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PLANNING THE MUSIC SUITE.

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A PUBLICATION DESIGNED TO IMPROVE THE PLANNING OF MUSIC SUITES IN SCHOOLS. THE INFORMATION CAN BE USED IN THE PREPARATION OF PLANS FOR NEW BUILDINGS AND IMPROVING FACILITIES FOR MUSIC EDUCATION IN EXISTING BUILDINGS. SECTIONS INCLUDED DEAL WITH--(1) THE MUSIC PROGRAM AND SPECIAL NEEDS OF THE MUSIC DEPARTMENT, (2) LOCATION OF MUSIC ROOMS, (3) TYPES AND SIZE OF MUSIC ROOMS, (4) ACOUSTICS, (5) ILLUMINATION, AND (6) HEATING, VENTILATION, AND HUMIDITY CONTROL. (RK)

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THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
Division of School Buildings and Grounds
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PLANNING THE **music** *SUITE*

Pamphlet No. 9

Planning the Music Suite

The University of the State of New York
The State Education Department
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THE UNIVERSITY OF THE STATE OF NEW YORK

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INTRODUCTION

Planning the Music Suite is one of a series of publications designed to improve the planning of specific areas in the school plant. It is hoped that it will be helpful to architects, school officials, music teachers, and local citizens' planning committees in the preparation of plans for new buildings and in the improvement of facilities for music education in existing buildings.

The manuscript was prepared co-operatively by Joseph G. Saetveit, Supervisor of Music Education, and Basil L. Hick of the Division of School Buildings and Grounds. Valuable assistance was given by Clark Eddy of the Schalmont Central School, Schenectady, Chairman of the Music Buildings, Rooms, and Equipment Committee of the New York State School Music Association.

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OBJECTIVES OF THE MUSIC PROGRAM

Twelve months after the launching of the Russian Sputnik, New York State Commissioner of Education Dr. James E. Allen, Jr., made the following statement to the New York State School Boards Association: "... the events of the past year have not given us any cause to de-emphasize education in the arts and humanities. On the contrary, they have presented reason for an increased emphasis. Scientific and technical advances have placed awesome power in human hands. This new power can dignify man or lead to his debasement and destruction. Human beings must equal their advances in scientific and technical knowledge with advances in social and political wisdom if we are to learn to live together in peace. The moral fiber, the inner security so urgently needed in the world of today and tomorrow stems from the appreciation of the aesthetic, of the spiritual, of the dignity of human beings — an appreciation which is fostered and nurtured by a knowledge and understanding of the arts and humanities."

At a recent national convention of the American Association of School Administrators, the following resolution was passed: "We believe in a well-balanced school curriculum in which music, drama, painting, poetry, sculpture, architecture, and the like, are included side by side with other important subjects such as mathematics, history, and science. It is important that pupils, as a part of general education, learn to appreciate, to understand, to create, and to criticize with discrimination those products of the mind, the voice, the hand, and the body which gave dignity to the person and exalt the spirit of man."

From a musical standpoint, the most important objective of music education is to help pupils sense aesthetic values in music and develop a lasting appreciation and enjoyment of good music.

Other goals are related to the success of pupils as individuals. Whatever his capacities may be, music can aid in satisfying the needs of each child. These needs may be to express moods and feelings, to develop muscial talent, to learn the necessary skills for solo and group performance, or to get information on the history and theory of music.

Several goals arise from the fact that music has become an important socializing force in our democratic society. It has become a democratic art, and all pupils should have the opportunity to enjoy it both as producers and consumers. In the bands, orchestras, and choruses, we see democracy in action. Such music groups offer ideal mediums through which pupils can learn self-control, self-discipline, and democratic attitudes. They also learn to work together and to appreciate the importance of the individual in the success of the group.

THE MUSIC PROGRAM AND SPECIAL NEEDS OF THE MUSIC DEPARTMENT

The program of music education for New York State schools consists of four types of activity: formal courses of study, performing groups, individualized instruction, and all-school music activities.

