils, individual pupils, or other groups will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.
3. Suggest desired locations for the physical education teaching stations or suggest factors which should determine their locations.

4. Indicate the extent to which the following types of equipment or facilities will be used and suggest any information which the architect should know about the various items.

a. Tackboard
   Linear feet _____, desired location ____________

b. Chalkboard
   Linear feet _____, desired location ____________

c. Drinking fountains
   Number of fountains _____, desired locations ______

   ________________________________

   d. Spectator seating
   Number of gymnasiums to be equipped with spectator seating ______, number of spectators to be accommodated in each gymnasium ________________

 Comments:

e. Public address system including record player

f. Electric scoreboard and timer

g. Facilities for attaching decorations or nets

   1) Narrow horizontal tack strips on available walls 10 to 15 feet above the floor to support decorations, etc.

   2) Device which can be lowered from center of ceiling to support streamers, microphones, etc.

   3) Caps and eyes spaced at approximately 10-foot intervals on available walls 10 to 15 feet above the floor to support game nets, decorations, etc.

h. Backboards and baskets for basketball

 Comments:
1. Recessed floor plates to secure standards for various types of activities such as volleyball

Suggest other equipment or facilities needed.

Comments:

5. Indicate the extent to which each of the following electrical services is needed. Below each service needed indicate the electrical equipment to be serviced and where the equipment is to be located.

a. 110-120 V., A.C. 1 2 3 F

b. 220-240 V., A.C. 1 2 3 F

c. Auxiliary lighting 1 2 3 F

d. Other ___________________________________________ 1 2 3 F

6. Suggest floor area needed for this type of teaching station or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet _______

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
Swimming Pool

1. Indicate the extent to which the following activities will be carried on in this type of teaching station.
   a. Conduct classes in swimming and diving 1 2 3 N
   b. Conduct classes in life saving 1 2 3 N
   c. Conduct interscholastic swimming events 1 2 3 N

Are there any other types of activities the class as a whole, small groups of five or six pupils, individual pupils, or other groups will carry on that will require special planning? If so, list these activities along with adequate explanation to enable the architect to develop plans.

2. Suggest desired location for the swimming pool or suggest factors which should determine the location.

3. Indicate the types of equipment to be provided for this type of teaching station.

4. Suggest area needed for this type of teaching station or suggest factors which should determine the area (see directions, Pamphlet C-1).
   Square feet ____
   Comments:

5. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
Other Special Physical Education Teaching Stations

1. If one or more teaching stations for physical education should be planned with special features not included in the other rooms as outlined above, indicate in the space provided below the special provisions or alterations which should be made for these teaching stations.

D. Indicate the extent to which each of the following auxiliary rooms will be used in the physical education, athletic, and recreation programs.

1. Gymnasiums for pupils whose physical education programs need modifications or individual adaptation.

2. Athletic equipment storage rooms

3. Physical education equipment storage rooms

4. Boys' dressing-locker room

5. Boys' shower room

6. Boys' body drying or toweling room

7. Girls' dressing-locker room

8. Girls' shower room

9. Girls' body drying or toweling room

10. Instructors' offices

11. Lobby of gymnasium

12. Other auxiliary rooms
   a. Towel service and storage rooms
   b. Varsity team rooms
   c. Equipment drying room
   d. Laundry room
   e. Training room
f. Officials' dressing-locker-shower room 1 2 3

g. Concession stand 1 2 3

h. Kitchenette 1 2 3

i. Ticket offices 1 2 3

j. Toilets 1 2 3

k. Check room 1 2 3

l. Chair storage 1 2 3

m. Handball courts with one, two, three, or four walls 1 2 3

Suggest other types of auxiliary rooms needed.

Comments:

E. For each of the needed auxiliary rooms listed in Item D, provide the information requested below.

**Gymnasiums for Individually Adapted or Adjusted Programs**

1. Number of gymnasiums to be planned _____

2. Indicate activities for which these rooms should be planned.

3. Suggest desired locations for these gymnasiums or suggest factors which should determine their locations.
4. Indicate types of furniture and equipment to be provided for this type of room.

5. Indicate types, dimensions, and quantities of materials to be stored and the types of storage needed.

6. Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Athletic Equipment Storage Rooms

1. Number of storage rooms to be planned ______

2. Indicate activities or uses other than storage for which these rooms should be planned.

3. Suggest desired locations for these rooms or suggest factors which should determine their locations.
4. Indicate types of equipment to be provided for these rooms.

5. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6. Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Physical Education Equipment Storage Rooms

1. Number of storage rooms to be planned ______

2. Indicate activities or uses other than storage for which these rooms should be planned.

3. Suggest desired locations for these rooms or suggest factors which should determine their locations.
4. Indicate types of equipment to be provided for these rooms.

5. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6. Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

Boys' Dressing-locker Room

1. Indicate the extent to which the following uses will be made of the boys' dressing-locker room.

   a. Dressing-locker room for boys' physical education classes 1 2 3 N

   b. Dressing-locker room for boys' varsity athletic teams 1 2 3 N

   c. Dressing-locker room for boys' visiting athletic teams 1 2 3 N

   d. Dressing-locker room for boys' intramural athletic teams 1 2 3 N

   e. Dressing-locker room for community recreation teams 1 2 3 N

   f. Dressing-locker room for auditorium stage participants 1 2 3 N
2. Suggest desired locations for the dressing-locker room or suggest factors which should determine the location.

3. Indicate the extent to which the following types of furniture and equipment will be used and suggest any information which the architect should know about the various items.

<table>
<thead>
<tr>
<th>Item</th>
<th>Linear Feet</th>
<th>Desired Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Chalkboard</td>
<td>Linear feet</td>
<td>desired location</td>
</tr>
<tr>
<td>b. Tackboard</td>
<td>Linear feet</td>
<td>desired location</td>
</tr>
<tr>
<td>c. Street clothes lockers</td>
<td>Number of lockers</td>
<td>dimensions of lockers</td>
</tr>
<tr>
<td>d. Gym or activity clothes lockers</td>
<td>Number of lockers</td>
<td>dimensions of lockers</td>
</tr>
<tr>
<td>e. Baskets for gym or activity clothes</td>
<td>Number of baskets</td>
<td>dimensions of baskets</td>
</tr>
<tr>
<td>f. Benches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Mirrors</td>
<td>Number of mirrors</td>
<td>dimensions of mirrors</td>
</tr>
<tr>
<td>h. Lavatories</td>
<td>Number of lavatories</td>
<td></td>
</tr>
<tr>
<td>i. Water closets</td>
<td>Number of closets</td>
<td></td>
</tr>
<tr>
<td>j. Urinals</td>
<td>Number of urinals</td>
<td></td>
</tr>
</tbody>
</table>
Suggest other types of equipment needed.

Comments:

4. Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet 0-1).

Square feet ____

Comments:

5. Indicate any additional information which the architect should know to aid in planning this type of room.

Boys' Shower Room

1. Check which of the following groups will use the boys' shower room.

   ___ a. Boys' physical education classes
   ___ b. Boys' varsity athletic teams
   ___ c. Boys' visiting athletic teams
   ___ d. Boys' intramural athletic teams
   ___ e. Community recreation teams
   ___ f. Auditorium stage participants
   ___ g. Other _____________________________________________

Comments:

2. Suggest desired locations for boys' shower room or suggest factors which should determine the location.
3. Indicate the degree of preference for each of the following types of shower facilities.

   a. Walk-around or lane showers arranged to provide tepid, warm, and cool water as one progresses through the lane

   b. Gang showers with individual controls and automatic temperature limit control and master shut off

   c. Gang showers with individual push button controls so adjusted that a given amount of water is emitted at a pre-set temperature

   d. Other

Comments:

4. Check the types of equipment needed in the shower room.

   ___ a. Towel bars, linear feet of bar needed

   ___ b. Liquid soap dispensers, number of dispensers

   ___ c. Bar soap trays, number of trays

Suggest other equipment needed.

Comments:

5. Suggest floor area needed for the shower room or suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square feet

Comments:

6. Indicate any additional information which the architect should know to aid in planning this type of room.

   Boys' Body Drying or Toweling Room

1. Check which of the following groups will use the boys' body drying room.

   ___ a. Boys' physical education classes

   ___ b. Boys' varsity athletic teams
c. Boys' visiting athletic teams

d. Boys' intramural athletic teams

e. Community recreation teams

f. Auditorium stage participants

g. Other

Comments:

2. Suggest desired locations for the body drying room or suggest factors which should determine the location.

3. Indicate the extent to which the following facilities will be used in the body drying room.

   a. Towel bars
      Number of linear feet of bar needed ______

   b. Narrow ledge with bull nose edge as a foot drying aid
      Number of feet of ledge needed ______

   c. Other
      ______

Comments:

4. Suggest floor area needed for the body drying room or suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

5. Indicate any additional information which the architect should know to aid in planning this type of room.
Girls' Dressing-locker Room

1. Indicate the extent to which the following uses will be made of the girls' dressing-locker room.
   a. Dressing-locker room for girls' physical education classes
   b. Dressing-locker room for girls' intramural athletic teams
   c. Dressing-locker room for boys' visiting athletic teams
   d. Dressing-locker room for community recreation teams
   e. Dressing-locker room for auditorium stage participants
   f. Storage space for gym or activity clothes
   g. Temporary storage for street clothes

   Suggest other uses.

   Comments:

2. Suggest desired locations for the dressing-locker room or suggest factors which should determine the location.

3. Indicate the extent to which the following types of equipment will be used and suggest any information which the architect should know about the various items.
   a. Chalkboard
      Linear feet _____, desired location ______________
   b. Tackboard
      Linear feet _____, desired location ______________
   c. Street clothes lockers
      Number of lockers _____, dimensions of lockers ___________
d. Gym or activity clothes lockers  
Number of lockers ______, dimensions of lockers ______

e. Baskets for gym or activity clothes  
Number of baskets ______, dimensions of baskets ______

f. Benches  

1 2 3 N

g. Full length mirrors  
Number of mirrors _____, desired locations ______

h. Other mirrors  
Number of mirrors _____, dimensions of mirrors ______

i. Lavatories  
Number of lavatories ______

j. Water closets  
Number of water closets ______

k. Dressing booths  
Number of booths _____, dimensions of booths ______

l. Shower stalls  
Number of stalls _____, dimensions of stalls ______

m. Combination dressing and shower stalls  
Number of stalls _____, dimensions of stalls ______

n. Hair dryers  
Number of dryers ______

Suggest other types of equipment needed.

Comments:

4. Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:
5. Indicate any additional information which the architect should know to aid in planning this type of room.

Girls' Shower Room

1. Check which of the following groups will use the girls' shower room.
   __ a. Girls' physical education classes
   __ b. Girls' intramural athletic teams
   __ c. Boys' varsity athletic teams
   __ d. Boys' visiting athletic teams
   __ e. Community recreation teams
   __ f. Auditorium stage participants
   __ g. Other ____________________________________________

Comments:

2. Suggest desired locations for the shower room or suggest factors which should determine the location.

3. Indicate the degree of preference for each of the following types of shower facilities.
   a. Walk-around or lane showers arranged to provide tepid, warm, and cool water as one progresses through the lane  P A NA
   b. Gang showers with individual controls and automatic temperature limit controls and master shut off    P A NA
   c. Gang showers with individual push button controls so adjusted that a given amount of water is emitted at a pre-set temperature P A NA
   d. Other ____________________________________________ P A NA

Comments:
4. Check the types of equipment needed in the shower room.
   ___ a. Towel bars, linear feet of bar needed ______
   ___ b. Liquid soap dispensers, number of dispensers ______
   ___ c. Bar soap trays, number of trays ______

Suggest other equipment needed.

Comments:

5. Suggest floor area needed or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

6. Indicate any additional information which the architect should know to aid in planning this type of room.

**Girls' Body Drying or Toweling Room**

1. Check which of the following groups will use the girls' body drying room.
   ___ a. Girls' physical education classes
   ___ b. Girls' intramural athletic teams
   ___ c. Boys' varsity athletic teams
   ___ d. Boys' visiting athletic teams
   ___ e. Community recreation teams
   ___ f. Auditorium stage participants
   ___ g. Other ________________________________

Comments:
2. Suggest desired locations for the body drying room or suggest factors which should determine the location.

3. Indicate the extent to which the following facilities will be used in the body drying room.
   a. Towel bars
      Number of linear feet needed ________
   b. Narrow ledge with bull nose edge as a foot drying aid ________
   c. Hair dryers
      Number of dryers ________
   d. Other ____________________________

   Comments:

4. Suggest floor area needed for each drying room or suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square feet ________

   Comments:

5. Indicate any additional information which the architect should know to aid in planning this type of room.

Instructors' Offices

1. Number to be planned ________

2. Indicate activities or uses for which these rooms should be planned.

3. Suggest desired locations for the offices or suggest factors which should determine their locations.
4. Indicate types of furniture and equipment such as desks, chairs, filing cabinets, shower, lavatory, water closet, etc. to be provided for these rooms.

5. Indicate types, dimensions, and quantities of materials to be stored and the types of storage needed.

6. Suggest floor area needed for each office including toilet, shower, etc. or suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square foot _____

   Comments:

7. Indicate any additional information which the architect should know to aid in planning these rooms.

Lobby of Gymnasium

1. In the space below indicate any special information which the architect should know to aid in planning the lobby. Include factors such as the relationship to other areas of the building, desirability of a common lobby for auditorium and gymnasium, special uses which will be made of the lobby, etc.

Other Auxiliary Rooms

1. For each of the other auxiliary rooms needed, provide the information requested below. Identify each room by indicating the uses for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than
Identify each of these rooms by a phrase which suggests the multiple uses for which it is to be planned—for example, varsity team and training room.

a. Type of room to be planned ____________________________
   
   1) Number of rooms of this type to be planned _____
   
   2) Indicate activities or uses for which these rooms are to be planned.
   
   3) Suggest desired locations for these rooms or suggest factors which should determine their locations.
   
   4) Indicate types of furniture and equipment to be provided for this type of room.
   
   5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.
   
   6) Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______

   Comments:
7) Indicate any additional information which the architect should know to aid in planning this type of facility.

b. Type of room to be planned ________________________________

1) Number of rooms of this type to be planned _____

2) Indicate activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet O-1).

Square feet _____

Comments:
7) Indicate any additional information which the architect should know to aid in planning this type of facility.

c. Type of room to be planned

1) Number of rooms of this type to be planned

2) Indicate activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet

Comments:
7) Indicate any additional information which the architect should know to aid in planning this type of facility.

d. Type of room to be planned ________________________________

1) Number of rooms of this type to be planned _____

2) Indicate activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet 0-1).

Square feet ______

Comments:
7) Indicate any additional information which the architect should know to aid in planning this type of facility.

**Health Education Teaching Stations**

1. Number to be planned _____

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. View slides, films, or other projected materials 1 2 3 F
   b. Write or draw on chalkboard 1 2 3 F
   c. Write or draw at desks or tables 1 2 3 F
   d. Small groups of pupils carry on conferences at conference tables 1 2 3 F
   e. Carry on research using materials stored in classroom 1 2 3 F
   f. Display pupil projects or work 1 2 3 F
   g. Store pupils' personal belongings 1 2 3 F
   h. Store partially completed pupil projects 1 2 3 F
   i. Store instructional supplies 1 2 3 F
   j. Store instructor's personal belongings 1 2 3 F

   Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each health education teaching station (see directions, Pamphlet C-1).

   Chalkboard, _____ linear feet; tackboard, _____ linear feet
Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

4. Furniture and equipment
   a. Check the types of desk and seating facilities needed (see directions, Pamphlet C-1).
      _1) Tablet arm chairs for pupils
      _2) Chair desks for pupils
      _3) Movable combination desk-chairs for pupils
      _4) Tables and chairs for pupils, number of pupils to be accommodated at each table, _____ pupils
      _5) Instructor's desk
      _6) Instructor's table, dimensions of table ___________
      _7) Instructor's combination desk and table
      _8) Other __________________________________________

   Comments:

   b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

   1) Conference tables and chairs
      Number of tables _____, dimensions of tables ______
   2) Workcounter and sink with hot and cold running water
   3) Display cases
   4) Display and map rails attached above chalkboard and tackboard
   5) Electrical outlets
      Number of outlets _____, desired locations ______
Suggest other types of equipment needed.

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. File drawers
   Number of drawers _____, size of drawers ____________
   Comments:

b. Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

c. Storage for instructional supplies
   Comments:

  d. Storage for pupils' personal belongings
     Comments:

  e. Storage for instructor's personal belongings
     Comments:
Suggest other types of storage needed.

