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ABSTRACT

The project on physical environment and special education attempted to formulate research based statements that would assist both special educators and architects in designing educational facilities for special education. The major implication of all findings was that a dearth existed in educators and facility planners who were trained and/or experienced in planning and designing special educational facilities. Data on teacher attitudes were said to include: minor modifications in teacher's working area could improve both environment and educational program; and teachers were excluded from planning school facilities in which they worked. Three areas for research efforts were then suggested: evaluation of facility planning, measurement of effective use of environment, and assessment of relationship between man and physical environment. It was then suggested that funding of improved special educational facilities might come from the government, both state and federal. The bulk of the report was appendixes concerning: appraisal and report on existing special education facilities in the U.S.; information useful to facility planners and a special planning process guide; methodology for field experimentation for measuring environmental role in educational process; and dissemination of information. (CB)

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FINAL REPORT

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PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION: AN INTERDISCIPLINARY APPROACH TO RESEARCH

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Department of Health, Education, and Welfare

U.S. Office of Education
Bureau of Education for the Handicapped

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INTRODUCTION

Educators involved in the growing number of programs offering educational services to exceptional children have increasingly recognized many of the shortcomings of placing these children in facilities designed for normal children. While many of these educators consider significant environmental modifications necessary to maximize the educational efforts directed at exceptional children, the amount of substantive material available to special educators who wish to make environmental changes is negligible.

The project "Physical Environment and Special Education: An Interdisciplinary Approach to Research" attempted to formulate a series of research-based statements which might assist both special educators and architects in designing appropriate environments for special education. Composed of an architect, a special educator, and a working panel representing the fields of architecture, special education, administration, and psychology, the project staff sought to identify some critical problems associated with present special education facilities, to suggest methods of ameliorating these problems, to find relevant literature about the design of educational facilities, and to define the planning process which should occur when designing educational environments.

Although architecture and special education are disciplines with different vocabularies, problems, and methods of problem solving, designing special education environments requires both fields. While the architect is the ultimate designer, the facility is inadequate unless it fills the needs and fits the goals of the educators and the children. Mutual environmental problem solving, then, was one of the project's most important goals.

To produce a workable environment, the dialogue between architect and educator must include consideration of utilization of space, the development and needs of the children, the strengths and weaknesses of children with particular disabilities, curriculum objectives, available staff, use of media, and an infinite list of other variables. Thus, specifying space use in terms of its educational function was another aim of the project.

Since no planning, however inclusive, can provide adequately for all future needs, the project also attempted to suggest some dimensions of environmental flexibility which would enable teachers to redefine their teaching-learning spaces as the need arose. Such flexibility could involve creating a series of small, private areas for use by acting out children or adjunctive personnel; joining of spaces to accomodate large group activities; establishing small spaces for individual, one to one teaching stations or areas for small groups to work independently.

This project can best be considered the first attempt to systematize the similarities and differences between the diciplines of architecutre and education, an attempt to create the necessary synthesis for effective environmental change--change which must ultimately benefit all handicapped children.

SUMMARY

In response to the special education community's increasing need to provide appropriate physical facilities for the education of exceptional children, the project "Physical Environment and Special Education" proposed the following specific objectives:

1. To appraise and report on the present status of special education facilities in the United States.

2. To identify and develop information that would be useful to facility planners and to evolve a specific planning process guide.

3. To suggest methodology which could be used for field experimentation which involved measuring the role of the environment in the educational process.

4. To disseminate all of the above information through articles, conferences, speeches, convention section meetings, etc.

Through the use of questionnaries sent to special educators and subsequent visits to selected sites, the staff learned that special education facilities are, for the most part, poorly designed and inadequately related to educational programing. Few special educators were sufficently aware of the contribution that the environment can make in conducting an educational program, and few were aware of the role they could play in obtaining improved facilities by working with the architects. Typically, special educators viewed the spaces in which they worked as unalterable, despite an awareness of the need for specific alterations. A majority of the architects called on to design special education facilites had little or no knowledge or experience in this area; yet, because of inadequately defined program requirements, these architects were the chief educational decision makers.

In short, the major implication of all of the findings is that there is presently a dearth of educators and facility planners who are suitably trained or experienced enough to plan and design special education facilities. Since the demand for new and improved facilities will continue, special education practitioners and administrators should be trained to understand the potential contribution of the physical environment, to-plan facilities more effectively, to engage in evaluations of completed buildings, and to communicate with architects. In addition , more funds should be available for experimentation regarding the relationship between the environment and human behavior, as well as for the design and contruction of needed facilities.

FINDINGS

The dearth of available information about the planning and effectiveness of presently occupied facilities was one of the reasons The Council For Exceptional Children undertook a project concerned with the physical environment for the education of exceptional children. Thus, almost from the establishment of the project, "Physical Environment and Special Education: An Interdisciplinary Approach to Research," plans to collect and interpret information which could be used by persons engaged in such planning were made.

The data presented in this statement was obtained by mailing a survey questionnaire to 495 schools where special education programs were in operation. The original list of special education programs was obtained by mailing information about the existence of the project to approximately 5,000 locations which were thought to have special education programs. It is possible that the data reflects the bias of coming from situations where there is an interest in or curiosity about the physical environment and its relationship to the effective education of exceptional children.

Two questionnaires were developed by the project staff, one for local special education administrators and the other for special education teachers. The administrator questionnaire was designed primarily to determine the planning process and procedures applied to special education facilities, while the teacher instrument attempted to assess the manner in which the present facilities are used.

The questionnaires were distributed by mailing packets of five (four teacher, one administrator) instruments to the administrator in each of the subject districts. Each administrator was given directions to distribute the teacher forms to persons who represented as many different programs for exceptional children within the district as possible. Responses to the administrator form, however, were solicited on the basis of the single most recently constructed or renovated school in the system which served exceptional children. Out of a total of 495 questionnaires sent to administrators, 331 or 66.9% were returned. A return rate of 53.9% (1,079 out of 1,898 questionnaires) was realized in the teacher sample. The total return rate achieved was 57.4% or 1,410 questionnaires received from a total mailing of 2,475.

The data from the returned and usable questionnaires was placed on punch cards for machine tabulation. Frequency counts of responses to questions were summarized and percentages based on the total number of responses to each item were computed. The combination of some questions which allowed multiple responses and the failure of respondents to answer some items resulted in some inaccuracy in the computed percentages. A number of questions were open ended and thus not summarized by the computer. These responses were hand tallied and classifi ' and are so indicated when presented.

Because of the nature of the material and responses, the statistical data should be considered as representing trends rather than absolutes. Therefore, the writer has tried to present the trends as objectively as possible and to interpret and extend the data subjectively.

It should be mentioned that the questionnaire data was also put to another use. The questionnaires were analyzed by criteria developed to isolate schools which evidenced effective planning and good facilities. As the questionnaires were returned, the responses were matched against the pre-determined criteria. From this process, seventeen potential sites were chosen. These sites were subjected to further evaluation during one-day visits by the project staff. Six sites were finally selected for intensive three-day site visits by the project staff and a representative of its working panel. Documenting the planning process that occurred and describing the facilities through interviews and photographs were the objects of these visits.

Children

Planners of facilities for special education programs must decide where to locate the proposed building. There are a number of variables, available sites, access to needed school services, geography and population centers, transportation, etc., which must be considered when making such a decision. Among the most significant points to consider is the desired relationship between special class and regular class children. While the issue of special education integration-segregation has been hotly discussed for many years, either decision has significant implications for school planners.

Table I summarizes the sampled administrators' responses to questions about the exceptional children currently being served in their programs and about whether these children are placed in regular schools or in buildings used exclusively for special education.

TABLE I

Current Programs and Location

Children	Current Programs		Regular Schools		All Special Education Schools	
	% of Ad. Res.	# of Ad. Res.	% of Ad. Res.	# of Ad. Res.	% of Ad. Res.	# of Ad. Res.
EMR	62.8	181	41.7	120	20.1	58
TMR	61.9	177	20.8	60	29.2	84
Speech Handicapped	56.6	163	34.0	98	10.4	30
Emotionally Dist.	53.1	153	29.2	84	15.6	45
Physically Hand.	52.1	150	18.8	54	20.1	58
Hearing Handicapped	49.3	142	27.8	80	16.7	48
Spec. Learning Disabilities	48.6	140	24.7	71	12.8	37
Visually Handicapped	36.1	104	27.1	78	12.8	37
Gifted	16.0	46	20.8	60	3.8	11

The data in Table I seems to support a trend to locate trainable mentally retarded children in separate facilities. It was expected that a similar situation would exist for physically handicapped children since many of the requirements for their physical environment are known to be different from those normally available in regular schools. It is of course possible that many programs for the physically handicapped are located in specially designed additions to regular schools.

An additional dimension to the issue of integration-segregation involves the questions of whether the integration of exceptional and more normal children occurs and, if so, the ways such integration is implemented. Administrators who responded to this item on the questionnaire were asked to indicate which exceptional children were "ever integrated with regular class children" and to list the activities during which integration occurred. The summarized data regarding frequency of occurrence is presented in Table II.

*Ad. Res. - Administrator Respondents

TABLE II

Frequency of Exceptional-Regular Children Integration

Exceptional Children	Reported Integration	
	% of Ad. Res.	# of Ad. Res.
Educable mentally retarted	46.5	134
Speech handicapped	41.3	119
Hearing handicapped	35.8	103
Emotionally disturbed	34.0	98
Visually handicapped	32.3	93
Physically handicapped	28.5	82
Special learning disabilities	26.0	75
Gifted	19.4	56
Trainable mentally retarded	14.9	43

In all cases except those involving the educable and trainable mentally retarded, the responding administrators said that integration occured in "all possible activities." Some respondents did not qualify the "all" with "possible," indicating that the exceptional children, particularly the speech, hearing, visually and physically handicapped, special learning disabled, and gifted. in their programs participated like regualr class students. Where specific activities were listed, the most frequently reported were physical education, assemblies, music, lunch, and arts and crafts.

The physical environment may serve to greatly enhance or inhibit the frequency of integration or segregation regardless of which is desired. Obviously, the construction of a special education school on a site devoid of regualr children will produce the ultimate in segregation. However, a similar effect may occur by assigning a specific space or set of spaces to exceptional children within a school which does include non-special class children. Special classes are often located in the basement, at the end of a wing, in relocatable facilities; or the exceptional students are separated from the regular children by program restrictions such as requiring special children to eat in their own rooms, to enter or exit at a separate entrance, or to use the same entrance as normal children, but at a different time.

If integration of exceptional and normal children is to be a goal of the educational program, then the physical and psychological environments must be carefully planned to provide the necessary accomodations. To prepare for integration, planners must determine where and when integration should occur and which children and adults should be involved. For example, planners should consider that special children must be able to go from one section of the building to another to mingle with regular children. This might call for clearly marked symbols on all doors to assist retarded children in getting to the right place.

Similarly, a textured strip in the floor or along the wall might help visually handicapped children progress through the building. If physically handicapped children are to participate in all school activities, as many architectural barriers as possible should be eliminated. To increase the mobility of the child in a wheelchair, gently sloping ramps should be used instead of steps and each lavatory throughout the building should have one toilet area for the use of this child. If deaf children are to be included in daily regular class activities, fire alarms should be equipped with a visual, in addition to the usual auditory, signal; and, if necessary, amplification equipment should be moved with the child from class to class.

In many schools where there is a sincere desire to integrate the normal and excepti child, careless facility planning or a lack of awareness renders this goal unattainable. Many junior and senior high school locker facilities have combination locks attached to the locker doors. Unfortunately, few retarded children will be able to remember their combination, and others will be unable to master the needed coordination to open or close their locks. Often, because many classrooms have doors that lead to the playground area, fences are placed around each of the associated outdoor areas. While fences may be needed for some children, their permanency is sometimes subject to question. The architect, through unguided or misguided direction, can create barriers to integration that no amount of teacher or administrator desire can overcome.

Community and Parent Involvement

In addition to serving the children in an integrated or non-integrated situation, the school also has a relationship with the parents of both normal and exceptional children and the surrounding community. Both historic and contemporary views of the school establish the school's responsibility for interpreting and implementing the nature of the school's relationship to parents and the rest of the community. Since this activity and the way in which it is pursued have environmental implications, the questionnaire had several items dealing with this area.

While it is, of course, impossible to know how many administrators answered with the socially desirable response, 88.5% (255) of the sampled administrators indicated that their schools served as a community resource. It was specifically indicated by 79.2% (228) of the sample that "programs of an informational nature about special education were given by the school system, to which neighborhood or school community groups were invited." Almost 60% (59.7% - 172) of the respondents reported that at least some of their school facilities were kept open for use by children after the usual school day. The most frequent activities occurring after school were community meetings, sports, youth activities, and special group use. In 18.8% (54) of the sample, the administrators indicated that when the community used the school it was necessary to open the entire building.

The Community's extensive use of the public schools after normal school hours suggests many items to be considered by environmental planners. Perhaps the first is the need for a careful and systematic inquiry into the use patterns of existing facilities, such as the average size of group frequency of group use, type of activity, necessary facilities and equipment, and storage requirements. Obtaining such information will contribute to the planner's understanding of the needed relationship between spaces. For example, parking facilities will need to be large enough to accomodate more cars at night than during the day if adults use the building. Refreshment preparation areas will also need to be near the used space. The entry area will require adequate lighting a lobby, a coat room, and adult scale rest rooms.

Control of all spaces used after school should receive considerable attention, particularly if children will be participating in meetings, athletics and other activities. If outside agencies sponsor such programs, provision for the storage of materials and equipment will be important.

In addition to the large scale meetings that occured in the school, smaller group meetings were also held frequently. Thus, meetings ranged in size from one-to-one meetings, through department or planning meetings, to full faculty and parent teacher organization meetings. Five hundred and four (49.5%) of the sampled teachers reported that the parents of exceptional children met with the regular parents group, while 43.3% (442) reported that the parents of exceptional children organized their own groups.

Parents and other adults seemed to participate frequently in the special education programs; for 49% (141) of the administrators reported the use of volunteers. Again, when planning, the specific task patterns of the volunteers need to be known in order to provide adequate operating space. Space for volunteers and/or parents should reflect the purposes of having these persons in the school. Since volunteers work essentially as aides, a single or series of station (s) with rapid access to classrooms might be created. Two-way communication systems linking the station (s) to classrooms and the offices might also be provided. If volunteer aides are expected to remain in a single classroom and yet serve others, appropriate signaling devices between rooms might be installed. Volunteers, like teachers, may need an opportunity for periodic privacy from the children. An aide station or another location could be outfitted as a lounge with suitable storage areas for coats, and other personal items. Like all private spaces, these should, if possible, be located outside the main areas of circulation and noise.

While parents may rarely become involved in the daily program, the data indicates that they are frequently able to visit their children's classrooms. Eight hundred and ninety, 87.4%, of the sampled teachers reported that the potential for scheduled parent visits existed. An additional 59.2% (603) said that such visits could occur at any time. If not over used, parent visiting privileges can greatly enhance parent-teacher communication. However, questions about the effect of the parents' presence on the behavior of their own children as well as on that of the entire class must be raised. Frequently, teachers encounter situations where the children's behavior depends on the presence or absence of a parent or other adult. The teacher's feelings about the presence of a parent or any adult in the classroom are also to be considered.

Since it is generally considered worthwhile for parents to be in the schools and to be familiar with the educational program and the teacher without disrupting the situation, the use of one-way viewing spaces and closed circuit television systems should be considered. About one-fifth of the sampled teachers (18.4% - 187) reported that such systems were presently being used in their classrooms. The obvious advantages are observation without affecting the behavior of the class and elimination of classroom interruptions. There are many other uses for such systems, some of which will be discussed later.

Although almost half (46.5% - 473) of the sampled teachers went to the homes of their children to meet with parents, parents and teachers usually met in school. However, within the school a wide variety of spaces were used for such meetings as is indicated in Table III.

TABLE III

Location of Teacher-Parent Meetings

Location of Meetings	% of T. Res.	# of T. Res.
Classroom	68.[illegible]	649
Child's home	11.0	112
Principal's office	10.6	108
Conference room	9.6	98
Teacher's office	6.5	66
Supervisor's office	3.6	37
Teacher's lounge	2.6	26
Library	1.4	14
Parent consultation room	1.4	14

The wide variety of spaces used may indicate a general absence of appropriate spaces for such meetings. If a school building is considered an environment which affects those involved, then spaces for small private meetings should be designed to meet the needs of the participants. A space for parent conferences should contain comfortable seating for both parent and teacher, carpeting, low lighting--preferably from lamps, a table, with ashtrays and sufficient space to examine children's work, and a telephone. The space should, if possible, have a window, enough room for two or three other staff members to participate in the meeting, and privacy. While the availability of such spaces is seen as most helpful to teachers, a similar space, adjacent to their offices, should be provided for the administrators of the building.

In some programs where many teachers and support personnel meet frequently with parents, consideration should be given to locating the meeting spaces just off a reception area. The reception area should stress comfort, both psychological and physical. Thus, placing a row of hard chairs or benchlike furniture in a corridor or outer office will not suffice. Since many of the parents coming to school will be accompanied by young children or children awaiting interviews, examinations, or diagnoses, a portion of the waiting area might be child scaled and include equipment, furniture, toys, and other materials for use by waiting children.

Some attempt was made to obtain information about the frequency and location of teacher-administrator meetings. Exactly three-fourths (75% - 216) of the administrator sample reported that they visited special education classes on a regular basis. Extensive systems for weekly, biweekly, and monthly meetings were also reported. Although the classroom and individual school conference rooms are used to some degree, the most frequent location is space attached to the administrative offices.

The Learning Space

Necessity requires examination of a large number of isolated elements in planning and discussing the physical environment for exceptional children's education. Perhaps the individual element which should receive the greatest amount of attention is the learning space itself. In the past these spaces have been called classrooms, but are now being called learning spaces with increasing frequency, since the traditional spatial boundaries are being subjected to radical change. It appears from the data collected through this project that, at present, the vast majority of special education programs use traditionally defined classrooms. Throughout the field of education there is a growing awareness that the physical environment can enhance or inhibit the daily operation of the educational program. Facilities are created to be permanent and thus changes in educational programing are prevented from occurring by inappropriate space. The net effect of this situation is "locking in" the type of program and activities currently used. To obtain information in this area, some questions were specifically designed to determine the relationship between the intended uses of the environment and its present uses.

The existence of a gap between planned and actual use of the environment was verified by the sampled teachers, for almost half (49.7% - 502) replied that their rooms were not being used in the same way as originally planned. Additionally, slightly over one-fifth (20.4% - 208) of the sampled teachers reported that some activities which occurred in their classrooms should not be permitted to occur there. In order of frequency, those mentioned include small group physical education, instructional activities, arts, and crafts, music, and others. It becomes clear that the special education classroom is a multi-use space. Despite the changing nature of the children, program, and teacher from day to day and year to year and the resulting different requirements, the environment remains virtually the same.

To obtain some clarification of the situation regarding permanence of oi space, the sampled teachers were asked if they had "... substantially modified your classroom since you initially occupied it?" Approximately three out of every ten teachers (28.6% - 291) responded affirmatively to this item. Although some confusion apparently occurred regarding the meaning of the word "substantial," many specific alterations were reported. These included, in order of mentioned frequency, rearrangment of furniture and the addition of partitions, carrels, book cases or shelves, tack boards (bulletin), storage space, and chalkboards. A variety of other modifications were mentioned less frequently, including the additon of domestic and other types of furniture, paneling, carpets, acoustical treatment, and new lighting and the removal of useless items.

Other items in the survey were directed to the specific assets and deficiencies of the spaces currently being used for the education of exceptional children. Examiniation of these items, particularly those which included an opportunity for open ended comments, suggests that teachers were generally unaware of the physical environment in which they operated. This lack of awareness can also be described as a general apathy of both a positive and negative nature about the environment. The response patterns suggest that teachers approach the space in which they are to work as predetermined and unalterable. Perhaps if teachers became more familiar with the environment, they would be more able to modify their own spaces and would contribute more to the planning of effective facilities.

The sampled teachers were asked initially to indicate those "architectural aspects of your teaching space that you would consider especially helpful in carrying out the teaching program." Analysis of the wide variety of responses suggested that the elements mentioned fall into the following categories:

space

furniture, equipment, and storage

physical comfort

Persons who propose engaging in facility planning through systematic methods must consider these three dimensions in the design of learning spaces. The successful planner will obtain further specific information in these areas. Only when this facet of planning is completed should the architect begin to think about putting a pencil on paper.

One of the critical, and often controversial, questions which occurs when educational facilities are planned is the size of the classroom or learning space. Often existing standards related to funding (state reimbursement formula) establish minimum, maximum, or actual size requirements. The questions, however, are whether or not a fixed standard is ever correct and, if a standard is fixed, for what group and over what period of time the standard should apply. It is possible that since special educators have worked in many different kinds and sizes of spaces they can react more meaningfully to this question than regular educators. Teachers of young trainable children operating in an old home have remarked on the intimacy of their space, the closeness of the children, and the consequent possibility of controlling each one. The same teachers with similar children who have moved to a new school with standard size classrooms make statements about loss of control, increased discipline problems, and more no' able teacher fatigue. The data revealed that between three and four of each ten sampled teachers (34.4% - 350) are currently operating in space which they consider too small. On the other hand, 2.1% (21) of the sampled teachers reported that their space was too large The elimination of present arbitrary standards about the size of learning spaces and the establishment of individually applied formulas that weigh the many variables involving the child, teacher, and program are needed to yield are more usable educational environment.

The effectiveness of a space is dependent not only upon its size, but also upon its usability. Responses to items querying usability reveal a need for flexible space, a space which can support the simultaneous or single operation of a variety of activities, groups, and equipment. The responding teacher sample indicated that through the use of relocatable walls and/or partitions, furniture, and equipment attempts were made to provide for flexibility. The "ability to divide space into two or more spaces" through the use of such devices was reported by 25.9% (264) of the sampled teachers. Of this group only 15.6% (159) had relocatable walls which meant the extensive use of other equipment to achieve this purpose. Almost 30 percent (29.6% - 301) of the responding teachers established special semi-permanent activity areas in their classrooms which were used for arts and crafts, libraries, and resource and media centers. About a fifth of the teachers (19.4% - 198) reported that small permanent spaces immediately adjacent to their classrooms were provided for special purposes.

The usability of a space is also directly related to the quality and quantity of the furniture and equipment that is available within it. Over a fifth (22.1% - 225) of the teachers reported that the furniture available in their classrooms was inappropriate. There was a frequently stated request for the availability of home like furniture. Again, about a fifth of the sampled teachers reported inadequate chalkboards (19.2% - 195) and tackboards (20.3% - 207). Frequent mention was made of the need for sinks, mirrors, display areas, internal communication systems, and additional electrical outlets.

It is well known that today's school planners are required to design a physical environment which will permit the greatest use of the currently available, and future, technological - educational devices. The present approach to the utilization of this instructional equipment, as indicated in the questionnaire data, is that of purchasing highly portable equipment and providing central storage space for it.

Recognizing that the present use pattern is changing since this equipment is frequently used with exceptional children, the questionnaire investigated what equipment was purchased and where it was stored. Table IV presents the summary of these items.

TABLE IV

Use and Storage Location of Instructional Equipment

Equipment	Always Available		Available in Another Classroom		Centrally Stored	
	% of T. Res.	# of T. Res.	% of T. Res.	# of T. Res.	% of T. Res.	# of T. Res.
16mm movie projector	6.6%	67	7.5%	76	70.4%	717
film strip projector	22.9%	233	11.4%	116	59.4%	605
opaque projector	8.4%	86	7.7%	78	55.8%	568
portable projection screen	11.6%	118	7.7%	78	54.9%	599
tape recorder	28.9%	294	10.5%	107	53.1%	541
overhead projector	18.1%	184	8.3%	85	49.5%	504
television	14.9%	152	14.8%	151	35.3%	359
viewmaster	14.6%	149	5.7%	58	31.6%	322
8mm movie projector	3.2%	33	2.7%	27	30.8%	314
teaching machines	8.8%	90	4.3%	44	22.8%	232
headsets and receivers	24.6%	250	8.6%	88	22.7%	231
record player	66.3%	675	9.3%	95	20.0%	204
dictation equipment	2.8%	28	2.5%	25	19.9%	203
permanent projection screen	27.9%	284	6.5%	66	18.2%	185
computer assisted instructional equipment	.7%	7	1.3%	13	11.7%	119

As indicated in the data, the only device permanently available in more than half (66.3% - 675) of the reported classrooms is a record player. Permanent projection screens, headsets and receivers, tape recorders, and film strip projectors are available in about a quarter of the reported classrooms. The only instructional device available in less than approximately a fifth of the sampled schools was computer assisted instructional equipment. The data reveals a trend to store instructional equipment centrally and make it available on a teacher request basis.

While it is apparent that much of the instructional equipment is generally used by most of the project sample teachers at some time, other, more specialized equipment for specific disabilities is used for children with special learning disabilities, the physically handicapped, and the emotionally disturbed and is stored in the classroom. In a somewhat surprising finding, the teachers of hearing handicapped children reported that specialized equipment for these children is found in central depositories rather than in classrooms.

To use equipment stored in a central storage area most effectively, the teacher must have fairly easy access to it. A question asking how much time was required for teachers to reach the room where audio-visual equipment was st. .ed indicated that almost 60% (59.8% - 609) of them could get to that space in two minutes or less. Interestingly, 133 teachers (13.1%) of the sample re .red more than five minutes to reach the equipment.

Planners of facilities for special education must be aware of the needs for and uses of the vast array of instructional equipment now available. Use of this equipment requires, in addition to adequate electrical service and central storage areas, efficient and effective classroom storage. When the storage capacity present in classrooms is inadequate, as was reported by 38% (387) of the teachers sampled, use of instructional materials is more difficult.

Frequently, cabinets, boo'. shelves, and other storage units placed in classrooms are of uniform size, quite unlike the teaching materials used in special education classrooms. Too often storage units are too deep and/or too high to permit teacl. rs rapid access to needed materials. Consequently, there is a need for storage capacity which accomodates materials and equipment of fiffering sizes and frequencies of use.

Also of importance are the provisions made for children's access to stored materials and equipment. If such access is desired, then the heighi, depth, and location of the units, as well as the types of closing or locking devices, should be considered. Educational objectives should affect the decisions in this area. If, for example, the development of independence is to be stressed, easy child access to the storage area can contribute to the realization of the objective.