In elementary schools, the formal course of instruction is general music, offered to all pupils from kindergarten through sixth grade. In most schools, the teaching of general music is shared between the music specialist and the classroom teacher, and takes place either in a special music room or in the regular classroom. Performing groups include band, orchestra or string ensemble, and glee clubs, and usually rehearse in a special music room, on the auditorium stage, in the cafeteria, or in some other multipurpose room. Individualized instruction usually includes small homogeneous groups of pupils and takes place in a small or medium-sized instrumental studio. All-school music activities include assembly programs, assembly sings, and concerts in which large groups meet in the auditorium, cafeteria, or other multipurpose room.

In the secondary schools, formal courses include general music 1 and 2, required of all pupils in grades 7 and 8, and the following electives in grades 9 through 12: theory 1, 2, and 3; general music 3; music appreciation; conducting; voice 1, 2, and 3; and, in some schools, introduction to the arts or some other humanities course. Performing groups include junior band, orchestra, choruses, senior band, orchestra, choruses, and sometimes special groups such as an *a cappella* choir, wind ensemble, stage or dance band, and other small ensembles. Individualized instruction is usually given throughout the school day on a rotation basis for small homogeneous groups. Secondary all-school activities include school assembly programs, assembly sings, concerts, recitals, and public events usually held in the school auditorium.

The needs of the music department are different from those of any other department in the school. The volume of sound is greater, requiring careful attention to acoustics. Because many instruments and other items of special equipment are used, facilities for storage and security are required. Location is important both for efficiency

in moving equipment and personnel and for minimizing disturbance to other classes. Ventilation, heating, and humidity control are important factors in musical performance and in maintaining proper intonations and in protecting certain expensive instruments. Lighting presents special problems. All these factors will be discussed in later sections of this bulletin.

The development of adequate music facilities requires a great deal of careful study and co-operative planning on the part of many people. The basic philosophy and objectives of the music program need to be established. The music offerings and facilities to meet present and future needs must be determined, based upon the philosophy and objectives, enrollment statistics, percentage of pupils to be served, and relative amounts of construction funds available for music. A planning committee composed of school officials, music teachers, and interested community leaders should be appointed to facilitate the task at hand. As many competent consultants as are available should be involved in the planning. They might include architects; acoustical engineers; heating, ventilation, and lighting experts; State Education Department personnel; college faculty members; pupils; parents; and other interested community citizens. Visits to new school buildings and conferences with others who are engaged in planning a music suite or who have recently gone through the planning and construction process may prove to be very helpful and valuable.

LOCATION OF MUSIC ROOMS

The ideal location for the music suite would be in a separate building conveniently situated between the school auditorium and the athletic field. Practically, however, such a plan — besides being costly in construction, heating, and maintenance — might present other disadvantages and might not be in keeping with the over-all school construction plans.

A good practical location for the music suite is in a music wing or portion of the main building near the stage of the auditorium. It should have a direct outside entrance to permit community and evening use as a separate unit and to make it easier for the marching band to assemble out of doors for practice, atheletic events, and parades.

The transmission of sound to other areas of the school building is a factor which should be given careful consideration. Physical isolation should be sought; but, if this cannot be fully achieved, it is possible to reduce the transmission of sound to other areas by means of acoustic treatment of rooms, insulation, and use of mechanical air-conditioning systems. A separate ventilation zone should be planned to eliminate transmission of sound throughout the building.

The various rooms of the music suite should form as compact a unit as possible in order to facilitate proper supervision and convenient storage of instruments, equipment, music, and other materials.