6. Suggest floor area needed or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

7. Indicate any additional information which the architect should know to aid planning this type of teaching station.

8. In event any of the teaching stations are not used full time for health education, what other types of activities are:

a. Most likely to function well in these rooms?

b. Least likely to function well in these rooms?

E. Check the types of outdoor facilities or areas to be provided for the physical education, athletic, and recreation programs.

1. Paved areas

__ a. Basketball courts, number ______
__ b. Volleyball courts, number ______
__ c. Tennis courts, number ______
__ d. Playground equipment area, area needed, ______ square feet
__ e. Shuffleboard courts, number ______
520

f. Handball courts
   1) One wall, number of courts __
   2) Two wall, number of courts __
   3) Three wall, number of courts __
   4) Four wall, number of courts __
   g. Multiple purpose area, area needed, ______ square feet

Suggest other paved areas needed.

Comments:

2. Boys' field games area
   a. Football fields, number ______
   b. Touch football fields, number ______
   c. Baseball diamonds, number ______
   d. Volleyball courts, number ______
   e. Soccer fields, number ______
   f. Softball diamonds, number ______
   g. Speedball fields, number ______
   h. Cinder track, length ________, width ________
   i. Multiple purpose area, area needed, ________ square feet

Suggest other areas needed.

Comments:

3. Girls' field games area
   a. Archery, area needed, ______ square feet
   b. Speedball fields, number ______
c. Volleyball courts, number _____

d. Hockey fields, number _____
e. Soccer fields, number _____
f. Softball diamonds, number _____
g. Cinder track, length _______, width _________
h. Multiple purpose area, area needed, _____ square feet

Suggest other areas needed.

Facilities for interscholastic athletics

a. Oval one-quarter mile cinder track with straightaway

b. Regulation football field
c. Regulation baseball diamond
d. Football practice fields, number _____
e. Baseball practice fields, number _____
f. Band practice field
g. Multipurpose area, area needed, _____ square feet

h. Stadium, seating capacity ______
i. Parking facilities, number of cars _____

Suggest other areas needed.

Comments:

5. Other areas

a. Hiking trails

b. Wooded area
c. Picnic area
**d. Pond or stream for boating, casting, etc.**

Suggest other areas needed.

Comments:

6. Storage

   **a. Physical education equipment**

   Comments:

   **b. Athletic equipment**

   Comments:

   **c. Recreation equipment**

   Comments:

   **d. Maintenance equipment**

   Comments:

Suggest other types of storage needed.

---

F. In the following space indicate any additional information about any aspect of the physical and health education, athletic, or recreation facilities or programs which the architect should know about to aid in planning these facilities. Schematic diagrams or pictures may also be
G. Indicate factors which the architect should take into consideration when planning the location of the physical and health education, athletic, and recreation facilities. Include factors such as accessibility to other portions of the educational plant and isolation of noises.
H. Summarize rooms and spaces needed for the physical and health education, athletic, and recreation programs.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching stations</td>
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<td>a.</td>
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<td>b.</td>
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<tr>
<td>2. Auxiliary rooms</td>
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<td>l.</td>
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</tbody>
</table>
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-12

SCIENCE

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-12

SCIENCE

Rooms and Spaces Included in This Pamphlet

Teaching stations 3

Auxiliary rooms 33

Summary of rooms and spaces 42
A. The number of teaching stations required for the science program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for the science program for the enrollment to be housed in the new building.

Number of teaching stations ________

Comments:

B. The rooms for the science program should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the science program.

For certain activities, auxiliary spaces are needed. Early in the planning process, it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or spaces within the teaching stations. For instance, space for storage could be planned as a separate room adjacent to the teaching station, an area within the teaching station, or a combination of these two.

C. Check subjects or offerings in the educational program which the science teaching stations are to serve.

_____ 1. Aeronautics       _____ 4. General Science
_____ 2. Biology           _____ 5. Physical Science

Suggest other science offerings to be provided.

Comments:

D. Check the type or types of teaching stations needed for the science program.

_____ 1. Teaching stations which provide a flexible room arrangement for all types of science activities with fixed science tables for pupil use arranged around the walls, a demonstration table and pupil desk-chairs located near the front of the room, and movable work tables located near the rear of the room.
2. Teaching stations which provide one room for laboratory type activities and an adjacent room for activities such as lecture, class discussion, writing, etc.

3. Teaching stations which provide a room equipped with one-way facing science tables in a fixed arrangement where pupils may be seated to carry on most activities associated with all types of science classes.

4. Teaching stations which provide a fixed arrangement with one area of a room equipped for laboratory type activities and another area of the same room equipped for activities such as lecture, class discussion, writing, etc.

Comments:

E. For each of the different types of teaching stations needed for the science program, provide the information requested below. Provision has been made to include information about four different types of teaching stations should the science program warrant that many. Identify each type by indicating the uses for which it is to be designed. For instance, if a teaching station is to be used for general science and biology, record in one of the sections which follows, general science and biology on the line which follows the item, "Type of teaching station to be planned."

1. Type of teaching station to be planned __________________________

   a. Number of teaching stations of this type to be planned ________

   b. Indicate the extent to which the following activities will be carried on in this type of teaching station.

      1) View slides, films, and other projected materials  1 2 3 N
      2) Write or draw on chalkboard  1 2 3 N
      3) Write or draw at desks or tables  1 2 3 N
      4) Small groups of pupils carry on conferences at conference tables  1 2 3 N
      5) Carry on research using reference materials in the classroom  1 2 3 N
      6) Individual pupils or small groups of pupils develop and carry on laboratory research or experiments  1 2 3 N
      7) Plan and carry out individual pupil projects  1 2 3 N
8) Teacher or pupils conduct demonstrations to illustrate scientific principles
9) Carry on construction type activities involving wood, metal, plastics, etc.
10) Teacher lecture
11) Carry on class discussions
12) Display pupil projects or work
13) Store apparatus and chemicals at pupil stations
14) Store partially completed pupil projects
15) Store instructional supplies
16) Store pupils' personal belongings
17) Store instructors' personal belongings

Are there any other types of activities which the classes as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

c. Suggest desired locations in the science suite for teaching stations of this type or suggest factors which should determine the locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
e. Indicate the extent to which the following types of desk and seating facilities, furniture, equipment, and services will be used and suggest any special information which the architect should know about the various items.

1) Desk and seating facilities
   a) Tablet arm chairs
   b) Chair desks for pupils
   c) Movable combination desk-chairs for pupils
   d) Tables and chairs for pupils
      Number of pupils to be accommodated at each table ______
   e) Instructor's desk
   f) Instructor's table
      Dimensions of table ______
   g) Instructor's combination desk and table
   h) Demonstration desk
      Dimensions of desk ______
   i) Other ____________________________

   Comments:

2) Furniture
   a) Conference or reading tables
      Number of tables _____, dimensions ______
   b) Worktables
      Number of tables _____, dimensions ______
   c) Workcounter or workbench
      Dimensions _______________
   d) Laboratory tables
      Type of tables ____________________________

   Comments:

   e) Other ____________________________

   Comments:
3) Equipment

a) Aquariums

Comments:

b) Terrariums

Comments:

c) Planting beds

Comments:

d) Sinks exclusive of those provided at laboratory tables

Comments:

e) Fume hoods

Comments:

f) Balance cases

Comments:

g) Key cabinets

Comments:

h) Display cases

Comments:

i) Display and map rails attached above chalkboard and tackboard

Comments:

j) Fire extinguishers
4) Services

a) Indicate the extent to which each of the following water services is needed, and below each service needed indicate where the services are to be provided.

(1) Tap water

(2) Distilled water

(3) Other _________________________________

b) On the left check the gas services available, on the right indicate the extent to which each is needed; and below each service needed indicate where the service is to be provided.

___ (1) Natural gas

___ (2) Bottled gas

___ (3) Other _________________________________

c) Indicate the extent to which each of the following electric services is needed. Below each service needed indicate specifications such as voltage, phase or other special features and where the service is to be provided.

(1) 110-120 V., A. C.

(2) 220-240 V., A. C.

(3) Direct current
(5) Other ____________________________

Suggest other services needed.

f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers
   Number of drawers _____, size of drawers _____
   Comments:

2) Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

3) Storage for chemicals
   Comments:

4) Storage for laboratory equipment
   Comments:
5) Storage for partially completed pupil projects

Comments:

6) Storage for instructional supplies

Comments:

7) Storage for pupils' personal belongings

Comments:

8) Storage for instructor's personal belongings

Comments:

9) Low-temperature storage

Comments:

Suggest other types of storage needed.
g. Suggest floor area needed for teaching stations of this type or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

i. In event this type of teaching station is not needed full time for the science program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?

j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these additional activities.

2. Type of teaching station to be planned __________________________

a. Number of teaching stations of this type to be planned ______

b. Indicate the extent to which the following activities will be carried on in this type of teaching station.

1) View slides, films, and other projected materials 1 2 3
2) Write or draw on chalkboard
3) Write or draw at desks or tables
4) Small groups of pupils carry on conferences at conference tables
5) Carry on research using reference materials in the classroom
6) Individual pupils or small groups of pupils develop and carry on laboratory research or experiments
7) Plan and carry out individual pupil projects
8) Teacher or pupils conduct demonstrations to illustrate scientific principles
9) Carry on construction type activities involving wood, metal, plastics, etc.
10) Teacher lecture
11) Carry on class discussions
12) Display pupil projects or work
13) Store apparatus and chemicals at pupil stations
14) Store partially completed pupil projects
15) Store instructional supplies
16) Store pupils' personal belongings
17) Store instructors' personal belongings

Are there any other types of activities which the classes as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.
c. Suggest desired locations in the science suite for teaching stations of this type or suggest factors which should determine the locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc., which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

e. Indicate the extent to which the following types of desk and seating facilities, furniture, equipment, and services will be used and suggest any special information which the architect should know about the various items.

1) Desk and seating facilities
   a) Tablet arm chairs  
   b) Chair desks for pupils  
   c) Movable combination desk-chairs for pupils  
   d) Tables and chairs for pupils  
      Number of pupils to be accommodated at each table _____
   e) Instructor's desk  
   f) Instructor's table  
      Dimensions of table ______________
   g) Instructor's combination desk and table  
   h) Demonstration desk  
      Dimensions of desk ____________
   i) Other __________________________________________  

_comments:

2) Furniture
   a) Conference or reading tables
      Number of tables _____, dimensions ______
      1 2 3 N
   b) Worktables
      Number of tables _____, dimensions ______
      1 2 3 N
   c) Workcounter or workbench
      Dimensions ____________________________
      1 2 3 N
   d) Laboratory tables
      Type of tables _________________________
      Comments:
      1 2 3 N
   e) Other ________________________________
      Comments:
      1 2 3 N

3) Equipment
   a) Aquariums
      Comments:
      1 2 3 N
   b) Terrariums
      Comments:
      1 2 3 N
   c) Planting beds
      Comments:
      1 2 3 N
   d) Sinks exclusive of those provided at laboratory tables
      Comments:
      1 2 3 N
   e) Fume hoods
      Comments:
      1 2 3 N
f) Balance cases
   Comments:

   g) Key cabinets
   Comments:

   h) Display cases
   Comments:

   i) Display and map rails attached above chalkboard and tackboard
   Comments:

   j) Fire extinguishers
   Comments:

4) Services
   a) Indicate the extent to which each of the following water services is needed, and below each service needed indicate where the service is to be provided.

      (1) Tap water

      (2) Distilled water

      (3) Other ____________________________

   b) On the left check the gas services available, on the right indicate the extent to which each is needed, and below each service needed indicate where the service is to be provided.

      (1) Natural gas
c) Indicate the extent to which each of the following electric services is needed. Below each service needed indicate specifications such as voltage, phase, or other special features and where the service is to be provided.

1) 110-120 V., A. C.

2) 220-240 V., A. C.

3) Direct current

4) Auxiliary lighting

5) Other ____________________________

Suggest other services needed.

f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers
   Number of drawers ______, size of drawers ______

Comments:
2) Bookshelving  
Open shelving, _____ linear feet  
Closed shelving, _____ linear feet  
Comments:

3) Storage for chemicals  
Comments:

4) Storage for laboratory equipment  
Comments:

5) Storage for partially completed project projects  
Comments:

6) Storage for instructional supplies  
Comments:
7) Storage for pupils' personal belongings

Comments:

8) Storage for instructor's personal belongings

Comments:

9) Low-temperature storage

Comments:

Suggest other types of storage needed.

g. Suggest floor area needed for teaching stations of this type or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
1. In event this type of teaching station is not needed full time for the science program, what other types of activities are:

   1) Most likely to function well in this type of teaching station?

   2) Least likely to function well in this type of teaching station?

j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these additional activities.

3. Type of teaching station to be planned

   a. Number of teaching stations of this type to be planned

   b. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   1) View slides, films, and other projected materials

   2) Write or draw on chalkboard

   3) Write or draw at desks or tables

   4) Small groups of pupils carry on conferences at conference tables

   5) Carry on research using reference materials in the classroom

   6) Individual pupils or small groups of pupils develop and carry on laboratory research or experiments

   7) Plan and carry out individual pupil projects

   8) Teacher or pupils conduct demonstrations to illustrate scientific principles

   9) Carry on construction type activities involving wood, metal, plastics, etc.

   10) Teacher lecture

   11) Carry on class discussions
12) Display pupil projects or work 1 2 3 N
13) Store apparatus and chemicals at pupil stations 1 2 3 N
14) Store partially completed pupil projects 1 2 3 N
15) Store instructional supplies 1 2 3 N
16) Store pupils' personal belongings 1 2 3 N
17) Store instructors' personal belongings 1 2 3 N

Are there any other types of activities which the classes as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

c. Suggest desired locations in the science suite for teaching stations of this type or suggest factors which should determine the locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

e. Indicate the extent to which the following types of desk and seating facilities, furniture, equipment, and services will be used and suggest any special information which the architect should know about the various items.

1) Desk and seating facilities
   a) Tablet arm chairs 1 2 3 N
b) Chair desks for pupils

c) Movable combination desk-chairs for pupils

d) Tables and chairs for pupils
   Number of pupils to be accommodated at each table _____

e) Instructor's desk

f) Instructor's table
   Dimensions of table ________________

g) Instructor's combination desk and table

h) Demonstration desk
   Dimensions of desk ________________

i) Other ______________________________________________________________________ 1 2 3 F

Comments:

2) Furniture

a) Conference or reading tables
   Number of tables _____, dimensions ________________

b) Worktables
   Number of tables _____, dimensions ________________

c) Workcounter or workbench
   Dimensions ________________

d) Laboratory tables
   Types of tables __________________________________________________________________
   
   Comments:

   e) Other ______________________________________________________________________ 1 2 3 F

   Comments:

3) Equipment

a) Aquariums
   
   Comments:
b) Terrariums
   Comments:

c) Planting beds
   Comments:

d) Sinks exclusive of those provided at laboratory tables
   Comments:

e) Fume hoods
   Comments:

f) Balance cases
   Comments:

g) Key cabinets
   Comments:

h) Display cases
   Comments:

i) Display and map rails attached above chalkboard and tackboard
   Comments:

j) Fire extinguishers
   Comments:
4) Services

a) Indicate the extent to which each of the following water services is needed and below each service needed indicate where the service is to be provided.

(1) Tap water 1 2 3 F

(2) Distilled water 1 2 3 F

(3) Other __________________________ 1 2 3 F

b) On the left check the gas services available, on the right indicate the extent to which each is needed, and below each service needed indicate where the service is to be provided.

___ (1) Natural gas 1 2 3 F

___ (2) Bottled gas 1 2 3 F

___ (3) Other __________________________ 1 2 3 F

c) Indicate the extent to which each of the following electric services is needed. Below each service needed indicate specifications such as voltage, phase, or other special features and where the service is to be provided.

(1) 110-120 V., A. C. 1 2 3 F

(2) 220-240 V., A. C. 1 2 3 F
f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers 1 2 3
   Number of drawers _____, size of drawers _____
   Comments:

2) Bookshelving 1 2 3
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

3) Storage for chemicals 1 2 3
   Comments:
4) Storage for laboratory equipment
   Comments:

5) Storage for partially completed pupil projects
   Comments:

6) Storage for instructional supplies
   Comments:

7) Storage for pupils' personal belongings
   Comments:

8) Storage for instructor's personal belongings
   Comments:

9) Low-temperature storage
   Comments:
Suggest other types of storage needed.

g. Suggest floor area needed for teaching stations of this type or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

i. In event this type of teaching station is not needed full time for the science program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?
j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these additional activities.

4. Type of teaching station to be planned

<table>
<thead>
<tr>
<th>a. Number of teaching stations of this type to be planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 N</td>
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b. Indicate the extent to which the following activities will be carried on in this type of teaching station.