Another storage problem frequently seen in special education programs, especially those for physically handicapped children, is related to the many types of mobility devices used by these children. In such programs, it is not uncommon for wheelchairs, crutches, standing tables, walking frames, etc. to be used. Because of changing activity schedules there are times during the day when some of this equipment must be stored. For the children's maximum mobility and safety, those items not in use should be appropriately stored. The most effective solution might be designing storage space specifically for the out-of-use equipment. Somewhere in the building there should be a large enough storage space for equipment not in use. Without such a space, unused furniture, left in classrooms or corridors, takes up valuable space and often produces serious safety hazards.

Teacher and child physical comfort, as indicated earlier, are elements of the environment considered especially important by teachers. Because classes for exceptional children are frequently located in renovated or reconditioned spaces, this need is often overlooked. Because of their handicaps, exceptional children may create special comfort demands. Physically handicapped or hyperactive children may, because of frequent or uncontrollable physical movements, need generally cooler temperatures. Visually handicapped children always require adequate lighting, but under some conditions may also need specialized illumination. And hearing handicapped children always require the best acoustical conditions possible.

The environmental deficiency most frequently reported by the sampled teachers was an inadequate cooling system (27.5% - 280). These teachers mentioned that the absence of adequate cooling directly affected the functioning of large group and physical activities as well as individual study and concentration. Fewer teachers reported heating system inadequacies (17.9% - 182), but those who did, indicated that the primary activities adversely affected were also study and concentration.

Over four of every ten teachers (43.5% - 433) responding to the questionnaire indicated that their teaching spaces were not free from extraneous noises during the school day. The types of noise reported seem to emanate from two distinct areas. First are those noises generated in and on the school site from, in the order of frequency, the playground the corridors, and other classrooms, including the gymnasium and cafeteria. The second group of noises are those from beyond the boundaries of the school. These noises, in order of mentioned frequency, are street traffic, industrial noise, trains and airplanes, and construction. Major activities affected by the noise include study and concentration, oral communication, large group music, and quiet activities.

With increasing frequency, attempts are being made to control the acoustic environment through the use of tile, carpeting, curtains, and other devices. Of these measures, acoustically tiled walls were least available since only 3.8% or 39% of the teachers sampled had such tile. Almost 30 percent (29.8% - 303) of the teachers indicated that carpeting is being used in their schools. Table V presents the breakdown of the location of carpets.

TABLE V

Location of Carpet In Sampled Schools

Location of Carpeting	% of T. Res.	# of T. Res.
Classroom	10.8	110
Offices	6.2	63
Special Purpose Rooms: dining, arts and crafts, play, music, teachers	4.2	43
Library	3.6	37
Hall	2.7	28
All	1.3	13
Entrance, foyer	.8	9

Close work, reading, and concentration were the major tasks disrupted by inadequate light. Sampled teachers (10.1% - 103) reported a lack of generally adequate illumination in about one out of every ten classrooms. Windows provided the major source of natural light in classrooms (89.8% - 914). Skylights were mentioned relatively infrequently (6.2% - 63). Two-thirds of the sampled teachers (66.4%) felt a combination of natural and artificial light was needed for normal school tasks. The presence of natural light from classroom windows was not without problems. Over a fifth of the sampled teachers (22.4% - 228) reported that the placement of windows in their classrooms served as a source of visual distraction for the children. Additionally, glare (most often thought of as sunshine) was reported as the cause of visual difficulties by 19.1% (194) of the surveyed teachers. The teachers reported that a wide variety of attempts were made to control or eliminate glare by using shades, venetian blinds, curtains and drapes, and tinted glass.

Educational Program

A section of the questionnaire was devoted to obtaining information about specific types of activities occurring in most programs for handicapped children. Over half the responding teachers (59.1% - 602) reported grouping their students for instruction in at lease one academic area. That practice is interesting in view of the fact that only 12.4% of the teachers were located in rooms originally designed to promote grouping. If so many teachers utilize grouping procedures in areas not designed for it, then even more grouping could occur in spaces designed with this purpose in mind. Almost half (48.8% - 497) of the sampled teachers also indicated that when they devised grouping schedules more than one group worked at a time. Such instructional practice suggests that some thought should be given to enabling individual groups to work as privately as possible without visual or auditory disturbances from other groups. Barriers between groups which permit the teacher to see what is happening throughout the room should also be considered.

Many teachers, ranging from 37.9% (386) in social studies to 74.8% (761) in arithmetic, work with their children on a one-to-one basis. The use of this technique plus the indication that an average of about a fifth (19.9% - 196) of the respondents isolated specific areas of the room for independent work, for creative efforts by the children, for child isolation for rest, discipline, or other purposes, underscores the need for the environment to allow the creation of small group or individual activity spaces. Again, the frequency of each of these instructional arrangements, the numbers of persons involved, and the need for rapid movement to and from spaces is information which should be obtained prior to the development of building designs.

In addition to participating in group instruction, the children worked frequently at their own desks and, as reported by about a third (31.0% - 316) of the teachers, used worktables as well. Over half (59.3% - 603) of the teacher respondents indicated that the children utilized more than one textbook and, in almost half the cases, used resource materials. Extensive use of chalkboards was also reported.

Instructional Areas

From the data received through this survey, it can be reported that approximately 7 or 8 of every 10 exceptional children were exposed to instruction in social sudies, arithmetic, language, reading and science.

TABLE VI

Areas of Instruction

Instructional Area	# of T. Res.	# of T. Res.
Language	86.0	875
Arithmetic	85.4	869
Reading	83.7	852
Social studies	77.4	788
Science	71.9	732

In most instances, these subjects were taught within the confines of a self contained classroom. Only 10% (9.2% - 93) of the teachers sampled reported that reading and science were most likely to be taught in rooms devoted exclusively to instruction in these areas.

Physical Education

Slightly over half (54.4% - 554) of the teachers in this sample gave instruction and held physical education activities in spaces specifically designed for this purpose. However, a gymnasium or another space used exclusively for physical education was available in only 41.6% (423) of the responding cases. In 36.4%

(371) of those spaces used for physical education activities, special adjustments were made to promote the participation of exceptional children. The major environmental adjustment reported was the addition of specialized equipment. Other modifications mentioned included arranging for physical therapy, treating the floor, providing mats, and arranging furniture. Frequent mention was made of special programing and scheduling to promote the involvement of special children in physical education.

Attempts were also made to obtain specific information about the nature of the physical education program. Approximately a quarter (23.8% - 242) of the responding teachers worked in school plants which included facilities for swimming. Despite the availability or absence of spaces for physical education activities, 52.0% (529) of the responding teachers indicated that they conducted some physical education activities in their classroom spaces. The teachers were asked to list the physical education activities conducted in their classroom. The most frequently conducted activity was related to developing or maintaining the physical fitness of the children. Games, coordination-sensory motor training, and dance were the types next most frequently mentioned while special activities and leisure activity were least often mentioned. Almost the same order and breakdown occur when the teachers described the total range of activities in the entire physical education program. Again, the most frequently mentioned were activities associated with physical fitness. Individual and team sports were the only notable addition to the list of classroom activities.

Although 46.8% (476) of the responding teachers were located in classrooms with adjacent play grounds 75.5% (769) had access to common playgrounds available to all classes. In 30.9% (315) of the sample, the teachers indicated that part of the outdoor area used by their classes were enclosed. The most frequent type of barrier used to separate the playground or outdoor area from adjacent property was a wire fence (52.5% - 534). Other types of barriers used included wood fences, brick walls, cinderblock walls, and natural barriers of trees and shrubs. The responding teachers were also asked to list the permanent equipment available on the playground. The five most frequently mentioned devices were swings, slides, monkey bars, jungle jims. see saws, teeter totters, and merry-go-rounds. Tires and balance beams were the only items mentioned not usually seen on standard equipment lists.

Since the storage of equipment used for physical education activities is frequently regarded as a problem, the teachers were asked about it. Provision for the outdoor storage of equipment was reported available by 24.3% (247) of the sampled teachers. Storage areas for physical education equipment in the classroom was reported available in 27.7% (282) of the sample.

Music

The majority (47.2% - 481) of the sampled teachers indicated that they do not teach music in their classrooms. Of the teachers who did teach music in their classrooms, 15% (153) used a specific place for this instruction because of the location of pianos and other musical equipment. Five hundred and forty-five (53.3%) of the teachers sampled grouped the children when teaching music, while 2.4% (24) worked with the children individually during music instruction. Twenty-one percent (214) of the teachers employed in buildings with music rooms reported that that was where music activities occur.

Record players (59.5% - 606) were the most frequently available equipment in classrooms for use in music activities. The frequency certain equipment was available is summarized in the talbles below:

TABLE VII

Record Players and Music Equipment Available in Classroom

Equipment	% of T. Res.	# of T. Res.
Tape recorders	32.0%	326
Rhythm instruments	30.5%	310
Pianos	17.3%	176
Musical instruments	6.4%	65

TABLE VIII

Music Equipment Available in Music Rooms

Music Equipment	% of T. Res.	# of T. Res.
Pianos	47.5%	484
Rhythm instruments	31.7%	323
Musical instruments	29.7%	302
Record player	16.4%	167
Tape recorders	11.8%	120

The data also indicates that if any of the equipment listed above was found in the classroom it was unlikely to also be available in the music room and vice versa.

Art

In 38.7% (394) of the sample, a school arts and crafts room was available for use by exceptional children. However, 64.2% (654) of the responding teachers reported that they conducted instruction in this area within the confines of their own classroom. Of that group 17.3% (176) repeatedly utilized a specific portion of the classroom for these activities generally for reasons of convenience or the location of necessary equipment. Storage of materials for arts and crafts activities was reported a difficult problem by 41.4% (421) of the sample population. Large tables allowing two or more children to work on joint art projects were found in 70.3%

(716) of the classrooms. These tables, however, were frequently used for many other purposes as well, including academic instruction, games, group interaction, eating, and library study.

As indicated by 35.5% (359) of the sample, the most common piece of arts and crafts related equipment available in the classrooms was a sink. Interestingly, only 25.3% of the special arts and crafts rooms were similarly outfitted with sinks. However, kilns (42.1% - 429), work benches (33.2% - 336) leather crafting tools (29.4% - 293), power tools (25.2% - 257), and potters wheels (19.2% - 195) were available in the specialized rooms.

Dramatic Arts

Auditoriums, multi-purpose rooms, gymnasia, lunch rooms, play rooms and assortment of other spaces served as locations for dramatic arts activities. About 12% (11.6% - 118) of the teachers sampled worked in schools with rooms especially designed for the dramatic arts. Similarly, a small number of classrooms (8.2% - 83) reported in this survey are supplied with special equipment or furnishings related to conducting dramatic arts activities. Puppets and puppet theaters, platform stages, and play clothes were the most frequently available special materials and equipment. Further evidence of the apparently small role played by dramatic arts in the sampled special education programs was that only 9.6% (98) of the sampled rooms had classroom storage space for costumes or other props.

Social Adjustment

Approximately one third of the teachers sampled had a private space or similar area available in their classrooms. These were used for a variety of purposes, including, in order of frequency, teacher determined isolation, child determined isolation, discipline, rest, instruction, observation storage, etc. Of the responding teachers located in classrooms without such spaces, 24.2% (246) of the sample indicated that similarly used spaces were available elsewhere in the building. Only about a fifth (20.2% - 206) of the teachers were able to observe children occupying the provate spaces.

The range of purposes for which such spaces were used was reflected by the variety of equipment and furniture provided in them. In order of frequency they are: chairs, desks, tables, windows, rugs, chalkboards, easy chairs and beds.

Eating

While 68.1% (693) of the sampled teachers reported that hot food was served in their schools, slightly over fifty-seven percent (57.4% - 584) indicated that their children ate in cafeterias. Where the exceptional children in this sample did eat in the regular cafeteria, a variety of seating arrangements occurred. Most frequently, separate tables were assigned to each class. However, other patterns such as integrating seating, matching children to furniture by size or age. placing younger with older to provide assistance for the former, and scheduling the special classes earlier were all utilized. In almost a quarter (24.7% - 251) of the entire sample, the special children ate in the classroom.

Thirteen percent (132) of the sampled teachers indicated that a portion of their classrooms had been modified to resemble a home eating environment. Most frequently, a kitchen or house keeping unit, including a refrigerator, stove, appliances, sink, cabinets, etc., served as the center of the eating area. Other modifications included establishing family groupings, having available child size house keeping toys, and using tablecloths, home style chairs, and tables.

Many teachers ate in the regular cafeteria (26.8% - 273) or the teachers' lounge (21.9% - 223). Other arrangements for teachers' dining included using a teachers' cafeteria (12.2% - 124), leaving the building (11.6% - 149), and eating in the classroom without the children (8.3% - 85). However, over 14 percent (14.7% - 150) of the sampled teachers ate in their classrooms with the children. A variety of other spaces, offices, school kitchens, conference rooms, multipurpose rooms, observation rooms, and, in two cases, stages, were also used as lunchrooms by teachers.

Material Preparation

A great variety of equipment is used by teachers in the preparation of their instructional materials. However, the reported data indicates that the most readily available and most used equipment was the ditto machine (including the rexograph or spirit duplicator.) This type of machine was used by 3 of every 4 teachers (77.1% - 785) and was unavailable to only 3% (31) of the sampled teachers. Mimeograph machines (66.3% - 675), thermofax machines (51.2% - 521), and copying machines (48.7% - 496) were all available to approximately half of the responding teachers.

The most frequent location for this equipment is the main office, although combination work-resource rooms are often available. This machinery is also found elsewhere, including other buildings, storage and supply rooms, classrooms, teachers' lounges, and audio-visual rooms.

Observation Systems

With the heavy emphasis that is now being placed on the educational and behavioral diagnosis of exceptional children, there is an awareness that more opportunities to observe the children are needed. Teachers' were asked, therefore, what kinds of observation systems are now being used and how often these systems are used. The following chart presents this information in summary form.

TABLE IX
Observation Systems

Type of Observation System	% of T. Res.	# of T. Res.
Portable video-tape equipment	10.5	107
One-way windows through observation room	8.9	91
Closed circuit television to a specified teaching space	6.8	69
One-way windows through teacher offices	5.2	52
One-way windows through classroom doors	5.1	51

Fewer than four of every ten special education classrooms had observation facilities. In approximately half of the programs utilizing closed circuit television systems, a formal relationship was maintained with university teacher preparation programs.

While no hard data was obtained about the adequacy or inadequacy of any of these systems, the project site visits yielded some observations. One-way vision windows were frequently placed in the wall between the corridor and classroom. Often when this situation existed, no equipment was provided for hearing what was occurring in the classroom and no seating was available for extended observation. When specific observation rooms were provided, the audio equipment was frequently broken, and the spaces were located between two classrooms and were designed to accomodate only three or four persons. Often resourceful teachers with storage problems had converted these infrequently used observation rooms into storage annexes. The presence of stored materials made access to the observation area difficult and also led to the interruption of observation sessions when children, aides, or the teacher entered to obtain stored items.

To minimize interruptions in observation rooms, a signal lamp which lights when the room is in use could be located above the door. Depending upon the feelings of the teachers and administrators in a particular school, some thought should be given to providing a signaling device for informing the classroom teacher when he is being viewed. Window shades could be mounted over the observation room's window to give the teacher the option of allowing no observation at certain times.

Two common approaches, the use of one-way windows in classroom doors and the provision of an observation area which can only be entered from within the classroom, have been proved ineffective. The first approach allows only one viewer at a time and offers no audio capabilities. In addition, corridor traffic is a constant distraction. When the observer can only enter the viewing space through the classroom, the class is informed that they are to be watched, and the purpose of observation is defeated.

Ancillary Personnel

Because of the increasing number of specialists involved in special education programs, planners of facilities should consider providi sufficient space for these persons to work comfortably. To assess the present situation, the sampled teachers were, asked to indicate the availibility of the ancillary personnel listed and the manner in which they were housed. The ten most frequently seen specialists, in order of availibility, and their housing accomodations are indicated below.

TABLE X

Assigned Spaces of Ancillary Personnel

Personnel	Own Office		Shared Office		No Assigned Place	
	% of T. Res.	# of T. Res.	% of T. Res.	# of T. Res.	% of T. Res.	# of T. Res.
Nurse	50.1	510	15.8	161	7.0	71
Psychologist	37.8	385	15.3	156	11.3	115
Speech therapist	40.4	411	21.4	218	8.6	88
Social worker	32.9	335	8.9	91	8.3	85
Librarian	39.4	401	5.0	51	3.8	39
Classroom aide	3.4	35	11.8	120	22.6	230
Physician	25.7	262	10.1	103	5.5	56
Guidance or pupil personnel counselor	28.8	293	8.2	83	3.3	34

Closely related to the effectiveness of ancillary personnel is the manner in which they communicate with the faculty. Responses to questions in this area indicated that almost half of teacher-ancillary personnel contact was made through informal personal contacts. Almost as much contact occurred through the use of the telephone- - an understandable situation in view of the itinerant nature of many of these specialists. This data clearly indicates that teachers need access to telephones and that the spaces in a school used by ancillary personnel should not be so isolated that contact with the regular staff is prevented or reduced.

Other modes of communication were somewhat available; intercoms between classrooms and administrative suites were located in slightly over a quarter of the schools where the sampled teachers (27.8% - 203) worked. Another 9.5% (97) of the teachers also indicated the availability of one way intercoms. When considering interschool communication systems, some attention should be directed toward providing teachers an opportunity to contact other persons when emergency conditions occur. This type of contact may be needed when children display severe acting-out behavior, have a toilet accident, or experience a seizure. In such cases, the teacher may want to contact the administrator, nurse, or aide. Some thought should also be given to the means for activating the communication mechanism. If a teacher is struggling with a child having a seizure, it may not be possible to reach a switch to turn on the communication system.

During the site visits, some teachers also reported that loud or sharp noises signaling the activation of the intercom were very disturbing for some children. It was suggested that a signal light or chime could accomplish the same objective.

Since many intercom systems are closely related to clock units, it is appropriate to mention that loud clocks are also disturbing to many children. If a facility is built to implement a philosophy of programing a stimulus-free space, then the planning must be carried through completely.

General

One question asked teachers to describe the environmental features which they considered especially helpful in conducting their teaching programs. The chart below indicates the specific items and the number and percentage of teachers mentioning each one.

TABLE XI

Desirable Features

Desirable Features of the Environment	% of T. Res.	# of T. Res.
Direct access to the outdoors	39.4	401
Drinking fountains in the teaching space	33.7	343
Bathrooms adjacent to the classroom	44.5	453
Sink in the classroom	35.3	359
Pleasant view to the outside	62.4	635
Private offices for teachers	7.9	80

Transportation

One area of the school plant for exceptional children which is often given insufficient attention is provision of adequate facilities and equipment for the arrival and departure of the students. It was learned from the questionnaires directed to the administrators that 72.9% (210) of these administrators' programs involved providing transportation for some exceptional children. Additionally, slightly under half (46.2% - 133) of the responding administrators indicated that the transportation system used for exceptional children was different from that provided for children enrolled in the regular program.

Solving the many problems associated with this area of school facilities involves consideration of many elements. At the head of the list is the circulation pattern of children and vehicles. In many schools, a large number of vehicles are employed to carry children to and from school. If all these vehicles arrived at one time, a serious safety hazard could be created if some children were unloaded all over the vehicular area, while other vehicles, which had discharged children, were moving to their next destination. The establishment of an arrival and departure schedule, which designates circular drive areas or one-way drive patterns restricting unloading to one area, might help solve the chaotic situation described previously.

Planners should also recognize that a wide variety of vehicles are used to transport exceptional children to school. Station wagons, taxis, and private autos, in addition to school buses of various sizes, are used. This situation requires that the unloading and loading areas be suitable for these vehicles. A further complication in planning is created by modifications which might have been made on some of these vehicles. The responding administrators reporting the following modifications were made on buses.

TABLE XII
Bus Modifications

Bus Modifications	% of Admin. Res.	# of Admin. Res.
Ramps for unloading	20.1	58
Ramps for loading	19.8	57
Hydraulic lifts on buses	16.0	46
Film or audio programs on buses	.3	1
Other	4.9	14

In addition to vehicular circulation, school planners should consider providing appropriate channels of movements for the children entering the building. The planners should decide whether exceptional children are to enter the building through a central corridor or through their own learning spaces. If the former decision is made, consideration should be given to providing special lane markings, floor coverings, or signaling systems to ease the flow of traffic.

One final consideration with regard to vehicles is providing adequate space for staff parking, with spaces close to the building for the use of itinerant personnel. The staff parking area and access to it should, if possible, be away from the main traffic area.

Planning (Administrator Data)

Throughout this project, investigation of the planning process used to develop special education facilities was emphasized. As a result, considerable attention was directed to this area on the questionnaires sent to administrators. The responding administrators answered the questions in terms of their most recent planning.

The first series of questions were concerned with identifying those persons involved in the planning process and the sequential manner in which this involvement occurred. It has been suggested that to obtain the best building product both the chief administrator and the architect should be hired as early as possible in the planning stage. The data indicates that this situation occurred in fewer than half of the sampled situations. In one hundred and thirty, 45.1% of the sample situations, the administrator of the proposed building was assigned prior to the determination of the requirements of the building. Almost all of those persons so assigned were consulted during the preparation of the building requirements. In 42.7% (123) of the sample, it was indicated that architects had been assigned prior to the determination of the problem requirements.

The staff hypothesized that persons representing various fields would be involved in school planning through assignment to formal committees. The data revealed, however, that if planning committees were formed, they were most frequently informal with no fixed meeting schedules or reporting mechanisms. Slightly over 28% (81) of the administrators sampled utilized formal committees, while 43.1% (124) did not create them and 26.7% (77) did not know whether such committees were or were not used. That many types of persons were involved is indicated in the following table.

TABLE XIII

Persons Involved in Special Education Facility Planning

Discipline	% of Admin. Res.	# of Admin. Res.
Architect	66.7	192
Teachers	48.3	139
Educational evaluation group	20.8	60
Physician or nurses	17.4	50
Parents	14.6	42
Citizen Committee	13.2	38
Materials specialist	10.4	30

Frequently architects commissioned to develop buildings utilize existing buildings as resources for ideas and information. The questionnaire indicated that 29.5% (85) of the architects did conduct such visits and 20.1% (58) did not. In 41% (118) of the responding cases, the administrators didn't know whether or not the architect made such visits. In 22.6% (65) of those cases where visits did occur, the architect was accompanied by special education staff from the employing district. The project staff f t that the information obtained on such visits should be presented to the local persons involved in the planning prior to decision making. The degree to which this occurred and the persons involved are indicated in Table XIV.

TABLE XIV

Persons Consulted in the Development of Special Education Facility Plans

Persons Consulted	% of Admin. Res.	# of Admin. Res.
Administrator responsible for planning	18.8	54
Director of special Education	14.9	43
Building committee	14.9	43
Superintendent of schools	13.9	40
Teachers	13.9	40
Board of education	11.1	32
Special education administrative staff	10.8	31

The data further indicated that in 31.3% (90) of the sample the special education teaching staff were given periodic opportunities to meet with the architect and present their points of view about the facility needs.

Questions about the types of investigations conducted prior to the planning of the building were also asked. The data received is presented in Table XV.

TABLE XV

Preliminary Investigations Prior to Planning

Type of Preliminary Investigation	% of Admin. Res.	# of Admin. Res.
Population analysis	50.3	145
Topological analysis	44.1	127
Zoning analysis	42.4	122
Transportation analysis	41.7	120
Economic analysis	35.4	102
Climatological analysis	19.8	57

Additional items asked about what sources of information were tapped to obtain information relative to the location and planning of the building. A variety of agencies considered to possess such information were listed and the responses are listed below in Table XVI.

TABLE XVI

Sources of Information for Special Education Facility Planning

City or County Agencies	% of Admin. Res.	# of Admin. Res.
Health agency	29.2	84
Planning department	22.2	64
Welfare department	13.5	39
Utilities commission	10.0	29
Department of sanitation	9.0	26
Department of roads and highways	8.0	23
Urban renewal or redevelopment agency	7.3	21
Chamber of commerce	5.9	17
Transit authority	4.2	12
Housing authority	3.8	11

The project staff was aware that the construction of school buildings frequently occurs as a result of the development of master plans. The development of master plans generally involves the collection of a large amount of information which contrasts existing and projected situations. Included in the administrator questionnaire was an item which asked about the existence of master plans for the construction of facilities to house special education programs. The responses below indicate that about a fifth of the sampled administrators were located in districts where such efforts occurred.

TABLE XVII

Duration of Master Plans

Years When Master Plan Will Be Implemented	% of Admin. Res.	# of Admin. Res.
Two to five years	6.9	20
Five to ten years	6.9	20
Two years	3.8	11
Ten or more years	2.4	7
One year	1.0	3

Fifty-six per cent (56.3% - 162) of the administrators sampled indicated that their state department of education offers assistance during the planning of construction projects. A smaller number (49.7% - 143) reported that their state department has a school facilities section which reviews architectural plans. Thirty-nine percent (39.6% - 114) of the sample reported that state department of education approval is needed for new construction and 21.2% (61) indicated that the same is needed for renovation.

Perhaps the most significant role played by the state is that of providing funds for the construction of special education facilities. As is indicated in the data presented in Table XVIII, the state was the greatest supplier of capital for the surveyed sample.

TABLE XVIII

Sources of Funding

Sources of Funding	% of Admin. Res.	# of Admin. Res.
State Construction fund	42.7	123
Local Tax support	30.2	87
Federal funds	25.0	72
Local bonds	20.5	59
Private funds	19.8	57
Other	5.9	17

The respondents were also asked to indicate the present situation in their district and state with regard to the use of "architectural barriers" guidelines. The data indicates that during the development of the buildings involved in the sample the existence of the guilelines was not known . In response to the existence of barriers legislation, 57.3% (165) indicated that they did not know. Twenty-one and two-tenths percent (61) answered the item affirmatively. Taking the question one step further, it was reported by 19.4% (56) respondents that their architects were given the guidelines. Again, however, a large number, 53.1% (153) did not know what had transpired.

Questions were also asked about evaluation of the completed building. Approximately a quarter of the sample (25.7% - 74) responded that either teachers or administrators were asked to make an evaluation of the building after it was completed. It appears from the data that where such evaluation's occurred, they were informal. The persons preparing the evaluation devices or procedures varied from the building consultant to the board. It appears that districts engaged in evaluation of facilities did so to obtain additional information for planning other buildings. Twenty-six and four-tenths percent (76) of the sample, or about the same number who conducted such evaluations, indicated that they made use of evaluative material in continued facility planning.

CONCLUSIONS AND RECOMMENDATIONS

With the growth of educational services being provided to handicapped children, there is a corresponding demand for adequate physical facilities to house these programs. At present, and based on the findings of the project, "Physical Environment and Special Education: An Interdisciplinary Approach to Research," it is clear that the majority of facilities being used for special education were not originally planned for that purpose. Consequently, the programs within those facilities operate in spite of the environment rather than in response to it. Such a situation in older schools is understandable, but a similar situation in many schools currently being constructed for handicapped children is not. Because of these recurring failures, the authors wish to present a series of recommendations for action in the areas of training, research, and government.