A few cautions regarding location of rooms within the music suite may be in order. Some schools have located the practice rooms with doors opening directly into a large rehearsal room. In spite of acoustic treatment of the practice rooms, sound is transmitted between the rooms making it impractical to use either one while the other is being used. In planning the suite, it is better to locate the practice rooms with doorways into a hallway or separate corridor. Practice rooms may be separated acoustically from the rehearsal rooms by placing storage rooms or walls having dead air space between them. It is important to provide a facility for supervision of all practice rooms. Sometimes this is accomplished by means of double glass windows in the walls which permit a view of each room from the music director's office or main music room. Glass windows should always be provided in practice room doors.

The use of the auditorium for regular rehearsals has some advantages, particularly in adjusting the seating and becoming accustomed to the acoustics of the auditorium prior to a concert. As a general rule, however, the problems arising out of conflicts with the drama and other departments make it more desirable to have a separate room for conducting regular rehearsals of performing organizations.

TYPES AND SIZES OF MUSIC ROOMS

Factors to be considered in planning types and sizes of music rooms are:

- School and community populations
- Trends in school and community population changes
- Music offerings and projected needs
- Cultural traditions of school and community
- Number of music teachers
- Other possible uses for music rooms

In New York State, the music departments of almost all schools have shown a marked increase in pupil participation beyond that which might be attributed to a normal increase in school population. Regents credit is now allowed for participation in music performing groups* as well as for formal courses in music. The supply of music teachers has increased, and the quality of music instruction has improved.

Area, county, district music festivals have helped to spur pupil interest in music activities. Clinics, conferences, and conventions sponsored by the State, eastern division, and national arms of the Music Educators National Conference have contributed to the increased effectiveness of the music education program in schools throughout the State.

Rehearsal Rooms

Choral Room. In estimating the appropriate size of the choral room, at least 15 to 18 square feet of floor space should be allowed for each person. The room should be wider than it is deep and should have windows. Risers are an accepted necessity in choral rooms in order that the tone of the singers in the back rows may be heard in proper proportion to the others and so that all singers may see the conductor. An elevation of 6 to 10 inches and a width of 30 to 40 inches are recommended for permanent or semipermanent choral risers. To insure safety in case of fire or emergency, the maximum width is recommended.

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* See *Syllabus in Music, Grades 7–12* and *Handbook for Applied Music*, State Education Department publications.

Fixed theater-type chairs or drop tablet-arm chairs are satisfactory. Special music arm chairs which are conducive to good posture for singing are available. Space should be allowed in front of the risers for the director's music stand, a grand or upright piano, radio-phonograph, tape recorder, teacher's desk, and music cabinets. The front wall should be equipped with a chalk board, screen for film projector, and electrical outlets. The windows should have shades, the rear wall should be equipped with electrical outlets for the film projector, and space should be provided for the projector table. Ample tack boards for bulletin displays should be provided.

Instrumental Room. In estimating the appropriate size of the instrumental room, approximately 20 to 25 square feet of floor space should be allowed for each person. The room should be large enough to accommodate the largest band or orchestra expected.

Instrumental directors are not in complete agreement regarding the desirability of having risers for the instrumental rehearsal room. Players in the back rows can, of course, see the conductor better when they are seated on risers. On the other hand, there is a tendency for the percussion and large brass instruments to overbalance the group from the elevated position. Symphony orchestra conductors prefer to have all players on the floor level while they sit or stand on a fairly high podium. Most school music directors, however, prefer to have raised platforms for their instrumental groups. By installing semipermanent risers or commercially constructed portable risers, it is possible to move them into the auditorium for concert performances.

Risers for the instrumental room should be at least 48 inches wide in order to accommodate instruments and stands in addition to chairs and pupils. The highest riser should be at least 72 inches wide to accommodate the unusually large instruments such as bass viols, tympani, and other large percussion instruments. Elevations of each level should be from 6 to 10 inches, depending upon the height of the ceiling.

It is important that instrumental rooms have high ceilings — 14 to 16 feet — providing at least 250 cubic feet of space per person. Music produced by a large instrumental organization is at times intensely loud and can be deafening to the ears unless there is ample room for dissipation and absorption. More will be said about this in the section on acoustics (page 10). Higher ceilings allow more window space, and this helps to provide better illumination and may contribute to more effective ventilation.