<table>
<thead>
<tr>
<th>1) View slides, films, and other projected materials</th>
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<tr>
<td>2) Write or draw on chalkboard</td>
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<td>3) Write or draw at desks or tables</td>
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<tr>
<td>4) Small groups of pupils carry on conferences at conference tables</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>5) Carry on research using reference materials in the classroom</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>6) Individual pupils or small groups of pupils develop and carry on laboratory research or experiments</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>7) Plan and carry out individual pupil projects</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>8) Teacher or pupils conduct demonstrations to illustrate scientific principles</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>9) Carry on construction type activities involving wood, metal, plastics, etc.</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>10) Teacher lecture</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>11) Carry on class discussions</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>12) Display pupil projects or work</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>13) Store apparatus and chemicals at pupil stations</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>14) Store partially completed pupil projects</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>15) Store instructional supplies</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>16) Store pupils' personal belongings</td>
<td>1 2 3 N</td>
</tr>
<tr>
<td>17) Store instructors' personal belongings</td>
<td>1 2 3 N</td>
</tr>
</tbody>
</table>
Are there any other types of activities which the classes as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

o. Suggest desired locations in the science suite for teaching stations of this type or suggest factors which should determine the locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc., which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

e. Indicate the extent to which the following types of desk and seating facilities, furniture, equipment, and services will be used and suggest any special information which the architect should know about the various items.

1) Desk and seating facilities

   a) Tablet arm chairs 1 2 3 N

   b) Chair desks for pupils 1 2 3 N

   c) Movable combination desk-chairs for pupils 1 2 3 N

   d) Tables and chairs for pupils 1 2 3 N

       Number of pupils to be accommodated at each table ________

   e) Instructor's desk 1 2 3 N

   f) Instructor's table 1 2 3 N

       Dimensions of table ________________
g) Instructor's combination desk and table

h) Demonstration desk
Dimensions of desk

i) Other

Comments:

2) Furniture

a) Conference or reading tables
   Number of tables, dimensions

b) Worktables
   Number of tables, dimensions

c) Workcounter or workbench
   Dimensions

d) Laboratory tables
   Type of tables
   Comments:

   e) Other

   Comments:

3) Equipment

a) Aquariums
   Comments:

b) Terrariums
   Comments:

c) Planting beds
   Comments:
d) Sinks exclusive of those provided at laboratory tables

Comments:

e) Fume hoods

Comments:

f) Balance cases

Comments:

g) Key cabinets

Comments:

h) Display cases

Comments:

i) Display and map rails attached above chalkboard and tackboard

Comments:

j) Fire extinguishers

Comments:

4) Services

a) Indicate the extent to which each of the following water services are needed and below each service needed indicate where the services are to be provided.

(1) Tap water

(2) Distilled water
b) On the left check the gas services available, on the right indicate the extent to which each is needed, and below each service needed indicate where the service is to be provided.

(1) Natural gas

(2) Bottled gas

(3) Other

Indicate the extent to which each of the following electric services is needed. Below each service needed indicate specifications such as voltage, phase, or other special features and where the service is to be provided.

(1) 110-120 V., A. C.

(2) 220-240 V., A. C.

(3) Direct current

(4) Auxiliary lighting

(5) Other
f. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

1) Filing drawers
   Number of drawers ____, size of drawers _____
   Comments:

2) Bookshelving
   Open shelving, _____ linear feet
   Closed shelving, _____ linear feet
   Comments:

3) Storage for chemicals
   Comments:

4) Storage for laboratory equipment
   Comments:
5) Storage for partially completed pupil projects

Comments:

6) Storage for instructional supplies

Comments:

7) Storage for pupils' personal belongings

Comments:

8) Storage for instructor's personal belongings

Comments:

9) Low-temperature storage

Comments:

Suggest other types of storage needed.
g. Suggest floor area needed for teaching stations of this type or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _____

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

1. In event this type of teaching station is not needed full time for the science program, what other types of activities are:

   1) Most likely to function well in this type of teaching station?

   2) Least likely to function well in this type of teaching station?

j. In event it is not financially feasible to provide a separate room for this type of teaching station, indicate other rooms or spaces which could be planned to accommodate these additional activities.

F. Indicate the extent to which each of the following auxiliary rooms will be used in the science program.

1. Planting or growing rooms 1 2 3

2. Greenhouses 1 2 3
3. Small animal rooms 1 2 3 N
4. Preparation rooms 1 2 3 N
5. Darkrooms 1 2 3 N
6. Display rooms 1 2 3 N
7. Storage rooms 1 2 3 N
8. Small laboratories for advanced experimentation 1 2 3 N
9. Conference rooms 1 2 3 N
10. Instructors' offices 1 2 3 N
11. Science library 1 2 3 N
12. Other ___________________________ 1 2 3 N

Comments:

G. For each of the auxiliary rooms listed in Item F that is needed for the science program, provide the information requested below. Identify each room by indicating the uses for which it is to be designed. In many instances it may be desirable to provide rooms which are to serve more than one purpose. If any rooms are to be planned to serve more than one purpose, identify each one by a phrase which suggests the multiple uses for which it is to be planned—for example, display and conference room and instructor's office.

1. Type of room to be planned ___________________________
   a. Number of rooms of this type to be planned _______
   b. Indicate the activities or uses for which these rooms are to be planned.
c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _____

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

2. Type of room to be planned______________________________

a. Number of rooms of this type to be planned_________
b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.
3. Type of room to be planned

a. Number of rooms of this type to be planned

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet

Comments:
g. Indicate any additional information which the architect should know to aid in planning this type of facility.

4. Type of room to be planned ________________________________

   a. Number of rooms of this type to be planned _____

   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of room.

   e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.
f. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

5. Type of room to be planned __________________________________________

a. Number of rooms of this type to be planned _______

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _____

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

h. Indicate the extent to which each of the following outdoor facilities are needed and suggest any special considerations such as activities to be carried on, locations, areas needed, water, gas and electric services needed, building or shelters needed, etc. which the architect should know to aid in planning the outdoor facilities.

a. Gardens

b. Nature trails

c. Ponds

d. Streams

e. Wooded areas

Suggest other outdoor facilities needed.

Comments:
I. In the space provided below, indicate any additional information about any aspect of the science rooms or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

J. Indicate factors which the architect should take into consideration when planning the general location of the science rooms. Include factors such as accessibility to other portions of the building and outside areas.
I. Summarize rooms and spaces needed for the science program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area (sq. ft.) per room</th>
<th>Page pamphlet</th>
</tr>
</thead>
</table>

1. Teaching stations
   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________
   e. ____________________

2. Auxiliary rooms
   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________
   e. ____________________
   f. ____________________
   g. ____________________
   h. ____________________
   i. ____________________
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-13

SOCIAL STUDIES

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-13
SOCIAL STUDIES

### Rooms and Spaces Included in This Pamphlet

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
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<td>Regular teaching stations</td>
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<tr>
<td>Special teaching stations</td>
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</tr>
<tr>
<td>Auxiliary rooms</td>
<td>7</td>
</tr>
<tr>
<td>Library and reading room</td>
<td>7</td>
</tr>
<tr>
<td>Conference rooms</td>
<td>8</td>
</tr>
<tr>
<td>Instructors' offices</td>
<td>9</td>
</tr>
<tr>
<td>Other auxiliary rooms</td>
<td>10</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>11</td>
</tr>
</tbody>
</table>
A. The number of teaching stations required for the social studies program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for the social studies program for the enrollment to be housed in the new building.

Number of teaching stations ________

Comments:

b. The rooms for the social studies program should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the social studies program. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations.

C. Check the subjects or offerings in the educational program which the social studies teaching stations are to house and suggest other offerings not listed.

   _1_. Core program  _4_. Problems of Democracy
   _2_. American History  _5_. American Government
   _3_. World History

Suggest other offerings.

Comments:

D. For each of the different types of teaching stations required for the social studies program, provide the information requested below.

   **Regular Teaching Stations**

1. Number to be provided ________

2. Indicate the extent to which the following activities will be carried on in this type of teaching station.

   a. View slides, films, or other projected materials  1 2 3 N
   b. Listen to recordings or broadcasts  1 2 3 N
   c. Write or draw on chalkboard  1 2 3 N
d. Write or draw at desks or tables 1 2 3 N

e. Small groups of pupils carry on conferences at conference tables 1 2 3 N

f. Teacher carry on conferences with individual pupils 1 2 3 N

g. Carry on research using reference materials stored in classroom 1 2 3 N

h. Carry on panel discussions 1 2 3 N

i. Display pupil projects or work 1 2 3 N

j. Store partially completed pupil projects 1 2 3 N

k. Store instructional supplies 1 2 3 N

l. Store pupils' personal belongings 1 2 3 N

m. Store instructor's personal belongings 1 2 3 N

Are there any other activities which the class as a whole, small groups of five or six pupils, or individual pupils will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

3. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _______ linear feet; tackboard, _______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
4. Furniture and equipment

a. Check the types of desk and seating facilities desired (see directions, Pamphlet C-1).

1) Tablet arm chairs for pupils
2) Chair desks for pupils
3) Movable combination desk-chairs for pupils
4) Tables and chairs for pupils, number of pupils to be accommodated at each table, ______ pupils
5) Instructor's desk
6) Instructor's table, dimensions of table ________________
7) Instructor's combination desk and table
8) Other _______________________________________________________________________

Comments:

b. Indicate the extent to which the following types of furniture and equipment will be used and suggest any special information which the architect should know about the various items.

1) Conference tables and chairs  1 2 3 N
   Number of tables _______, dimensions of tables ______

2) Workcounter  1 2 3 N
   Dimensions of workcounter ________________

3) Sink with hot and cold running water  1 2 3 N
   Desired location of sink ________________

4) Display cases  1 2 3 N

5) Display and map rails attached above chalkboard and tackboard  1 2 3 N

6) Record player  1 2 3 N

7) Radio  1 2 3 N

8) Television  1 2 3 N

9) Electrical outlets  1 2 3 N
   Number of outlets _____, desired locations ______
Suggest other types of furniture and equipment needed.

Comments:

5. Indicate the extent to which the following types of storage facilities will be used and suggest types, dimensions, and quantities of materials to be stored.

a. Filing drawers
   Number of drawers ____, size of drawers ____________
   Comments:

b. Bookshelving
   Open shelving, ________ linear feet
   Closed shelving, ________ linear feet
   Comments:

c. Storage for instructional supplies
   Comments:

d. Storage for instructor's personal belongings
   Comments:
e. Storage for pupils' personal belongings

Comments:

Suggest other types of storage needed.

6. Suggest floor area needed for each regular teaching station or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

**Special Teaching Stations**

1. If one or more social studies teaching stations should be planned with special features not included in the other teaching stations as outlined above, indicate in the space provided below the special provisions or alterations which should be made for these teaching stations.
E. In event any of the teaching stations are not needed full time for the social studies program, what other types of activities are:

1. Most likely to function well in these rooms?

2. Least likely to function well in these rooms?

F. Indicate the extent to which each of the following auxiliary rooms will be used in the social studies program.

1. Library and reading room 1 2 3 N
2. Conference rooms 1 2 3 N
3. Instructors' offices 1 2 3 N
4. Other ____________________________ 1 2 3 N

Comments:

G. For each of the auxiliary rooms that is necessary for the social studies program (Item F), provide the information requested below. Complete only those portions of this section which pertain to the needs of the contemplated program.

Library and Reading Room

1. Indicate activities or uses for which this room should be planned.

2. Suggest a desired location for the library and reading room in the social studies suite or suggest factors which should determine its location.
3. Indicate types of furniture and equipment to be provided for this room.

4. Indicate types, dimensions, and quantities of materials to be stored and the type of storage needed.

5. Suggest floor area needed for this room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).
   
   Square feet ________
   
   Comments:

6. Indicate any additional information which the architect should know to aid in planning this type of room.

   **Conference Rooms**

1. Number to be planned ________

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for the conference rooms in the social studies suite or suggest factors which should determine the locations of these rooms.

4. Indicate types of furniture and equipment to be provided for these rooms.
5. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.

6. Suggest floor area needed for each room or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _______

Comments:

7. Indicate any additional information which the architect should know to aid in planning this type of room.

---

Instructors' Offices

1. Number to be planned _______

2. Indicate the activities or uses for which these rooms should be planned.

3. Suggest desired locations for the offices in the social studies suite or suggest factors which should determine the locations of these rooms.

4. Indicate types of furniture and equipment to be provided for these rooms.

5. Indicate types, dimensions, and quantities of materials to be stored and type of storage needed.
6. Suggest floor area needed for each office or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

**Other Auxiliary Rooms**

1. If other auxiliary rooms are needed, describe the facilities to be provided in the space below. Include data similar to that requested in the preceding sections on auxiliary rooms.

H. In the space below indicate any additional information about any aspect of the social studies rooms or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.
I. Indicate factors which the architect should take into consideration when planning the location of the social science rooms. Include factors such as accessibility to other portions of the building and isolations from noises.

J. Summarize the rooms and spaces needed for the social studies program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Pages in pamphlet</th>
</tr>
</thead>
</table>

1. Teaching Stations
   a. ___________________________  ______  ______  ______
   b. ___________________________  ______  ______  ______
   c. ___________________________  ______  ______  ______

2. Auxiliary Rooms
   a. ___________________________  ______  ______  ______
   b. ___________________________  ______  ______  ______
   c. ___________________________  ______  ______  ______
   d. ___________________________  ______  ______  ______
   e. ___________________________  ______  ______  ______
   f. ___________________________  ______  ______  ______
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-14

VOCATIONAL EDUCATION

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-14

VOCATIONAL EDUCATION

Rooms and Spaces Included in This Pamphlet

Teaching stations 3

Auxiliary rooms 13

Summary of rooms and spaces 20
A. The number of teaching stations required for the vocational education program for various projected enrollments has been calculated in accordance with directions in Pamphlet B-1. Indicate in the space below the calculated number of teaching stations required for the vocational education program for the enrollment to be housed in the new building.

Number of teaching stations _______

Comments:

B. The rooms for the vocational education program should be planned according to the number of teaching stations required and the types of activities that will be carried on in the various rooms. Maximum flexibility of use is possible when each space is planned to house many aspects of the program. In addition to teaching stations, auxiliary spaces may be needed. Early in the planning process, it will be necessary to determine whether these spaces are to be separate rooms closely related to the teaching stations or separate areas within the teaching stations. For instance, space for shop instruction or demonstration may be developed as a separate room which may also be used for planning or it may be an area within the shop where folding chairs or workbenches may be used for seating.

C. Indicate the extent to which experiences in the following trades should be provided in the vocational education program.

1. Air conditioning 1 2 3 N 13. Pattern making 1 2 3 N
2. Auto mechanics 1 2 3 N 14. Plastering 1 2 3 N
3. Aviation 1 2 3 N 15. Plumbing 1 2 3 N
4. Baking 1 2 3 N 16. Printing 1 2 3 N
5. Cafeteria management 1 2 3 N 17. Radio 1 2 3 N
6. Carpentry 1 2 3 N 18. Refrigeration 1 2 3 N
7. Cosmetology 1 2 3 N 19. Sheet metal 1 2 3 N
8. Electrical 1 2 3 N 20. Steam fitting 1 2 3 N
9. Food preparation 1 2 3 N 21. Tailoring 1 2 3 N
10. Machine tools 1 2 3 N 22. Tearoom management 1 2 3 N
11. Masonry 1 2 3 N 23. Watch repairing 1 2 3 N
12. Painting 1 2 3 N 24. Woodworking
Suggest other trades.

Comments:

D. For each of the different types of teaching stations needed for the vocational education program, provide the information requested below. Identify each different type of teaching station needed by indicating the uses for which each is to be designed. If a teaching station is to be used for auto mechanics, record auto mechanics on the line following the item, "Type of teaching station to be planned," in one of the sections which follows. Identify each different teaching station which is needed in a similar manner.

If more teaching stations are needed than space is provided for, attach additional pages to this pamphlet and provide information similar to that requested in the following sections.

1. Type of teaching station to be planned __________________________

______________________________

a. Number of teaching stations of this type to be planned ______

b. Indicate the activities that will be carried on in this type of teaching station.
c. Suggest desired locations for teaching stations of this type or suggest factors which should determine their locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _______ linear feet; tackboard, _______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

e. Indicate types of furniture and equipment to be provided for this type of teaching station.
f. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

---

g. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

---

h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
1. In event this type of teaching station is not needed full time for the vocational education program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?