Training

During the project, numerous visits and conversations with teachers regarding the physical environments in which they worked occurred. It became apparent that the majority of these teachers felt that the design and furnishings of their working spaces were predetermined and totally out of their hands. This attitude is, of course, incorrect, but has immediate implications for the training of teachers.

First, minor modifications in the teacher's own working space can markedly improve the environment and ultimately the program. Excessively reverberating sound due to many hard surfaces can be reduced by the addition of curtains, drapes, or strips of burlap placed around the room. The addition of a throw or area rug can create the space for quiet activities such as story telling, creative dramatics, counseling, etc. To make maximum use of the environment, teachers and aides should be sensitized to the concept of environment as a definite factor in enhancing the operation of the program. Such sensitization is required more than ever today, for the definite trend in the design of educational facilities is toward open space and undefined areas. It is only through the teacher's use of portable equipment and furniture that this environment can be made effective.

Secondly, in the past, as is indicated by the data collected during this project, teachers have been denied the opportunity to participate in the planning of the school buildings in which they work. This situation is easily documented by the cited visits to schools where insufficient storage, one-sized furniture, and divider walls that were somehow never used were in evidence. Numerous other examples of the lack of relationship between schools and teachers' programs can be cited, but the point is that teachers must become more involved in the facility planning process to participate effectively. It is mandatory that they be prepared to do so by having some awareness of environmental requirements and possibilities.

Usually when school buildings are completed, the architect disappears from the scene and vague, subjective staff comments about the building provide the only evaluation. Since no school building is perfect and many have excellent features which could be duplicated in new construction, there is a real need for staff evaluation of school buildings. Again, training educational practitioners to be aware of what the environment is and what it could be is fundamental to effective evaluation.

All of the above comments are applicable to the training of educational administrators as well. Obviously, the leaders of the planning process must know what the environmental potentials are. Further, they must understand what is involved in developing plans for a school building, particularly with regard to the involvement of the community, local staff, and the architect. It is required that the administrator be aware of what the architect's respo ibilities are in the planning and design of the building. Too often special educators who have had very little experience in the design of facilities do not expect enough from architects and, as a result, develop and accept ineffective buildings. Since the architect and the educator do not speak the same language and have different motivations, the educators must inform the architect about the demands which are going to be placed on the structure. The demands must be stated explicitly, point by point, area by area, purpose by purpose. The educator must make the decisions which will affect the nature of the building being designed. If the educator fails to do this, then the architect makes the educational decisions. Perhaps an example will clarify this point. On a visit to a construction site of a school for the multiply handicapped, including the perceptually disabled, the staff learned that glass to enclose the entire entry area to each learning space had been ordered. Educators, however, we e concerned about stimulus control and restriction of the child's visual field. Obviously, the use of this glass will compromise the basic educational purpose of the learning space. When the staff asked how this situation occurred, they learned that the architect had made the decision about the glass.

Educational administrators need to be taught how to communicate with architects. If the architect did nothing but design special education buildings, then he alone would be most competent to make all the environmental decisions. However, architects work one week on a bank, another week on a laundromat, another week on a school. Therefore, educators must state their requirements and rule on the decisions.

Architects, as well as educators and administrators, need to be trained. The need for acquiring sufficently detailed information in order to offer environmental alternatives to their clients should be impressed upon the architects. Awareness of the elements to be included and of the process to be used during the planning of a building is another responsibility of the architect. It is the architect who should acquaint the educational administrators with the need for a systematic method of identifying information relevant to the planning of the building and the administrator's responsibility for making major decisions in response to the information acquired.

Research

As a result of the project's activities, three areas for research efforts can be suggested. The first of these, evaluating facility planning and measuring the effective use of the environment, are of immediate practical concern while the third, assessing the relationship between man and the physical environment is somewhat esoteric. The only reasons that the last area does not yet have practical application are that the body of knowledge currently available is limited and that there are methodological difficulties. As more research is done in this area and the results are translated into the practical domain, better facilites will be developed.

Of more immediate benefit to special educators would be an evaluation of the ways special education facilities are used. Administrators and teachers often begin planning an environment with little idea of how space is used. For example, how often what number of children come together with how many adults in what spaces are questions which need to be asked during planning. What types of storage compartments are most used or what furniture is most adaptable to the many needs of handicapped children are some others. The answers to these and many other questions can be used by the planners to develop buildings where space is utilized most effectively. Planners should use the method to develop specific elements in a specific building rather than to produce comprehensive plans for all special education facilities.

The way special education facilities are built should be critically evaluated. Examining or evaluating a situation or object of mutual concern is one of the most effective ways of involving representatives of other disiciplines in a discussion with educational facilities planners. All can benefit from the discussion, but educators who are planning or who will plan buildings benefit particularly.

Government

As the demand for special education facilities increases, so does the demand for funds to support such efforts. The inability of local school districts to finance capital improvements is a problem which need not be restated here. State authorities, therefore, will have a larger part in funding such buildings. Unfortunately, there is as yet insufficient state money available for this purpose. Perhaps the federal government has a role to play in providing some of this financial support, particularly for the development of model programs in modern facilities.

It is acknowledged that when funds are granted by state or federal authorities, the problem of concomitant restrictions is present. Unfortunately these restrictions often prevent the facility design from effectively meeting the program goals of the local agency. This is particularly true about state policies concerning specific numbers of children in certain spaces and arbitrary square feet formulas which limit the designer's approach to developing a new environment and the combination of the facilites and special education division might make more funds available and provide more effective state building policies.

Appendix #1

PROPOSAL

A. Objectives

Few would dispute the statement that "to be effecitve as an instrument of education, a school building must be designed and equipped primarily for the benefit of all the children who are to be housed and taught in it." (Sachs, M. N., "Provisions for Exceptional Children," School Executive, December 1955, 75, pp 72 and 73). Yet when "all the children" who must use a school include a portion of children who are handicapped, the problem of effecitve planning for educational efficiency becomes complex and uncharted.

Architectural and educational planning must be effected to meet growing needs for physical facilities for handicapped children. Macki ("Spotlighting Advances in Special Education," Exceptional Children 1965, 32, p. 78) reports that between 1948 and 1963 the identified school age population needing special education increased 28%. Furthermore, the volume of letters reaching the headquarters office of The Council for Exceptional Children requesting information or advice regarding architectural planning for handicapped children has increased manifoldly in the last ten years, with such inquiry letters being received at the rate of about forty per year.

Furthermore, discerning a need to disseminate information both to architects and educators regarding parameters of architectural-educational planning for handicapped children, The Council for Exceptional Children awarded a grant to Louisiana State University to compile an annotated bibliography on all available publications (through September, 1965) to distribute to interested parties. That bibliography is Appendix D of this application. It was found, however, that of the 46 titles listed in the bibliography eight have very little relevance to architectural-educational planning, seven dealt primarily with specifications for the mobility of sensorially deprived children, seventeen gave limited building specifications using non-theoretically-based rationales, and only five articles attempted to define parameters for architectural and educational explanations and innovations. In short, although fragmented bits of architectural planning and specifications can be found in the literature, there has been no serious attempt to define broad educational goals and objectives for handicapped children and translate such goals and objectives into architectural terms.

In a further attempt to explore avenues of communication to fill this dearth of architectural and educational information, The Council for Exceptional Children sponsored a conference entitled "An Architectural-Educational Investigation of Education and Training Facilities for Exceptional Children." Ten authorities in the field of special education, mathematics, architecture, and the behavioral sciences were invited to meet and discuss, in roundtable fashion, joint parameters of educational and architectural goals and objectives for handicapped children. Appendices A, B, and C of this application show the structure and results of this conference which serve to delineate some parameters of architectural and educational dialogue. This conference further resulted in the translation of some of these parameters to architectural planning in a specific school district (Appendix E).

Contained in the report of the conference are several specific recommendations highlighting the need for continued architectural and educational planning. A primary finding, also, is that intelligent planning cannot occur without experimentation. Theory must be translated into hypotheses and tested prior to universal recommendation. Further, technological innovations have shown that architectural planning need not be constricted by singular educational theories. Consequently, imaginative planning, or even "far-out" planning, must be effected to both stimulate the expansion of educational theory and field test varying educational milieu. Finally, with so many dimensions possible to both the architect and the educator, it is vital to coordinate architectural and educational planning through a central unit of organization so as to disseminate most efficiently and effectively the findings of research.

Specifically, this project proposes the following objectives:

1. An assessment of national needs relevant to architectural and educational planning will be effected by national survey techniques. The dimensions of such needs will be as broad and as varied as possible and will embrace varying "schools of thought" existing within educational and learning theory. Dimensions will encompass different geographic regions, socioeconomic status of school population, financial resources, and community support. National needs, as well as national trends in design and planning, will form an initial publication of this project.

2. A core working panel of interdisciplinary behavioral scientists, along with architects and professional educators will attempt to translate these assessed needs into architectural design. The Project Director will then attempt to translate verbal descriptions of architectural design into actual drawings and prototypes.

3. The working panel of this project will attempt to translate derived architectural design to researchable projects for evaluation and field testing. Emphasis will be upon appropriate experimental design without constriction of finance, geography, or political climate. The process of the articulation of educational needs into architectural and experimental design will form the basis of a publication designed to aid both architects, educators, and other behavioral scientists.

4. Once research design has been formulated for testing architectural and educational innovations, it will be an objective of this project to institute evaluative and experimental procedures based on these designs. These field studies will be instituted not only in those participating local districts which are building, but in those districts, observed in site visits, which contain dimensions of educational planning that the working panel wishes to investigate. The working panel will evaluate some participating districts, and graduate students will be hired to evaluate other sites.

5. Participating school districts will have the advantage of common planning and assumed planning comprehensiveness through the studies and consultation of the working panel. Furthermore, it will be the purposes of this project to help cooperative school districts investigate the possibilities of group purchasing of materials and equipment for greater economy and flexibility. Hence the efficacy of lower prices by volume buying and the possibility of attracting required manufacturing changes by volume buying will be evaluated. The topics of two working papers have already been delineated in objective 1 and objective 3. The dissemination facilities of The Council for Exceptional Children will be in a position to effect dissemination of all the findings of the project and to all phases of special education in all parts of the country. Such dissemination channels include the monthly journal, Exceptional Children, with a subscription population of over 30,000, a monograph series, monthly supplementary publications, divisional newsletters, and mailing facilities to the more than 26,000 members of The Council for Exceptional Children who are directly concerned with the educational milieu of the handicapped child.

6. It is possible that The Council for Exceptional Children will instigate, upon termination of this project, a consultant service to local school districts planning the construction of new facilities for handicapped children. The results of this project will form the foundations for this consultant service and should help to make more efficient the function of a central coordination unit in influencing architectural and educational trends in the education of exceptional children.

7. The research of this project will, of necessity, examine both basic educational theory and objectives. Such work should stimulate further research to which the consultation services of The Council for Exceptional Children could be available.

B. The Description of Activities

This project shall be carried out in four phases, described as follows:

Phase 1. Analysis of National Needs

Phase 1 will be devoted to the collection of information relevant to the long-term goals of the project, i.e., a survey of all states to identify ongoing architectural planning and building and the assessment of needed research paramenters necessary to effect more efficient national planning. The collection of this information will be effected, in preliminary stages by the contacts of The Council for Exceptional Children and from personal knowledge of the Project Initiator, Project Director, and Research Consultant, using mailed surveys and questionnaires. When this information has been gathered, the formation of the workign panel of the project will be effected to begin the process of synthesizing and categorizing the initial information into problems of concern to the panel and this project. The working panel will be composed of five consultants representing special education, architecture, psychology, educational administration, and research in addition to the staff of this project. They will meet initially to consider the problems and categories determined from the preliminary information and execute a series of regional visits for the purposes of exploring these problems in more depth and scope, offering information about such problems to local school districts, and determining school districts in which to conduct research.

Phase 2. Design

It is the purpose of this phase to design both architectural innovations from existing educational needs of local school districts and theoreticians, and to design experimental evaluation techniques to evaluate such innovations. Since it is anticipated that research disign will, in effect, test educational need and theory, both architectural and experimental design are included in this phase. Two, two-day conferences will highlight this phase of activity. At each conference, the working panel will attempt further sophistication of the national planning problems into research design. They will work from the first paper, detailing national needs, and from architectural models, prototypes, and innovations rendered in graphic form by the Project Director. After both architectural design and research schema have been devised, the working panel will ask certain visited school districts to undertake evaluation of certain parameters of the problems, and will be offered the services of the project to assist in the implementation of architectural innovations and its evaluation.

Phase 3. Execution of Design

The third phase of this project initiates the experimental design and controls a series of programmatic field experiments. It is expected that many of these experiments will be conducted within participating local school districts initiating significant architectural changes, but further environmental settings will have to be found for the field testing of isolated parameters. To effect such further testing, the working panel will select various sites with which to conclude their evaluative program of architectural-educational design parameters. Graduate students in universities close to these field sites will be asked to conduct the research requested by the working panel. Such field research will be generally supervised by the Project Director at the advisement of the working panel. It is hoped that the majority of all experimental designs may be finished, within rough limits, at the same time to effect comprehensiveness in evaluating the multiple results.

Phase 4. Dissemination

The facilities of The Council for Exceptional Children are uniquely situated to accommodate the ideal dissemination channels for this project. The monthly journal of The Council for Exceptional Children, Exceptional Children, has a circulation of over 30,000 and is included in most libraries in this country. Furthermore, the journal is circulated to special education professionals in all areas of the country, a population that exceeds 26,000. Progress reports and continuing dissemination activities will occur throughout the project's duration. Such dissemination should serve to prepare the field for efficient use of the consultation services which might possibly result from this project. Furthermore, the monograph and book series of The Council for Exceptional Children provides professional dissemination channels for the results of the experimental survey studies mentioned as phases of the project. At the CEC Clearinghouse for the Educational Research Information Center, all data will be stored, abstracted, and disseminated through ERIC channels on microfiche. Specifically, publications to be derived from this project include (1) a listing of architectural-educational parameters for planning, (2) suggested evaluative and experimental designs for field testing the architectural innovations, (3) a survey of existing practices in the United States regarding architectural and educational innovations, (4) research design and self-evaluative tools for the institution of field experimentation, and (5) a comprehensive report of all findings of this project.

C. The Use to be Made of Findings

The need for research and demonstration in the area of architectural and educational innovations is predicated upon a lack of theory and coordinated effort within these two fields and in an overwhelming need for facilities. Assuming that a central coordinating unit to most efficiently disseminate results of experimentation and its discipline is needed, this proposal hopes to establish such a unit and to further perpetuate it under the organizational funds available from members of the special education profession. Such a unit proposes to do the initial research of this project, maintain it in updated form, and use it as the foundation for providing consultative services to both architects and educators in the planning of efficacious building and remodeling facilities. Working through the previously formed consultative channels of The Council for Exceptional Children, this service would have immediate access to university-level training programs, state level administration, and local level planning. Continuing dissemination of updated and innovative ideas would be a regular function of the publications of The Council for Exceptional Children.

Appendex #2

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Appendix #3

Research Conference

AN ARCHITECTURAL-EDUCATIONAL INVESTIGATION
OF EDUCATION AND TRAINING FACILITIES FOR EXCEPTIONAL CHILDREN

I. Conference Background

On September 9 and 10, 1965, The Council for Exceptional Children, NEA, sponsored a research conference titled "An Architectural-Educational Investigation of Education and Training Facilities for Exceptional Children." This conference was a culmination of considerable planning by the Executive Committee of The Council for Exceptional Children and Mr. Bertram Berenson, Chairman of the Department of Architecture, Hampton Institute, Hampton, Virginia. The purpose of the conference was to effect the beginning of a continuing dialogue between the architectural and the educational professions. The four major deficits under consideration were intellectual, neurological, communication, and behavioral; and within each one of these, subcategories of impairments were described by both the participants and invited observers.

This paper is an attempt to summarize the ensuing dialogue of the conference. It was obtained from the tapes of the conference and can by no means be considered comprehensive. Because of the rapid exchange of ideas and the "brain-storming" format of the dialogue, valuable ideas may be lost to posterity save for the relistening to the tapes of the conference. Such tapes will remain available at The Council for Exceptional Children headquarters in the NEA building, Washington, D.C., for students of architectural and educational innovations.

As may be expected from the heterogeneity of the participants, diverse and divergent avenues of discussion occurred. Different "schools" emerged with regards to educational objectives, goals, and particularly, methodology. An almost universal lack of specific delineation of disability areas was encountered, leading to pervading confusion of stable educational objectives. Predetermined parameters of architectural and educational dimensions were found so inadequate as to prevent their utilization in considering innovative educational changes. Consequently, although the attached agenda (Appendix B), was adhered to, it cannot be considered conclusive or even comprehensive to the total scope of the dialogue.

II. Deterrents to Efficient Architectural-Educational Dialogue

The need for architectural and educational dialogue might seem obvious. New schools have to be built, and architects must design them. One might suspect, then, that it is the architect who must assume the major burden for information concerning the newest trends of special education. However, these assumptions can only lead to superficiality of thought. The building of facilities for special education must, in fact, be the result of a continuing effort at communication between educator and an architect. The educator may use architectural technology to innovate; and the architect must have knowledge of educational needs to apply planning. Consequently, the articulation between the two professions must undoubtedly suffer many impasses before ideal coordination and cooperation will occur. Even the responsibilities for establishing this communication and the possible outcomes have not been determined by precedents, making the objectives and goals tenuous.

A further specific problem to efficient dialogue is that of the translation of an educational technique to a building. Too often, either functions specified in educational objectives have not been built into buildings, or else have been built in with too many restrictions. Unfortunately, an educational function may become obsolete in this age of increased knowledge, and a constriction in providing for this obsolescence can become a built-in hazard to architectural-educational planning.

The planning of architectural and educational designs by experts rather than practitioners has long been felt a deterrent to creativity. Consequently, lay opinion and ideas in the design of the educational facilities of the procurement of lay ideas in its content, it hoped to set the atmosphere for such communication at a later date.

Avoidance of the danger of architectural and educational planning for only the staff, rather than the children, must be met by objective comprehensiveness and multi-faceted approaches. Once again, the vital use of children in design planning and research is emphasized.

The lack of adequate theory clearly delineating either curricular or building goals is another problem to be faced both in architecture and in education. As an example, no definitive theory or research has adequately evaluated the value of classrooms for atypical children which are either integrated or nonintegrated with normal children.

The nature of special education requires that problems of design be concerned not with specific educational function for all children, but rather with specific overall curriculum goals to be obtained in a specific classroom with a specific group of children. The employment of this latter concept should embody flexibility of function and multiple uses of various design components.

Economy is another practical problem faced in the articulation of architecture and education. It is postulated that many excellent architectural innovations will often be discarded because of factors of immediate financing. Hence, it behooves not only the architect but the educator to determine long range economic feasibility and relate such feasibility to the overall educational goals of each child and his surrounding society.

In summary, the seeming needs and problems of the architectural-educational dialogue indicate a unique type of thinking concerning educational and architectural problems. Perhaps a new discipline is necessary to effect conversation between two traditional disciplines. Yet it is suggested that before our culture begins to train "edutechturalists," it must support joint meetings of both architects and educators to produce a learning conversation so that "experts" emerge with clear and concise knowledge of both disciplines. Only when the two disciplines can understand each other's needs, problems, goals, handicaps, and aspirations can mutual cooperation produce widespread progress.

III. Need for Research

The theoretical solutions to the general and specific needs derived from architectural and educational dialogue must of necessity involve a professional who is highly research oriented. Only with a continuing quest for "if--then--" statements and antecedents to "because" statements can architects and educators attempt to build a foundation for innovative, creative, and effective educational plans. It is with this research orientation that theory must be built, tested, revised and reformulated.

There are significant areas of exploration which will allow the architect greater opportunity to complement the traditional intuitive design function with substantive information. The most pressing question seems to be whether through a conscious manipulation of the environment the designer can change or reinforce the patterns of activity which a special education facility is expected to house. In order to accomplish this it must first be determined what those are and in what ways they can be stipulated in precise terms.

A great deal of confusion exists in understanding the position of the architect in the design and construction of the types of facilities that were discussed. Broadly stated, the problem appears to be one of transcribing information, prevailing attitudes, and traditional predispositions into meaningful and substantive building. The design parameters, then suggest a multi-disciplinary orientation with the architect functioning as translator of the verbal goals stated by special educators and behavioral scientists. Moreover, there is a need for accurately measuring the activities in which the children and teachers are involved, a careful description of curricula in terms of these various activities, and further speculation concerning possible manipulations of the environment in order to achieve more effective and efficient use of space.

After the assumption is made that certain design variables can reinforce the teaching or learning situation, it was suggested that specific kinds of equipment be investigated as to their feasibility in design. For instance, the blackboard suggested many uses not presently considered integral with its design: A blackboard on which children can draw while sitting on the floor, lying down, or standing up, and one which the teacher can use simultaneously was discussed as one relevant item, and methods for applying it to the classroom were also mentioned. It was also made clear by the architect that hardware is presently available to position this simple teaching tool in a way such that it can be used by children in any posture. Other transparent and translucent materials are available for use with wax composition crayons, chalk, poster paint, or adhesive materials to describe the work of the children. The discussion of blackboards, or chalkboards, generated further discussion concerning surfaces in general for wall and ceiling.

The most obvious research-oriented solution to the aforementioned problems and needs is embodied in an experimental building. Previously, experimental buildings have been conceived but have not shown outstanding success because the experimentation carried on in these buildings has been inadequately sophisticated and because the research design allowed for a multiplicity of confounding variables. An example of this type of research is that done with windowless classrooms, showing that such buildings are not significant accelerators of academic, cultural, or social achievement.

The design of any experimental building should maximize the possibilities of research of both basic and applied nature. Such experimental buildings, in other words, should not merely measure, for instance, the effect of a change of wall upon academic achievement, but should attempt to measure motivation, learning environment, and other conceptual terms not yet operationally defined. The teaching-learning process per se should be investigated within the confines of the proposed experimental building.

The experimental building should also include possibilities for new technological innovations. Because technological innovations include developments not yet invented, today's innovations can become tomorrow's memory. However, "science fiction thinking" and extensive doses of imagination may help to prevent needless waste and inefficiency caused by this obsolescence.

Finally, any good research should provide avenues for dissemination. Such dissemination should include activities of a public relations nature, which would attempt to "sell" school boards and the general public on innovative types of educational-architectural planning, and to overcome "traditional attitudes" of conservatism. Such public relations and dissemination activities could further promote wide field testing of architectural and educational ideas, and effect broad applications of research principles to pragmatic methodology.

Possibilities for such research exist at the present time. Under Public Law 88-164, a center for research and development in special education will be established. Such a center could employ architectural and educational design to effect the aforementioned research-oriented problems. Further research conferences such as the one being described could add immeasurably to the theoretical and practical solution to problems. A compact of schools building special education facilities, paralleling the School Construction Systems Development project in California, could allow field testing of experimental centers. A full knowledge of increased technological developments and building materials and accessories would keep architects and educators informed of possibilities. The establishment of values and priorities in building, goals, and expenditures could be developed through conferences. Further, a "problem-oriented" approach through conferences could establish guidelines for planning, structure such planning, and assure consideration of all details.

A word of caution, however. The tradition of relying upon research-based models cannot always be considered adequate in view of the innovations possible through the joint efforts of education and architecture. Further dialogue between the two disciplines must inevitably invent or create. Future communicational patterns must, of necessity, also assume the form of sessions in creativity and "brainstorming", rather than dependence upon research results.

IV. Parameters for Research

A. Foundational Questions

To produce adequate design, the architect must ask certain questions of the educator. To effect meaningful education, the educator must answer these questions. This conference demonstrated that the questions were easier to ask than to answer, not only because there is an inadequate body of educational knowledge, theory, and research from which to draw meaningful implications, but also because the answers need to be flexible to different groups. It should be kept in mind, then, that these questions must be asked with regard to each different educational grouping, each age level, each disability level, and in each geographical region. Some of the primary foundational questions forming the basis of practical dialogue are as follows:

1. For whom are we designing? What are the demographic and educational characteristics of the group for whom the educational plant is being built? What are their primary disabilities? What are their strengths?

2. What are the goals for this group? Are educational and societal goals the same or different? If so, in what way? Can these goals be effected? What are the best methods for obtaining these goals?

3. What is the child's immediate environment and personal needs?

4. How can the environment be manipulated to reach the aforementioned goals?

5. What are a child's primary variables of interaction? Do they differ from time to time? If so, how? What are his secondary variables of interaction?

6. How can we form an educationally sound interaction of children, teachers, curriculum, and environment?

7. What provisions can or should be made for parents?

8. What is the developmental process? When should changes occur to reflect development? When, for example, should doors be supplied with doorknobs rather than pulls?

B. Flexibility

Flexibility in teaching and learning spaces for special education purposes has two meanings. First, the use of a single space for more than one purpose without changing its geometry. This might mean moving children from one furniture grouping to another within the same room. The other suggests the physical manipulation of the space in order to provide different visual environments for a variety of classroom events. Within these two broad categories the characteristics of flexible, static or dynamic physical environment can be further defined.

The description and evaluation of the flexible classroom systems is subject to empirical judgment since little research has been undertaken in this field. Although it was assumed that there is a significant behavioral result from changing the surroundings, there is no agreement as to the magnitude or mode of such environmental changes on the children. However, it is known that retarded or emotionally disturbed children adjust more slowly to changes in the environment than normal children. This factor alone may have an effect on the architecture. Rapid shift in the classroom organization takes many forms, and the time and personnel necessary for accomplishing these changes becomes a factor in describing flexibility. The complexity of the cue change caused by environmental manipulation raises some basic questions. What is the child's capacity for change in a time span? And, is it possible to equate the speed and magnitude in a changing environment with the productivity of the students? The answers to both of these questions again will require research and evaluation.

There are four possible methods for changing teaching spaces. First, the teacher can restructure the classroom for short periods of time. Second, the child may change parts of the classroom also for short periods of time. Third, the maintenance department of the school system may make more substantive changes that would be used for longer periods of time. And last, an outside planning agency may make complex changes. Such changes directly relate to the curriculum which should be made known to the architect prior to the design of a new facility.

The uses of flexible space should directly relate to:

a. Curriculum sequence

b. Behavioral changes in the child

c. Measurement techniques as to rate of change in learning or social behavior.

Additional resource personnel, either classroom assistants or master teachers also reflect flexibility in the teaching space. Additional areas for ancillary staff should be provided and the innovative abilities of the teacher to realize the potential of the teaching area may be partially helped by either the classroom aide or a master teacher visually or in voice communication with the teacher.