Furnishings of the instrumental room should be similar to those of the choral room except that chairs must be movable and without permanent arm rests. Special folding chairs, which have retractable arm tablets and are designed for good playing posture are available. These chairs are especially functional because more and more conductors are including some teaching of theory and appreciation during rehearsal periods and occasionally expect their pupils to write notes and take examinations.

Modern instrumental rooms provide storage space for the large instruments around the back of the room as near as possible to their playing position. In addition to improving efficiency and ease of handling, this arrangement helps to prevent accidents and possible damage to the instruments.

Acoustical engineers recommend that, in designing choral and instrumental rooms, the walls be made nonparallel and broken into two or three segments having slightly varying angles of reflection. This helps to prevent the formation of "standing waves" at certain frequencies and permits a more evenly distributed balance of sound throughout the room. This becomes increasingly important if the room is to be used for recording or broadcasting purposes.

Some large schools have a need for separate rooms for the band and orchestra. Essentially the size and arrangement of the two rooms should be similar except that, because of the greater volume of sound produced by the band, its room should have a higher ceiling or have more absorption through additional acoustic treatment of the ceiling and walls.

Broadcast Control Booth. Recent developments in closed- and open-circuit television, improvements in recording and broadcasting equipment, and increased use of school facilities by adult community organizations have made it advisable to include a broadcasting or recording control booth adjacent to the instrumental rehearsal room. Such a control booth should be well insulated for sound and should have nonparallel, double glass windows, for direct viewing of performing groups.

Classrooms

General Music, Theory, Appreciation. Regular academic classrooms accommodating 30 to 40 pupils may be used for classes in general music, theory, and appreciation. Acoustic treatment and sound insulation is quite essential. Space should be provided for one or two pianos, radio-phonograph, television, tape recorder, teacher's desk, and filing cabinets in the front of the room. The front wall

should be equipped with a chalk board having some permanently painted music staves. Part of the wall should be equipped with a bulletin board for displaying musical materials. A film screen and electric outlets should also be provided. The rear wall should be equipped with electrical outlets for a film projector. A closet should be provided for storing music stands, extra chairs, music books, recordings, and other teaching materials. The room should be located near the other music rooms to facilitate the moving and sharing of materials. This room may also be used for other purposes, such as class instruction in voice and instruments, and for small ensembles.

Instrument Class, Ensemble, and Sectional Rehearsal Room. A classroom for individualized instruction including sectionals and small ensembles may be slightly smaller than a regular classroom. It should be acoustically treated and should be located near the other music rooms. Some schools offer class instruction in piano as well as in the band and other orchestra instruments. Such a room should be large enough to hold a number of studio upright pianos or small electronic pianos. Electrical outlets should be provided every 4 to 5 feet around the baseboard of the room.

Listening Room. Better schools throughout the country have in recent years added a new type of room to the music suite — the listening room. It has proved to be a most popular and valuable addition. It is equipped with several high-fidelity turntables, each having a number of sets of earphones. In some schools, this room is a part of the music suite, in others, it is located in or near the library or is part of a student lounge. A record library should be near the listening room so that pupils may select recordings for leisure time or for assigned listening.

Practice Rooms

Practice rooms are quite essential to the development of a superior school music program. Local policy regarding individual and small ensemble practice before, during, and after school will determine the necessary number and size of practice rooms. Some may be just large enough for one person, his instrument, and a music stand (6 by 8 feet). Others will be large enough for an upright studio piano and one or two instrumentalists with chairs and music stands (8 by 10 feet). A few should be large enough for two pianos (8 by 12 feet); and others should be large enough for trios, quartets, and other small ensembles (10 by 12 feet). Acoustical engineers suggest that rooms having nonparallel walls (slightly trapezoid in shape) are superior acoustically.