2. Type of teaching station to be planned ____________________________

a. Number of teaching stations of this type to be planned ________

b. Indicate the activities that will be carried on in this type of teaching station.

c. Suggest desired locations for teaching stations of this type or suggest factors which should determine their locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _____ linear feet; tackboard, _____ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.
e. Indicate types of furniture and equipment to be provided for this type of teaching station.

f. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

g. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet _____

Comments:
h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

i. In event this type of teaching station is not needed full time for the vocational education program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station.

3. Type of teaching station to be planned ____________________________

________________________________________

a. Number of teaching stations of this type to be planned ________

b. Indicate the activities that will be carried on in this type of teaching station.
c. Suggest desired locations for teaching stations of this type or suggest factors which should determine their locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, _______ linear feet; tackboard, _______ linear feet

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

e. Indicate types of furniture and equipment to be provided for this type of teaching station.
f. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

---

g. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.

---
i. In event this type of teaching station is not needed full time for the vocational education program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?
4. Type of teaching station to be planned

a. Number of teaching stations of this type to be planned

b. Indicate the activities that will be carried on in this type of teaching station.

c. Suggest desired locations for teaching stations of this type or suggest factors which should determine their locations.

d. Indicate the approximate number of linear feet of chalkboard and tackboard needed in each teaching station of this type (see directions, Pamphlet C-1).

Chalkboard, ______ linear feet; tackboard, ______ linear feet.

Suggest any special considerations such as locations, vertical widths, rulings or etchings, special uses, etc. which the architect should know to aid in planning the space to be used for chalkboard and tackboard.

e. Indicate types of furniture and equipment to be provided for this type of teaching station.
f. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

g. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

h. Indicate any additional information which the architect should know to aid in planning this type of teaching station.
1. In event this type of teaching station is not needed full time for the vocational education program, what other types of activities are:

1) Most likely to function well in this type of teaching station?

2) Least likely to function well in this type of teaching station?

E. Indicate the extent to which the following auxiliary rooms will be used in the vocational education program.

1. Related classrooms
2. Demonstration rooms
3. Planning rooms
4. Conference rooms
5. Instructors' offices
6. Library and reading room
7. Tool rooms
8. Partially completed project storage rooms
9. Storage rooms
10. Boys' toilet and washroom
11. Girls' toilet and washroom

Suggest other types of rooms or spaces needed.

Comments:
For each of the auxiliary rooms listed in Item E that is needed for the vocational education program, provide the information requested below. Identify each room by indicating the use for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one purpose. If any rooms are to be planned to serve more than one purpose, identify each one by a phrase which suggests the multiple uses for which it is to be planned — for example, conference room and instructor's office.

1. Type of room to be planned ____________________________________________

   a. Number of this type to be planned ______

   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms or suggest factors which
      should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this
      type of room.

   e. Indicate types, dimensions, and quantities of materials to be
      stored and types of storage needed.
f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

2. Type of room to be planned ________________________________

__________________________ ________________________________

a. Number of this type to be planned ______

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

3. Type of room to be planned

__________________________

a. Number of this type to be planned ______

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

3. Type of room to be planned _____________________________

   a. Number of this type to be planned _______

   b. Indicate the activities or uses for which these rooms are to be planned.

   c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of room.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

4. Type of room to be planned ____________________________

a. Number of this type to be planned ______

b. Indicate the activities or uses for which these rooms are to be planned.

c. Suggest desired locations for these rooms or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be stored and type of storage needed.
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ________

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

h. In the space below, indicate any additional information about any aspect of the vocational education rooms or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.
II. Indicate factors which the architect should take into consideration when planning the general location of the vocational education rooms in relation to other areas of the building. Include such factors as accessibility to other portions of the building and isolation of noises.

I. Summarize rooms and spaces needed for the vocational education program.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq.ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
</table>

1. Teaching stations
   a. ____________________________   ______   ______   ______
   b. ____________________________   ______   ______   ______
   c. ____________________________   ______   ______   ______
   d. ____________________________   ______   ______   ______
   e. ____________________________   ______   ______   ______

2. Auxiliary rooms
   a. ____________________________   ______   ______   ______
   b. ____________________________   ______   ______   ______
   c. ____________________________   ______   ______   ______
   d. ____________________________   ______   ______   ______
   e. ____________________________   ______   ______   ______
A MANUAL FOR PLANNING

A SECONDARY SCHOOL BUILDING

Pamphlet C-15

ADMINISTRATION

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-15

ADMINISTRATION

Contents

Administrative staff activities 2
Facilities to be used for administrative purposes 3
Summary of rooms and spaces to be provided 19
A. Inclusion in this pamphlet of various personnel, activities, or facilities does not imply that the administrative suite is the best location in which to house them. The nature of the educational program to be housed and other factors pertinent to the building planning process should determine their locations.

B. Indicate the extent to which the following types of activities will be carried on by the administrative staff. If any of the activities are to be carried on in areas of the building removed from the administrative suite, indicate the locations in the building where they are to be accommodated. Use the spaces under the activities in which to indicate the locations.

1. Keep records  
2. Handle communications  
3. Confer with school patrons, pupils, and staff personnel  
4. Counsel pupils  
5. Process pupils entering or leaving school  
6. Duplicate various types of materials  
7. Operate telephone switch board  
8. Operate public address system  
9. Secure, handle, and account for school funds  
10. Inform public of aims, accomplishments, and needs of the school  
11. Store and distribute books and school supplies  
12. Give individual tests  
13. Give group tests
14. Give medical examinations (see Pamphlet C-19) 1 2 3 N

15. Give dental examinations (see Pamphlet C-19) 1 2 3 N

16. Schedule school and community activities related to the school. 1 2 3 N

17. Carry on research activities 1 2 3 N

Suggest other types of activities which will be carried on by the administrative staff and suggest where these activities should be housed.

C. Indicate the extent to which the following types of facilities will be used for administrative purposes. If any of the facilities are not to be provided in the administrative suite, indicate where they should be located or suggest factors which should determine their locations. Use the spaces under the activities to indicate the locations.

1. General office 1 2 3 N

2. Waiting room for adults 1 2 3 N

3. Waiting room for pupils 1 2 3 N

4. General office and waiting room 1 2 3 N

5. Private offices
   a. Principal 1 2 3 N
   b. Assistant principal 1 2 3 N
c. Dean of boys

d. Dean of girls

e. Director of guidance

f. Visiting teacher

g. Guidance counselors

h. Director of audio-visual education

i. Director of athletics and recreation

j. Director of research

k. Director of curriculum

l. Other

6. Counseling rooms

7. Conference rooms

8. General supply room

9. Book storage room

10. Teachers' workroom

11. Teachers' restrooms or lounges

12. Toilets

   a. Teachers, one for each sex
b. Secretarial and clerical personnel

c. Principal

d. One for each sex for personnel in administrative suite

e. Other

13. Record room

14. Inactive record storage room

15. Vault

16. Public address system control room

Suggest other types of facilities needed for the administrative staff.

D. For each of the different types of facilities listed in Item C that is needed for administrative purposes, provide the information requested below. Identify each facility by indicating the uses for which it is to be designed.

In many instances, it may be desirable to provide facilities which are to serve more than one purpose. If any such facilities are to be planned, identify each one by a phrase which suggests the multiple uses for which it is to be planned— for example, general office workroom and supply room.

1. Type of facility to be planned

   a. Number to be planned
b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

c. Suggest desired locations for these facilities or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of facility.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:
g. Indicate any additional information which the architect should know to aid in planning this type of facility.

2. Type of facility to be planned ________________________________
   
a. Number to be planned _____
   
b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.
   
c. Suggest desired locations for these facilities or suggest factors which should determine their locations.
   
d. Indicate types of furniture and equipment to be provided for this type of facility.
   
e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.
f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning type type of facility.

7. Type of facility to be planned _____________________________

   a. Number to be planned ______

   b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

   c. Suggest desired locations for these facilities or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of facility.
c. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

   g. Indicate any additional information which the architect should know to aid in planning this type of facility.

4. Type of facility to be planned ________________________________

   a. Number to be planned ______

   b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

   c. Suggest desired locations for these facilities or suggest factors which should determine their locations.
d. Indicate types of furniture and equipment to be provided for this type of facility.

e. Indicate types, dimensions, and quantities of materials to be stored, and types of storage needed.

f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

5. Type of facility to be planned ____________________________

a. Number to be planned _____
b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

c. Suggest desired locations for these facilities or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of facility.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:
6. Type of facility to be planned ____________________________

   a. Number to be planned _____

   b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

   c. Suggest desired locations for these facilities or suggest factors which should determine their locations.

   d. Indicate types of furniture and equipment to be provided for this type of facility.

   e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.
f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______
Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

7. Type of facility to be planned ______________________________

a. Number to be planned ______

b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

c. Suggest desired locations for these facilities or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of facility.
c. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

8. Type of facility to be planned ________________________________

   a. Number to be planned ______

   b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

   c. Suggest desired locations for these facilities or suggest factors which should determine their locations.
d. Indicate types of furniture and equipment to be provided for this type of facility.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

9. Type of facility to be planned ____________________________

   a. Number to be planned ________
b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

c. Suggest desired locations for these facilities or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of facility.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:
g. Indicate any additional information which the architect should know to aid in planning this type of facility.

10. Type of facility to be planned ________________________________

a. Number to be planned ______

b. Indicate activities or uses for which these facilities are to be planned. Include the number of personnel, if any, to be accommodated.

c. Suggest desired locations for these facilities or suggest factors which should determine their locations.

d. Indicate types of furniture and equipment to be provided for this type of facility.

e. Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.
f. Suggest floor area needed for this type of facility or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ________

Comments:

g. Indicate any additional information which the architect should know to aid in planning this type of facility.

E. In the space provided below, indicate any additional information about the administrative facilities which the architect should know to aid in planning these facilities. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

F. Indicate factors which the architect should take into consideration when planning the location of the administrative suite. Include factors such as accessibility to other portions of the buildings and isolation from noises.
0. Summarize rooms and spaces needed for administrative purposes.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td></td>
<td></td>
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<td>7</td>
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<td>8</td>
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<td>9</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-16

AUDITORIUM AND STAGE

Rooms and Spaces Included in This Pamphlet

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body of auditorium</td>
<td>3</td>
</tr>
<tr>
<td>Stage</td>
<td>6</td>
</tr>
<tr>
<td>Auxiliary rooms</td>
<td>10</td>
</tr>
<tr>
<td>Combination facility</td>
<td>16</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>17</td>
</tr>
</tbody>
</table>
A. Indicate the extent to which the following activities will be carried on in the auditorium and related rooms and spaces.

1. View slides, films, or other projected materials
2. View telecasts
3. Carry on panel discussions
4. Present lectures
5. Carry on debates
6. Present dramatic productions
7. Present musical productions such as operettas and band and orchestra concerts
8. Plan stage settings
9. Build stage settings
10. Demonstrate facets of the school program to pupils and parents
11. Carry on regular class activities
12. Carry on study activities
13. Conduct vocal music classes
14. Carry on band and orchestra rehearsals
15. Broadcast programs
16. Carry on physical education classes
17. View athletic events

Are there other types of activities that large numbers of pupils, small groups of pupils, individual pupils, or other groups will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.
B. In addition to the body of the auditorium, stage, and lobby, indicate the extent to which the following auxiliary rooms will be used.

1. Stagecrafts planning room
2. Stagecrafts workshop
3. Rehearsal stage
4. Green room
5. Dressing rooms
6. Make-up rooms
7. Wardrobe storage rooms
8. Stage property storage rooms
9. Projection booth

Suggest other types of rooms or spaces needed.

C. For each of the rooms or spaces to be provided as a part of the auditorium provide the information requested below.

Body of Auditorium

1. Indicate the activities or uses for which the body of the auditorium should be planned.

2. Indicate the auditorium seating capacity needed for:
   a. School purposes, ______
   b. Community uses, ______

3. Is a balcony acceptable? ______

4. Check the type of floor and seating arrangements needed.
   ______ a. Level floor with fixed theater type seating
b. Level floor with fixed theater type seating with folding tablet arms attached

c. Level floor with folding chairs

d. Sloping floor with fixed theater type seating

e. Sloping floor with fixed theater type seating with folding tablet arms attached

f. Rear portion of the floor sloping with fixed theater type seating and front portion of the floor level with folding chairs.

g. Other

Comments:

5. Indicate the extent to which the following facilities will be used and suggest any special information which the architect should know about the various items.

a. Orchestra pit

Comments:

b. Public address system

Comments:

c. Clocks

Comments:

d. Electrical outlets

Comments:

e. Organ

Comments:
Suggest other facilities needed.

6. Check the lighting facilities needed in the auditorium.
   ___ a. Aisle lights
   ___ b. Pilot lights controlled by switches near entrance to illuminate path to main control panel
   ___ c. A row of lights across the front of the auditorium ceiling to light the forestage and forepart of the auditorium without turning on all the houselights
   ___ d. Light control panel without provisions for dimming house lights with panel located:
       ___ 1) On stage on same panel with stage lights controls
       ___ 2) In projection booth
       ___ 3) Other ______________________________
   ___ e. Light control panel with provisions for dimming house lights with panel located:
       ___ 1) On stage on same panel with stage lights controls
       ___ 2) In projection booth
       ___ 3) Other ______________________________

Suggest other facilities needed.

7. Indicate any additional information which the architect should know to aid in planning the body of the auditorium.
### Stage

1. Indicate the activities or uses for which the stage should be planned.

2. Indicate the extent to which the following facilities and equipment will be used and where applicable check features to be included with certain facilities and equipment. Also suggest any special information which the architect should know about the various items.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Options</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Front curtain, valence, and track system</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>b. Cyclorama setting</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>1) With curtain on curved track</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) With rear curtain and two side curtains mounted on track</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) With rear curtain and two side curtains mounted on pipe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Other ____________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Oleo setting with track system</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>1) With oleo curtain and grand drapery border</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) With tormentors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) With tabs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Other ____________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Theater-size motion picture screen</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>e. Counter-weight system</td>
<td>1 2 3 N</td>
<td></td>
</tr>
<tr>
<td>1) To raise and lower scenery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) To raise and lower border lights</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
f. Stage lighting equipment

1) Footlights
2) Border lights
3) Strip lights
4) Flood lights
5) Spotlights

   a) To be located in ports in the auditorium ceiling
   b) To be located in the balcony
   c) To be located in the projection booth
   d) To be located on stage
   e) Other _________________________________

h. Light control panel without provisions for dimming 1 2 3 N

Light control with provisions for dimming 1 2 3 F

l. Back stage crossover

   1) Separate backstage crossover
   2) Adequate space between cyclorama or stage settings and back of stage
   3) Other _________________________________

Suggest other facilities or equipment needed.
3. Check the items which indicate the desired locations for the stage lights control panel.

   ___ a. On the same panel with the auditorium houselights
   ___ b. In a booth in front of the stage apron
   ___ c. On the stage side of the proscenium wall
       ___ 1) On the same level as the stage floor
       ___ 2) Elevated above stage floor to permit walking underneath
   ___ d. In the projection booth
   ___ e. Other _______________________________________________________

4. Indicate the preference for stage apron or forestage.

   a. A permanent apron with direct access from body of auditorium          P A NA
   b. A permanent apron without direct access from body of auditorium        P A NA
   c. An apron made of blocks which may be arranged in the usual bluff division or in steps for glee clubs and for easy transition from auditorium to stage  P A NA
   d. Other _____________________________________________________________

5. Check the type of stage flooring preferred.

   ___ a. All hardwood
   ___ b. Forestage hardwood and remainder of stage double softwood so stage screws can be used
   ___ c. Forestage and area bounded by the cyclorama, hardwood and the wing and backstage areas double softwood so stage screws can be used
   ___ d. Other _________________________________________________________
6. Indicate the extent to which storage for the following items will be used and suggest dimensions and quantities of materials to be stored.

a. Scenery
   Comments:

b. Costumes
   Comments:

c. Stage properties
   Comments:

d. Auxiliary lighting equipment
   Comments:

e. Risers
   Comments:

f. Folding chairs
   Comments:

g. Pianos
   Comments:
Suggest other types of materials to be stored and types of storage needed.

7. Suggest factors which should determine the floor area needed for the stage. Include such items as width of proscenium opening, depth of lower stage, depth of stage behind front curtain, width of offstage space on each side of proscenium arch, etc.

Lobby

1. In the space below provide any special information which the architect should take into consideration in planning the lobby. Include such factors as the relationship to other areas of the building, special uses which will be made of the lobby area, etc.