Since each child progresses at a different rate, it is possible to equate his progress with a series of known criteria. One such criterion is the ratio of children in the class to the teacher. It has been suggested that the classroom be designed to provide spaces for one, two, four, eight or twelve children depending on the individual child's capability for group participation in learning or training. Individual or small group methods have proven useful in training children with certain types of handicaps and this factor also should be taken into consideration in the design of flexible rooms. An order of preference for the most needed and used spaces must therefore be developed.

Some general criteria for flexible teaching and training spaces are:

1. All visual parameters of the movable elements should be easily and rapidly changed. This will allow the visual environment to become more complex over a period of time and in relationship to the child's capability for coping with it.

2. Flexibility should be both internal and external: Rooms with static limits would be changeable internally - subdivided, made simpler or more complex. Rooms adjacent or in close proximity to one another could be coupled or reorganized into one larger space.

3. The addition of teaching machines, visual and auditory aids, data collection and distribution devices as well as immediate viewing equipment such as two-way mirrors should be included as an integral part of the architectural design.

4. Flexible furniture and equipment such as multi-use desks and chairs,

display boards and storage units should reflect both curriculum needs and the various spaces in which they might be used.

C. Furniture, Materials, Hardware and Teaching Equipment

One cannot remain indifferent to the lack of furniture and equipment designed to be compatible with special education facilities. Although teaching machines are coming into use in special classes; the notion of multisensory input devices as part of the design scheme is not often pursued. Rather, the equipment is applied in arbitrary ways to the spaces allocated for various activities without regard to the way it might be used. Furniture and hardware, then, are not considered to have any intrinsic education or training value when in actuality they play a major part in how information and ideas are distributed and are not, as frequently assumed, merely cosmetics applied to the finished product.

For instance, posture is in a sense a training vehicle and body position will necessarily change as the task in which the child or teacher is involved varies. The position for painting might be different from the position for listening, and in turn various games are played in sitting, standing and semi-standing positions which can be partially reinforced through the use of chairs and tables suitable to the activity. It is also possible that an activity such as listening to music can best be accomplished on the floor. Then the floor might be designed to make sitting posture more comfortable for long periods of time, allow for the use of floor easels, flat drawing pads, games, etc. Tables, chairs, easels, blackboards, teaching machines, audio-visual equipment, physical fitness devices and even crayons and other materials should have compatible uses in the overall sequence of classroom activities.

The task of orientation of some teaching and training programs for impaired children lends itself to basic functions such as grooming, personal hygiene, housekeeping on one scale and to recreation on the other. There is an easily recognized difference in the areas in which these activities will go on, but it is not as yet known how much space is actually required for these tasks or how equipment may be used to expedite or make more efficient the cognitive response of the children. A mirror, properly placed may perform many functions such as a reminder of where the child is located, a time element, or as a visual game. A door may be just a barrier, but also it may train a child in the operation of hardware, it may be a surface on which objects are drawn or where a permanent cue to place or direction may be indicated. Its size, color or position, method of operation, type of lock or other hardware, texture or weight may also be design considerations indicating such things as privacy, or what may occur behind it.

Although a door may have a primary function as a barrier, other designed objects in a space may have a series of parallel functions. It should be a pre-determined judgment of the architect as to the functional reliability of all components of a space if the possibility exists that they might be used for a teaching or training purpose.

D. Information Transmission

The available information collection and transmission equipment suggests an investigation as to which of these systems presents the best and most efficient way of helping teachers and researchers to evaluate children's behavior and the feasibility and usefulness of teaching methods. Since ongoing evaluation of the child's progress is usually part of the training process, more accurate methods might be determined for collecting meaningful information if the systems could be equated with the teaching program and in turn these methods appear as part of the architectural concept.

Various types of equipment were discussed, all of which seem to have bearing on the design and planning process:

1. Audio tape

2. Video tape

3. Still photographs

4. Motion pictures

5. Two-way radio.

The preceding are considered information input categories and were discussed as part of a more general pattern of both observation components and information input. The system should be included in the program since in the case of special education, the ongoing evaluation procedures should be integral with the teaching and training program.

Information output devices also include most mechanisms capable of producing visual and auditory signals using the same media as the input equipment. The potential uses of computerized information may be related to both in organizing the program in both the architectural and teaching contexts.

Transmission interaction must take into account various configurations of events: teacher-child (individually and in groups), child-child (also singly and in groups), teacher-master teacher, teacher-assistant teacher, classroom activities-observers. Included in the information transmission plan must be the capability of introducing control, information or the observation potential into ancillary spaces adjacent to or actually a part of the classroom complex. For instance, visual control of storage areas, administrative spaces, observation spaces and lavatories. An order of precedence in terms of equipment and use should be developed.

If it is determined that information and control can be partially accomplished through mechanical means, then the teacher can more efficiently utilize her time of teaching and the children may be partially relieved of periods of non-activity or boredom.

Another problem arises in designing multiple input channels that allow differentiation by both teacher and child. The complexity of operating these devices must be related to the relative difficulty of the task to be undertaken. This question must also be taken into consideration in developing the program.

V. Suggested Educational Needs - Suggested Architectural Solutions

Throughout the conference, many educational needs were stated. Sometimes these needs fit a theoretical educational conceptualization. Sometimes they did not. Consequently, it was felt that a listing of separate needs and their possible architectural innovations should be listed in an itemized fashion. This listing would facilitate the use of such needs as reference points for decisions concerning various desability groups, learning syndromes, or conceptual frameworks of learning or methodology. The educational needs and their architectural counterpoints are as follows:

A. Many exceptional children will have a need to displace hyperkinetic energy. This must be done without disturbing other children, the teaching process, or the teacher. Small rooms or quiet areas adjacent to a central work area is a suggested answer to this need.

B. Many children exhibit continuous verbal negative responses which need extinction. In other words, there must be some control for excessive yelling and screaming by children. Architectural solution to this problem would include rooms that mask or damp noise considerably, the use of sound equipment and/or the building of withdrawal and isolation areas, which avoid the spread of "noise contagion" or interrupting behavior.

C. The teacher needs to be free from mechanical and non-teaching activities. The obvious answer is, of course, teacher aids. However, teaching freedom also requires easy access and manipulation of auditory and visual materials, room space, and any mechanical adaptation of the environment or the educational process.

D. The four dimensions of architecture which may provide a sound base for manipulation to meet educational needs seem to be flexibility, mobility, multiplicity, and safety. Of these concepts, the construct of flexibility as a "large number of variables available to solve each individual problem" seems to express that dimension of architecture most innovative to the process of architectural-educational planning. Flexibility of space may be attained by teacher-controlled wall and ceiling movements, a loft area or subterranean area or large movable cabinets or wall enclosures in which aids, materials, and furniture may disappear when not in use, different uses of three dimensional space, and indoor-outdoor flexibility. The use of air walls, various acoustical materials, differing fabrics and textures, and multiple lighting possibilities, may create incredibly flexible and variant possibilities for space adaption.

E. Although not always intrusive behavior, "talking-out behavior" must customarily be silenced to retain the adequate attention span of the entire group. Consequently, individual masks, separate carrels, or sound-absorbent materials in space could be employed to eliminate such behavior.

F. A teacher, as a human being, has a need to withdraw from her class and pupils occasionally. A teacher's office with adequate vision of the class, yet an insurance of privacy, is an absolute necessity for efficient and adequate working conditions.

G. It was universally agreed that there should be an intimate relationship between the curriculum and the physical plant. Since curriculum is generally meant to reflect the development of a child intellectually and physically, it was concluded that the child's environment must also reflect this development. Consequently, individual rooms which grow with the child and the group to form larger group rooms seemed necessary. Furthermore, such rooms should be equipped with developmental mechanics, such as hardware which may be moved up the wall or expanded to meet physical growth. Physical arrangement of special classes should reflect the growth from individual instruction through small groups to much larger public school classes.

H. Many programs in special education will necessarily be itinerant. Although the problems of itinerant classrooms are numerous and great, it is entirely conceivable that a travelling teacher may be able to someday transport her classroom with her. Consequently, architectural planning in the future must deal with that type of structure which may be totally or partially portable and as utilitarian and functional as any other type of specialized structure.

I. Many children need feelings of physical security. Although psychological security can be given by the teacher, it has been noted in psychological-architectural research that small rooms tend to produce a feeling of safeness and security in young children -- "womb-rooms." Consequently, a room capable of being scaled down will effect this security as will a cloistered room available to the child on an individual basis.

J. It is universally agreed that teachers must be specially trained to use the new architectural and educational innovations which will undoubtedly occur. Consequently, facilities for the functions of teacher training and teacher education must occur in new buildings. It is presently felt that this is best accomplished by observation rooms adjacent to the classroom where a master teacher may effect radio communication with the practice teacher but is, himself, not viewed by the class. Indeed, the radio communication must be made to the student teacher via visually unobtrusive receiver-earphones. Great research success has been shown in this methodology of teacher training.

K. Most authorities in special education would give consensus to the idea that most exceptional children need individual instruction, at least in the early or formative years of special education. Consequently, all space must be convertible to individual space as necessary, either through the aforementioned cloisters, study rooms, or adjacent facilities. However, the use of space for different disability groups must differ, as the mentally retarded child must "overlearn" and the neurologically impaired child must be free from "distracting or extraneous stimuli." Heterogeneity of grouping must be responded to by individuation.

L. Many exceptional children have needs for space in which to socialize and to interact with each other. A circular classroom which included flexible adaptations for individuation may encourage this socialization process. Further, socialization rooms such as waiting rooms or recreation rooms may be also used.

M. Many uses were found from rooms adjunctive to the classroom. It is quite possible that certain adjunctive rooms can fit all specific needs such as observation, individual tutorial sessions, teachers offices, offices for experimenters, "quiet rooms," reception rooms, or adjunctive play rooms. The use of single or several rooms for multiple solutions to needs presents, of course, the problem of mechanical facilitation and removal of certain materials, the solutions of which have been discussed in previous sections.

N. Many exceptional children have needs to be routinized to the point of allocating certain spaces in rooms with certain functions. Thus a reception room may serve as "quieting room" before entering the class each day. Furthermore, a corner of the room may be designated as a mathematics study room, and always be used as such. It is felt that the same area can be used with multiple functions but can be changed by the use of lights, different shapes, movable walls, and the like. All such rooms should work with the four variables of space, lighting, acoustics, and accessibility in determining the differential functions of its section and of its whole. Children have differing curriculum needs requiring various equipment. It is suggested that there be separate spaces for tutoring, and it is further suggested that each of these separate spaces have individualized equipment. Closed circuit television with separate switches for visual and audial input and output would allow individualization of curriculum, using novel and helpful sensory channels. Recording equipment needs to be used in many classrooms and should be easily accessible and usable.

O. Research also dictates that specific technical materials be built in a room used for research purposes. In order to determine classroom movement and reaction, micro-switches need to be imbedded in the walls and the floor. Chair switches can signal the teacher and record other types of data. Voice-activated recorders, either remote-controlled or manual, may be needed. Pre-wired panels for multiple microswitches under nylon carpeting to track children's movement may facilitate research of the future. Ceiling loop transmission antennae will promote better accoustical equipment for hard-of-hearing children in walkaway units or for future student teacher coaching. Numerous 110 AC outlets will be necessary for electrical equipment. Many channelled tape recorders will be necessary for recording not only audially but visually through videotapes, etc. And, central recording will be necessary for the preservation of data. It may be necessary to route many channels of recording into analog computers for scanning and pattern perception as well as for immediate feedback.

P. Since space will often be shared for larger groups, it may be necessary to connect two or more classrooms. Consequently, equipment will have to be connected between classrooms. This may necessitate liftout ceiling troughs for the pre-wired connections of certain types of research in teaching equipment.

Q. It is felt that many children need a quieting period before the learning session begins. Consequently, a reception room might be a necessity. Such a room should be small and intimate, non-stimulating, geared for temporary or short-term occupancy, and should be a different space from that used for the learning process itself.

R. Recent research has shown that immediate feedback is most desirable to facilitate learning. Consequently, learning carrels may be employed with automated devices for immediate feedback. Such carrels do not necessarily mean "teaching machines", but rather machines which may be programmed at will by the teacher.

S. In research, as well as operant conditioning methodology and other forms of teaching, a teacher often needs to know frequencies of certain types of behavior. Such behavior must often be tallied by a student or observer. Consequently, built-in circuitry to facilitate tallies of frequency by an observer in a viewing room with feedback to the teacher would be necessary. It is suggested that an electrical counter that could be plugged into the wall of the viewing room and connected to a screen in the classroom visible only to the teacher would effect most ideally this frequency counting.

T. Although toilet training is often a problem with many exceptional children, the modification of toilet rooms has been infrequently considered. However, toilets and bathroom facilities must also meet the crite[illegible] of developmental progression. Consequently, it is suggested that toilets be adjustable in height and complexity of operation. Furthermore, they should be movable and variable in entrance to reflect the development in use from "adjacent to the classroom" to "down the hall" use.

U. Many children, as well as exceptional children, have a need to experience aesthetic pleasure both tactually and visually. Consequently, an outdoor garden with statuary and artistic objects may influence the development of aesthetic appreciation. Various textures can be used in the indoor-outdoor facilities, which cannot be used in the indoor classrooms alone.

V. Display of student productions is a device to build motivation through positive reward. Consequently, an ideal classroom should consider the extensive use of display space for exhibiting. All surfaces should be available, including those surfaces found on the top of cabinets and parallel to the floor. Such surfaces should not be easily marred and should allow for the display of three-dimensional objects as well as written and drawn productions.

W. Scheduling of classes and individual students within classes for various activities throughout the day has long been a deterrent to ideal curricular goals. The use of the "fifty minute subject hour" or the "reading time" has taken very little account of individual readiness, differentiated rates of learning, or physical or psychological conflicts. The resulting solution to these needs is, of course, complete individualization or the flexibility necessary to effect this condition. Only when the environment, teacher, and curriculum can adapt to meet specific educational needs and characteristics of specific children can scheduling become unnecessary and irrelevant as a deterrent to the attainment of education.

VI. Research Conference Follow-up - Consequent Building Designs

Following the conference reported here and as a partial result of the ideas generated, a complex of buildings was designed to house educational, medical, psychological, and diagnostic services for the handicapped and gifted children of Mower County, Minnesota. The suggested plans reflect the attempt of the architect to capture in the building design the potential for implementing the educational innovations that were suggested by the conference participants.

If the conference were evaluated to identify its single most mentioned emphasis, it would most certainly be the suggestion that maximum flexibility of all types must be a mandatory consideration in designing school buildings for exceptional children. This flexibility regards primarily giving the teacher the opportunity to create spaces designed for different functions, numbers of children, children of different ages, and teaching equipment. The construct of space flexibility is not restricted to the interior of the building, but extends to the total dimensions of the school which, with minor modification, can be increased or decreased in size or altered in shape.

A keen awareness of the need for flexibility was evidenced in both of the above aspects in the architectural drawings. The design of all the buildings employs the modular concept. Such an approach permits rapid restructuring or adding-on to the existing buildings. It is possible to increase the size of the basic pavilion by adding 60 x 60 units with a minimum of difficulty. Further, the mechanical outlets and electrical grids are included in the prefabricated octet trusses which permit the rapid connection of new and already existing units. Provision is also made in the basic ceiling design to allow for the relocating of all air conditioning and heating ducts as the requirements of the area they serve are altered. Since these units are designed to serve a semi-rural northern region, the need for adapting the buildings to the changing needs and climate of the area is obvious.

The use of the modular design is extended into the classroom units. The classroom teacher or the children themselves rapidly change the basic room space into a series of smaller or larger areas. A typical room in either the building for the educable mentally retarded or the crippled children consists of four small "U-shaped" areas placed on the corners of a larger square-shaped room. By moving easily-sliding panels the fourth side of the "U-shaped" areas can be closed off to form an isolated space. The utilization of these panels permits the creation of a maximum of five independent spaces which can be utilized simultaneously for a variety of purposes. In addition to the mobile panels to adjust vertical space, adjustable ceilings provide for the alteration of horizontal space.

Beyond using the panels and ceilings to create new physical spaces, provision has been made to utilize both natural and artificial light to create new "psychological spaces". A number of windows and an overhead skylight in each room permit utilization of the maximum amount of daylight. Additionally, a centrally-suspended electric light unit provides for directing single or combinations of lights into various room areas. This is not restricted to white light, but includes colors as well. The control of this unit is given to the teacher through a switch series allowing for the maximum manipulation of this light. Display space is increased because both sides of each of the panels can be used for this purpose. Additionally, individual temperature and humidity controls permit the further individualization of space depending upon function and population number. The rooms are acoustically engineered to reduce noise. To encourage the use of all space, all floors contain panel heating permitting their use even during winter weather.

Some concern was expressed during the conference regarding the provision of bathroom facilities based on children's developmental cycle. As a result, bathrooms at the pre-primary and primary units are designed as an integral part of the room, which allows for speed of action on the part of the children and maximum supervision by the teacher.

Because of the limited number of classroom units in each building, it was possible to include in the basic design the elimination of the majority of corridors which were generally considered by the conferees as expensive and limited in use. Space to store coats and boots and for casual conversation was provided as part of an entry alcove to each room. The small entry areas would also serve to define to the children that the rest of the room area was only for learning.

Since this facility has been designed to provide opportunities to develop in-service training for local personnel as well as pre-service training, and diagnostic and research experiences for affiliated university people, maximum avenues for observation have been included in the design. One-way viewing screens provide for immediate observation while through the provision for television and video tape screening, large numbers of people can observe classes, diagnostic sessions, demonstrations, and therapy both at viewing stations in the school and at universities. Provision for all necessary sound equipment has also been included in the plan.

An examination of the design of these buildings indicates that not only are they architecturally functional but they encourage the educator to use the building to experiment in the education of exceptional children. While it is apparent that the architectural-educational conference has produced meritorious and workable ideas, it must be symbolic of only a "romantic fling" of the two disciplines and must be followed by "courtship" and "marriage" in order to conceive further ideas.

Appendix #4

The Council For Exceptional Children

PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION

Research Questionnaire

(Administrator)

THE COUNCIL FOR EXCEPTIONAL CHILDREN

PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION

RESEARCH QUESTIONNAIRE

A DEPARTMENT OF THE NATIONAL EDUCATION ASSOCIATION 1201 SIXTEENTH STREET NW WASHINGTON D.C. 20036

THE COUNCIL FOR EXCEPTIONAL CHILDREN

A DEPARTMENT OF THE NATIONAL EDUCATION ASSOCIATION 1201 SIXTEENTH STREET NW WASHINGTON D.C. 20036

The Community

1 Does the school offer a resource to the community for interpreting the needs and problems of special education? Yes 1-☐ No 2-☐

2 Are programs of an informational nature about special education given by your school system to which neighborhood or school community groups are invited? Yes 1-☐ No 2-☐

3 Are facilities at the school made available to the neighborhood after school hours? Yes 1-☐ No 2-☐

3A If yes, can you list some of the school - community activities that occur?

__________ __________ __________

__________ __________ __________

4 Is it necessary to open the entire school when such activities are being held? Yes 1-☐ No 2-☐

5 If community volunteers work in the school during the day, is there a room where they may meet? Yes 1-☐ No 2-☐

5A If yes, what is that room called? ____________________

6 Is a summer program maintained at your school? Yes 1-☐ No 2-☐

In your opinion does the location, appearance and style of the school enhance the neighborhood and community?

		Yes	No
7	Location	1-☐	2-☐
8	Appearance	1-☐	2-☐
9	Style	1-☐	2-☐

Parent Contact

10 If there is a parent association in the school, do the parents of your children participate in the activities sponsored by that group? Yes 1-☐ No 2-☐

11 Is there an organized group for parents of exceptional children in the school? Yes 1-☐ No 2-☐

Indicate with a check (✓) in the appropriate boxes below if parents of either regular or exceptional children were consulted during the planning of any portion of the school.

		Yes	No	Don't Know
12	Parents of regular children	1-☐	2-☐	3-☐
13	Parents of exceptional children	1-☐	2-☐	3-☐

14 When you meet with a child's parent(s), where does this meeting usually occur?

Teacher's office 1-☐	Your office 2-☐	Principal's office 3-☐	Supervisor's office 4-☐
Child's home 5-☐	Library 6-☐	Teacher's lounge 7-☐	Conference room 8-☐
Parent consultation room 9-☐	Other 10-☐ ______		

15 Are parents permitted to visit their children's special education classrooms? Yes 1-☐ No 2-☐

16 If yes, are parents allowed access to the classroom at unscheduled times? Yes 1-☐ No 2-☐

17 Can a parent observe his child in the classroom without being seen? Yes 1-☐ No 2-☐

18 Do you ever visit any of your children at home? Yes 1-☐ No 2-☐

19 If yes, have you ever seen something in a child's home that you would have liked in a classroom? Yes 1-☐ No 2-☐

19A If yes, can you briefly describe it? ______________________

____

In-Service and Pre-Service Training

20 Which of the following observation-listening systems, if any, are available in the school?

- One-way vision mirrors through teachers' offices with sound transmission 1-☐
- One-way vision mirrors through teachers' offices without sound transmission 2-☐
- One-way vision mirrors through the classroom doors with sound transmission 3-☐
- One-way vision mirrors through the classroom doors without sound transmission 4-☐
- One-way vision mirrors through a specifically designed observation room with sound transmission 5-☐
- One-way vision mirrors through a specifically designed observation room without sound transmission 6-☐
- Two-way intercom 7-☐
- One-way intercom 8-☐
- Portable video tape equipment 9-☐
- Closed circuit television to a specified teaching space 10-☐
- Other ______________ ______________ 11-☐

21 If you have closed circuit television in the school, is it utilized in cooperation with a teacher preparation program? Yes 1-☐ No 2-☐

22 Is there an in-service program of education for teachers in your system? Yes 1-☐ No 2-☐

23 Is use ever made of the special class children and teachers in the school system as instructional models for in-service programs? Yes 1-☐ No 2-☐

24 If yes, do the demonstrations using these teachers occur in rooms planned for this purpose?
Yes 1-☐ No 2-☐

24A If yes, can you briefly describe how these rooms differ from usual classrooms?

____

____

Ancillary Personnel

Please indicate by checking (✓) in the appropriate columns

Column A – those persons in the school who have their own individual offices

Column B – those persons in the school who share their office

Column C – those persons in the school with no regularly assigned place to work

Column D – those persons in the school that have adequate space for the storage of materials

Column E – those persons that are not currently available

Personnel	Column A Own office	Column B Shared office	Column C No assigned place	Column D Adequate storage	Column E Not currently available
25 Speech therapist	1-☐	2-☐	3-☐	4-☐	5-☐
26 Occupational therapist	1-☐	2-☐	3-☐	4-☐	5-☐
27 Physical therapist	1-☐	2-☐	3-☐	4-☐	5-☐

Personnel	Column A Own office	Column B Shared office	Column C No assigned place	Column D Adequate storage	Column E Not currently available
28 Crisis teacher	1-☐	2-☐	3-☐	4-☐	5-☐
29 Librarian	1-☐	2-☐	3-☐	4-☐	5-☐
30 Instructional materials specialist	1-☐	2-☐	3-☐	4-☐	5-☐
31 Itinerant teacher	1-☐	2-☐	3-☐	4-☐	5-☐
32 Arithmetic specialist	1-☐	2-☐	3-☐	4-☐	5-☐
33 Reading specialist	1-☐	2-☐	3-☐	4-☐	5-☐
34 Classroom aide	1-☐	2-☐	3-☐	4-☐	5-☐
35 Educational diagnostician	1-☐	2-☐	3-☐	4-☐	5-☐
36 Psychologist	1-☐	2-☐	3-☐	4-☐	5-☐
37 Social worker	1-☐	2-☐	3-☐	4-☐	5-☐
38 Guidance or pupil personnel counselor	1-☐	2-☐	3-☐	4-☐	5-☐
39 Attendance officer	1-☐	2-☐	3-☐	4-☐	5-☐
40 Physician	1-☐	2-☐	3-☐	4-☐	5-☐
41 Dentist	1-☐	2-☐	3-☐	4-☐	5-☐
42 Nurse	1-☐	2-☐	3-☐	4-☐	5-☐
43 School work study coordinator	1-☐	2-☐	3-☐	4-☐	5-☐
44 Rehabilitation counselor	1-☐	2-☐	3-☐	4-☐	5-☐

45 Which of the following methods do you most regularly use to contact any of the above ancillary personnel?

Written referral 1-☐ Telephone 2-☐ Intercom 3-☐ Messenger 4-☐

Prearranged appointment 5-☐ Informal personal contact 6-☐ Other 7-☐ ______

Planning

46 Was the administrator of the facility in question assigned prior to determining the requirements of the building?

Yes 1-☐ No 2-☐ Don't Know 3-☐

47 If yes, was the administrator consulted during this phase of the project?

Yes 1-☐ No 2-☐ Don't Know 3-☐

48 Which of the following persons were consulted during the planning phase of the facility?

An architect 1-☐ Teachers 2-☐ An educational evaluation group 3-☐ Parents 4-☐

Materials specialist 5-☐ Citizen committee 6-☐ A physician and/or nurse 7-☐

Other 8-☐ ______ 9-☐ ______ 10-☐ ______

49 Was a formal committee assigned to develop the educational specifications for the building?

Yes 1-☐ No 2-☐ Don't Know 3-☐

49A If yes, what were the professional affiliations of the committee members?

______ ______ ______

______ ______ ______

50 Was the architect assigned prior to the determination of the requirements of the building?

Yes 1-☐ No 2-☐ Don't Know 3-☐

51 If no, at what stage indicated below was the architect commissioned to design the building?

During the development of educational specifications 1-☐

After completion of the educational specifications 2-☐

At another time 3-☐ Don't Know 4-☐

Please indicate by checking (✓) in the appropriate boxes below the person(s) who selected the architect for the facility.

52 Director of special education 1-☐

53 Superintendent of schools 2-☐

54 Administrator responsible for facilities 3-☐

55 Special education administrative staff 4-☐

56 Board of education (or directors) 5-☐

57 Other 6-☐ ________ 7-☐ ________

57A Which person(s) in the school system has final approval of the architect's design for a new facility?

________ ________ ________ ________

57B What school district officials make final approval on modifications or renovations of existing facilities?