In planning the location of practice rooms, special attention should be given to (a) the means of supervision, and (b) the minimizing of sound transmission to other areas. By arranging them in a series along a corridor and equipping them with soundproof double glass windows, they may be supervised easily without interruption from the music office or a central point. Proper acoustical treatment and insulation will help to absorb the sounds and prevent their transmission to other areas. Adequate lighting and ventilation is essential for personal comfort.

Storage Rooms

Instruments. If possible, provision for the storage of large band and orchestral instruments should be made near the rear or sides of the rehearsal room for convenience and safety. Portable racks having casters may be purchased or constructed to accommodate bass viols, cellos, tubas, and sousaphones. These racks may be rolled into compartments with sliding or accordion-type doors which may be locked for protection.

The instrument storage room should be conveniently located near the rehearsal room or rooms and should be large enough to accommodate all school-owned and privately owned instruments in the building. If there are two rehearsal rooms, the instrument storage room might well be located between them, thus providing convenience plus sound insulation. Oversized doors placed at opposite ends of the room permit a smooth flow of traffic at peak periods without danger of personal injury or damage to instruments.

Ventilation, heating, and humidity must be carefully controlled for the best protection of the instruments.

Individual compartments of varying sizes appropriate for each instrument should be provided. Steel lockers equipped with locks and ventilated doors are most serviceable and give the best protection. A felt cloth lining helps to prevent scratching and reduces clatter. Compartments constructed of wood or plywood are also practical but do not provide adequate security unless equipped with doors and locks.

Uniforms and Robes. Band and orchestra uniforms, choir robes, and other school-owned attire represent a sizeable investment and must be protected against moths, dust, and theft. They should be kept free from wrinkles and systematically arranged for efficient distribution and return. In large schools, a separate room which has Dutch doors is usually provided for dispensing and receiving garments. In smaller schools, space may be provided in the instrument storage

room or along one wall of the rehearsal room. The space should be high enough that uniforms or robes will not touch the floor when hanging on racks. Notches and labels help to keep the uniforms and robes at equal intervals and facilitate identification. Separate compartments should be provided for caps, belts, and other accessories.

Music Library. The size and arrangement of the music library room will depend somewhat upon the type of filing system used for choral and instrumental music. Steel filing cabinets — letter-size for choral music and legal size for band and orchestra compositions — are commonly used. To make use of the space above the filing cabinets, wooden compartments with sliding doors may be constructed for the storage of less frequently used materials.

Some music directors prefer to store music in specially constructed cardboard boxes. This system uses less floor space and more wall space. Ordinary book shelves, properly spaced, may be used to hold the boxes. A ladder should be provided for reaching the high shelves easily.

Space should be provided in the music library for worktables, desk, chairs, and some type of music sorting cabinet. Music sorting racks and filing cabinets may be purchased or constructed of wood or masonite.

Repair Shop. In some schools an instrument cleaning and repair area is provided in the instrumental rehearsal room, the music library, or in one of the teacher's offices. A small separate room which can be securely locked is more satisfactory. It should contain a work bench with a rack above it for tools and a cabinet for storing extra parts. It should have electrical and gas outlets as well as a sink with running water.

Offices

Office space for music personnel depends upon the size of the school and magnitude of the music program. It is essential that comfortable, attractive, efficient office space be provided for the director of music and for each member of the music staff. A desk, two or three chairs, files. cabinets, shelves for books, and space for other special materials and equipment should be provided.

ACOUSTICS

The Role of Acoustics in the Music Suite

The term "acoustics" may be defined simply as the science of sound. Like any other science or engineering specialty, it involves principles, laws, formulas, mathematical calculations, and a vast store of technical data. For the purpose of this brochure, however, the discussion will be limited to those elements of architectural acoustics which should be of major concern to any person involved in the planning of a music suite. When these elements are taken into consideration before the rooms are constructed, favorable sound treatment can be obtained with little, if any, additional cost.

Two general purposes are served by architectural acoustics. First, it seeks to provide a satisfactory acoustic or sound environment; second, it seeks to provide good conditions for hearing.