Auxiliary Rooms

1. For each of the auxiliary rooms listed in Item B, page 3, that is needed in connection with the auditorium, provide the information requested below. Identify each room by indicating the uses for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one purpose. If any rooms are to be planned to serve more than one purpose, identify each one by a phrase which suggests the multiple uses for which it is to be planned—for example, wardrobe storage and dressing room.
a. Type of room to be planned ________________________________

1) Number of this type to be planned _____

2) Indicate the activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet _____

   Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.
b. Type of room to be planned ________________________

1) Number of this type to be planned ______

2) Indicate the activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamohlet C-1). Square feet ______

Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.
c. Type of room to be planned ____________________________

1) Number of this type to be planned ______

2) Indicate the activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.
d. Type of room to be planned

1) Number of this type to be planned

2) Indicate the activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

   Square feet

   Comments:

7) Indicate any additional information which the architect should take into consideration in planning this type of facility.
D. In the space provided below, indicate any additional information about any aspect of the auditorium or activities to be carried on in the auditorium which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

E. Indicate the extent to which the following factors should determine the location of the auditorium.

1. Isolated from quiet areas of the building
2. In an area of the building with toilets and drinking fountains so that this facility can be shut off from the remainder of the building for community use
3. In an area of the building accessible from all classrooms
4. In an area of the building where adjacent classrooms are available for use as dressing rooms
5. In an area of the building where physical education dressing locker rooms are available for use as dressing rooms
6. Oriented so that stage participants have access to stage without going through the body of the auditorium or the lobby
7. Located so that the stage is convenient to the facilities checked below to facilitate carrying on cooperative projects
   - a. Industrial arts shops
   - b. Art studios
   - c. Home economics rooms
Suggest other factors which should be considered in planning the location of the auditorium.

F. If financial limitations make it necessary to plan a multiple use facility for assembly purposes, provide the information requested below.

1. Indicate the degree of preference for the following combination uses for which a multiple use assembly facility should be planned.
   a. Assembly and music  P A NA
   b. Assembly, physical education, and athletics  P A NA
   c. Other  P A NA

Comments:

2. Indicate any special considerations which the architect should know to aid in planning a combination facility of this type.
G. Summarize rooms and spaces needed in connection with the auditorium.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Body of auditorium</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>2. Stage</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>3. Lobby</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>4. Auxiliary rooms</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
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<tr>
<td>b.</td>
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<td></td>
<td></td>
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<tr>
<td>c.</td>
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<tr>
<td>d.</td>
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<tr>
<td>e.</td>
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<tr>
<td>f.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Combination facility</td>
<td></td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>
A MANUAL FOR PLANNING

A SECONDARY SCHOOL BUILDING

Pamphlet C-17

FOOD SERVICE FACILITIES

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-17

FOOD SERVICE FACILITIES

Rooms and Spaces Included in This Pamphlet

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dining facilities</td>
<td>4</td>
</tr>
<tr>
<td>Kitchen and kitchen auxiliary spaces</td>
<td>8</td>
</tr>
<tr>
<td>Other facilities</td>
<td>20</td>
</tr>
<tr>
<td>Summary of rooms and spaces</td>
<td>22</td>
</tr>
</tbody>
</table>
A. Indicate the degree of preference for the following types of food service facilities for school lunch purposes.

1. Complete preparation, service, and dining facilities planned for table service
   - Preference: A, NA

2. Complete preparation, service, and dining facilities planned for cafeteria type service
   - Preference: A, NA

3. Preparation of food in kitchen with cafeteria type service and dining facilities in
   a. Classrooms
   - Preference: A, NA
   b. Gymnasium
   - Preference: A, NA
   c. Other
   - Preference: A, NA

4. Preparation of food in a central kitchen serving more than one building with facilities in each building for serving and dining
   a. Table service in dining room
   - Preference: A, NA
   b. Cafeteria type service and dining in:
      1) Dining room
      - Preference: A, NA
      2) Classrooms
      - Preference: A, NA
      3) Gymnasium
      - Preference: A, NA
      4) Other
      - Preference: A, NA

Comments:

B. Check the uses for which the food service facilities should be planned.

___ 1. Preparation and serving of a complete plate lunch
___ 2. Preparation and serving of a variety of foods to permit a selection
___ 3. Preparation and serving of partial lunches, single hot dishes, or other items to supplement home prepared lunches
___ 4. Preparation and serving of school or community banquets
   a. Table service, number to be accommodated
b. Cafeteria type service, number to be accommodated at one time ______

c. Other ________________________________

5. Preparation and serving of light lunches or refreshments to school activity groups or to community groups

Suggest other uses for which the food service facilities should be planned.

C. Indicate the extent to which the following rooms, spaces, and facilities will be needed in the food service area.

<table>
<thead>
<tr>
<th>Room/Space/Facility</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kitchen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Dining rooms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Serving lines for serving complete lunches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Snack or dairy bars where partial lunches brought from home can be supplemented</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>with items such as milk or ice cream</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Temporary storage for pupils' personal belongings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. In cubicles with direct access to pupils in the serving lines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. In a check room</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Hand washing facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. In an alcove with direct access to pupils in the serving line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. In nearby pupil toilets</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>c. Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Faculty dining room</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Chair storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Built-in stage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Check rooms for community or out of school use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Toilets in addition to regular pupil toilets</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12. Facilities for cafeteria workers

  a. Dressing and locker rooms
  b. Shower rooms
  c. Toilets
  d. Other

D. For each of the rooms or spaces to be provided as a part of the food service facilities, provide the information requested below.

Dining Facilities

1. Indicate the degree of preference for the following types of dining facilities.

   a. A large dining room with formal, commercial-type arrangements for efficiency of feeding large groups

   b. A large dining room with an arrangement of spaces and furniture that provides an informal setting

   c. A large dining room with an arrangement of spaces and furniture that lends itself to other uses such as study

   d. Small dining rooms with informal settings

   e. Other

   Comments:

2. Indicate the extent to which dining rooms should also be designed for the following uses.

   a. Place to accommodate pupils who bring their lunches

   b. Study hall

   c. Library reading room

   d. Meeting room for school or community groups

   e. Activities room

   f. Projection room

   Suggest other uses.
3. Indicate the capacities for which the dining rooms should be planned or suggest factors which should determine the capacities.

a. Percent of the total pupil enrollment who will eat a hot meal in the dining room, ______ percent

b. Percent of the total pupil enrollment who will eat a home prepared lunch in the dining room, ______ percent

c. Number of faculty members who will eat in the same dining room with pupils ______

d. Maximum number to be accommodated in each dining room at one sitting ______

Comments:

4. Indicate the number of dining rooms to be planned.

Number ______

Comments:

5. Indicate the extent to which the following types of furniture and equipment will be used in the dining rooms and suggest any special information which the architect should know about the various items.

a. Folding tables and chairs
   Number of pupils to be accommodated at each table ______

b. Fold-in-wall type tables
   Number of pupils to be accommodated at each table ______

c. Folding type tables with casters to permit rolling them away for storage
   Number of pupils to be accommodated at each table ______

d. Tables and chairs which are suitable for study as well as dining purposes
   Number of pupils to be accommodated at each table ______
1) For dining purposes ______
2) For study purposes ______

e. Portable stage
   Dimensions ____________

f. Microphone outlets for use with building public address system
   Number of outlets ______, desired locations ______

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  ___________
9. Indicate factors which the architect should take into consideration if a faculty dining room is needed. Include factors such as desired location, number to be accommodated at one sitting, other uses which will be made of this space, etc.

10. Indicate factors which the architect should take into consideration if chair storage is needed.

11. Indicate factors which the architect should take into consideration if storage is needed for tables.

12. Indicate factors which the architect should take into consideration if a built-in stage is needed in connection with the dining room.

13. Indicate any additional information which the architect should know to aid in planning the dining facilities.
Kitchen and Kitchen Auxiliary Spaces

1. Indicate the meal capacity for which the kitchen should be planned.
   a. For school lunch purposes, ____ meals
   b. For other purposes, specify purposes ____________________________ __________ meals

   Comments:

2. Suggest a desired location for the kitchen or suggest factors which should determine its location.

3. In planning the kitchen and kitchen auxiliary spaces, it is necessary to provide an arrangement so that the various work spaces allow for a flow of materials in logical sequence of use. These spaces include receiving, storage, preparation, serving, dishwashing, disposal of wastes, and cleaning. There is also need to provide facilities where planning and accounting can be carried on and facilities for the personal needs of the cafeteria workers. Provisions are made in the following pages to indicate information which the architect should take into consideration when planning the various facilities and spaces.

   a. Receiving facilities

      1) Suggest desired locations for the receiving space or suggest factors which should determine the location.

      2) Suggest floor area needed or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

         Square feet __________

         Comments:

      3) Suggest other factors which the architect should know to aid in planning this space.
b. Storage facilities

1) The storage facilities should be adequate for:
   a) Central storage for all supplies for all food service facilities in the entire school district
   b) Storage for supplies for the food service facilities in the building being planned
   c) Other ______________________________

Comments:

2) Indicate the frequency with which supplies will be delivered to this facility.

3) Dry storage
   a) Suggest desired locations for the dry storage spaces or suggest factors which should determine the locations.

   b) Suggest types, dimensions or sizes, and quantities of materials to be stored and types of storage needed.
c) Suggest floor area needed for dry storage or suggest factors which determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

d) Suggest other factors which the architect should know to aid in planning the dry storage facilities.

4) Refrigerated storage

a) Check the types of storage needed and indicate the capacity or floor area required or suggest types, dimensions, and quantities of materials to be stored.

   (1) Walk-in storage, floor area, ______ square feet

   __ (2) Reach-in storage, capacity, ______ cubic feet

   __ (3) Deep freeze, capacity, ______ cubic feet
b) Suggest other factors which the architect should know to aid in planning the refrigerated storage facilities.

5) Indicate other types of storage needed and suggest types, dimensions, and quantities of materials to be stored.

c. Facilities for the preparation of foods

1) To assist the architect to develop facilities for the preparation of food, list in the spaces below, 10 typical menus which illustrate the various types of foods which will be prepared in the kitchen and which illustrate the various types of kitchen equipment which will be needed. Underline the various types of foods which will be prepared in the kitchen and indicate the number of servings or the quantity of each type of food to be served. Two examples are shown—one for a cafeteria serving plate lunches and the second for a cafeteria serving a variety of foods so that pupils have a selection.

Example 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baked Haddock</td>
<td>250</td>
</tr>
<tr>
<td>Parsley Buttered Potatoes</td>
<td>250</td>
</tr>
<tr>
<td>Peach-Cream Cheese Salad</td>
<td>250</td>
</tr>
<tr>
<td>Rolls and Butter</td>
<td>250</td>
</tr>
<tr>
<td>Apple Betty</td>
<td>250</td>
</tr>
<tr>
<td>Milk</td>
<td>250</td>
</tr>
<tr>
<td>Creamed Chicken on Biscuits</td>
<td>150</td>
</tr>
<tr>
<td>Buttered Peas</td>
<td>100</td>
</tr>
<tr>
<td>Lima Beans</td>
<td>150</td>
</tr>
<tr>
<td>Hamburger on Bun</td>
<td>175</td>
</tr>
<tr>
<td>Mexican Slaw</td>
<td>150</td>
</tr>
<tr>
<td>Fruit Jello</td>
<td>100</td>
</tr>
<tr>
<td>Ice Cream</td>
<td>150</td>
</tr>
<tr>
<td>Apple Pie</td>
<td>100</td>
</tr>
<tr>
<td>Milk</td>
<td>225</td>
</tr>
</tbody>
</table>

Example 2

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baked Haddock</td>
<td>250</td>
</tr>
<tr>
<td>Parsley Buttered Potatoes</td>
<td>250</td>
</tr>
<tr>
<td>Peach-Cream Cheese Salad</td>
<td>250</td>
</tr>
<tr>
<td>Rolls and Butter</td>
<td>250</td>
</tr>
<tr>
<td>Apple Betty</td>
<td>250</td>
</tr>
<tr>
<td>Milk</td>
<td>250</td>
</tr>
<tr>
<td>Creamed Chicken on Biscuits</td>
<td>150</td>
</tr>
<tr>
<td>Buttered Peas</td>
<td>100</td>
</tr>
<tr>
<td>Lima Beans</td>
<td>150</td>
</tr>
<tr>
<td>Hamburger on Bun</td>
<td>175</td>
</tr>
<tr>
<td>Mexican Slaw</td>
<td>150</td>
</tr>
<tr>
<td>Fruit Jello</td>
<td>100</td>
</tr>
<tr>
<td>Ice Cream</td>
<td>150</td>
</tr>
<tr>
<td>Apple Pie</td>
<td>100</td>
</tr>
<tr>
<td>Milk</td>
<td>225</td>
</tr>
</tbody>
</table>

Note in the second example that biscuits are prepared in the kitchen but hamburger buns, ice cream, and apple pie are not prepared in the kitchen.
<table>
<thead>
<tr>
<th>Menu 1</th>
<th>Menu 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu 3</td>
<td>Menu 4</td>
</tr>
<tr>
<td>Menu 5</td>
<td>Menu 6</td>
</tr>
<tr>
<td>Menu 7</td>
<td>Menu 8</td>
</tr>
<tr>
<td>Menu 9</td>
<td>Menu 10</td>
</tr>
</tbody>
</table>
Indicate any types of foods to be prepared for other than school lunch purposes which will require special kitchen facilities.

2) Check the equipment which will be needed to prepare the various types of foods suggested above. Space is provided in which to indicate equipment specifications.

<table>
<thead>
<tr>
<th></th>
<th>Cooking equipment</th>
<th></th>
<th>Tables</th>
<th></th>
<th>Sinks</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Range</td>
<td></td>
<td>(1) Cook's</td>
<td></td>
<td>(1) Dishwashing</td>
</tr>
<tr>
<td>(2)</td>
<td>Deck oven</td>
<td></td>
<td>(2) Salad-sandwich</td>
<td></td>
<td>(2) Vegetable</td>
</tr>
<tr>
<td>(3)</td>
<td>Steam jacketed kettle</td>
<td></td>
<td>(3) Baker's</td>
<td></td>
<td></td>
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<tr>
<td>(4)</td>
<td>Steam cooker</td>
<td></td>
<td>(4) Vegetable preparation</td>
<td></td>
<td></td>
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<tr>
<td>(5)</td>
<td>Other</td>
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<td>(5) Clean dish</td>
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<td></td>
<td></td>
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<td>(6) Soiled dish</td>
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<td>(7) On wheels</td>
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<td>(8) Other</td>
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</tbody>
</table>

(1) Dishwashing
(2) Vegetable
3) If the nature of the foods to be prepared will require a separate preliminary preparation area, indicate the facilities needed or the preparation work to be carried on.

4) Indicate the types of materials and equipment for which storage must be provided in the food preparation area and suggest types of storage needed.
5) Suggest other factors which the architect should know to aid in planning the facilities needed for the preparation of food.

**d. Facilities for serving food**

1) Indicate types of food counters needed.

__ a) Serving counters where complete plate lunches will be served

__ b) Serving counters where a variety of foods will be served to permit a selection of foods

__ c) Serving counters where partial lunches or single hot dishes will be served to supplement home prepared lunches

__ d) Snack or dairy bars (see Item 4, page 16)

__ e) Other _______________________________________

Comments:

2) Suggest desired locations for the serving counters or suggest factors which should determine the locations.

3) Check the facilities needed for the serving of food. In the space under each item needed, indicate pertinent information such as quantity needed, specifications, etc. which the architect should know.

__ a) Trav rail

__ b) Space for trays

__ c) Space for flatware

__ d) Hot unit
e) Cold unit
f) Pastry unit
g) Milk unit or cooler
h) Ice cream cabinet
i) Space for cashier

Suggest other facilities needed.

Comments:

4) If snack or dairy bars are needed, provide information to indicate desired locations, types of food to be served, furniture and equipment needed, and other special considerations which the architect should know to aid in planning the snack bars.

5) Suggest other factors which the architect should know to aid in planning the facilities for serving food.

e. Facilities for soiled dish return, dishwashing, and clean dish storage.

1) Suggest desired locations for the soiled dish return, dishwashing facilities, and storage for clean dishes.
2) Check the types of equipment needed for cleaning and storing dishes and indicate quantity and specifications of each type of equipment.

a) Soiled dish table with
   (1) Scraping holes and garbage cans underneath
   (2) Disposal unit connected to sewer

b) Pre-rinse sink

c) Dishwashing sink

d) Dishwashing machine

c) Clean dish racks

f) Clean dish table

g) Dish truck

h) Tray truck

i) Storage for supplies

j) Water heater

Suggest other facilities needed.