________ ________ ________ ________

58 Is approval by the state department of education necessary for new buildings? Yes 1-☐ No 2-☐ ; for renovations? Yes 3-☐ No 4-☐

59 Are written program statements on which the building design is to be based made available to persons outside the school district? Yes 1-☐ No 2-☐

60 Was the architect required to visit facilities for the children of the same type as to be housed in this facility?
Yes 1-☐ No 2-☐ Don't Know 3-☐

61 If yes, was he accompanied by any special education staff on these visits? Yes 1-☐ No 2-☐

62 If yes, did the architect keep a written record during the visits? Yes 1-☐ No 2-☐

63 If yes, which of the following persons, if any, had an opportunity to react to them?

Director of special education	1-☐
Superintendent of schools	2-☐
Administrator responsible for planning	3-☐
Special education administrative staff	4-☐
Board of education	5-☐
Teachers	6-☐
Building committee	7-☐
Other 8-☐ ________	9-☐ ________

64 Was the special education teaching staff given periodic opportunity to meet with the architect to present their point of view about the facility? Yes 1-☐ No 2-☐

65 Were teachers consulted regarding the selection of classroom equipment and furniture? Yes 1-☐ No 2-☐

66 Is equipment and furniture ever field tested in the classroom prior to its selection? Yes 1-☐ No 2-☐

67 Is a method prescribed for teachers to use for the evaluation of equipment and furniture? Yes 1-☐ No 2-☐

68 Are teachers or administrators asked to make an evaluation of the building after it has been completed?
Yes 1-☐ No 2-☐

68A If yes, who designed the evaluation device or procedure? ________

69 Has the result of any evaluations been used in the planning of other buildings? Yes 1-☐ No 2-☐

Please indicate with a check (✓) which of the following preliminary investigations were conducted prior to the planning of the building.

		Yes	No
70	Zoning analysis	1-☐	2-☐
1	Topological analysis	1-☐	2-☐
2	Climatological analysis	1-☐	2-☐
3	Transportation analysis	1-☐	2-☐
4	Population analysis	1-☐	2-☐
5	Economic analysis	1-☐	2-☐

Indicate with a check whether city, county and/or state agencies are consulted regarding:

		City	County	State
6	Projected special education population	1-☐	2-☐	3-☐
7	Projected population growth for the area	1-☐	2-☐	3-☐
8	Possible redistricting of school systems	1-☐	2-☐	3-☐
9	Combining many schools into one	1-☐	2-☐	3-☐

10 Which of the following city or county agencies are made aware or asked to consult on the planning and location of special education facilities?

Department of Roads and Highways	1-☐	Planning Department	2-☐
Utilities Commission	3-☐	Urban Renewal or Redevelopment Agency	4-☐
Health Agency	5-☐	Housing Authority	6-☐

Welfare Department 7-☐ Transit Authority 8-☐

Chamber of Commerce 9-☐ Department of Sanitation 10-☐

Other 11-☐ ________ Other 12-☐ ________

11 Is there a district master plan for the construction of facilities for special education? Yes 1-☐ No 2-☐

12 If yes, will the master plan be implemented in:

One year 1-☐ Two years 2-☐ Two to five years 3-☐

Five to ten years 4-☐ Ten or more years 5-☐

13 Where are the funds obtained for the construction of facilities for special education?

State construction fund 1-☐ Local bonds 2-☐ Federal funds 3-☐

Local tax support 4-☐ Private funds 5-☐ Other 6-☐ ________

14 Does your state department of education have a school facilities section that reviews architectural plans? Yes 1-☐ No 2-☐

15 If yes, have you ever been required to substantially modify your plans at the direction of the reviewing agency? Yes 1-☐ No 2-☐

16 Does your state offer assistance in the planning phase of your construction project(s)? Yes 1-☐ No 2-☐

17 Has your state passed "architectural barriers" legislation? Yes 1-☐ No 2-☐ Don't Know 3-☐

18 Was your architect given the "architectural barriers" guidelines? Yes 1-☐ No 2-☐ Don't Know 3-☐

Administrative Organization

Indicate in the appropriate columns:

Column A – the type of children for which programs are currently being operated

Column B – the type of children for which programs may occur in your system

Column C – the type of children that are in programs housed in regular schools

Column D – the type of children that are in programs housed in facilities devoted entirely to special education

	Children	Column A Current programs	Column B Programs that may occur	Column C Programs in regular schools	Column D Programs in all special education facilities
19	Trainable mentally retarded	1-☐	2-☐	3-☐	4-☐
20	Educable mentally retarded	1-☐	2-☐	3-☐	4-☐
21	Hearing handicapped	1-☐	2-☐	3-☐	4-☐
22	Visually handicapped	1-☐	2-☐	3-☐	4-☐
23	Physically handicapped	1-☐	2-☐	3-☐	4-☐
24	Speech handicapped	1-☐	2-☐	3-☐	4-☐
25	Emotionally disturbed	1-☐	2-☐	3-☐	4-☐
26	Gifted	1-☐	2-☐	3-☐	4-☐
27	Special learning disabilities (brain-injured, perceptually handicapped)	1-☐	2-☐	3-☐	4-☐
28	Other ____________	1-☐	2-☐	3-☐	4-☐

29 Does your school district have a director of special education? Yes 1-☐ No 2-☐

30 Is there a supervisor associated with the special education program in your district? Yes 1- ☐ No 2- ☐

30A If no, what is the title of the person that has daily administrative responsibility for the program in your district?

____

31 Is there an administrator that visits special education classes on a regular basis? Yes 1- ☐ No 2- ☐

32 Are there regularly scheduled meetings of the special education staff with the administrator? Yes 1- ☐ No 2- ☐

32A If yes, approximately how frequently do they occur? ______________

32B If yes, where do they occur? ______________

33 If yes, is attendance by all staff required? Yes 1- ☐ No 2- ☐

Please indicate in:

Column A - those exceptional children that are ever integrated with regular class children

Column B - the activities in which this occurs

	Children	Column A Integration occurs	Column B Activities		
34	Trainable mentally retarded	1- ☐			
35	Educable mentally retarded	1- ☐			
36	Hearing handicapped	1- ☐			
37	Visually handicapped	1- ☐			
38	Physically handicapped	1- ☐			
39	Speech handicapped	1- ☐			

	Children	Column A Integration occurs	Column B Activities		
40	Emotionally disturbed	1-☐	______	______	______
41	Gifted	1-☐	______	______	______
42	Special learning disabilities (brain-injured, perceptually handicapped)	1-☐	______	______	______
43	Other ______	1-☐	______	______	______

44 Is transporatation provided for any of the children in your district? Yes 1-☐ No 2-☐

45 If yes, is there a transportation system which the school uses for exceptional children that is different from the one used for regular class children? Yes 1-☐ No 2-☐

46 If yes, is any of the following provided in relation to the buses used by the exceptional children?

Hydraulic lifts on the buses	1-☐
Ramps for loading	2-☐
Ramps for unloading	3-☐
Film or audio programs on the buses	4-☐
Bus aides	5-☐
Other ______	6-☐

The Council For Exceptional Children

PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION

Research Questionnaire

(Teacher)

THE COUNCIL FOR EXCEPTIONAL CHILDREN

PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION

RESEARCH QUESTIONNAIRE

A DEPARTMENT OF THE NATIONAL EDUCATION ASSOCIATION 1201 SIXTEENTH STREET NW WASHINGTON D.C. 20036

THE COUNCIL FOR EXCEPTIONAL CHILDREN

A DEPARTMENT OF THE NATIONAL EDUCATION ASSOCIATION 1201 SIXTEENTH STREET NW WASHINGTON D.C. 20036

Parent Contact

1 If there is a parent association in your school, do the parents of your children participate in the activities sponsored by that group? Yes 1- ☐ No 2-☐

2 Is there an organized group for parents of exceptional children at your school? Yes 1-☐ No 2-☐

Indicate with a check (✓) in the appropriate boxes below if parents of either regular or exceptional children were consulted during the planning of any portion of your school.

		Yes	No	Don't Know
3	Parents of regular children	1- ☐	2-☐	3-☐
4	Parents of exceptional children	1- ☐	2-☐	3-☐

5 When you meet with a child's parent(s), where does this meeting usually occur?

Teacher's office 1- ☐	Your classroom 2-☐	Principal's office 3-☐	Supervisor's office 4-☐
Child's home 5-☐	Library 6-☐	Teacher's lounge 7-☐	Conference room 8-☐
Parent consultation room 9-☐	Other 10-☐ ________________		

6 Are parents permitted to visit their children's special education classrooms? Yes 1- ☐ No 2-☐

7 If yes, are parents allowed access to the classroom at unscheduled times? Yes 1-☐ No 2-☐

8 Can a parent observe his child in the classroom without being seen? Yes 1-☐ No 2-☐

9 Do you ever visit any of your children at home? Yes 1-☐ No 2-☐

10 If yes, have you ever seen something in a child's home that you would have liked in your classroom? Yes 1- ☐ No 2-☐

10A If yes, can you briefly describe it? ______________________________

____

Equipment

Check (✓) in the appropriate boxes below the equipment:

Column A – that is always available in your classroom

Column B – that is available in another classroom

Column C – that is available from a central resource room, instructional media center, or storage room

Equipment	Column A always available in your classroom	Column B available in another classroom	Column C available in resource room, instructional materials center, or storage room
11 Tape recorder	1-☐	2-☐	3-☐
12 Computer assisted instructional equipment	1-☐	2-☐	3-☐
13 16 mm movie projector	1-☐	2-☐	3-☐
14 8 mm movie projector	1-☐	2-☐	3-☐
15 Film strip projector	1-☐	2-☐	3-☐
16 Opaque projector	1-☐	2-☐	3-☐
17 Viewmaster	1-☐	2-☐	3-☐

Equipment	Column A always available in your classroom	Column B available in another classroom	Column C available in resource room, instructional materials center, or storage room
18 Teaching machines	1- ☐	2- ☐	3- ☐
19 Record player	1- ☐	2- ☐	3- ☐
20 Overhead projector	1- ☐	2- ☐	3- ☐
21 Headsets and receivers	1- ☐	2- ☐	3- ☐
22 Dictation equipment	1- ☐	2- ☐	3- ☐
23 Permanent projection screen	1- ☐	2- ☐	3- ☐
24 Portable projection screen	1- ☐	2- ☐	3- ☐
25 Television	1- ☐	2- ☐	3- ☐
Specialized equipment for:			
26 Trainable mentally retarded	1- ☐	2- ☐	3- ☐
27 Educable mentally retarded	1- ☐	2- ☐	3- ☐
28 Hearing handicapped	1- ☐	2- ☐	3- ☐
29 Visually handicapped	1- ☐	2- ☐	3- ☐
30 Physically handicapped	1- ☐	2- ☐	3- ☐
31 Speech handicapped	1- ☐	2- ☐	3- ☐
32 Emotionally disturbed	1- ☐	2- ☐	3- ☐
33 Gifted	1- ☐	2- ☐	3- ☐
34 Special learning disability (brain-injured, perceptually handicapped)	1- ☐	2- ☐	3- ☐

35 Approximately how long does it take you to get to the room where audio visual equipment is stored?

One minute	1-☐	Two minutes	2-☐	Three minutes	3-☐
Four minutes	4-☐	Five minutes	5-☐	More than five minutes	6-☐

Initial Environmental Use

36 Is the classroom in which you presently teach used in the same way as it was originally planned? Yes 1-☐ No 2-☐

37 In contrast to the original plans for your building, are there activities that occur in your classroom which should not occur there? Yes 1-☐ No ☐

37A If yes, can you briefly indicate which activities? ____________________

Can you indicate if any of the following environmental inadequacies are present in your classroom? If so, indicate which activities are adversely affected.

Inadequacies	Present in your classroom	Activities Inhibited
38 Too little space	1-☐	____________
39 Too much space	1-☐	____________
40 Shape of the room	1-☐	____________
41 Limited view of entire room	1-☐	____________
42 Inappropriate furniture	1-☐	____________
43 Inadequate storage	1-☐	____________
44 Inadequate light	1-☐	____________

Inadequacies	Present in your classroom	Activities Inhibited
45 Inadequate sound control	1- ☐	
46 Inadequate heating system	1- ☐	
47 Inadequate cooling system	1- ☐	
48 Inadequate chalkboards	1- ☐	
49 Inadequate tackboards	1- ☐	
50 Other ____	1- ☐	
51 Other ____	1- ☐	

52 Have you substantially modified your classroom since you initially occupied it? Yes 1- ☐ No 2- ☐

52A If yes, can you briefly describe the changes you have made?

Actual Environmental Use

53 Is there any particular architectural aspect(s) of your teaching space that you would consider especially helpful in carrying out the teaching program? Yes 1- ☐ No 2- ☐

53A If yes, can you briefly describe it (them)?

Indicate with a check (✓) those environmental characteristics that are contained in your teaching space.

	Characteristics	Located in your teaching space
54	Movable walls or partitions	1- ☐
55	Areas for special activities such as library, resource center, art studio, etc.	1- ☐
56	Ability to divide space into two or more spaces	1- ☐
57	Small permanent special use spaces located adjacent to your classroom	1- ☐
58	Immediate access to outdoors	1- ☐
59	Pleasant view to outside	1- ☐
60	Direct access to outdoors	1- ☐
61	Adequate storage	1- ☐
62	Teacher's private office	1- ☐
63	Teacher is able to view the entire room	1- ☐
64	Bathrooms immediately adjacent to the classroom	1- ☐
65	Drinking fountain in the teaching space	1- ☐
66	A stage	1- ☐

67 Do you feel that color is an important factor in the design of the classroom? Yes 1-☐ No 2-☐

68 If you were in your present district during the planning of the building in which you are currently located, did you assist the architect or his color consultant in choosing the color scheme for your classroom? Yes 1-☐ No 2-☐

69 Do the children ever remark about the color of their classroom? Yes 1-☐ No 2-☐

70 Is the ceiling in your classroom acoustically tiled? Yes 1-☐ No 2-☐ the walls? Yes 3-☐ No 4-☐

1 Are sections of your building carpeted? Yes 1-☐ No 2-☐

1A If yes, which sections? ____________ ____________ ____________

2 Is your teaching space relatively free of outside noises during the teaching day? Yes 1-☐ No 2-☐

2A If no, can you indicate the major sources of noise that are present in your classroom from outside sources?

____________ ____________ ____________

____________ ____________ ____________

3 Does your classroom contain skylights? Yes 1-☐ No 2-☐

4 Do you have windows in your classroom? Yes 1-☐ No 2-☐

5 Do the windows in your classroom provide adequate light without the constant use of artificial lighting equipment? Yes 1-☐ No 2-☐

6 Is the lighting system adequate to suit the general teaching program? Yes 1-☐ No 2-☐

7 Do you feel the window placement in your classroom creates visual distraction for your students? Yes 1-☐ No 2-☐

8 Are you able to control the glare in your classroom? Yes 1-☐ No 2-☐

8A If yes, can you briefly indicate how? ____________

____

9 Are you able to raise or lower the amount of light in your classroom? Yes 1-☐ No 2-☐

10 Are there portable or prefabricated temporary buildings at your school? Yes 1-☐ No 2-☐

10A If yes, how long have the temporary buildings been located at your school? ____________

11 Are there windows in the doors leading into your classroom? Yes 1- ☐ No 2- ☐

12 Does the door to your classroom remain open while you are teaching? Yes 1- ☐ No 2- ☐

12A If yes, can you indicate why? ______________________________

____

13 Are the children able to open and close the doors in the classroom without assistance? Yes 1- ☐ No 2- ☐

Instructional Areas

Indicate with a check (✓) in which of the following areas your children are provided instruction as part of their curriculum.

	Areas	Instruction Provided
14	Social studies	1- ☐
15	Arithmetic	1- ☐
16	Language	1- ☐
17	Reading	1- ☐
18	Science	1- ☐

Indicate with a check (✓) in the appropriate columns below:

Column A - those instructional areas that are taught in a self-contained classroom

Column B - those instructional areas that are taught in a special room

Column C - those instructional areas that are taught in a room devoted exclusively to instruction in that area

	Areas	Column A taught in a self-contained classroom	Column B taught in a special room	Column C taught in a room devoted exclusively to instruction in that area
19	Social studies	1-☐	2-☐	3-☐
20	Arithmetic	1-☐	2-☐	3-☐
21	Language	1-☐	2-☐	3-☐
22	Reading	1-☐	2-☐	3-☐
23	Science	1-☐	2-☐	3-☐

Please indicate by checking in the appropriate boxes instructional areas in which the listed approaches and design features are used or are present in the classroom.

	Instructional Approaches	Instructional Areas				
		Social studies	Arithmetic	Language	Reading	Science
24	Children are grouped for instruction	1-☐	2-☐	3-☐	4-☐	5-☐
25	Room was designed to promote grouping	1-☐	2-☐	3-☐	4-☐	5-☐
26	Room is teacher modified for grouping	1-☐	2-☐	3-☐	4-☐	5-☐
27	More than one group works at a time	1-☐	2-☐	3-☐	4-☐	5-☐
28	Children work at their own desks	1-☐	2-☐	3-☐	4-☐	5-☐
29	Children work at worktables	1-☐	2-☐	3-☐	4-☐	5-☐
30	Some work occurs on a teacher to single child basis	1-☐	2-☐	3-☐	4-☐	5-☐
31	Children use more than one textbook	1-☐	2-☐	3-☐	4-☐	5-☐
32	Children use only one textbook	1-☐	2-☐	3-☐	4-☐	5-☐
33	Children use resource materials	1-☐	2-☐	3-☐	4-☐	5-☐

	Instructional Approaches	Instructional Areas				
		Social studies	Arithmetic	Language	Reading	Science
34	Adequate material storage space	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
35	Chalkboard used by children	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
36	Tackboard used by children	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
37	Easel used by children	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
38	Easel used by teacher	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
39	Specific area of room arranged for independent work or for creative efforts by children	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
40	Mobile laboratory used	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
41	Permanent laboratory used	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
42	Display space provided for children's work	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐

Indicate by checking in the appropriate boxes where the materials for each of the listed instructional areas are stored.

	Storage Space	Instructional Areas				
		Social studies	Arithmetic	Language	Reading	Science
43	Open shelves	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
44	Closed cabinets	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
45	Open closet	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
46	Clothes closet	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
47	Mobile carts	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐
48	Open cabinets	1- ☐	2- ☐	3- ☐	4- ☐	5- ☐

	Storage Space	Social studies	Arithmetic	Language	Reading	Science
		Instructional Areas				
49	Table tops	1-☐	2-☐	3-☐	4-☐	5-☐
50	Desks	1-☐	2-☐	3-☐	4-☐	5-☐
51	Locked closets	1-☐	2-☐	3-☐	4-☐	5-☐
52	Other ________	1-☐	2-☐	3-☐	4-☐	5-☐
53	Other ________	1-☐	2-☐	3-☐	4-☐	5-☐

Indicate which of the following duplicating machinery is available for your use and where it is stored.

		Available	Not Available	Where Located
54	Thermofax machine	1-☐	2-☐	________
55	Mimeograph machine	1-☐	2-☐	________
56	Ditto machine (Rexograph, Spirit Duplicator)	1-☐	2-☐	________
57	Copying machine (Xerox, 3M)	1-☐	2-☐	________
58	Other ________	1-☐	2-☐	________

59 In which of the following instructional areas, if any, do you use games that require the movement of furniture and/or equipment?

Social studies 1-☐ Arithmetic 2-☐ Language 3-☐ Reading 4-☐ Science 5-☐

60 If the children sit on the floor can they use a permanent tackboard? Yes 1-☐ No 2-☐

61 Can you move your chalkboard up and down? Yes 1-☐ No 2-☐ ; side to side? Yes 3-☐ No 4-☐

62 Can the children while seated at their desks see all of the chalkboard in the room by only turning their heads? Yes 1-☐ No 2-☐

63 If you were involved in the planning of the building in which you are presently located, can you indicate in which of the following instructional areas the architect was provided with a statement indicating the nature of each program and the way it is implemented?

Social studies 1-☐ Arithmetic 2-☐ Language 3-☐ Reading 4-☐ Science 5-☐

64-5 What facilities exist in the school or related area for the pre-vocational or vocational training of the student?

Print shop	1-☐	Automobile shop	2-☐
Gas station	3-☐	Food shop	4-☐
Laundry	5-☐	Landscape area	6-☐
Secretarial skill area	7-☐	Meat shop	8-☐
Woodshop	9-☐	Cafeteria	10-☐
Metal shop	11-☐	Practical nursing area	12-☐
Farm area	13-☐	Other 14-☐	________
Tailoring area	15-☐	Other 16-☐	________

Physical Education

66 Do your children receive physical education instruction in a room specially designed for this purpose?
Yes 1-☐ No 2-☐

67 If there is a special room is it devoted exclusively to physical education activities? Yes 1-☐ No 2-☐

68 If there is a special space, have any special adjustments been made to promote the participation of your children in physical education activities? Yes 1-☐ No 2-☐

68A If yes, can you briefly describe these adjustments. ______________________

____

____

69 Is there a swimming pool in your facility? Yes 1-☐ No 2-☐

70 Do parts of classes ever use the physical education space? Yes 1-☐ No 2-☐

70A Briefly list the activities that comprise the physical education program.

______ ______ ______

______ ______ ______

1 Do you ever conduct physical education activities inside your classroom? Yes 1-☐ No 2-☐

1A If yes, briefly list those physical education activities you conduct in your classroom.

______ ______ ______

______ ______ ______

2 Do you have a place in your classroom to store equipment generally used for physical activities? Yes 1-☐ No 2-☐

3 Is there a common playground for all classes? Yes 1-☐ No 2-☐

4 Is there a playground available that is adjacent to your classroom? Yes 1-☐ No 2-☐

5 Are provisions made for the outdoor storage of physical education and play equipment? Yes 1-☐ No 2-☐

6 Is any part of the outdoor area that is used by your class enclosed? Yes 1-☐ No 2-☐

7 What barrier, if any, is used to separate the playground or outdoor area from adjacent property?

Wire fence 1-☐ Wood fence 2-☐ Brick wall 3-☐ Cinderblock wall 4-☐

Other 5-☐ ______________________

7A Briefly list types of permanent equipment available for use by the children on the playground.

______ ______ ______

______ ______ ______

Music

8 Do you teach music in your classroom? Yes 1-☐ No 2-☐

9 If yes, is there a specific place in your classroom where music instruction takes place? Yes 1-☐ No 2-☐

9A If yes, briefly indicate why it occurs there.

______

______

9B If music activities occur in your classroom, where do you store the materials?

______

10 Is the storage space sufficient? Yes 1-☐. No 2-☐

11 Is music conducted in your classroom generally for one child at a time or for the children as a group?

One child at a time 1-☐ Children as a group 2-☐

12 Is there a music room in your building which is available to your class? Yes 1-☐ No 2-☐

13 If yes, is this where all music activities occur? Yes 1-☐ No 2-☐

14 Do music activities ever occur outdoors? Yes 1-☐ No 2-☐

Please indicate by checking from the list below whether each item is available in your classroom, in a music room, or in both.

	Items	Classroom	Music Room	Both
15	Piano	1-☐	2-☐	3-☐
16	Rhythm instruments	1-☐	2-☐	3-☐
17	Musical instruments	1-☐	2-☐	3-☐
18	Record player	1-☐	2-☐	3-☐
19	Tape recorder	1-☐	2-☐	3-☐
20	Music books	1-☐	2-☐	3-☐

Art

21 Do you teach arts and/or crafts in your classroom? Yes 1-☐ No 2-☐

22 If yes, is there a specific place in your classroom where arts and/or crafts instruction takes place? Yes 1-☐ No 2-☐

22A If yes, briefly indicate why it occurs there. ____________________

____

____

23 Do you have sufficient storage space in your classroom for arts and/or crafts materials and equipment?
Yes 1-☐ No 2-☐

24 Are there any large tables where two or more children can work together on an art project in your room?
Yes 1-☐ No 2-☐

24A If yes, can you indicate for what other activities the tables are used? ____________

____________ ____________ ____________

25 Is there a place set aside in the classroom where children may display their own arts and/or crafts work?
Yes 1-☐ No 2-☐

Please indicate by checking from the list below whether each item is available in your classroom, in an arts and/or crafts room or in both.

		Classroom	Arts and/or Crafts Room	Both
26	Kiln	1-☐	2-☐	3-☐
27	Workbenches	1-☐	2-☐	3-☐
28	Sink	1-☐	2-☐	3-☐
29	Leather crafting tools	1-☐	2-☐	3-☐
30	Potters wheel	1-☐	2-☐	3-☐
31	Power tools	1-☐	2-☐	3-☐

32 Do arts and/or crafts activities ever occur outdoors? Yes 1-☐ No 2-☐

33 Is there an arts and/or crafts room in your building which is available to your class? Yes 1-☐ No 2-☐

34 If yes, is this where all arts and/or crafts activities occur? Yes 1-☐ No 2-☐

34A If an occupational therapy program is provided for the children in your school, where does it occur?

____

Dramatic Arts

35 If your children participate in dramatics arts activities, does this occur in a room specially designed for this purpose? Yes 1-☐ No 2-☐

35A If yes, can you indicate the name of that room and what other activities occur there?

Name of Room	Other Activities
____________	____________
	____________
	____________

36 Is any special equipment or furnishings available in your classroom for dramatic arts activities? Yes 1-☐ No 2-☐

36A If yes, can you briefly list that equipment below?

____________ ____________ ____________ ____________

37 Do you have storage equipment in your classroom for costumes or other props that children use in dramatic arts activities? Yes 1-☐ No 2-☐

Social Adjustment

38 If there is a single private room or similar area in your classroom, please indicate for which of the following purposes it is utilized.

Child determined isolation 1-☐ Teacher determined isolation 2-☐ Rest 3-☐

Discipline 4-☐ Other 5-☐ ____________

39 If there is such a room or area, can you see a child from your room when he is in this space? Yes 1-☐ No 2-☐

40 If you have such a private room or space, what pieces of furniture or equipment does it contain?

No furnishings	1-☐	Window	2-☐	Chalkboard	3-☐	Desk	4-☐
Chair	5-☐	Table	6-☐	Easy chair	7-☐	Rug	8-☐

Other 9-☐ ____________________

41 If an adjacent private room or area to your classroom is not available, is there a space in another area of the building that provides a similar resource for your children? Yes 1-☐ No 2-☐

42 Are there places in your classroom where children may go in groups on their own? Yes 1-☐ No 2-☐

43 If yes, are these areas where the children go separated in any way from the main classroom space? Yes 1-☐ No 2-☐

43A If yes, briefly describe the way in which the space is separated.

____

____

44 Would you allow your students to reorganize their classroom under your direction if it were technically possible? Yes 1-☐ No 2-☐

Eating

45 Has part of your classroom been modified to resemble a home eating environment? Yes 1-☐ No 2-☐

45A If yes, can you briefly describe these modifications?

____

____

46 Is there a cafeteria that serves hot food in your school? Yes 1-☐ No 2-☐

47 If yes, do your children eat in this cafeteria? Yes 1-☐ No 2-☐

47A If yes, what special seating arrangements, if any, are made for your children?