The acoustic environment of a given space is determined by (*a*) the intensity and character of all sounds existing in that space, and (*b*) the way in which sounds are prolonged and spread within the space. A satisfactory environment for a given space can be specified only in terms of the functions which that space is to serve. Practice rooms must be insulated from one another and from other building noises. Choral rooms should not have the same acoustic treatment as band rooms because the sounds produced have different characteristics and are not so intense.

Satisfactory hearing conditions in an enclosed space require: (*a*) sufficiently low level of background noise; (*b*) adequate separation of successive sounds (reverberation control); (*c*) proper distribution of sound; (*d*) sufficient loudness of sounds which are to be heard (sometimes, amplification is needed).

Major Acoustic Problems and Their Solutions

Background Noise. The location of the music suite and the rooms within the suite will largely determine the extent of background noises. Playground or shop noises may be a disturbance to a rehearsing organization. On the other hand, sounds from the music suite become noise factors to other classrooms, library, and offices.

If segregation or separation cannot solve the acoustic problem of background noise, it is possible to find other solutions; namely, by insulation, by placing barriers in the path of the sound, or by using materials that dissipate or absorb sound energy.

Reverberation. Reverberation time is defined as the time in seconds for the sound to die away to one millionth of its initial intensity. Different rooms, serving different purposes, require different reverberation times. Large rooms tolerate longer times than smaller ones. The reverberation time of any room or auditorium should lie within certain acceptable limits. Too long a time makes hearing difficult and the acoustic environment uncomfortable, while too short a time makes the room sound dead and music seems to lose its natural tone and resonance.

The reverberation time of any room may be controlled by the use of construction materials, all of which have known coefficients of absorption. An acoustical engineer should be consulted during the early stages of planning a music suite so that the reverberation time will be as satisfactory as possible for each different room. Occasionally, because of differences in personal preferences, the reverberation time of a finished room may require modification by the addition or subtraction of small areas of acoustic materials.

Distribution of Sound. Proper distribution means that sound is equally distributed throughout the entire area of the room and that there are no dead spots and no excessively live spots. The shape of the room determines to a marked degree the manner in which sound is distributed within it. The shape and angles of the walls determine the direction in which reflected sound will travel. Sometimes flutter echoes — multiple reflections of sound back and forth between hard parallel surfaces, noticed especially when clapping the hands — are a serious problem. They may be eliminated by using nonparallel wall construction or by adding segments of acoustic tile in appropriate places on opposite walls. Standing waves, observed as unusually loud resonance at certain low frequencies, are sometimes a problem in small rooms. This may also be corrected by using nonparallel wall construction and proper placement of acoustic tile on portions of the wall.

Amplification — Acoustic Reflectors. A common problem faced by music directors is the great loss of sound from the stage to the audience in the school auditorium. This is particularly true of choruses and orchestras when the sounds produced are relatively soft, but it also applies to the concert band. The loss of sound is due to the high

open space above the stage and the absorption of the stage curtains and drapes. The solution for this problem is to purchase or construct suitable acoustic reflectors which are appropriately placed above and behind the performers. These reflectors, made of hard materials having smooth painted surfaces, not only make it possible for the audience to hear the performers more satisfactorily; they also help the players and singers hear each other, thus improving the intonation, balance, blend, and general quality of the performance. Several manufacturers have designed portable acoustic reflectors which may be adapted to choral or instrumental risers. Demonstrations of these reflectors at conferences and conventions have proved their great value beyond a shadow of doubt. Electronic amplifiers are helpful to speakers but are generally avoided by music directors and performers because they tend to distort quality and balance, especially when more than one performer is involved.

For a more detailed discussion of acoustics and other important factors involved in planning the music suite, see *Music Buildings, Rooms, Equipment, Music Education Research Council Bulletin Number 17,* Music Educators National Conference, 1201 16th Street, NW, Washington 6, D.C.