Comments:

3) Suggest other factors which the architect should know to aid in planning the facilities for handling soiled and clean dishes.

f. Facilities for disposal of wastes

1) Check the factors which are to be considered in planning the facilities for the disposal of wastes.

a) Garbage to be disposed of mechanically

b) Combustibles burned in incinerators

c) Wet garbage transported away daily
d) Non-combustible wastes transported away daily

e) Cans and floors cleaned with hot water from hose bib

f) Wastes stored temporarily on screened-in platform

g) Wastes stored temporarily in a refrigerated room

Suggest other factors to be considered.

Comments:

2) Suggest desired locations for facilities for the disposal of wastes or suggest factors which should determine the locations.

3) Indicate types and quantities of equipment to be provided for disposal of wastes.

4) Suggest other factors which the architect should know to aid in planning the facilities for disposal of wastes.

g. Facilities for cleaning kitchen and auxiliary rooms

1) Suggest factors which should determine the facilities to be provided for cleaning purposes—for instance, hot and cold running water available from a hose bib in dishwashing and waste disposal rooms, etc.
2) Indicate types and quantities of equipment to be provided for cleaning purposes.

3) Suggest other factors which the architect should know to aid in planning the facilities to be provided for cleaning purposes.

b. Office facilities

1) Indicate activities or uses for which the office facilities should be planned.

2) Indicate a desired location for the office or suggest factors which should determine the location of the office.

3) Indicate types of furniture and equipment to be provided for office use.

4) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

5) Suggest floor area needed for office space or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ____

Comments:
1. Facilities for cafeteria workers

1) Indicate the extent to which the following types of facilities are needed for the cafeteria workers.
   a) Dressing and locker rooms
   b) Shower rooms
   c) Toilet rooms
   d) Other

2) Indicate the number of cafeteria workers for which facilities must be provided.
   a) Adult workers
   b) Part time or part-time assistants
      (1) Male
      (2) Female
      (1) Boys
      (2) Girls

Comments:

Other Facilities

1. If other rooms or spaces are needed in connection with the food service facilities, describe the facilities to be provided in the space below. Include data similar to that requested in preceding sections of this pamphlet.
E. Suggest total floor area needed for the kitchen and auxiliary facilities.
   Square feet ______
   Comments:

F. Indicate below any additional information about the food service facilities which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

G. Indicate factors which the architect should take into consideration when planning the location of the food service facilities. Indicate factors such as accessibility to other portions of the building, ease of delivery of supplies, and isolation of noises and undesirable odors.
H. Summarize rooms and spaces needed for food service.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
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A MANUAL FOR PLANNING

A SECONDARY SCHOOL BUILDING

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio

Pamphlet C-18

LIBRARY
Pamphlet C-18

LIBRARY

Rooms and Spaces Included in This Pamphlet

Library reading rooms  4
Auxiliary rooms  7
Summary of rooms and spaces  12
A. Indicate the extent to which the following activities will be carried on in the library suite.

1. Circulate library materials 1 2 3 N
2. Individuals carry on research using library materials 1 2 3 N
3. Do recreational reading 1 2 3 N
4. Browse through publications of various types 1 2 3 N
5. Pupils study texts or other materials which they bring with them 1 2 3 N
6. Listen to recordings 1 2 3 N
7. Conduct classes in the use of the library 1 2 3 N
8. Classes use library as resource and work center 1 2 3 N
9. Small groups carry on conferences around conference tables 1 2 3 N
10. Preview films or slides 1 2 3 N
11. Display books, periodicals, etc. 1 2 3 N
12. Display pupil projects 1 2 3 N
13. Repair books 1 2 3 N
14. Bind books 1 2 3 N
15. Catalog library materials 1 2 3 N
16. Store the following types of materials for ready use by pupils and teachers
   a. Books 1 2 3 N
   b. Periodicals 1 2 3 N
   c. Encyclopedias 1 2 3 N
   d. Atlases and dictionaries 1 2 3 N
   e. Films, film strips, and slides 1 2 3 N
   f. Maps 1 2 3 N
   g. Globes 1 2 3 N
   h. Recordings 1 2 3 N
   i. Other ____________________________________________ 1 2 3 N
17. Store projectors

18. Hold meetings

Are there any other activities which entire classes, small groups of five or six pupils, individual pupils, or other groups will carry on that will require special planning? If so, list those activities along with adequate explanation to enable the architect to develop plans.

B. Indicate the extent to which the following rooms will be used in the library suite.

1. Library reading rooms

2. Auxiliary rooms
   a. Librarians' offices
   b. Workrooms
   c. Conference rooms
   d. Library classrooms
   e. Stackrooms
   f. Film or slide library or storage rooms
   g. General teaching aids storage rooms
   h. Audio-visual aids storage rooms
   i. Audio-visual aids equipment storage rooms
   j. Film or slide previewing rooms
   k. Museum rooms
   l. Listening rooms
   m. Storage rooms

Suggest other types of rooms or spaces needed.
C. For each of the rooms listed in Item B that is needed in the library suite, provide the information requested below.

**Library Reading Rooms**

1. Total library reading room capacity should be adequate to accommodate what percent of the total school enrollment? _____ percent

   Comments:

2. Maximum number to be accommodated in each reading room. ____ pupils

   Comments:

3. Number of reading rooms to be planned _____

4. Indicate the activities for which these rooms should be planned.

5. Indicate the extent to which the following types of furniture and equipment will be used in the library reading room and suggest any special information which the architect should know about the various items.

   a. Charging desk 1 2 3 F
   b. Librarian's work table 1 2 3 F
   c. Librarian's desk 1 2 3 N
   d. Card catalog trays 1 2 3 N
      Number of trays _____
   e. Reading tables 1 2 3 N
      Number of tables _____, dimensions of tables _____
f. Conference tables
   Number of tables _____, dimensions of tables _____

  g. Chairs
   Number of chairs _____

  h. Book trucks
   Number of trucks _____

  i. Stands for dictionaries, atlases, etc.
   Number of stands _____

  j. Racks for newspapers
   Number of racks _____

  k. Racks or shelves for periodicals
   Number of racks or shelves _____

  l. Tackboard
   Linear feet _____

  m. Display cases
   Comments:

Suggest other types of furniture and equipment needed.

Comments:

6. Indicate the extent to which the following types of storage
   facilities will be used in the library reading room and suggest
   types, dimensions, and quantities of materials to be stored.

  a. Filing drawers
     Number of drawers _____, size of drawers _____
     Number of drawers _____, size of drawers _____
### Comments:

#### b. Bookshelving

1) Open shelving  
   Linear feet ______

2) Closed shelving  
   Linear feet ______

#### Comments:

#### c. Cabinets to store teaching aids such as:

1) Maps  
   1 2 3 N

2) Charts  
   1 2 3 N

3) Globes  
   1 2 3 N

4) Films  
   1 2 3 N

5) Slides  
   1 2 3 F

6) Recordings  
   1 2 3 F

7) Other ____________________________  
   1 2 3 F

#### d. Storage for librarian's personal belongings  
   1 2 3 F

Suggest other types of storage needed.
7. Suggest floor area needed for the reading rooms or suggest factors which should determine the area needed (see directions, Pamphlet C-1).

Square feet ______

Comments:

8. Indicate any additional information which the architect should know to aid in planning this type of facility.

Auxiliary Rooms

1. For each of the auxiliary rooms listed in Item B that is needed in the library suite, provide the information requested below. Identify each room by indicating the use for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one use. Identify each room of this type by a phrase which suggests the uses for which it is to be planned—for example, librarian's office and workroom.

a. Type of room to be planned ____________________________

1) Number of rooms of this type to be planned _____

2) Indicate the activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.
5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-l).

   Square feet ____

   Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.

b. Type of room to be planned __________________________

   1) Number of rooms of this type to be planned _____

   2) Indicate the activities or uses for which these rooms are to be planned.

   3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

   4) Indicate types of furniture and equipment to be provided for this type of room.
5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.

c. Type of room to be planned ________________

1) Number of rooms of this type to be planned _____

2) Indicate activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.
5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ______

Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.

d. Type of room to be planned ______

1) Number of rooms of this type to be planned ______

2) Indicate activities or uses for which these rooms are to be planned.

3) Suggest desired locations for these rooms or suggest factors which should determine their locations.

4) Indicate types of furniture and equipment to be provided for this type of room.
5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed for this type of room or suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square feet ______

   Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.

D. In the space provided below, indicate any additional information about the library rooms or program which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

E. Indicate factors which the architect should take into consideration when planning the location of the library. Include factors such as accessibility from other portions of the building and isolation from noises.
F. Summarize rooms and spaces needed in the library suite.

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A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-19
MISCELLANEOUS FACILITIES

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet C-19

MISCELLNEOUS FACILITIES

In this pamphlet, provision is made to provide information on various facilities not included in the preceding pamphlets in the C-series.

Facilities Included in This Pamphlet

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| B. Homerooms | 6 |
| C. Rooms for study | 6 |
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| O. Site | 37 |
| P. Summary of rooms and spaces | 39 |
A. **Health Service Facilities**

1. Indicate the extent to which the following activities will be carried on in the health service rooms.

   a. Examinations by:
      
      1) Nurses
      1 2 3
      
      2) Doctors
      1 2 3
      
      3) Dentists
      1 2 3
      
      4) Psychiatrists
      1 2 3
      
      5) Other ____________________________
      1 2 3

   b. Vision tests
      1 2 3

   c. Hearing acuity tests
      1 2 3

   d. Emergency treatment of injured personnel
      1 2 3

   e. Isolation of pupils who become ill
      1 2 3

   f. Rest for pupils who are ill or are recuperating
      1 2 3

   g. Administration of immunizations and vaccinations
      1 2 3

   h. Dental work
      1 2 3

   i. Health counseling with pupils and parents
      1 2 3

   j. Health education meetings for parents
      1 2 3

   Suggest other types of activities.

2. Indicate the extent to which each of the following factors should be considered in planning the location of the health service rooms.

   a. In an area which is free from excessive noises
      1 2 3

   b. Near the physical education facilities
      1 2 3

   c. In an area so that the general office waiting room can be shared
      1 2 3

   Suggest other factors.

---

\(^1\) See Pamphlets C-11 and C-15
3. Indicate the extent to which each of the following health service facilities will be used.

a. Waiting room
b. Dental health room
c. Nurse's office
d. Doctor's office
e. Record room
f. Dressing cubicles
   Number of cubicles ______

g. Rest or isolation cubicles
   Number of cubicles ______
h. Health education classroom
i. Conference room

Suggest other facilities needed.

4. For each of the different types of rooms needed for the health service suite, provide the information requested below. Identify each different room by indicating the uses for which it is to be designed—for example, office for doctor and nurse.

a. Type of room to be planned ___________________________

1) Number of rooms of this type to be planned ______

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.
b. Type of room to be planned

1) Number of rooms of this type to be planned

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

c. Type of room to be planned

1) Number of rooms of this type to be planned

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

5. Indicate what uses will be made of the health service rooms during vacation periods.
6. Indicate any additional information about any aspect of the health service program or rooms which the architect should know to aid in planning these rooms.

B. Homerooms

1. Making provisions to house homeroom groups is a problem in planning a secondary school building. Since pupils occupy homerooms only a portion of the school day, a very low percent of room utilization results if extra rooms are provided primarily to house homeroom groups. The impracticability of constructing rooms wholly for this purpose suggests that some special rooms or teaching stations which are not of the academic type be used as homerooms.

Indicate the degree of preference for rooms or teaching stations to be used as homerooms.

a. Academic classrooms or teaching stations P A N A

b. Special teaching stations

1) Agriculture classroom P A N A

2) Art studios P A N A

3) Home economics laboratories, specify which ones P A N A

4) Science laboratories, specify which ones P A N A

5) Shops, specify which ones P A N A

6) Typing classrooms P A N A

7) Other business education classrooms P A N A

8) Study rooms P A N A

9) Library P A N A

10) Lunchroom P A N A

11) Auditorium P A N A

Suggest other rooms which should be planned for homeroom purposes.

2. Indicate desired homeroom enrollments:

a) Average _____ b) Maximum _____
3. Indicate any special considerations which the architect should know to aid in planning the rooms to be used for homeroom purposes.

C. Rooms for Study

1. Study hall capacity needed (see Pamphlet B-2), ___ pupils

2. Indicate the degree of preference for each of the following rooms for study purposes.

   a. Academic classrooms

   b. Lunchroom

   c. Library reading room

   d. Special study rooms

   e. Auditorium (if adequately equipped and lighted)

   f. Other _______________  

   Comments: 

3. If special rooms are to be provided for study purposes, indicate the number of rooms to be provided for this use, maximum number of pupils to be accommodated in each room, factors which should determine the locations of study rooms, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the floor area needed, and other pertinent information which the architect should know.
4. If rooms in the building are to serve as study rooms in addition to housing some other activities, indicate which rooms or which types of rooms are to serve in such a capacity and indicate any special considerations such as special furniture and equipment needed for study purposes which the architect should know to aid in planning.

D. Facilities for Exceptional Children

1. Indicate the extent to which special facilities are needed for each of the following types of exceptional children.

   a. Crippled children 1 2 3 F
   b. Children with defective hearing 1 2 3 F
   c. Children with defective vision 1 2 3 F
   d. Children with defective speech 1 2 3 F
   e. Delicate children 1 2 3 F
   f. Slow-learning children 1 2 3 F
   g. Socially handicapped children 1 2 3 F
   h. Gifted children 1 2 3 F

   Suggest others for which special facilities are needed.

2. For each of the different types of exceptional children for whom special facilities are needed, provide the information requested below. Identify each different type of facility needed by indicating the types of exceptional children for whom it is to be planned.

   a. Type of facility to be planned ______________________

      1) Number of pupils to be accommodated _____

      2) Indicate activities or uses for which this facility is to be planned.
3) **Suggest factors which should determine the location of this facility.**

4) **Indicate types of furniture and equipment to be provided for these pupils.**

5) **Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.**

6) **Suggest floor area needed or suggest factors which should determine the area (see directions, Pamphlet C-1).**

   **Square feet ______**

   **Comments:**

7) **Indicate any additional information which the architect should know to aid in planning this type of facility.**

b. **Type of facility to be planned ________________________________**

   1) **Number of pupils to be accommodated ______**

   2) **Indicate activities or uses for which this facility is to be planned.**

   3) **Suggest factors which should determine the location of this facility.**
4) Indicate types of furniture and equipment to be provided for this facility.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed or suggest factors which should determine the area (see directions, Pamphlet C-1).

Square feet ____

Comments:

7) Indicate any additional information which the architect should know to aid in planning this type of facility.

c. Type of facility to be planned ____________________________

1) Number of pupils to be accommodated ____

2) Indicate activities or user for which this facility is to be planned.

3) Suggest factors which should determine the location of this facility.
4) Indicate types of furniture and equipment to be provided for this facility.

5) Indicate types, dimensions, and quantities of materials to be stored and types of storage needed.

6) Suggest floor area needed and suggest factors which should determine the area (see directions, Pamphlet C-1).

   Square feet _____

   Comments:

7) Indicate any additional information which the architect should know to aid in planning this facility.

E. Special Activity or Service Facilities for Pupils

   1. Activity facilities

   a. Indicate the extent to which the following types of activities will be carried on by pupils. In the space under the various items, indicate where these activities are to be accommodated.

   1) Carry on pupil governmental activities

   2) Prepare school annual for publication

   3) Prepare school newspaper for publication

   4) Sell school supplies for pupil use
5) Hold club meetings

6) Carry on social activities such as:
   a) Dances
   b) Parties
   c) Other ________________

7) Prepare and serve simple refreshments

8) Sell tickets to pupil activities

Suggest other activities which pupils will carry on that will require special planning and indicate where they will be carried on.

b. For each of the special rooms needed for the pupil activities listed in Item a, provide the information requested below. Identify each room by indicating the uses for which it is to be designed. In many instances, it may be desirable to provide rooms which are to serve more than one use. Identify each room of this type by a phrase which suggests the uses for which it is to be planned—for example, club meeting and pupil government court room.

1) Type of room to be planned _______________________
   a) Number of rooms of this type to be planned _____

   b) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know. (Use space provided on next page)
2) Type of room to be planned ________________________
   a) Number of rooms of this type to be planned _____
   b) Indicate activities or uses for which these rooms should
       be planned, factors which should determine their loca-
       tions, furniture and equipment to be provided, types
       of storage needed or types of materials to be stored,
       factors which should determine the area needed, and
       other pertinent information which the architect should
       know.

3) Type of room to be planned ________________________
   a) Number of rooms of this type to be planned _____
   b) Indicate activities or uses for which these rooms should
       be planned, factors which should determine their loca-
       tions, furniture and equipment to be provided, types
       of storage needed or types of materials to be stored,
       factors which should determine the area needed, and
       other pertinent information which the architect should
       know.
c. In the space provided below, indicate any additional information about any aspect of the special activity program or rooms which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect.