____

____

48 Do your children eat in the classroom? Yes 1-☐ No 2-☐

49 Where do you eat your lunch?

Teacher's lounge 1-☐ Teacher's cafeteria 2-☐ Regular cafeteria 3-☐

Classroom with your children 4-☐ Classroom without your children 5-☐ Out of the building 6-☐

Other 7-☐ ______________________________

Ancillary Personnel

Please indicate by checking (✓) in the appropriate columns

Column A - those persons in your school who have their own individual offices

Column B - those persons in your school who share their office

Column C - those persons in your school with no regularly assigned place to work

Column D - those persons in your school that have adequate space for the storage of materials

Column E - those persons that are not currently available

Personnel	Column A Own office	Column B Shared office	Column C No assigned place	Column D Adequate storage	Column E Not currently available
50 Speech therapist	1-☐	2-☐	3-☐	4-☐	5-☐
51 Occupational therapist	1-☐	2-☐	3-☐	4-☐	5-☐
52 Physical therapist	1-☐	2-☐	3-☐	4-☐	5-☐
53 Crisis teacher	1-☐	2-☐	3-☐	4-☐	5-☐
54 Librarian	1-☐	2-☐	3-☐	4-☐	5-☐
55 Instructional materials specialist	1-☐	2-☐	3-☐	4-☐	5-☐
56 Itinerant teacher	1-☐	2-☐	3-☐	4-☐	5-☐
57 Arithmetic specialist	1-☐	2-☐	3-☐	4-☐	5-☐
58 Reading specialist	1-☐	2-☐	3-☐	4-☐	5-☐
59 Classroom aide	1-☐	2-☐	3-☐	4-☐	5-☐
60 Educational diagnostician	1-☐	2-☐	3-☐	4-☐	5-☐
61 Psychologist	1-☐	2-☐	3-☐	4-☐	5-☐
62 Social worker	1-☐	2-☐	3-☐	4-☐	5-☐
63 Guidance or pupil personnel counselor	1-☐	2-☐	3-☐	4-☐	5-☐
64 Attendance officer	1-☐	2-☐	3-☐	4-☐	5-☐
65 Physician	1-☐	2-☐	3-☐	4-☐	5-☐
66 Dentist	1-☐	2-☐	3-☐	4-☐	5-☐
67 Nurse	1-☐	2-☐	3-☐	4-☐	5-☐

Personnel	Column A Own office	Column B Shared office	Column C No assigned place	Column D Adequate storage	Column E Not currently available
68 School work study coordinator	1- ☐	2-☐	3-☐	4-☐	5-☐
69 Rehabilitation counselor	1- ☐	2-☐	3-☐	4-☐	5-☐

70 Which of the following methods do you most regularly use to contact any of the above ancillary personnel?

Written referral 1- ☐ Telephone 2-☐ Intercom 3-☐ Messenger 4-☐

Prearranged appointment 5-☐ Informal personal contact 6-☐ Other 7-☐ ____________

In-Service and Pre-Service Training

1 Which of the following observation-listening systems, if any, are available in your classroom?

One-way vision mirrors through teachers' offices with sound transmission 1- ☐

One-way vision mirrors through teachers' offices without sound transmission 2- ☐

One-way vision mirrors through the classroom doors with sound transmission 3- ☐

One-way vision mirrors through the classroom doors without sound transmission 4- ☐

One-way vision mirrors through a specifically designed observation room with sound transmission 5- ☐

One-way vision mirrors through a specifically designed observation room without sound transmission 6- ☐

Two-way intercom 7- ☐

One-way intercom 8- ☐

Portable video tape equipment 9- ☐

Closed circuit television to a specified teaching space 10-☐

Other ____________________ ____________________ 11-☐

2 If you have closed circuit television in your building, is it utilized in cooperation with a teacher preparation program? Yes 1-☐ No 2-☐

3 Is there an in-service program of education for teachers in your system? Yes 1-☐ No 2-☐

4 Is use ever made of the special class children and teachers in your school system as instructional models for in-service programs? Yes 1-☐ No 2-☐

5 If yes, do the demonstrations using these teachers occur in a room planned for this purpose? Yes 1-☐ No 2-☐

5A If yes, can you briefly describe how this room differs from your own classroom?

____

____

Criteria for Selection of Potential Sites

The project staff felt that the criteria used in the initial screening of the returned questionnaires for selection of the sites to be visited should attribute heavy weight to:

1. The comprehensiveness of the planning process.
2. The personnel involved in the design process.
3. The success of the environment as a supporting device for the educational program.

Much of the evaluation of the planning process was directed toward consideration of the nature of the planning groups. Participation of the following persons was considered in order of high to low priority:

1. Architect
2. Teachers
3. Educational Evaluation group
4. Physician or nurse
5. Materials specialist
6. Citizens committee

If a panel of two or more of these persons was formally assigned the success of the final environment was increased.

Other items that were given close scrutiny were the following:

1. The assignment of the architect prior to the development of educational specifications.
2. The architect was required to visit other facilities for children that would be housed in the one he was to design.
3. Periodic opportunity was provided for the teachers to meet with the architect and review the plans to date.
4. Some type of field testing was utilized prior to the selection of classroom furniture.
5. Either an informal or formal evaluation occurred after the completion of the facility.
6. Indication that some preliminary analyses of the following were conducted:

    a. Zoning analysis
    b. Topological analysis
    c. Climatological analysis
    d. Transporation analysis
    e. Population analysis
    f. Economic analysis

7. Indication that related agencies were contacted regarding construction of the facility.
8. Parent involvement in either the planning and/or life of the school.
9. The existence of an in-service and/or pre-service training program possibly supported through the availability of video-tape equipment, closed circuit television and one-way vision systems.

The above ciriteria were applied to all questionnaires. A group of thirty' prospective sites were thus indentified for further examination. The second phase of the selection process was completed with attention paid to the following criteria:

1. The comprehensiveness of the special education program in terms of disability areas served.
2. The maintenance of a summer program.
3. The availability of ancillary personnel.
4. Special space provided for a class to serve as instructional models.
5. The presence of a master plan for the development of special education facilities.
6. If a program for physically handicapped children was provided, the availability of an appropriate transportation system
7. That the classrooms used by the responding teachers were being used as designed and/or if teachers modified the environment themselves.
8. The characteristics of the classrooms as indicated by the responding teachers.
9. Where relevant, the presence of pre-vocational or vocational training facilities.
10. The availability of outdoor play space, especially when partially enclosed.
11. The use of rugs in various spaces.
12. Indication of unusual environmental features such as the presence of skylights with or without regualr windows and the availability in the classroom of an isolation (crisis) area.

A re-examination of the questionnaires will be made prior to the pre site selection visits for purposed of verification. Additional information will be obtained re key areas which will yield data assisting in the final selection process.

Six Selected Sites

Mr. Royce E. Lapp
Assistant Superintendent of Instruction
Bassett Unified School District
904 N. Willow
Bassett, California
213/333-5251

Mr. Herbert M. Cole, Jr.
Coordinator-Special Education
San Bernardino City Schools
799 "F" Street
San Bernardino. California 92410
714/885-4431

Mrs. Julia Wickersham
Board of Public Instruction
Duval County Courthouse
330 East Bay Street
Jacksonville, Florida 32202
904/355-8871

Dr. Everett A. McDonald, Jr.
Superintendent of Schools
Centennial School District
Warminster, Pennsylvania 18974
215/672-7100

Mr. Ralph Baird
Tacoma Public Schools
So. 8th and Tacoma Avenue
Tacoma, Washington 98401
206/383-1811

Mr. Gordon R. Hauck
Coordinator of Special Education Services
Lake Washington Schools #414
11133 N. E. 65th
Kirkland, Washington 98033
206/822-2261

Suggested Guidelines for Site Visit Organization

In order to obtain as much information as possible from as many people as possible and yet reduce inconvenience, the staff of the project would like to suggest that the following guidelines be considered when specific plans for the visit are determined.

1. The team will arrive in the area of the site the night prior to the beginning of the visit. This will enable the team opportunity to arrive at the designated school the next morning prior to the arrival of the children. If more than one building is to be visited, it would be desirable to observe arrival at each of them on different days. Similarly, the team would like to remain at each site at least long enough to observe the children depart.

2. After observation of the children arriving at the school, the team would like to engage in a wuick guided tour of the school.

3. Following the tour, the team would like to begin the interviews. Again, to reduce inconvenience, the visiting team would like to meet with some persons as a teamand divide to meet with others. The suggested list of persons needed for interviewing, the approximate minimum time needed, and the team organization follows:

Superintendent of schools	locally determined	full team
School board member	locally determined	full team
Director of special education	ninety minutes	full team
Person responsible for buildings	ninety minutes	full team
Architect	ninety minutes	full team
Educational-architectural programmers	ninety minutes	full team
Teachers as many as possible in each facility each of the first two days	sixty minutes	one team member per each teacher
Supervisors of special education programs	ninety minutes	one team member per each supervisor
Psychologist or diagnostician serving each facility	sixty minutes	one team member
Speech therapist serving each facility	sixty minutes	one team member
Occupational therapist serving each facility	sixty minutes	one team member
Physical therapist serving each facility	sixty minutes	one team member

Media specialist	sixty minutes	one team member
Head custodian in each facility	sixty minutes	one team member
Principal in each facility	ninety minutes	full team

This list is merely suggested as a guide since there may be other persons in your district who are in a position closely related to the current operation of the building or originally to its planning. It is also possible that some of the persons on the above list are not available in your district. We would like to suggest that you feel free to add interviews for any persons who can contribute to our search for information about the planning and functioning of the school (s).

4. It would be preferable if the interviews could occur in the home spaces of those being interviewed whenever possible.
5. There is no need to specially structure the order in which we meet the interviewees.
6. We would like to have some opportunity to observe the children circulating through the building and also while they are eating.
7. The visiting team is prepared to meet with interviewees at any hour, prior to, during, or after the school day, whichever is most convenient.
8. A minimum of two and a half days have been set aside for the visit and hopefully all needed activity can be scheduled during that time.
9. While visiting the schools and when taking photographs, all attempts will be made to avoid disrupting the program. We will be using available light for the photography which should further reduce the interruption.

Interview Schedule for Practitioners

Introduction-We are concerned with the way educational facilities work and are thinking about such things as

How you work with the kids and how they work with each other?
How you present material to them-from the front of the room, in small groups, using media?
How you manage the children-the movement of children, controllingnoise, treating discipline problems, storage?
What is right and wrong with your assigned space, materials, equipment, school that enhances or inhibits what you are trying to accomplish?

Questions

1.1 How does your program work and what are you trying to accomplish?

1.2 Do you ever have occasion to rearrange anything in your room?

1.2a Why? Children's needs, teacher's needs, activity demands, other

1.2b When?

1.2c With what frequency?

1.2d What do you rearrange?

1.2e Does anyone help you with the rearrangement ?

1.2f Do you always rearrange things the same way?

1.2g Are there any difficulties in rearrangeing? What are they?

1.2h How long does it take?

1.2i Do you note any particular problems associated with conducting programs in the rearranged environment? Visual or auditory control, discipline, heating and cooling, other.

1.2j Is there specific kinds of rearrangements that you are unable to accomplish? What kinds and why?

1.3 Do you have occasion to use instructiona, mobility, or special purpose equipment in your program?

1.3a What kind?

1.3b With what frequency?

1.3c For what purpose?

1.3d Used by how many children?

1.3e Where do you use it?

1.3f When do you use it?

1.3g Are there difficulties in using it? Limited light, inadequate power, immobile, limited access.

1.3h Where is it stored?

1.3i How easy is it to use?

1.3j Who uses it?

1.3k Can the children use it by themselves?

1.4 Are there any materials (teaching) that are available in your school, or on the market, but that you could not use in your room for some specific environmental reason?

1.5 Are there materials that you use in your program that you are unable to store in your program?

2.1 Are you satisfied with the storage space that you have?

2.2 Is any of the storage space especially good?
- 2.2a Because of quantity?
- 2.2b Because of location?
- 2.2c Because of access?

2.3 Is any of the storage space especially poor?
- 2.3a Because of quantity?
- 2.3b Because of location?
- 2.3c Because of access?

2.4 Where are the following items stored?
- 2.4a Teaching materials?
- 2.4b Children's equipment (mobility devices)?
- 2.4c Children's personal possessions?
- 2.4d Teacher's personal possessions?
- 2.4e Teaching equipment (media)?

2.5 What storage is available outside your visual working space?
- 2.5a Where is it located?
- 2.5b What is stored there?
- 2.5c How often do you go there?

2.6 How do you decide where various items should be stored (access, size, shape, use)?

2.7 Do the children have direct access to any storage spaces?
- 2.7a Which ones?
- 2.7b For what kind of items?
- 2.7c Are the children encouraged to help themselves at storage compartments?

2.8 Are there any special needs not met by the storage system you are presently using?

3.1 What other persons on the staff work with the same children that you do?
- 3.1a Who?
- 3.1b How often?
- 3.1c For what purpose?
- 3.1d Where?

3.2 Do you have opportunity to talk with any of these persons?
- 3.2a Who?
- 3.2b How often?
- 3.2c For what purpose?
- 3.2d Where?
- 3.2e Do you meet or talk with them as often as you would like?

3.3 How often do you meet with or talk to the building principal and/ or the special education director?

3.3a Where?
3.3b How often?
3.3c How do you make contact with them?

3.4 Do you ever have occasion to talk with a child's parents?
3.4a How often?
3.4b Where?
3.4c How do you contact them?

3.5 Is the place where the coffee pot is located the best place to meet people in the school?
3.5a Are there other places where people congregate?
3.5b Where are they?
3.5c Are these spaces used only for meetings?
3.5d If not, what else are they used for?
3.5e How often are these rooms used for meetings ?
3.5f Is the place where meetings are held comfortable?

3.6 Where do you store the materials that you use for instructional preparation?
3.6a Is the place where you prepare private? Shared?
3.6b Can it be locked?
3.6c Where is it located?
3.6d What specific work do you there?
3.6e Do you like the space?

3.7 Is there ever occasion to work closely with other persons?
3.7a Why?
3.7b With what frequency?
3.7c Where?
3.7d Are there problems working in that space?

3.8 Is there a workroom that is available for use by more than one teacher at a time?
3.8a What is made there?
3.8b What is stored there?
3.8c What equipment is available there?
3.8d Are resource personnel available there or elsewhere to assist you?
3.8e Where is the space located?
3.8f Is the space suitable to meet your needs?
3.8g Could the space be improved?

4.1 Are there any specific features of the designed environment that are particularly hazardous to the safety of you or the children?
4.1a At exits or entrances?
4.1b In lavatories?
4.1c In corridors?
4.1d On stairs?
4.1e In play areas?
4.1f In classrooms?
4.1g In eating areas?

4.1h In the parking lot?
4.1i At doors ?

4.2 Are there any accidents that have repeatedly occurred within or around the building this year?

4.3 Do you ever have fire drills?
4.3a Are there any specific difficulties that are encountered by your children ?
4.3b Where?
4.3c Why?

5.1 Are any facilities used by exceptional children also used by children from the regular program at the same time?
5.1a Which facilities?
5.1b With what frequency ? Scheduled basis?
5.1c Where are the facilities located?
5.1d Are there specific limitations to these spaces being jointly used by regular and special children?
5.1e Is there a need for additional facilities that can be used this way?
5.1f Are there particular problems that occur while these spaces are being jointly used?

5.2 Are any facilities used by exceptional children also used by regular children but at different times?
5.2a Which facilities ?
5.2b With what frequency? Scheduled basis?
5.2c Where are the facilities located?
5.2d Are there specific problems that inhibit the sharing of space?
5.2e Is there a need for additional space like this?

5.3 Do you have opportunity to formally and informally meet with educators primarily responsible for the regular program?
5.3a Where does this occur?
5.3b With what frequency?
5.3c Under what conditions?
5.3d Do you feel a need for more contact with these people?
5.3e What inhibits this interchange form occurring more?

6.1 Is there a playground available for use by your children?
6.1a Are there any special features of the terrain, shape or equipment that makes it especially usable by your children?
6.1b Are there any features of the terrain. shape or equipment that make it especially difficult for your children to use?
6.1c With what frequency do your children use the playground?
6.1d Is it possible to stand at one point and see the entire playground?
6.1e Does more than one activity occur at the same time?

6.2 Is there a gymnasium type space available for use by your children?
6.2a Are there any special features of that area or its equipment that makes it especially usable by your children?
6.2b Are there any features of the area or its equipment that make it especially difficult for your children to use?

6.2c With what frequency do your children use this space?
6.2d Are you able to stand at one point and observe all the children in the space?
6.2e Does the noise level in this area ever become a problem?
6.2f Does more than one activity occur at the same time?

6.3 Do you ever conduct any physical activities in your usual working space?
6.3a What type of activities?
6.3b What difficulties occur?
6.3c With what frequency does this occur?

6.4 Do you conduct physical activities in spaces other than the playground, gymnasium, classrooms, etc.?
6.4a Where?
6.4b With what frequency?
6.4c What difficulties are encountered?

6.5 Is any of the equipment used for physical activities "homemade" or modified for use by your children?
6.5a What equipment?
6.5b Where is it located?
6.5c Who describes the equipment to be constructed?
6.5d Is this or any commercial equipment specifically related to achieving program objectives?

6.6 Where do physical activities occur when weather concitions prohibit going outside?

7.1 As you think about the specific problems presented by the work, are there any features in the environment which assist the child to function?

8.1 When your children are required to move about the building alone, do they get lost?
8.1a Are special purpose rooms used by the children such as lavatories clearly identified to them?

8.2 Are there any special problems associated with the children entering or exiting from the building?

8.3 Are there any points of traffic congestion within the building?
8.3a Where do they occur?
8.3b Why do they occur?
8.3c When do they occur?

9.1 Do you ever receive visitors to watch you work with the children?
9.1a Where do they position themselves?
9.1b How often do you receive visitors?
9.1c Does the presence of visitors present any special problems to you or the children?

9.2 If there is a formalized system for observation, can you describe it? (observation room with one-way glass, cctv)
9.2a Where is it located?
9.2b What sound system is used?

9.2c How well does it work?
9.2d Wehn it is in use, does it present any special problems to you or the children?

10.1 What equipment do you usually use that requires electrical power?
10.1a Is there enough sources of power in your working space?
10.1b If not, how does this limitation effect your program?
10.1c Do you have easy access to all wall outlets?

10.2 Does your working space have sufficient illumination?
10.2a For what activities do you turn the lights out?
10.2b How do you achieve sufficient darkening for the use of films, slides, etc.?
10.2c Where is the switch for the lights located ?
10.2d Does a single switch control all the lights?
10.2e Is it possible to turn out only a portion of the lights and still leave some on?
10.2f Arethere any special difficulties related to darkenting the room?

10.3 Is there any equipment in your working space that frequently breaks?
10.3a What equipment?
10.3b Why does it break?
10.3c Is there any equipment that you especially avoid using because of its potential for breaking?

10.4 Do you have a communications system from your classroom to the rest of the building?
10.4a How does it work?
10.4b How often do you use it?
10.4c Who can you contact?
10.4d Does it create any special problems?

10.5 Are you able to control the climate in your working space?
10.5a Heating? How?
10.5b Cooling? How? Do you have air conditionaing?
10.5c Are there any special problems that occur associated with the heating and/or cooling system such as none, hot spots, cool spots, etc?
10.5d Is the floor ever cold?
10.5e Are there any drafts present? Where?

11.1 Were you employed by this district when the planning for these spaces occurred?

ASK QUESTIONS 11.1 a-g ONLY IF ANSWER TO 11.1 IS YES

11.1a Did you have an opportunity to meet with the architect?
11.1b How often?
11.1c Alone or with other persons?
11.1d What kind of information did the architect request and what information did you provide?

11.1e Did you make any specific suggestions that were included in the building?

11.1f Can you indicate the way in which the planning of the building occurred?

11.1g Did you participate in evaluating the building?

12.1 If you had the opportunity to redesign your teaching space, what would be the main things that would be changed?

Interview Schedule for Planners

Introduction We are primarily concerned with determining the way in which these facilities for handicapped children came about. Our main focus is on the way the building was planned, how specific decisions were made and what problems occurred. We are of course also interested in the effectiveness of the present structures.

Questions

1.1 When were these buildings constructed?
1.2 How many classrooms are included?
1.2a Is this the number initially assigned by educational authorities?
1.3 What are your general feelings about the building?
2.1 How much time was allowed for planning prior to design?
2.2 At what point in the planning did you get involved?
2.2a Prior to initial decision about building?
2.2b During decision to construct building?
2.2c Prior to development of educational specifications?
2.2d During development of educational specifications?
2.2e After development of educational specifications?
2.3 What were some of the factors considered that led to a decision to construct these facilities?
2.3a What prior information and/or data was prepared or available for consideration?
2.3b Were alternatives considered other than building new facilities?
3.1 How was the architect for the building selected?
3.1a Was a screening procedure used?
3.1b Was a committee organized to consider the architect?
3.1c Who was on the committee?
3.1d Who made the final decision about the architect?
3.1e What criteria were applied for that choice?
3.1f Did the architect have prior experience with these types of facilities?
3.1g At what point in the planning was the architect hired?
3.1h Were there any specific community or other pressures that could be identified as selecting a particular architect?
3.2 How often did you meet with the architect?
3.2a Was a committee formed to meet with the architect?
3.2b Who were the members?
3.2c How often did the committee meet?
3.2d What involvement did teachers have with the architect?
3.3 Did the architect visit other facilities for exceptional children?
3.3a How many did he visit?
3.3b Did educators accompany him?
3.3c Did the architect obtain reaction from the planning committee or others to what was seen?

3.3d What persons reacted?

3.4 What other information did the architect use prior to planning the building?

3.4a Where and how was this information obtained?

3.4b Were any consultants used? Representing what disciplines?

3.4c What community agencies participated in the planning?

3.4d Did a citizens or parents' committee become involved in the planning?

4.1 What specific limitations were presented to the architect?

4.1a Budget?

4.1b Significant building code restrictions?

4.1c Design criteria?

4.1d Other?

5.1 Were educational specifications or similar program documents prepared?

5.1a What was your role in their development?

5.1b Was a committee organized to prepare this statement?

5.1c Was this a group that was involved throughout the process and could be called a planning group?

5.1d Who were the members of this group?

5.1e With what frequency did they meet?

5.1f How was the information included in the document obtained?

5.1g At what point in the planning process were they developed?

5.1h To what degree was the architect involved in the development of these statements?

5.1i Did anyone from the board or administration review the program documents?

5.1j Who finally accepted or rejected the plans?

5.2 Was the state department of education involved in the planning?

5.2a If so, at what point and on what level?

6.1 Who was involved in the selection of the site?

6.1a What factors were considered in making that decision?

6.1b Were there any community or other pressures that could be identified as significantly bearing on the final selection of a site?

7.1 How were design decisions made about specific problems?

7.1a Where was information bearing on these decisions obtained?

7.1b Did any of these decisions occur as a result of visits to other schools?

7.1c Were teachers given an opportunity to generate and react to possible solutions?

7.2 What general planning factors were considered and how did each bear on the finally determined solution?

7.2a Climate

7.2b Transportation

7.2c Communications systems

7.2d Teacher training activities

7.2e Other

7.3 What specific major requirements for the new structure were made to the architect?

7.4 Was consideration given to the use of the school by the community, other agencies, parents, etc. during planning?

7.4a If so, how do these influence the planning?

8.1 Did the total cost of the building meet original budget?

8.1a How much did it cost?

8.1b How were the funds raised?

8.1c If by referendum, how many times was it taken to the people?

8.1d If by referendum, what was stressed to obtain passage?

8.1e What alternates were not included in the building due to cost?

9.1 Has any evaluation of the building occurred?

9.1a What did the evaluation reveal?

9.1b What type of evaluationprocedure was used?

9.1c Did the teachers participate in the evaluation?

9.1d What will be done with the results of the evaluation?

10.1 Was the construction of this building part of a district master plan?

10.1a To what degree have special educators been involved in the preparation of the master plan ?

11.1 If you had the opportunity to either plan the building differently or resturcture the planning process, what would you do differently?

REGIONAL WORKSHOP DISSEMINATION CONFERENCES

As a portion of the dissemination activities conducted by the project staff, three regional workship-dissemination conferences were conducted during the summer, 1969. The three major objectives of the conferences were (1) to provide a structured setting in which educational facility planners and educational practitioners could effectively interact; (2) to present some of the questionnaire and site visit findings of the project; (3) to introduce and test the use of the planning process guide, a systematic approach to planning special education facilities.

The conferences, as explained in appendix 14, were organized around a simulated problem approach. The materials presented in appendices 11 through 13 all pertain to the regional conferences and include:

Appendix 11	The planning process guide, including directions for its use.
Appendix 12	The programs for the three conferences
Appendix 13	The simulated problems written for the conferences including: 1. New construction of a trainable mentally retarded center in a city - Ashat TMR 2. Renovation of an existing school in a city for use by young multiply handicapped children 2 to 7 - Noster MH 3. A new building in a county cooperative program to be used by physically handicapped children- Kwash PH 4. Construction of an addition to a regular elementary school in a suburban district for use by children with learning disabilities - Renn SLD Four problems were presented to give conferees the opportunity to select the one most closely related to their needs.
Appendix 14	A summary of the evaluations submitted by conference participants along with their reactions to the usability of the planning process guide.

PLANNING PROCESS GUIDE

On the basis of the information obtained from the questionnaire circulated among administrators and teachers and the detailed observations made in visiting the six selected schools, a Planning Process Guide was developed. The Guide is designed to facilitate orderly and systematic thinking about the various educational and architectural factors which must be related in order to obtain a desirable total environment in which the learning processes of handicapped students may take place. An enormous number of variables must always be taken into consideration--the relation of the school to the surrounding community and its various needs and uses, the type of construction to be undertaken and its relation to the specific site, transportation problems, the kind of students to be educated and the program which is to be offered them, the kinds of demands to be made on the space in relation to the on-going program, the relationship between personnel and the various kinds of spaces, the problems of financing and construction, and the kinds of interactions which will take place. In addition to these, one must never lose sight of the inevitable changes which will occur with time--changes in the community environment, possible changes in numbers and kinds of handicapped students, and the changes which will be desired as new educational m methods and materials are developed. Because of the immense variability in all these factors, it would obviously be fool-hardy to attempt to lay down specific guidelines for design and construction of buildings for handicapped students.

Instead, the Planning Process Guide was developed to provide a coherent means of approaching these significant factors and their interrelationships. The Guide may best be thought of as a catalytic grid to stimulate thinking on those factors which emerged as significant in the research of the group. It provides a series of points for interaction, so that those people involved in the planning of buildings may share their varied information and insights in a constructive and comprehensive manner. In other words, it offers a series of relevant and related questions to which the various planners may respond and thus pool their information to develop the outlines of the desired educational program and a maximally supportive physical environment.