Illumination

A special bulletin entitled *School Lighting Standards,* including the Regulations of the Commissioner of Education, section 165, may be secured free of charge by writing to the Division of School Buildings and Grounds, State Education Department, Albany, New York 12201.

In planning music rooms, careful attention to illumination is necessary because of the special nature of work that is done in the music rooms. Printed or manuscript music is usually very fine in size, and small details are extremely important. Musicians are expected to read accurately and rapidly. Distance from the eye to the page varies with the kind of instrument played. Irregular seating arrangement complicates the problem of glare. Music rooms are used day and night throughout the year. Musicians are, as a general rule, sensitive individuals and respond favorably to an appropriately planned environment.

The minimum foot-candle requirements for music rooms should be the same as for sewing rooms, drafting rooms, art rooms, and other rooms where fine detail work is to be done; i.e., 30 to 40 foot-candles of illumination should be maintained on the music stands or tablet-arm chairs. Visual comfort depends not only upon ample light (foot-

candles), but on reasonably low brightness difference between various surfaces within the visual field. A high contrast between the printed music and the page on which it is printed is desirable. On the other hand, high brightness differences within the remainder of the visual field, between the page of music and the walls or ceiling, should be limited.

Rooms of the music suite, particularly music rehearsal rooms, must be provided with a clear glass window area. Besides providing illumination and giving a comfortable feeling to the occupants of the room, it permits relief for their eyes through substantial change in focusing distance. This clear glass area should be located to allow a view to the exterior (not the sky) from a seated position in any part of the room.

Glass areas should be placed and arranged to minimize brightness differences. A direct view of the sky or other bright exterior surfaces produces glare and should be avoided. The following may aid in the control of glare: Limit clear glass window height, install tinted glass, use extended roof overhang, install venetian blinds, and use outdoor foilage.

The color and finish of walls, floors, ceilings, furniture, and equipment should be designed to provide a pleasing and stimulating environment and to obtain low brightness differences and freedom from glare.

HEATING, VENTILATION, AND HUMIDITY CONTROL

Since temperature and humidity have a marked effect upon the pitch and maintenance of musical instruments, it is important that uniform temperature and humidity be maintained in rooms of the music suite. Sudden changes in temperature are likely to cause serious damage to certain instruments, especially strings, woodwinds, and some in the percussion family.

A temperature of 68–70 degrees Fahrenheit is recommended for all music rooms. If possible, separate thermostatic controls should be provided for the rooms of the music suite.

Proper ventilation is exceptionally important in all music rooms. Pupils singing or playing wind instruments use the oxygen content of air more rapidly than do pupils in regular classroom activity. Choral groups are especially subject to flatting and poor intonation when the air becomes foul or the room becomes overheated. Mechanical ventilation is the best way to supply healthful, invigorating conditions within music rooms, and it has the further advantage of making it possible to close windows in order to keep sounds from disturbing other areas.

If air ducts are used to ventilate other rooms or sections of the building, it is imperative that special precautions be taken to prevent sound transmission. Ducts must be lined with fireproof sound-absorbing material, and should contain bends and baffles to prevent sound from being transmitted.

Air conditioning of all space in the music rooms provides the best year-round control of temperature, ventilation, and humidity. This would permit the maintenance of relative humidity within the desirable range of from 30 to 60 per cent. If complete air conditioning is not possible, the installation of a humidifier for use in the winter months should be carefully considered. Some schools have found that the cost of the humidifier may be saved in the tuning of pianos alone, to say nothing of the savings in damages to string, woodwind, and certain percussion instruments.

APPENDIX

Manufacturers and Suppliers of Special Equipment for the Music Suite

The following is a list of manufacturers and suppliers of special equipment for the music suite who have exhibited at recent national and eastern division conventions or in publications of the Music Educators National Conference.