2. Service facilities

a. Storage for pupils' personal belongings

1) Indicate the degree of preference for each of the following facilities to be provided for storage of pupils' personal belongings.

a) Hooks and open shelves

   (1) Desired locations
   ___ (a) In corridors
   ___ (b) In rooms used as homerooms
   ___ (c) Other ______________________

   (2) Indicate any special considerations which the architect should know to aid in planning these facilities.

b) Home lockers

   (1) Desired locations
   ___ (a) In homerooms
   ___ (b) In small alcoves along corridors
   ___ (c) In available corridor walls
   ___ (d) In corridor walls adjacent to homerooms
   ___ (e) Other ______________________

   (2) Number of lockers to be provided

   (a) In immediate construction, _____ lockers
   (b) For later installation, _____ lockers
(3) Indicate the dimensions of the lockers.

(4) Check the type of lock to be provided.

   ____ (a) None
   ____ (b) Padlock, key type
   ____ (c) Padlock, combination type
   ____ (d) Built-in, key type
   ____ (e) Built-in, combination type
   ____ (f) Other ____________________

(5) If locks are to be provided are they to be master keyed?

   Yes _____, No _____

   c) Other ____________________

   d) Indicate any additional information which the architect should know to aid in planning the facilities for the storage of pupils' personal belongings.

b. Indicate any special areas of the building not covered in other pamphlets where drinking fountains are needed.

c. Indicate any special areas of the building not covered in other pamphlets where first aid equipment should be provided.

d. Should an elevator be provided for pupil use?

   Yes _____, No _____

Comments:
e. In the space provided below, indicate any additional information about any aspect of the pupil service facilities which the architect should know to aid in planning these facilities.

F. Special Service Facilities for the Staff

1. Indicate the extent to which the following types of activities will be carried on by teachers. In the space under the various items, indicate where these activities are to be accommodated.

a. Carry on private conferences with individual pupils 1 2 3 N

b. Confer with five or six pupils 1 2 3 N

c. Carry on staff conferences on school problems 1 2 3 N

d. Confer with citizens on school or community problems 1 2 3 N

e. Do routine clerical work 1 2 3 N

f. Check pupil projects or papers 1 2 3 N

g. Receive written house communications and mail 1 2 3 N

h. Prepare for class activities 1 2 3 N

i. Rest or relax at noon or during non-teaching periods 1 2 3 N

j. Store active pupil records 1 2 3 N

k. Store personal belongings 1 2 3 N

l. Store monies or valuables belonging to school organizations 1 2 3 N

Suggest other special staff activities that will require special planning to accommodate them and indicate where accommodations are to be provided for them. (Use space provided on next page)
b. For each type of special room needed to accommodate special staff activities, provide the information requested below. Identify each different room by a phrase which indicates the uses for which it is to be designed—for example, instructors' offices and conference rooms (one for every three academic type classrooms, each to accommodate four instructors), teachers' workroom, or teachers' restrooms (one for each sex).

1) Type of room to be planned ____________________________
   a) Number of rooms of this type to be planned _____
   b) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

2) Type of room to be planned ____________________________
   a) Number of rooms of this type to be planned _____
   b) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know. (Use space provided on next page)
3) Type of room to be planned ____________________________

a) Number of rooms of this type to be planned ____

b) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

c. Indicate any information such as locations, fixtures to be provided, type of storage facilities needed, and number of toilet rooms to be provided which the architect should know to plan toilet facilities for staff members.

d. In the space provided below, indicate any additional information about any aspect of the special service facilities for teachers which the architect should know to aid in planning these rooms. Schematic diagrams or pictures may also be of value to suggest desirable features to the architect. (Use space provided on next page)
6. Building Service Facilities

1. Indicate the extent to which it is desirable to plan building service facilities such as the heating plant as a laboratory for study and work experiences.

2. Indicate the extent to which the following building service facilities will be needed.
   a. Heating plant
      1) Central heating plant
      2) Other type of heating facilities, specify
   
   b. Fuel storage room

   c. Ash storage room

   d. Fan room

   e. Meter room

   f. Switchboard room

   g. Storage room for custodial supplies

   h. Storage rooms for custodial and engineering equipment

   i. Storage rooms for cleaning supplies and equipment

   j. Utility or sink closets

   k. Custodians' workshop

   l. Custodians' office

   m. Custodians' dressing-locker facilities

   n. Lunchroom for custodial workers

   o. Receiving and shipping room

   p. Garden tool storage
3. For each of the different types of rooms needed for the building service facilities, provide the information requested below. Identify each different room by indicating the uses for which it is to be designed—for example, receiving and storage room.

a. Type of room to be planned ______________________________

1) Number of rooms of this type to be planned ______

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

b. Type of room to be planned ______________________________

1) Number of rooms of this type to be planned ______

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.
c. Type of room to be planned

1) Number of rooms of this type to be planned

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

d. Type of room to be planned

1) Number of rooms of this type to be planned

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

e. Type of room to be planned

1) Number of rooms of this type to be planned

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage
facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

f. Type of room to be planned ____________________________

1) Number of rooms to be planned ______

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

g. Type of room to be planned ____________________________

1) Number of rooms of this type to be planned ______

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know. (Use space provided on next page)
h. Type of room to be planned ____________________________

1) Number of rooms of this type to be planned _____

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

i. Type of room to be planned ____________________________

1) Number of rooms to be planned _____

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.
4. Indicate the extent to which each of the following facilities will be needed.

a. Elevators
   1) Freight
   2) Passenger
   3) Other

b. Incinerator

Comments:

5. Indicate any additional information which the architect should know to aid in planning the building service facilities.

H. Special Audio-Visual Education Facilities

1. Indicate where the following activities will be carried on.

   a. Small groups of pupils or teachers preview projected materials

   b. Individuals listen to recordings

   c. Small groups of pupils or teachers listen to recordings

   d. Teachers prepare audio-visual aids such as slides, maps, charts, etc.

   e. Pupils prepare audio-visual aids

   f. Record individual voices

   g. Record group discussions
2. If any special rooms are needed for the audio-visual education program, provide the information requested below. Identify each room by indicating the uses for which it is to be designed—for example, film and projector storage room.

a. Type of room to be planned ____________________________

1) Number of rooms of this type to be planned ______

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know. (Use space provided on next page)
b. Type of room to be planned __________________________

1) Number of rooms of this type to be planned _____

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.

c. Type of room to be planned __________________________

1) Number of rooms of this type to be planned _____

2) Indicate activities or uses for which these rooms should be planned, factors which should determine their locations, furniture and equipment to be provided, types of storage facilities needed or types of materials to be stored, factors which should determine the area needed, and other pertinent information which the architect should know.
I. Communication Systems

1. If room communication facilities are needed, check the type preferred.

__ a. Central public address system
   __ 1) One-way system
   __ 2) Two-way system
      __ a) With monitoring tone signal audible in classroom being monitored
      __ b) With origination of communications from classrooms controlled from classrooms

__ b. Room telephone system
   __ 1) For communication between any classroom and office
   __ 2) For communication between any one room and any other room in the building

__ c. One-way public address system and room telephones

__ d. Other __________________________

Comments:

2. Indicate the rooms to be equipped with communication facilities and the type of facilities needed by checking in the appropriate columns at the right.

<table>
<thead>
<tr>
<th>Rooms</th>
<th>P. A. system</th>
<th>Room telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. All offices</td>
<td>__________</td>
<td>__________</td>
</tr>
<tr>
<td>b. All classrooms, laboratories, and shops</td>
<td>__________</td>
<td>__________</td>
</tr>
<tr>
<td>c. Auditorium</td>
<td>__________</td>
<td>__________</td>
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<tr>
<td>d. Gymnasium</td>
<td>__________</td>
<td>__________</td>
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<tr>
<td>e. Storage rooms</td>
<td>__________</td>
<td>__________</td>
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<td>f. Boiler room</td>
<td>__________</td>
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<tr>
<td>g. Custodian's office</td>
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<tr>
<td>h. Lunchroom manager's office</td>
<td>__________</td>
<td>__________</td>
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<tr>
<td>i. Teachers' lounges</td>
<td>__________</td>
<td>__________</td>
</tr>
</tbody>
</table>
Suggest other rooms or spaces to be equipped with communication facilities

Comments:

3. Indicate the factors which should determine the location of each of the following:
   a. Public-address system control panel
   b. Telephone switch board

4. Indicate the extent to which central public address system microphone outlets are needed in the following locations.
   a. Principal's office 1 2 3 F
   b. Public address system control room 1 2 3 N
   c. Conference room in the administrative suite 1 2 3 N
   d. Music studio 1 2 3 N
   e. Auditorium 1 2 3 N
   f. Gymnasium 1 2 3 N
   g. Speech or dramatics classrooms 1 2 3 N
   h. Dining room 1 2 3 N
   i. Outside the building 1 2 3 N

Locations

Suggest other rooms or spaces where microphone outlets are needed.

Comments:
5. Indicate the extent to which outside or public telephones will be used in the following rooms.

a. General office 123 N
b. Principal's office 123 N
c. Dean of boys' office 123 N
d. Dean of girls' office 123 N
e. Athletic director's office 123 N
f. Nurse's office 123 N
g. Lunchroom manager's office 123 N

Suggest other rooms where telephones are needed.

Comments:

6. If public telephone pay stations are needed in the building, indicate factors which should determine where they should be located.

7. Indicate the degree to which it is essential to provide each of the following additional communication systems.

a. Fire alarm system 123 N
b. Fire department alarm system 123 N
c. Sprinkler alarm system 123 N
d. Electric clock system 123 N

1) List rooms or spaces to be provided with electric clocks.
e. Electric program system

1) Indicate rooms or spaces to receive the program signal and whether the signal device is to be a chime, buzzer, bell, or other type.

f. Door bell indicator system

1) List entrances to be equipped with push buttons and designate where the indicators from each entrance are to be located such as main entrance indicator in principal's office or service entrance indicator in custodian's office. Are cut-off switches to be provided? Yes ___, No ___

8. Indicate any additional information which the architect should take into consideration when planning the communication facilities.

J. Corridors

1. The following items reflect some purposes for which building corridors may be designed. Indicate the degree of preference for each as a factor to be considered in planning the corridors.

a. Corridors which serve as circulation arteries from one area of the building to a second  P A N A

b. Corridors which serve as circulation arteries as well as areas in which pupils can enhance learning opportunities through group experiences and through conversational exchanges around exhibited materials  P A N A

c. Other ____________________________________________________________________ P A N A
2. Indicate the extent to which each of the following types of display facilities will be used in building corridors and indicate special considerations such as locations, dimensions, etc., which the architect should know to aid in planning these facilities.

a. Tackboard
   Comments:

b. Glass protected tackboard
   Comments:

c. Exhibit cases at the main entrances
   Comments:

d. Exhibit cases so located that in effect the classrooms are extended into the corridor
   Comments:

Suggest other types of display facilities needed.

3. Indicate the extent to which it is desirable to make provisions for each of the following in the corridors.

a. Pictures to be hung on the walls
   Comments:

b. Murals to be painted on the walls
   Comments:

c. Placques to be hung on the walls
   Comments:

d. Statues
   Comments:

e. Other ____________________________
   Comments:
4. Indicate any additional information which the architect should know to aid in planning the corridors.

X. Toilet Facilities for Pupil and Public Use

1. Indicate the extent to which it is necessary to plan toilets in the following locations.

   a. One pupil toilet for each sex on each floor

   b. A number of relatively small pupil toilet rooms for each sex located on each floor in areas convenient to pupils

   c. Toilets for each sex for public use accessible from the following rooms:
      1) Auditorium
      2) Gymnasium
      3) Library
      4) Cafeteria
      5) Other

   d. For public use locate pupil toilets accessible from the following rooms:
      1) Auditorium
      2) Gymnasium
      3) Library
      4) Cafeteria
      5) Other

2. Indicate the extent to which the following items should be considered in planning toilet rooms for pupil or public use.
a. Stalls with doors
b. Stalls without doors
c. Some stalls with doors and remainder without doors
   Number of stalls with doors _______
d. Hooks on which to hang clothes in each stall
e. Small shelves for paraphernalia in each stall
f. Soap containers in each lavatory for:
   1) Bar soap
   2) Liquid soap
   3) Other ____________________________
g. Paper towel dispensers at each lavatory
h. Receptacles for used towels
   1) Built-in receptacles
   2) Movable containers
   3) Other ____________________________
i. Mirrors
   1) Full length mirror in each girls’ toilet
   2) Mirrors with shelves underneath in all toilet rooms
   3) Mirrors located away from lavatories to reduce crowding and clogging of drains with hair and other debris
j. Floor drains
k. Hot and cold running water available from hose bib to aid in washing down floor
l. Other ____________________________
3. Indicate any information which the architect should know about fixtures to be provided in the toilet rooms and desired locations for the fixtures in the rooms.

4. Indicate the types of floor, wainscoting, wall, and ceiling finishes desired.

5. Indicate storage facilities needed for cleaning equipment, supplies, etc.

6. Indicate any special considerations about toilet facilities which the architect should know to aid in developing plans for these facilities.

I. Special or Auxiliary Heating and Ventilating Facilities

1. Indicate the extent to which the following heating provisions are needed:
   a. Warm floors in dressing-locker, shower, and body drying rooms
   b. Provisions so that one or more of the following facilities can be heated during out-of-school hours without heating the remainder of the building
      1) Administrative suite (see Pamphlet C-15)
      2) Auditorium (see Pamphlet C-16)
      3) Dining room (see Pamphlet C-17)
      4) Kitchen (see Pamphlet C-17)
      5) Gymnasium and auxiliary rooms (see Pamphlet C-11)
      6) Swimming pool (see Pamphlet C-11)
      7) Library and auxiliary rooms (see Pamphlet C-18)
8) Music studios (see Pamphlet C-10)
9) Shops (see Pamphlets C-1, C-7, and C-14)
    Specify which shops
10) Agriculture rooms (see Pamphlet C-1)
11) Planting areas (see Pamphlet C-12)
12) Greenhouse (see Pamphlet C-12)
13) Animal rooms (see Pamphlet C-12)
14) Other

Comments:

c. Suggest any other special factors concerning heating which
   the architect should take into consideration in planning
   this building.

2. Indicate the extent to which special or additional means of
   ventilating the following rooms will be needed. In the space
   provided under the various items, indicate any special con-
   siderations which the architect should know to aid in planning
   the facilities needed for auxiliary ventilation.

   a. Cafeteria kitchen (see Pamphlet C-17)
   b. Cafeteria dry storage room (see Pamphlet C-17)
   c. Foods laboratory (see Pamphlet C-6)
   d. Dressing-locker rooms (see Pamphlet C-11)
   e. Activity or gym clothes lockers (see Pamphlet C-11)
f. Shower and body drying rooms (see Pamphlet C-11) 1 2 3 N

g. Equipment drying rooms (see Pamphlet C-11) 1 2 3 N

h. Science laboratories (see Pamphlet C-12) 1 2 3 N

i. Shops (see Pamphlets C-1, C-7, and C-14) 1 2 3 N

Specify which shops ______________________________

Suggest other rooms where special ventilating facilities will be needed.

3. Indicate any additional information which the architect should know to aid in planning the facilities needed for heating and ventilating purposes.

M. Community Use of the Building

1. Indicate the extent to which the following rooms or spaces will be used by the community.

   a. Agriculture shops 1 2 3 N

   b. Art studios 1 2 3 N

   c. Academic classrooms 1 2 3 N

   d. Home economics laboratories 1 2 3 N

   e. Industrial arts shops 1 2 3 N

   f. Science laboratories 1 2 3 N

   g. Vocational industrial education shops 1 2 3 N

   h. Library 1 2 3 N
Suggest other rooms or spaces the community will use.

2. If the uses which the community will make of the various rooms or spaces in the building will require special considerations in planning and they have not been treated elsewhere in this manual, indicate these special considerations in the appropriate pamphlets. This information should be listed in connection with the item provided for additional information found in the concluding pages of the various pamphlets. For instance, if community groups will make use of the photographic studio and darkroom in the art suite and special storage facilities are needed to accommodate equipment, indicate that information on pages 10 to 14 of Pamphlet C-3.

3. If the building is to serve all members of the school community, indicate any special provisions such as toilet and drinking facilities scaled down in size for use by young children, etc., which should be provided. Include adequate information to aid the architect to plan these special facilities.