The Planning Process Guide consists of eight two-dimensional matrixes numbered one through eight and also includes a form that allows placement of composite answers derived from the matrixes. The titles are:

1. Community Characteristics
2. Building Site
3. Transportation
4. Children and Daily Program
5. Daily Program and Environment
6. Personnel
7. Finance and Codes
8. Interaction Maps

Vertical and horizontal lines intersect in each of the matrices. At these intersections a factor that might apply to the design of an envoronmental program is taken under consideration. Not all intersections will be relevant to all design problems. Therefore, the participants must be selective in establishing the relevance of the information derived at each intersection. The intersections must be considered in a linear order. When factors dealing with a given problem are determined at the intersections, this information should be placed in the program requirements column of the summary sheet. When a program factor is deemed significant to the designer, its environmental equivalent is placed in the opposite column.

The intersecting horizontal and vertical lines will point out problems, but not necessarily define them since the context or special conditions in any instance will delineate the final design solution.

For instance, in Chart 1 the intersection of school located in a residential area with the vertical line marked population shifting will require a more complete analysis of the existing population (age groups, number of children, trend in condition of neighborhood, etc.) in order that future use of learning spaces by either young children or other more advanced groups can be predicted. Elements of classroom flexibility should be considered if families with older children should move to that area and the school should shift from elementary use to junior high school level or to use by some other age grouping (vis-a-vis, children in pre-school programs only).

Chart 2, Building Site, is straight-forward. However, the intersection between relocatable and climate may indicate that a relocatable structure due to severe climatic conditions may not be justified unless a permanent connection between the relocatable building and existing services (cafeteria, gymnasium, library, central storage rooms, special activities spaces which protect students and teachers in inclement weather) is an environmental factor.

The transportation chart (3) allows for investigation of all forms of public and private vehicles and their relationships to facility design. Questions suggesting the relationships between arrival areas and the sizes of vehicles, the frequency with which they arrive and depart, and such items as special equipment for loading and unloading children are raised. All pertinent information can be listed on the summary sheet and related environmental soultions can be drawn from it.

In Chart 4, the vertical lines indicate the modes through which learning occurs. The intersection of emotional development and the social mode might raise the question whether small spaces should be provided to enhance certain activities that lend themselves to this particular phase of education. The speech therapist functions primarily through the auditory and visual modes although facility and motor functions also play a part in speech therapy. The position of the child and therapist during interaction must be considered and these questions may be delineated and answ and answers developed as the matrix is covered step by step.

Chart 5 will assist in organizing the environmental elements directly related to the daily program of the child; and the following matrix (6) allows systematic investigation of those persons who come in contact with the children during the learning experience and, more specifically, allows identification of those places where contact occurs.

PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION

PLANNING PROCESS GUIDE

The Council for Exceptional Children, 1201 Sixteenth Street, N.W., Washington, D.C.

PROGRAM REQUIREMENTS	EQUIVALENT ENVIRONMENTAL FACTORS

COMMUNITY CHARACTERISTICS

1

	School Location: Residential Area	School Location: Commercial Area	School Location: Industrial Area	Public Agencies on Site Present/Future: Health	Public Agencies on Site Present/Future: Welfare	Public Agencies on Site Present/Future: Recreation	Public Agencies on Site Present/Future: School District	Public Agencies on Site Present/Future: Public Safety	Private Agencies on Site Present/Future	Other
Community Socio-Economic Level										
Neighborhood Socio-Economic Level										
School Population Socio-Economic Level										
Population Growth or Decline										
Population Stability										
Population Shifting										
Land Use: Present										
Land Use: Future										
Other										

BUILDING SITE

2

	Other	Relocatable	Addition to Existing Building	Renovation	New Construction
Topography					
Climate					
Available Area					
On-Site School Access					
Barriers					
Drainage					
Safety Hazards					
Age of Existing School					
Condition of Existing School					
Present Student Capacity of School					
Future Planning Considerations					
Land Use Changes					
Traffic Re-Routing					
Public Transit					
Population Shifts					
Other					

TRANSPORTATION 3

	Public System	District System: Regular Busses	District System: Mini-Busses	District System: Station Wagons	District System: Taxies	Private Vehicles	Other
Arrival-Departure Schedule							
Weather Protection							
Arrival Area							
Inside							
Outside							
Departure Area							
Inside							
Outside							
On-Site Parking							
Staff Entry							
Visitors Entry							
Special Equipment							
Busses							
Cars							
On-Site							
Public Pedestrian Access							
Other							

CHILDREN & DAILY PROGRAM

4

	Visual	Auditory	Tactile	Motor	Verbal	Social	Other
Mental Development Academic Instruction							
Physical Development Physical Education							
Recreation							
Emotional Development							
Social Development							
Ancillary Services Speech Therapy							
Physical Therapy							
Occupational Therapy							
Food Service							
Circulation							
Summer Program							
Other							

DAILY PROGRAM & ENVIRONMENT 5

	Mental Development: Academic Instruction	Physical Development: Physical Education	Physical Development: Recreation	Emotional Development	Social Development	Ancillary Services: Speech Therapy	Ancillary Services: Physical Therapy	Ancillary Services: Occupational Therapy	Food Service	Circulation	Summer Program	Other
Storage												
Child												
Teacher												
Disposable Materials												
Disposable Equipment												
Permanent Materials												
Permanent Equipment												
Media Materials												
Media Equipment												
Teacher Preparation Space												
Materials												
Machines												
Equipment												
Environmental Control												
Lighting - Permanent/Variable												
Acoustics - Permanent/Variable												
Spatial Configuration - Permanent/Variable												
Other												
Architectural Hardware												
Learning Spaces												
Toilet Areas												
Circulation Spaces												
Furniture												
Observation Systems												
Architectural Barriers												
Other												

PERSONNEL

6

	Other	Volunteers	Administrator	Researcher	Physician	Psychologist	Occupational Therapist	Speech Therapist	Ancillary Staff: Physical Therapist	Number of Other Personnel	Number of Aides	Number of Teachers	Number of Children
Number of Learning Stations													
Special Areas													
Resource Areas													
Diagnostic Areas													
Indoor Physical Education Areas													
Outdoor Physical Education Areas													
Administrative Service Areas													
Health Service Areas													
Training Services													
Social Service Areas													
Community Service Areas													
Meeting Areas													
Observation Areas													
Offices													
Other													

Required Space

Construction Code Requirements

Funds Available

Square Footage Per Child

Funding Sources
- Bonds
- Taxes
- Other

Code Restrictions
- Federal
- State
- Local

INTERACTION MAP

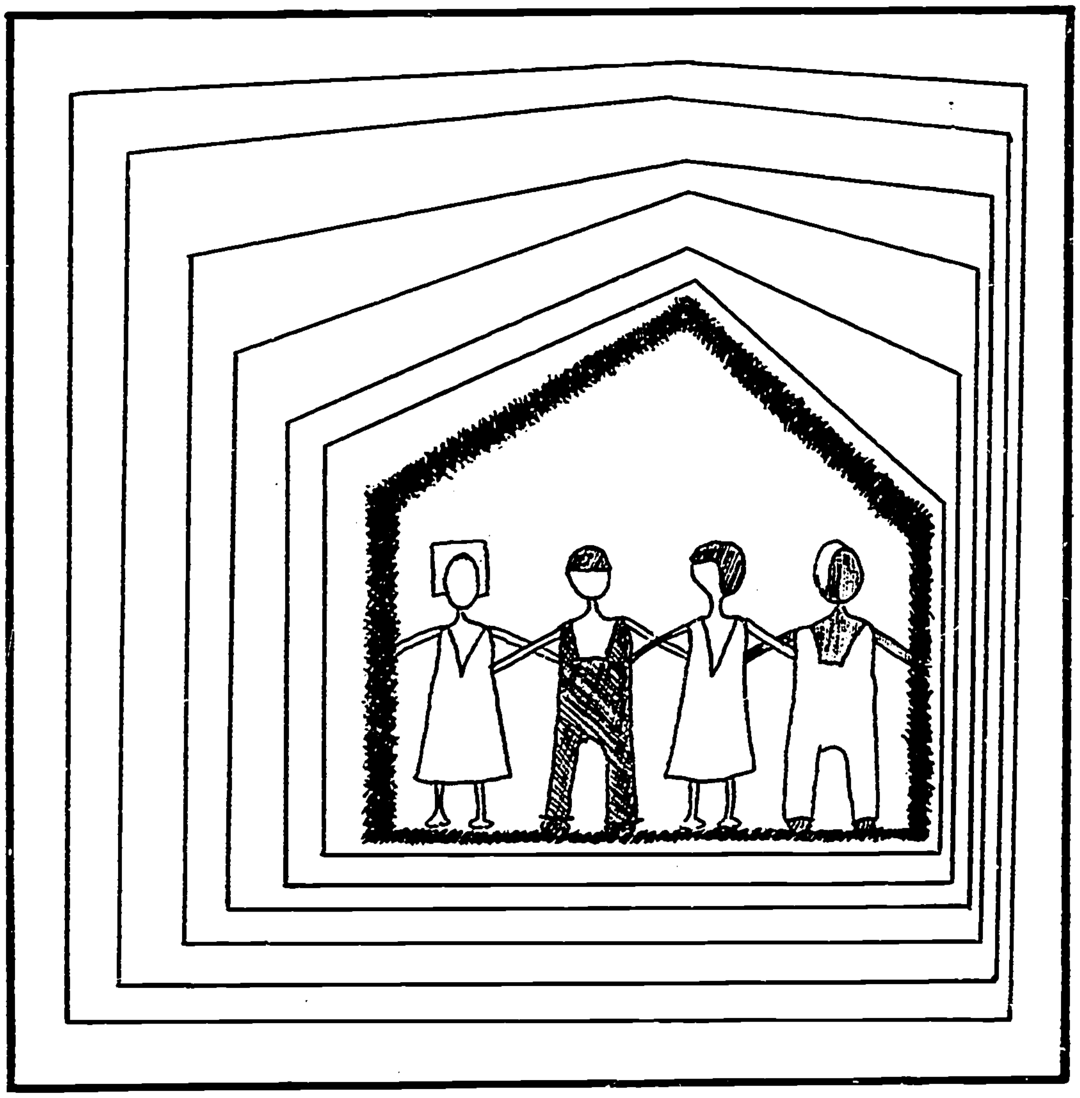
			Other	Over 50	21-50 Children	13-20 Children	9-12 Children	5-8 Children	2-4 Children	Single Child -- Frequency / Place
Children										
Teachers										
Aides										
Other Personnel										
Ancillary Staff										
Physical Therapist										
Speech Therapist										
Occupational Therapist										
Psychologist										
Physician										
Researcher										
Administrator										
Volunteers										
Other										

WORKSHOP DISSEMINATION CONFERENCE

PHYSICAL ENVIRONMENT & SPECIAL EDUCATION

Programs

the council for exceptional children washington d.c.



WORKSHOP - DISSEMINATION CONFERENCE

PHYSICAL ENVIRONMENT & SPECIAL EDUCATION

PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION:
AN INTERDISCIPLINARY APPROACH TO RESEARCH
COUNCIL FOR EXCEPTIONAL CHILDREN
1201 SIXTEENTH STREET, N.W.
WASHINGTON, D.C.

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Alan Abeson
Project Coordinator
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Project Secretary

Research Consultant

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Boston, Massachusetts

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Professor of Special Education and Educational Psychology
The Pennsylvania State University
University Park, Pennsylvania

Mr. Ivan K. Garrison, Director
Four Rivers Special Education District
Jacksonville, Illinois

Dr. Herbert Quay, Chairman
Division of Educational Psychology
College of Education
Temple University
Philadelphia, Pennsylvania

Dr. Ernest P. Willenberg
Director of Special Education
Los Angeles Board of Education
Los Angeles, California

This project was performed pursuant to a grant from the Bureau of Education for the Handicapped, U.S. Office of Education, Department of Health, Education and Welfare.

Program

Regional Workshop – Dissemination Conference on
"Physical Environment and Special Education"
Stardust Hotel – Las Vegas, Nevada
July 30 – August 1, 1969

Wednesday, July 30

6:30 – 9:00 p.m.	Registration – Reception Foyer
7:00 – 9:00 p.m.	Hospitality Room – International Room Slide Presentation (7:30 – 8:30) Progress and Problems in Special Education Facilities Alan Abeson and Bertram Berenson Project Staff Physical Environment and Special Education The Council for Exceptional Children Washington, D.C.

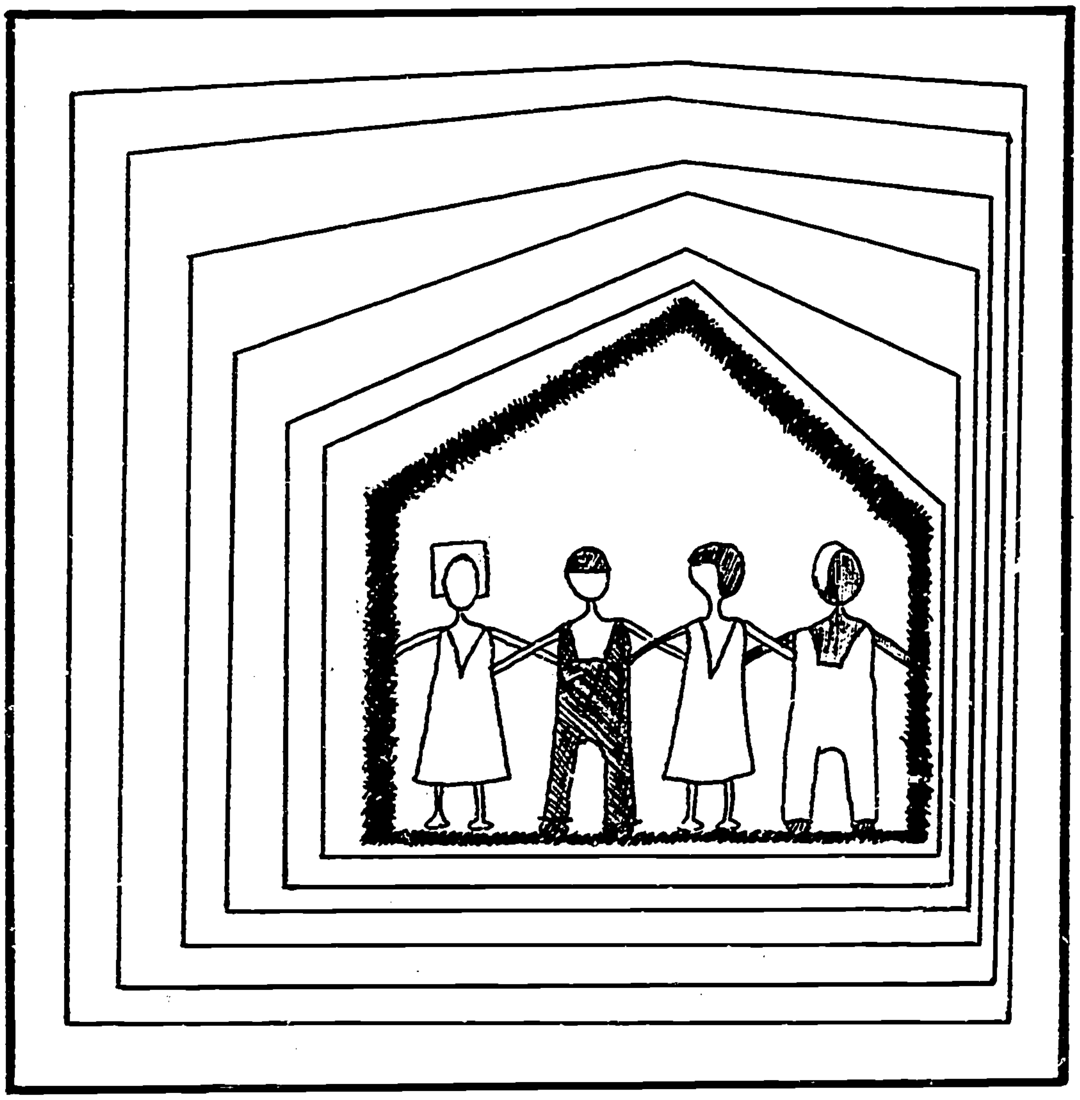
Thursday, July 31

8:30 – 9:00 a.m.	Registration – Reception Foyer
9:00 a.m.	General Orientation Session – International Room Keynote Speaker Dr. Leo Connor, Superintendent Lexington School for the Deaf Jackson Heights, New York
10:00 a.m.	Analytical Planning Equals Objectives – International Room
12 noon	Luncheon – Pan American Room
1:30 p.m.	Identifying and Ordering the Variables – International Room
5:00 – 6:00 p.m.	Essence, Spirits and Serendipity – Pan American Room

Friday, August 1

9:00 a.m.	Decisions and Alternatives – International Room
12 noon	Lunch
1:30 – 3:00 p.m.	Discussion Panel – Process Brings Us Where? – International Room
3:00 – 3:15 p.m.	Where Are We Now? – Member of Project Working Panel International Room
3:15 – 3:30 p.m.	Where Will We Be Tomorrow? – International Room

the council for exceptional children washington d.c.



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Program

Regional Workshop – Dissemination Conference on
"Physical Environment and Special Education"
The Leamington – Minneapolis, Minnesota
August 3 – 5, 1969

Sunday, August 3

6:30 – 9:00 p.m.	Registration – Taft/Wilson Foyer
7:00 – 9:00 p.m.	Hospitality Room – Taft/Wilson Rooms Slide Presentation (7:30 – 8:30) Progress and Problems in Special Education Facilities Alan Abeson and Bertram Berenson Project Staff Physical Environment and Special Education The Council for Exceptional Children Washington, D.C.

Monday, August 4

8:30 – 9:00 a.m.	Registration – Hall of Cities Foyer
9:00 a.m.	General Orientation Session – Twin Cities Keynote Speaker Dr. Henry Ray, Director Teaching and Learning Resources Centennial School District Warminster, Pennsylvania
10:00 a.m.	Analytical Planning Equals Objectives – Twin Cities
12 noon	Luncheon – New York Room
1:30 p.m.	Identifying and Ordering the Variables – Twin Cities
5:00 – 6:00 p.m.	Essence, Spirits and Serendipity – Hoover Room

Tuesday, August 5

9:00 a.m.	Decisions and Alternatives – Twin Cities
12 noon	Lunch
1:30 – 3:00 p.m.	Discussion Panel – Process Brings Us Where? – Twin Cities
3:00 – 3:15 p.m.	Where Are We Now? – Member of Project Working Panel – Twin Cities
3:15 – 3:30 p.m.	Where Will We Be Tomorrow? – Twin Cities

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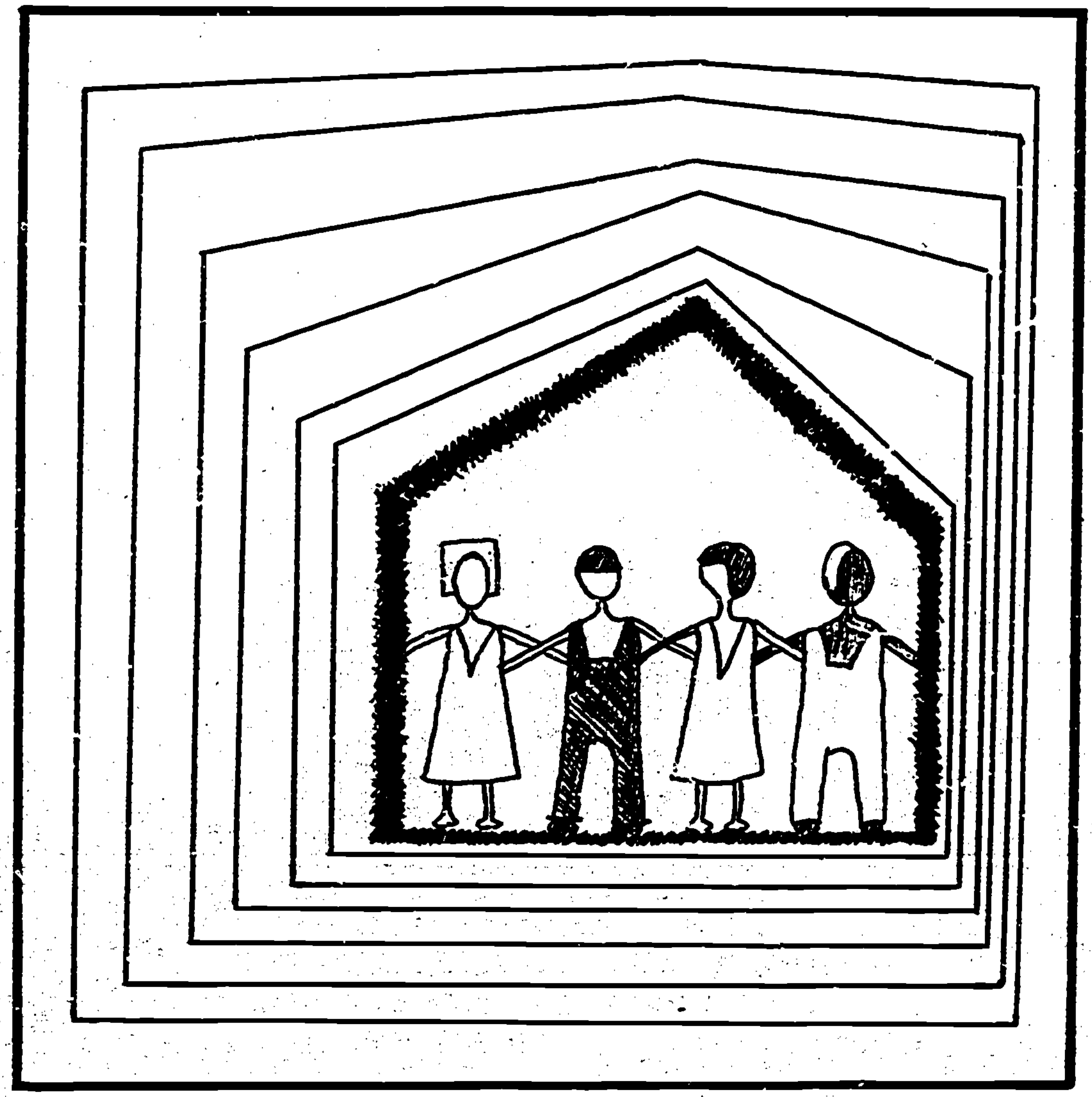

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Program

Regional Workshop - Dissemination Conference on "Physical Environment and Special Education"

White House Motor Inn - Atlanta, Georgia
August 6 - 8, 1969

Wednesday, August 6

6:30 - 9:00 p.m.	Registration - Mezzanine Lobby
7:00 - 9:00 p.m.	Hospitality Room - Independence Hall, Sections A&B Slide Presentation (7:30 - 8:30) Progress and Problems in Special Education Facilities Alan Abeson and Bertram Berenson Project Staff Physical Environment and Special Education The Council for Exceptional Children Washington, D.C.

Thursday, August 7

8:30 - 9:00 a.m.	Registration - Mezzanine Lobby
9:00 a.m.	General Orientation Session - Independence Hall, Sections A&B Keynote Speaker Mr. Richard Veenstra, AIA Partner, Willis and Veenstra 411 East Monroe Jacksonville, Florida
10:00 a.m.	Analytical Planning Equals Objectives - Independence Hall Sections A&B
12 noon	Luncheon - Assembly Room, Sections B&C
1:30 p.m.	Identifying and Ordering the Variables - Independence Hall Sections A&B
5:00 - 6:00 p.m.	Essence, Spirits and Serendipity - Assembly Room, Section B

Friday, August 8

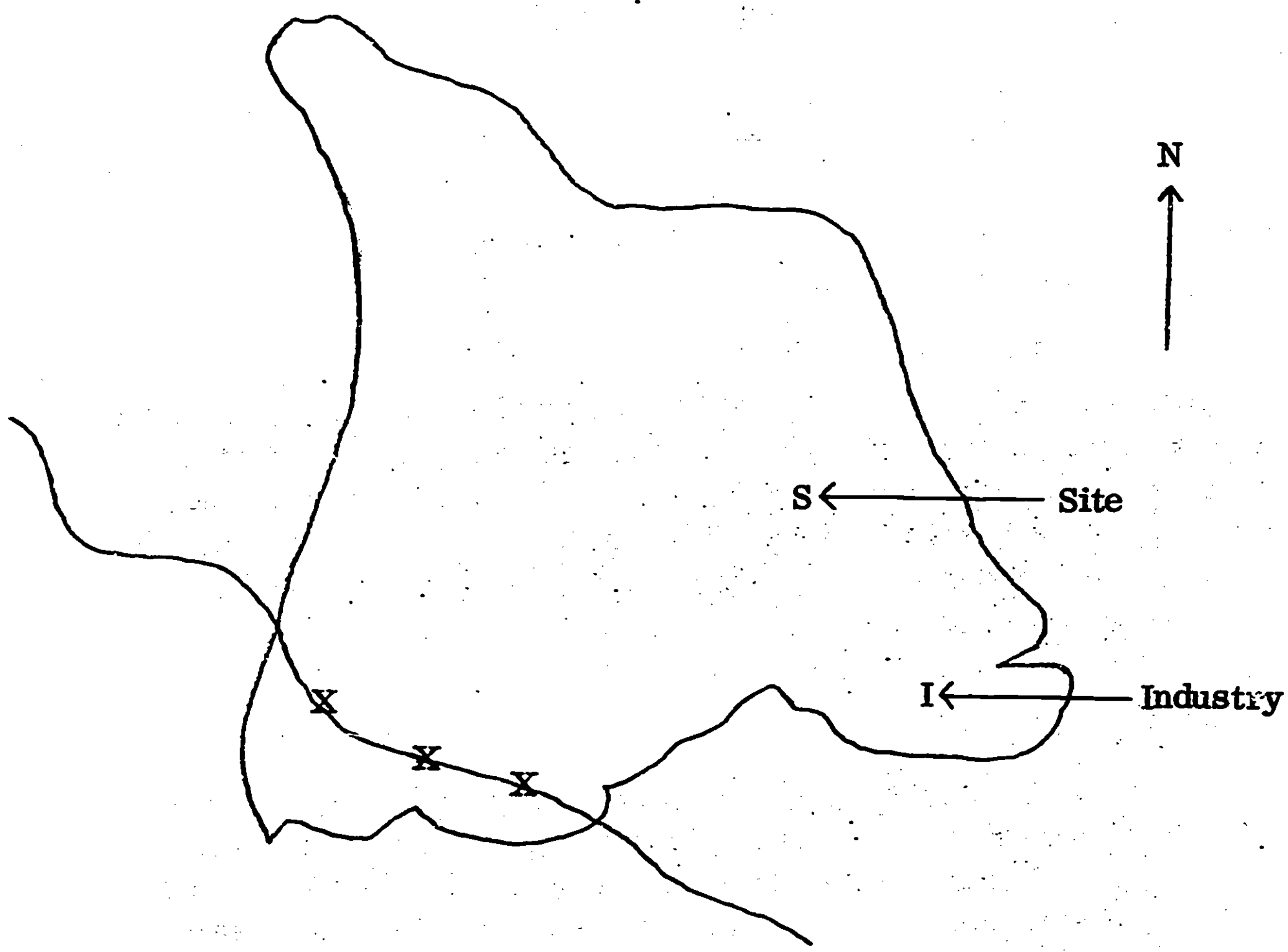
9:00 a.m.	Decisions and Alternatives - Independence Hall, Sections A&B
12 noon	Lunch
1:30 - 3:00 p.m.	Discussion Panel - Process Brings Us Where? - Independence Hall Sections A&B
3:00 - 3:15 p.m.	Where Are We Now? - Member of Project Working Panel Independence Hall, Sections A&B
3:15 - 3:30 p.m.	Where Will We Be Tomorrow? - Independence Hall, Sections A&B

SIMULATED PROBLEMS WRITTEN FOR THE CONFERENCES

Ashat

Geography

Ashat is an incorporated city located 25 miles to the east of the state capital. The boundaries of the city encompass an area of approximately 30 square miles. A river bisects Ashat in the southern portion of the city with three bridges (x) available for both vehicle and pedestrian crossing.