American Rawhide Manufacturing Company
1103 N. Branch St.
Chicago, Ill.
Miscellaneous equipment

Berntsen Brass and Aluminum Foundry
2334 Pennsylvania Ave.
Madison, Wis.
Miscellaneous equipment

Clarin Manufacturing Company
4640 W. Harrison St.
Chicago 44, Ill.
Music chairs, miscellaneous equipment

Humes & Berg Manufacturing Company, Inc.
4801 Railroad Ave.
East Chicago, Ind.
Portable risers, music stands, miscellaneous equipment

J. & J. Tool and Machine Company
Bela Division
9505 S. Prairie St.
Chicago 28, Ill.
Music room chairs and tablet armchairs

Krauth & Benninghofen
Hamilton, Ohio
Music stands

Lyons Band Instrument Company, Inc.
223 W. Lake St.
Chicago 6, Ill.
Band room and music office equipment

Merson Musical Products Corporation
6 W. 20th St.
New York 11
Music stands, miscellaneous equipment

Midwest Folding Products Sales Corporation
Roselle, Ill.
Risers, platforms, and stage equipment

Mitchell Manufacturing Company
2744 S. 34th St.
Milwaukee 46, Wis.
Stands, risers, miscellaneous equipment

Monroe Company
353 Church St.
Colfax, Iowa
Risers, platforms, miscellaneous equipment

Mutschler Brothers Company
Nappanee, Ind.
Furniture, miscellaneous music room equipment

Norwood Company, Inc.
Morton Grove, Ill.
Music stands

Overly Manufacturing Company
574 W. Otterman St.
Greensburg, Pa.
Miscellaneous equipment

Paul A. Schmitt Music Company
88 S. 10th St.
Minneapolis, Minn.
Sorting racks, music folio cabinets, miscellaneous equipment

Paysen Manufacturing Company
Box 136
Fairbury, Nebr.
Risers, miscellaneous equipment

Peery Products Company
Box 8156
Portland 7, Ore.
Risers, platforms

Peripole, Inc.
51–17 Rockaway Beach Blvd.
Far Rockaway 91
Music laboratories, sound kits, and miscellaneous special music equipment

Plasti-Music Company
109 Parker Dr.
Evansville 14, Ind.
Music holders

S and H Manufacturing Company
316 Summit St.
Normal, Ill.
Roll-away instrument racks, miscellaneous equipment

School Specialties
48 W. Northfield Rd.
Livingston, N.J.
Record keeping devices, portable sound equipment, flags, and other special equipment

Schreiber's
Airport Road North
Bloomington, Ill.
Steel instrument cabinets, music holders, miscellaneous equipment

Stagecraft Corporation
25 Belden Ave.
Norwalk, Conn.
Portable shells, outdoor concert shells, and sound reinforcement systems

Wenger Music Equipment Company
13 Wenger Bldg.
Owatona, Minn.
Portable indoor and outdoor acoustical shells, band wagons, risers, stands, chair stands, and other equipment

Pamphlet No.	Other Publications Prepared by Division of School Buildings and Grounds
1.	Schools as Community Centers
3.	Planning the School Health Suite
4.	Planning the Elementary School Plant
5.	Planning Building Facilities for Vocational Agriculture
6.	Planning the School Library
7.	Planning the Indoor Physical Education Facilities
8.	Planning Schools for Use of Audio-Visual Instructional Materials
9.	Planning the Music Suite
10.	Planning the Outdoor Physical Education Facilities
11.	Sanitary Facilities in School Buildings
12.	Planning for Safety in School Buildings
14.	The School Site and Development of School Grounds
15.	Planning the School Auditorium
16.	Planning the School Lunchroom
17.	School Building Projects, A Guide to Administrative Procedures
18.	A Planning Guide for Vocational-Industrial Technical Building Facilities for Comprehensive High Schools
19.	Planning the Science Facilities for Secondary Schools
20.	Planning and Equipping the Homemaking Center
21.	Planning the Art Room for Secondary Schools
23.	Planning Facilities To Accommodate Adult Education