N. Cleaning Systems

1. Indicate the extent to which the following types of cleaning systems will be used.

   a. Central vacuum cleaning system 1 2 3 F

   b. Portable vacuum cleaners 1 2 3 F

   c. Other __________________________ 1 2 3 F

Comments:
0. **Site**

1. Indicate the extent to which it is necessary to make provisions for each of the following in addition to the main buildings in planning the site.

   a. Building areas

      1) Bus garage
      2) Buildings for agriculture purposes
      3) Greenhouses
      4) Field house
      5) Stadium
      6) Outdoor swimming pool
      7) Buildings for storage of maintenance supplies and equipment
      8) Shelter house
      9) Bicycle shelter
     10) Flag staff
     11) Areas for building expansion

     Suggest other building areas needed.

   b. Service and building auxiliary areas

      1) Sidewalks for pedestrians
      2) Bus loading and unloading areas

         a) Open loading and unloading areas
            Number of buses to be accommodated

         b) Covered loading and unloading docks
            Number of buses to be accommodated

         c) Other
            Number of buses to be accommodated

      3) Separate bicycle approach
      4) Bicycle parking area
5) Automobile driveways
6) Service drives and loading areas
7) Sanitation facilities, filtration bed, etc.
8) Auto parking areas
   a) For school patrons who will visit building during school day
       Number of cars ______________
   b) For members of the school staff
       Number of cars ______________
   c) For pupils
       Number of cars ______________
   d) For auditorium, gymnasium, and outdoor events
       Number of cars ______________
   e) Other

Suggest other areas needed.

c. Outdoor educational areas
1) Terraces adjacent to ground floor classrooms
2) Shop areas adjacent to shop units (see Pamphlets C-2 and C-7)
3) Fertility garden areas (see Pamphlets C-2 and C-12)
4) Future study areas (see Pamphlet C-12)
5) Areas for agriculture projects (see Pamphlet C-2)
6) Driver education areas (see Pamphlet C-5)
7) Areas for aviation projects
8) Areas for science education (see Pamphlet C-12)
9) Areas for physical education and recreation
    (see Pamphlet C-11)

Suggest other areas needed.
2. Suggest any additional information which the architect should know to aid in planning the site.

P. Summarize rooms and spaces needed for miscellaneous facilities.

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Number of rooms</th>
<th>Suggested floor area per room (sq. ft.)</th>
<th>Page in pamphlet</th>
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<td>a.</td>
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A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

SUMMARY

Pamphlet D-1

The Bureau of Educational Research
The College of Education
The Ohio State University
Columbus, Ohio
Pamphlet D-1

SUMMARY

Contents

Directions for completing Table 1, Summary of rooms and spaces 2
Table 1, Summary of rooms and spaces 3
Directions for completing Table 2, Summary of outdoor facilities 6
Table 2, Summary of outdoor facilities 6
Directions for developing the brief descriptions of rooms and spaces and outdoor facilities 8
Miscellaneous suggestions 8
Form 4 9
Form 5 11
Form 6 12
Pamphlet D-1 is designed to serve three purposes: (1) to provide tables for summarizing the numbers and types of rooms and outdoor facilities to be provided in the new plant, (2) to provide forms in which to compile the descriptions of the rooms and the outdoor facilities, and (3) to provide a form in which to list miscellaneous suggestions not included in other portions of the manual. The completed Pamphlet D-1 in effect constitutes the educational specifications. Sufficient copies of this manual should be filled out so that at least one copy can be retained by the general committee and one copy can by transmitted to the architect. The general committee should be responsible for completing this pamphlet.

Directions for Completing Table 1, Summary of Rooms and Spaces

The data for this summary can be obtained from the summaries in Pamphlets C-2 through C-19. The table is to be completed in accordance with the following directions:

Column 1 - Type or use of room — In this column record by type or use the various rooms needed in the new building as summarized in the pamphlets mentioned above. List each type of room separately in the order in which each occurs in the individual pamphlets.

Column 2 - Pamphlet number — Record in this column the number of the pamphlet which contains data on each room such as C-10 for music rooms.

Column 3 - Page in pamphlet — In this column list the page number in the pamphlet on which data concerning each room are recorded or, if the data are recorded on a series of pages, list only the number of the first page in the series.

Column 4 - Number of rooms in initial construction — In Column 4, record the number of rooms of each type to be included in initial construction.

Column 5 - Additional rooms to be provided in future expansion — Record in this column the number of additional rooms of each type to be provided in future expansion. The number of additional teaching stations needed can be obtained from Form 3, Pamphlet B-2. The architect's preliminary plans should show the locations of these additional rooms so a more functional relationship among rooms is likely when an addition is made to the building.

Note: It is likely that some facilities such as the cafeteria kitchen should be planned at
the beginning with sufficient capacity to accommodate the ultimate enrollment.

Column 6 - Suggested floor area per room — Record in this column the suggested floor area for each room.

Table 1
SUMMARY OF ROOMS AND SPACES

<table>
<thead>
<tr>
<th>Type or use of room</th>
<th>Pamphlet number</th>
<th>Page in pamphlet</th>
<th>Number of rooms in initial construction</th>
<th>Additional rooms to be provided in future expansion</th>
<th>Suggested floor area per room (sq. ft.)</th>
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<tbody>
<tr>
<td>1.</td>
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**Summary of Rooms and Spaces**

*Table 1 (continued)*

- 719 -
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<tr>
<td>Suggested floor area per room</td>
<td>Additional rooms to be provided in future expansion</td>
<td>Number of rooms in initial construction</td>
<td>Page in pamphlet</td>
<td>Pamphlet number</td>
<td>Type of use of room</td>
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**Summary of Rooms and Spaces**

Table I (continued)
Directions for Completing Table 2, Summary of Outdoor Facilities

The data for the summary can be obtained from Pamphlets C-2 through C-19. This table is to be completed in accordance with the following directions:

Column 1 - Type of facility -- In this column record by type the various outdoor facilities needed. List each type of facility separately in the order in which it occurs in the individual pamphlets.

Column 2 - Pamphlet number -- Record in this column the number of the pamphlet which contains data on each facility such as C-2 for agriculture facilities.

Column 3 - Page in pamphlet -- In this column, list the page number in the pamphlet on which data concerning each facility are recorded or, if the data are recorded on a series of pages, list only the number of the first page in the series.

Table 2

SUMMARY OF OUTDOOR FACILITIES

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Pamphlet number</th>
<th>Page in pamphlet</th>
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**SUMMARY OF OUTDOOR FACILITIES**

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<th>Type of facility</th>
<th>Pamphlet number</th>
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</table>
Directions for Developing the Brief Descriptions of Rooms and Outdoor Facilities

Forms 4 and 5 are to be used by the general committee in summarizing the data contained in the pamphlets in the C-series. A separate sheet should be used for each room or facility. These sheets should be attached to this pamphlet as a part of the educational specifications. As the general committee members prepare these descriptions, they should eliminate any inconsistencies which may appear in the information contained in the pamphlets in the C-series. The completed summaries and descriptions should be returned to the special committees for analysis and for reconciliation of the information contained in the C and D pamphlets. The data in the various pamphlets must be in agreement before they are transmitted to the architect.

In the preparation of these descriptions, it is suggested that the general committee be as brief as possible without sacrificing clarity and completeness.

Copies of these forms are available at the Bureau of Educational Research, The Ohio State University, or they may be prepared locally in this same form or in a modified form adjusted to the needs of the particular project.

Miscellaneous Suggestions

Form 6 is for listing miscellaneous suggestions which have not been covered in other portions of the manual. The following examples are illustrative:

1. Special groupings of rooms to achieve a particular purpose.

2. Suggested wall finishes, flooring surfaces, wainscoting, and similar features.

3. Special considerations to be given to lighting, ventilation, acoustics, and factors dealing with health, safety, and sanitation.

4. Undesirable building features to be avoided.

If more space is needed than is provided on this form, attach additional sheets to this pamphlet as a part of the educational specifications.
BRIEF DESCRIPTION OF ROOM

1. Type or use of room ________________________________

2. If this room is a part of a suite or a series of rooms which are to be grouped together, indicate the groups or series of which it is a part. ________________________________

3. Pamphlet in which facility is described, Pamphlet C—____.

4. Number of rooms of this type to be planned ____.

5. Activities for which this room will generally be used

6. Preferred location of room in building

7. Desired amount and preferred location of chalkboard

8. Desired amount and preferred location of tackboard

9. Amount and description of furniture and equipment preferred

10. Kinds of utilities and desired locations
11. Types of materials to be stored and desired locations of storage facilities

12. Suggested floor area per room, ______ square feet.

13. Other information which the architect should know about this type of room.
BRIEF DESCRIPTION OF OUTDOOR FACILITY

1. Type or use of facility ______________________________________

2. Pamphlet in which facility is described, Pamphlet C-_____

3. Activities for which this facility will generally be used

4. Preferred location of facility on site

5. Characteristics of facility

6. Other information which the architect should know about this facility
MISCELLANEOUS SUGGESTIONS
Form A

The Bureau of Educational Research
The College of Education
The Ohio State University

INQUIRY ON A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

On the basis of the portion of the manual on planning a secondary school building that you have used, provide the information requested below.

1. What advantage do you see in having a staff participate in the planning of a school building?

2. What disadvantages do you see in such a procedure?

3. Would this type of instrument help you as a school administrator to do the educational planning for a secondary school building?

Comment:

a. What difficulties do you envision that the staff will have in using an instrument of this type?
b. What difficulties do you envision that the administrator will have in using an instrument of this type?

4. In what ways did this instrument give too much direction or emphasis or too many suggestions? Reference to a particular section would be helpful.

5. In what ways is this instrument inadequate in providing a proper amount and kind of directions or suggestions?
In connection with each of the five sections below check the item which reflects your experience with the portion of the manual you used. Please include any comments which will help to clarify your response or which may be helpful in revising the manual.

1. To what extent does the pamphlet you used enable you to provide for the architect the information which you think he should know about the educational program?

   ____ little, ____ some, ____ much

   Comments:

2. Indicate the extent to which the instructions in the pamphlet and the accompanying pamphlet of directions were easily understood.

   ____ easy to understand
   ____ some difficulty in understanding
   ____ difficult to understand

   If there were sections that seemed particularly difficult to understand, please explain in the space below the difficulties encountered.
3. To what extent is the pamphlet you worked with easy to use (i.e., time to complete the pamphlet, ease with which responses can be made, etc.)?

_____ easy to use
_____ difficult to use
_____ extremely difficult to use

List factors which contributed to the ease or difficulty of using the pamphlet.

4. To what extent does the pamphlet you used list or make provision for listing the facilities needed to conduct the contemplated educational program or to carry on the necessary service?

_____ little, _____ some, _____ much

If any features were lacking, please list them in the space below.

5. To what extent does the pamphlet you used provide opportunity for indicating to the architect the importance which you attach to the various aspects of planning (i.e., teaching methods, location of facilities, physical features of rooms, etc.)?

_____ little, _____ some, _____ much

If there were sections where this does not exist, please list and explain in the space below.

6. List any other comments which you care to make about the pamphlet or the proposed planning procedure.
Form C

The Bureau of Educational Research
The College of Education
The Ohio State University

INQUIRY ON A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

On the basis of your experiences in planning secondary school buildings and your use of the manual, *A Manual for Planning a Secondary School Building*, provide the information requested below:

1. What advantages did you see in having the staff participate in the planning of the high school building?

2. What disadvantages did you see in having the staff participate?

3. Did this instrument help you as a school administrator to do the educational planning for the building?

Comments:

a. What difficulties did you find that the staff had in using this instrument?
b. What difficulties did you have as an administrator in using this instrument?

4. In what ways did this instrument give too much direction or emphasis or too many suggestions? References to particular sections would be helpful.

5. In what ways was this instrument inadequate in providing a proper amount and kind of directions or suggestions? References to specific items would be helpful.

6. List any other comments which you care to make about the manual or the proposed planning procedure.
On the basis of your experiences in planning secondary school buildings and your study and use of the planning manual, *A Manual for Planning a Secondary School Building*, provide the information requested below.

1. How helpful is the information that is requested in the pamphlets in the C-series to you as an architect in planning a secondary school building for a given enrollment and a given educational program?

2. Do these pamphlets cover the important information which you as an architect need in planning school buildings?

   If not, what additional information do you need that is not covered in these pamphlets?

3. Did the rating scales help you to determine the degree of importance that the staff attaches to the various items?
4. Did the types of information which are requested in the pamphlets make it difficult for you to plan the building? Would they tend to tie your hands?

5. What difficulties did you have in using these pamphlets after they were filled out by the staff and turned over to you?

6. List any other comments which you care to make about the manual or the proposed educational planning procedure.
Form B

The Bureau of Educational Research
The College of Education
The Ohio State University

INQUIRY ON A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

On the basis of your experiences in planning secondary school buildings and your study of the planning manual, A Manual for Planning
A Secondary School Building, provide the information requested below.

1. How helpful would information of the type that is requested in the pamphlets in the C-series be to you as an architect who is planning a secondary school building for a given enrollment and a given educational program?

2. Do these pamphlets cover the important information which you as an architect need in planning school buildings?

If not, what additional information do you need that is not covered in these pamphlets?

3. Will the rating scales help you to determine the importance which the staff attaches to the various items?
4. Would the types of information which are requested in the pamphlets make it difficult for you to plan a building? Would they tend to tie your hands?

5. What difficulties do you envision that you would have in using these pamphlets after they have been filled out by the staff and turned over to you?

6. List any other comments which you care to make about the manual or the proposed planning procedure.
Form F

The Bureau of Educational Research
The College of Education
The Ohio State University

INQUIRY ON A MANUAL FOR PLANNING
A SECONDARY SCHOOL BUILDING

Pamphlet C-__ ____________________________________________________________

In connection with each of the five sections below check the item which reflects your experience with the portion of the manual you studied. Please include any comments which will help to clarify your response or which may be helpful in revising the manual.

1. To what extent does the pamphlet you studied enable you to provide for the architect the essential information which you think he should know about the educational program?

_____ little, _____ some, _____ much

Comments:

2. Indicate the extent to which the instructions in the pamphlet you studied and the accompanying pamphlet of directions were easily understood.

_____ easy to understand
_____ some difficulty in understanding
_____ difficult to understand

If there were sections that seemed particularly difficult to understand, please explain in the space below the difficulties encountered.
3. To what extent is the pamphlet you studied easy to use (i.e., time to complete the pamphlet, ease with which responses can be made, etc.)?

_____ easy to use
_____ difficult to use
_____ extremely difficult to use

List factors which would contribute to the ease or difficulty with which the pamphlet could be used.

4. To what extent does the pamphlet you studied list or make provision for listing the facilities needed to conduct a secondary school educational program or to carry on the necessary services?

_____ little, _____ some, _____ much

If any features were lacking, please list them in the space below.

5. Does the pamphlet you studied provide opportunity for indicating to the architect the importance which you attach to the various aspects of planning (i.e., teaching methods, locations of facilities, physical features of rooms, etc.)?

_____ little, _____ some, _____ much

If there were sections where this did not exist, please list and explain in the space below.

6. List any other comments which you care to make about the pamphlet or the proposed planning procedure.
On the basis of your recent experiences in planning a secondary school building and your study of the planning manual, *A Manual for Planning a Secondary School Building*, provide the information requested below.

1. What advantages do you see in having a staff participate in the planning of a school building?

2. What disadvantages do you see in such a procedure?

3. Would this instrument help you as a school administrator to do the educational planning for a secondary school building?

Comments:

a. What difficulties do you envision that the staff will have in using the instrument?
b. What difficulties do you envision that the administrator will have in using this instrument?

4. In what ways does this instrument give too much direction or emphasis or too many suggestions? References to particular sections would be helpful.

5. In what ways is this instrument inadequate in providing a proper amount and kind of directions or suggestions? References to specific items would be helpful.

6. What difficulties do you envision that the architect may have in using the information which the staff would provide in the various pamphlets?

7. List any other comments which you care to make about the manual or the proposed planning procedure.
I, Arthur Eugene Wohlers, was born near Danbury, Ohio, December 10, 1913. My elementary and secondary school education was obtained in the Danbury Township schools. My undergraduate work was taken at Bowling Green State University, Bowling Green, Ohio, from which I received the degree Bachelor of Science in Education in 1935. Following attendance at summer sessions, I received the degree Master of Arts from The Ohio State University in 1939. My professional experience, which was interrupted by three years of service in the United States Army Air Forces, includes nine years as a teacher and four years as a principal in Ohio secondary schools. Since August, 1951, I served two years as a Research Assistant and one year as a Research Associate in The Bureau of Educational Research at The Ohio State University during which time I completed the requirements for the degree Doctor of Philosophy.