The general topography can best be described as flat. The average January temperature is 29 degrees while in July it is 75 degrees. Annual precipitation is 39 inches. A table of average temperatures and precipitation in selected states is presented below for reference.

Average Temperatures and Precipitation in Selected States Throughout the U.S.

State	January	July	Precipitation (Inches)
Alabama	48	82	50
Arizona	49	87	7
California	52	68	16
Colorado	28	72	15
Georgia	45	79	47
Illinois	26	75	33

State	January	July	Precipitation (Inches)
Kansas	32	80	28
Louisiana	55	82	63
Maryland	35	76	44
Minnesota	12	72	25
North Carolina	42	78	43
Ohio	27	72	35
Oklahoma	37	82	31
Pennsylvania	32	75	42
Tennessee	40	80	45
Vermont	16	69	33
West Virginia	35	75	39

Population

The present population of Ashat is 88,000 people producing an average population density of 2,933 persons per square mile. Ashat, like many formerly rural-suburban communities has been growing at a rapid rate. In 1959 there were 62,000 people in the community and projections indicate that in the next decade an additional 20,000 persons will become residents. At present there are approximately 23,000 families living within the city limits.

Income and Employment

Approximately 25% of the working population is employed in industry while another 50% are white collar workers. Many of the latter group commute to the state capital for work. The median income for Ashat is $4,800. Approximately 20% of the population is considered low income earning less than $3,000 a year. Two-thirds of the residents own their own homes and over half the population received high school or more education with the median number of years of school completed being 10.1.

City Government

Since Ashat is an incorporated city, it must by law have a mayor and council which are elected every four years. Operating as part of the city government are departments of health, welfare, recreation, transportation, zoning and others usually found in city government. The annual budget for the city is $20,741,000.

County Government

Ashat also serves as the seat of the county government. The county system is directed by an elected board of supervisors and an appointed manager. Many of the functions provided by the city agencies are also supplied to the county by similar agencies. The zoning board for example reviews all public construction that occurs in the county including the city. The county office of education operates primarily as an extension of the state and provides such specialized services as special education, vocational education, data processing, etc. to districts that wish to purchase the services. The county office is directed by a board representing the entire county and a superintendent appointed by the board.

Education

The Ashat City School District is operated by a six person elected board of education and a board appointed superintendent. Board elections are conducted every two years for two seats with a full term of office being six years. At present, the district provides for 22,198 children in 21 elementary schools (approximately 10,200 children), six middle schools (approximately 4,800 children), two high schools (approximately 4,000 children) and one community college for 3,000 students. The community college, one high school, two middle schools and six elementary schools were constructed within the past six years. The total city budget for education in the last fiscal year was $11,026,000. Because of the high rate of construction in the district, there is employed within the Division of School Construction an engineer who serves as the major liaison between the school district and architects. A permanent three board member subcommittee acts to select architects and oversee the development of facilities.

Special Education

Under state law, special classes are required for the educable mentally retarded, crippled, speech, hard of hearing, and visually handicapped. The state provides to each school district maintaining one or more approved special classes for handicapped children state aid at the rate of $2,800 for each class maintained and $350 per year for each child receiving home instruction, except that no district receives less than $175 per year for each EMR child enrolled in an approved special class having 10 to 20 enrolled children.

The Division of Special Education within the State Department of Public Instruction is administered by a director and a single consultant for each of the following areas: educable mentally retarded (EMR), trainable mentally retarded (TMR), deaf and hard of hearing, blind and visually handicapped, special learning disabilities, and emotionally disturbed, physically handicapped, and federal programs. A Division of School Planning also operates at the state level and all school renovations and construction in the state must be cleared through it. No one on the staff of that department is specifically familiar with special education and when review is sought, the counterpart special education division is contacted.

The state also provides financial aid for the transportation of handicapped children from the district to and from school. Although a specific formula has been established, depending upon the type of carrier used, the average amount of reimbursement to the district is approximately $.17 per mile traveled.

Special Education in Ashat

Within Ashat there is a Director of a Division of Special Education with equal status to the Director of Pupil Personnel Services and the Director of Curriculum. He reports to the Superintendent through an Assistant Superintendent of Instructional Services. The present director was formerly a school psychologist employed by the county program in a neighboring state.

At present the special education program operates special class programs for the educable and trainable mentally retarded, physically handicapped, emotionally disturbed, and hard of hearing. Itinerant services operate for the homebound and hospitalized and for some severely disturbed children. Resource room programs are provided for the visually handicapped while the blind and deaf are sent to private or public programs in the nearby city or in the state residential centers. Speech therapy is also offered through the Division of Special Education. One consultant-supervisor is employed for the program in mental retardation, another for the physically handicapped and emotionally disturbed program, and a third for the hard of hearing, visually handicapped, and speech therapy. Social work and school psychology are provided by pupil personnel services.

Presently, the number of exceptional children served by the Ashat City School District is as follows:

	Children	Classes	Teachers
Educable Mentally Retarded	360	25	
Trainable Mentally Retarded	144	9	
Physically Handicapped	242	22	
Emotionally Disturbed	90	11	
Hard of Hearing	38	4	
Homebound and Hospitalized	200 (annually)		3
Itinerant Emotionally Disturbed	150 (annually)		3
Visually Handicapped	20 (annually)		1
Speech Therapy	300 (annually)		2

Plant Planning

Recognition of the need for the construction of school buildings and their spiraling cost led the state legislature to provide funds which, under certain conditions, can be used by local districts for construction. The major condition of eligibility is that a school district be bonded to the extent of ninety percent of capacity. If this condition is met, then the amount of aid granted by the state may not exceed fifty percent of the cost of the project. Since the Ashat City School District has reached this level of indebtedness, they are eligible for these funds.

Participation in this grant program requires that the following review and approval procedure be followed.

> The Commissioner of Education shall approve all plans and specifications for construction.
>
> In order that the State Commissioner of Education may determine whether minimum school building standards are being met, the following procedures shall be observed:
>
> 1. Approval of preliminary plans and outline specifications.
>
>   The preliminary plan shall identify and give size of spaces, show possibilities of flexibility and future expansion. A map of the site showing the proposed location of the building shall be a part of the preliminary plan.
>
>   Outline specifications shall include such information as type of walls, floors, roof, heating, ventilating, lighting, windows, doors, etc.
>
> 2. Approval of final plans and complete specifications including alternates. The final plans and complete specifications must be approved by the State Commissioner of Education prior to the advertisement for bids.
>
> 3. Approval of all change orders which affect space allotment, structure, or health and safety prior to the time contractors are advised to make changes.
>
> 4. The superintendent of schools shall be responsible for submitting plans and specifications to the State Commissioner of Education for approval.

Trainable Mentally Retarded (TMR) Center

When bond issues are presented to the voters of Ashat, specific projects are not listed and final allocations are determined by the board. Consequently, the board, after turning down annual requests for funds for TMR construction during the past three years, authorized the Division of Special Education to begin planning for a $500,000 building. The board expected to take advantage of state aid for half the cost of the building.

Repeated appeals to the board of the need for this building included the following rationale.

1. At present the nine existing classes for the trainable are scattered in seven elementary schools and one junior high school. Such an arrangement causes numerous difficulties in terms of grouping the children, providing essential supplementary services to them, coordinating transportation, supervising teachers, and adequately articulating the program from one year to the next.

2. Six of the existing classes are currently occupying spaces that were never intended to be used as classrooms. As a result, the teachers and children are faced with problems of storage, toileting, grouping, lighting, ventilation, noise, inadequate access to corridors and playgrounds, and due to general overcrowding, not being able to use the gym, stage, etc.

3. Since the inception of the TMR program, the classes have had no permanent room or school as they are the first classes forced out by other demands and the last to be reassigned space. As a result, teacher morale has been low and major moving efforts of materials and equipment frequently occur annually.

4. The presently used spaces do not permit the implementation of techniques requiring the use of equipment and materials that have been used successfully in other places with these children. Generally, even such rudimentary items as chalkboards, tackboards, shades, and electrical outlets are not available.

5. With the anticipated growth of this program (possibly through mandatory state legislation, a bill was introduced but narrowly failed in this session) there is recognition that to make the program truly educational and more related to serving the children, parents and the community, more adequate space is required.

Background Information - Ashat TMR Program

At present all diagnosis and evaluation for children identified as potentially mentally retarded occurs at the state institution for the mentally retarded located in Ashat where an outpatient diagnostic center operates. Children are referred for diagnosis from the schools, private physicians and other agencies. Children are accepted for the TMR program when they reach 5 and appear to be toilet trained. For younger children and those over 5 but not toilet trained, a small private school is operated by the Ashat Association for Retarded Children. There is currently a waiting list for public school entrance of about sixty children.

The basic orientation of the entire TMR program is the development of skills of self care, basic academics, independent functioning in the community, social adjustment and the acquisition of some vocationally related skills and/or attitudes. A small sheltered workshop program is operated on a partial sub-contract basis by the Ashat Association for Retarded Children. Close liaison occurs between the workshop and the schools and some children are placed in each setting on a half day basis. It is expected that this aspect of the program will expand in conjunction with the new center. The director of the sheltered workshop is a teacher that formerly had taught the one existing junior high school trainable class.

The Ashat Association for Retarded Children is a group that has been organized for ten years and has always had an active membership between 100 and 150. Most active in the group are two lawyers and three housewives, one a former teacher. The unit is sufficiently organized to have actively campaigned during board elections and to have succeeded in electing one of their own executive board members to it. That person is currently in the third year of his term of office.

No federal money is currently being used in the trainable program. However, a Title I, ESEA proposal written to develop specialized materials for instruction in vocational attitudes was not funded.

Program Guidelines

After the board approved the project, the Director of the Division of Special Education and the consultant for trainable programs, along with a few teachers and representatives of other agencies, both within the school and community, began the planning process by stating the following broad program principles.

1. The center will be designed to accommodate 18 teachers, 2 social workers, one full-time adaptive physical education teacher, one full-time psychologist, one full-time nurse, two vocational counselors, one administrator, one secretary and a maximum of 225 children between the ages of 5 and 21.

2. The focus of the curriculum will be upon the development of skills of self care, basic academics, independent functioning in the community, social adjustment and the acquisition of vocationally related skills and/or attitudes.

3. Emphasis will be placed on the use of the center for pre and in-service activities (in conjunction with a private university located in the county) for teachers, therapists, psychologists, social workers, aides, and as an educational and counseling center for the parents of the children. This will

require that some type of observation system be provided in the building.

4. The center will be designed to contribute to the amelioration of the negative behavior frequently associated with learning by these children such as distractibility to extraneous stimuli.

5. A portion of the center will be devoted to regularly scheduled parent counseling with maximum consideration devoted to the parents' needs and comfort. Associated with this space will be a children's waiting room.

6. Adequate and effective space will be provided for instruction in arts and crafts, physical education, recreation, hygiene, speech, home economics, the creative arts, and prevocational training.

7. Extensive use will be made of commercially available and homemade materials and equipment, especially instructional media.

8. Many groupings of children will occur varying from one teacher working with individual children and large groups of children working with one or more teachers requiring an environment that permits restructuring.

9. Provisions will be made for the effective utilization of teacher aides on the basis of one aide per each regular teacher.

10. A summer school and recreation program will be housed in the center with the possibility that some "normal" youngsters will participate.

11. The atmosphere and appearance of the center will be non-institutional.

12. An internal communications system will be provided to permit teacher to teacher and teacher to office to teacher contact to occur.

13. A series of internal courts providing rapid access to and awareness of the outdoors will be included.

14. The daily schedule will require that all children are in school until 2:00 p.m.

15. The entire building will conform to barriers guidelines. Special emphasis will be placed on providing for the safe and easy access of the children when arriving and departing from the school by regular school bus, mini-buses, station wagons and private vehicles. Some children with physical handicaps will be transported on buses using hydraulic lifts and ramps.

16. One specially designed toilet area will be required for the care of children that have toilet accidents.

17. Provision will be made for each teacher to control the climate in each learning space.

18. Adequate provision will be made for the controlled isolation of children by teachers.

19. Space will be designed for the preparation of materials by teachers and the availability of equipment and raw materials to do so.

20. The adjoining playground will be designed with a goal of contributing to the development of physical fitness in the children.

Site

In order to obtain as much use of the money provided for the center as possible, the board decided to place the building on a site already owned by the district that has housed a junior high school for seven years. Since the district operates without a master plan, no consideration prior to the construction of the junior high school had been given to the use of the same site for another school. The dimensions of the site (including the junior high school) are 540' x 340' as indicated on the following page.

Topographically, the site is flat with the outstanding highlight, the Musquapsink Brook that runs through it.

The site is located in a section of the community that has been fully populated by housing developments. All homes are single family variety and have been built for the most part during the past fifteen years. The Ashat Industrial Center is about ten minutes away while downtown shopping is twenty minutes away in a southwest direction.

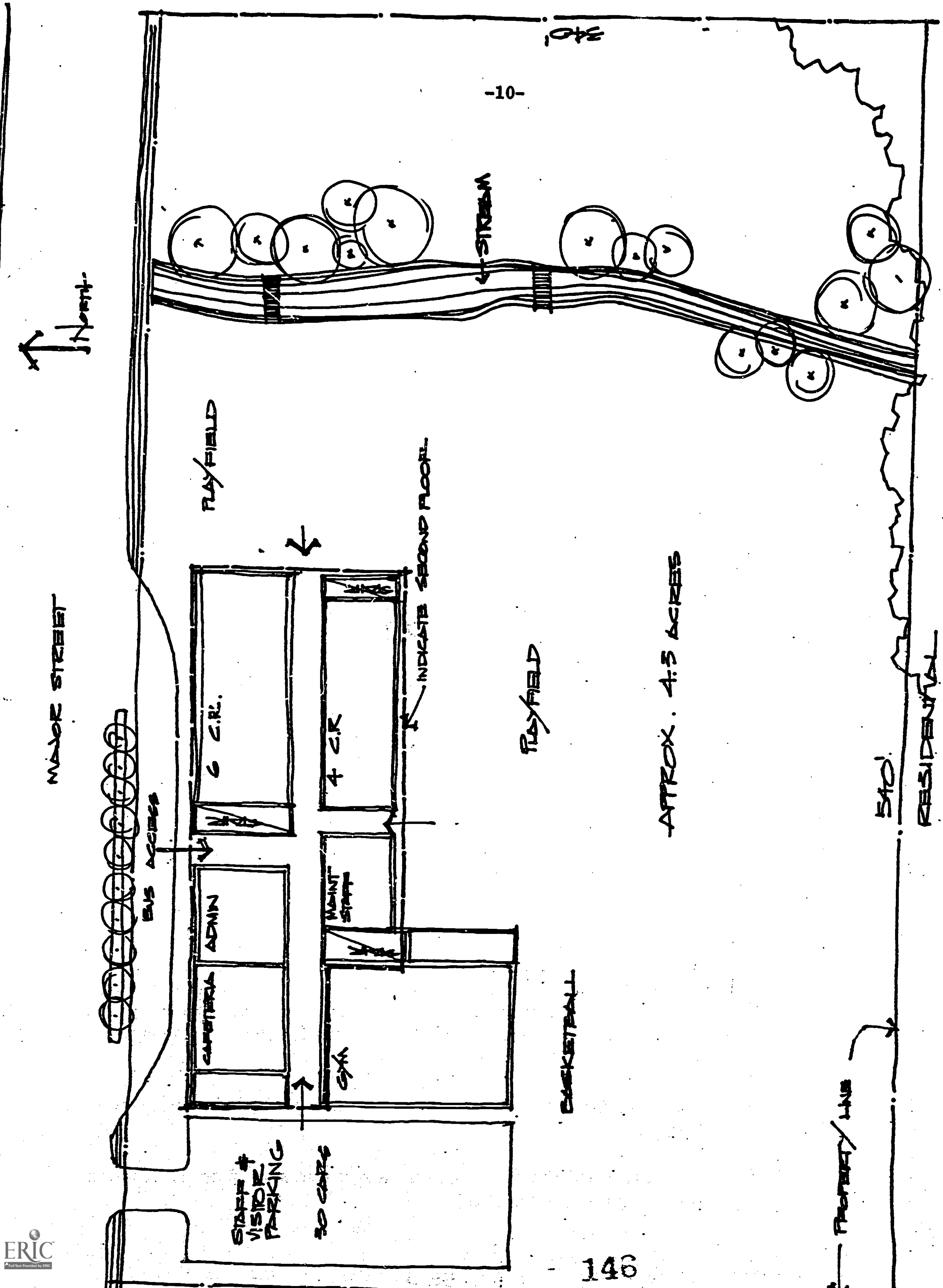
At present the average building costs in Ashat are $23-25 per square foot excluding site development and furnishings.

The Problem

As educators and architects working on the trainable mentally retarded center in Ashat, you are now faced with beginning the design process that hopefully will result in the creation of an efficient and effective building. The total task of planning a facility is obviously one that cannot be completed during this meeting. For this reason, your deliberations should be directed to providing at a minimum the following at 12:00 p.m. on the final day of the conference.

1. A description of the type of activities that will occur with consideration of spatial needs.

2. A bubble diagram indicating the relationships that should occur between all needed spaces in the building.


North
MAJOR STREET
BUS ACCESS
ADMIN
CAFETERIA
6 C.R.
4 C.R.
MAINT STAFF
GYM
INDICATE SECOND FLOOR
PLAY FIELD
PLAY FIELD
STREAM
BASKETBALL
STAFF & VISITOR PARKING
30 CARS
APPROX. 4.5 ACRES
340'
540'
RESIDENTIAL
SITE PLAN 1" = 50'
PROPERTY LINE

3. A listing of specific elements which would be requirements for this building.

4. Optional - if time - a preliminary floor plan.

5. Optional - if time - a preliminary "learning space."

The results of your work should be presented on 8-1/2"x11" paper (provided to you) for duplication and distribution to all conferees.

Facility Guidelines

The following specific guidelines must be adopted or rationales for changes must be indicated when designing the building.

1. Height of building - type of construction

   All buildings of frame construction shall be only one story high. All two story buildings shall have at least fire-resistant corridors and fire-resistant stairways with non-skid treads, and all buildings of three or more stories shall be of fire-resistant material except doors, windows, floor covering, and roofing.

2. Ceiling height

   The ceiling height in each classroom shall average at least 10 feet, provided a minimum ceiling height of 9 feet may be used in classrooms with approved forced air ventilation and fluorescent lighting. Ceiling heights in shops shall be governed by the purpose for which the shop is to be used.

3. Safety

   a. Exits

      All buildings, except one classroom schools, shall have at least two exits remote from each other, and the total exit facilities of any school building shall be at least 22 inches in width for each 100 people to be housed at any one time. No single exit door shall be less than [illegible] inches wide.

   b. Glass

      No glass other than fixed wire glass shall be used in any interior door or interior corridor wall. Walls between rooms and other rooms such as view windows in libraries, laboratories, and shops shall be wire glass, laminated glass, tempered glass or approved plastic sheet. Glass in the lower two-thirds of any exterior door or within 4'6" of the floor of exterior corridor walls or a landing shall be one of the above listed types of safety glass. No glass in any building shall be larger than 1400 square inches unless it be an approved safety glass of one of the above types.

   c. Handrails

      Every stairway and outside steps with four or more risers (3 steps) shall have handrails as follows:

(1) One handrail if the stairway is 44" or less in width

(2) One handrail on each side if the stairway is more than 44" in width

(3) When the required width of a flight of stairs exceeds eighty-eight inches there shall be an intermediate handrail continuous between landings. The handrail shall be substantially supported, terminating at the upper end with newels or standards at least six feet high with no projections.

(4) Change of direction of stairways shall be by landing. (No winders)

d. Doors

All classroom and exit doors shall open outward. All exit doors shall be equipped with panic hardware, except doors in one or two classroom building which open directly outside from classrooms.

No lock shall be placed on any classroom door which requires a key for egress.

4. Toilets

Toilet rooms for each sex shall be provided, and there shall be at least one water closet of appropriate height for each 30 girls and one for each 40 boys. In addition, there shall be a urinal of appropriate height for each 40 boys. Lavatories shall be provided in all toilet rooms or immediately adjacent to the toilet rooms in the ratio of one fixture for each 50 pupils. The sewage disposal system used shall meet standards set up by the State Department of Public Health. If septic tanks are used, a minimum of 10 linear feet of drainage tile per child shall be provided. (This means 10 feet per child to be housed in any particular building.) A percolation test satisfactory to the State Department of Public Health shall be run before locating a disposal field. Floor drains shall be provided in all toilet rooms.

5. Drinking water

A protected source of drinking water shall be provided which meets sanitary requirements for purity as set up by the State Department of Public Health. One drinking fountain bubbler shall be provided for each 60 pupils enrolled, with not more than two bubblers placed at one location.

6. Corridors

All primary corridors in buildings containing 10 or more rooms shall be at least 10 feet wide, net, exclusive of lockers, except that a 6-foot corridor will be accepted if it is single-loaded and if the adjoining classrooms have outside exits. No double-loaded corridor, primary or secondary shall be less than 8 feet wide. All corridor ceilings shall be at least 8 feet high. No dead end corridor shall extend more than 20 feet beyond a stairway or other means of exit therefrom.

7. Classrooms

Regular classrooms in all schools embracing grades 1-8 or any combination of these grades shall contain at least 748 square feet, net, exclusive of cloak room or locker space. Regular classrooms in all schools embracing grades 7-12 or any combination of these grades shall have a minimum floor space of 22 square feet per pupil exclusive of cloak or storage rooms. If mathematics laboratories are provided, these laboratories shall contain a minimum of 30 square feet per pupil.

8. Science laboratories

Science laboratories for general science and biology shall have a minimum floor space of 30 square feet per pupil. If used as a combination laboratory-lecture room, the furniture and equipment shall be designed to accommodate the pupils for these purposes. Science laboratories for chemistry and physics shall have a minimum floor space of 30 square feet per pupil. Combination laboratory-lecture rooms shall have a minimum floor space of 45 square feet per pupil. Storage space shall be provided in addition to the floor space requirement mentioned above.

9. Homemaking laboratories

Combination homemaking laboratories shall have a minimum floor space of 45 square feet per pupil, and in addition to this requirement, there shall be, in connection with the homemaking department, a living room-dining room, a rest room, and storage closets. In a school with an enrollment of 100 or fewer pupils, a living area in one end of a laboratory 45 feet long may substitute for the living room-dining room.

10. Commercial rooms

In all commercial suites, there shall be a minimum floor area of 24 square feet per pupil. In office practice laboratories, there shall be 34 square feet per pupil. Additional floor space shall be provided for storage.

11. Art rooms

In all art rooms, there shall be a minimum floor space of 30 square feet per pupil. Additional floor space shall be provided for storage.

12. Music rooms

A vocal music room shall have a floor area of 15 square feet per pupil for the largest class accommodated; instrumental music rooms shall have 20 square feet per pupil. Additional area for storage shall be provided for sheet music, instruments, and uniforms. Additional areas for individual practice rooms shall be provided.

13. Library

In all schools embracing grades 1-8 or any combination of these grades having 15 teachers or more, a library shall be provided to seat the largest class, plus 15 pupils. This space shall be computed on the basis of 20 square feet per pupil. Additional space shall be provided for storage of instructional materials and a workroom with running water, shelves, and cabinets. In all schools embracing grades 1-12 and in all schools embracing any combination of grades 7-12, a library shall be provided large enough to house 15 per cent of the enrollment. This space shall be computed on the basis of at least 20 square feet per pupil to be accommodated. Additional space shall be provided for a conference room, storage space for magazines, audio visual materials and equipment, and a workroom supplied with running water, shelves, and cabinets. Each of these rooms shall contain at least 120 square feet. The conference room and workroom shall be separated from the library and each other with a vision strip to facilitate supervision.

14. Physical education facilities

Every school shall be provided with an area for physical education consisting of a well drained, smooth, playground, and one of the following:

a. A play room with a minimum of 35 square feet per pupil taking physical education during the peak load (1800 square feet minimum); or

b. A gymnasium with a minimum floor space of 35 square feet per pupil taking physical education during the peak load (2400 square feet minimum); or

c. A hard surface outside area with a minimum space of 35 square feet per pupil taking physical education during the peak load.

Note 1: Handwashing and toilet facilities shall be made available to all children taking physical education.

Note 2: Wherever gymnasiums are built for pupils in grades 7 to 12, facilities for dressing and showering shall be provided according to the following minimum standards:

(a) 12 square feet of floor space per pupil in peak load in any class

(b) 12 square feet of floor space for each shower head

(c) There shall be one shower head for every five pupils, based upon the peak load in the largest class.

15. Industrial arts and/or vocational trade and industrial shops

If included in the school program, these shops shall conform to the following space requirements based on a minimum of 20 pupils per class:

a. Auto mechanics - 2400 square feet

b. Building trades, bricklaying, plastering, painting, and decorating, home mechanics, machine shop, general metals, general shop, foundry, welding, printing, power sawing, sheet metal, and woodworking - 1920 square feet

c. Electricity, radio-T. V. repair, electronics, industrial chemistry, shoe repair, leather craft, handicraft, cosmetology, drafting, commercial art, commercial photography (including shop and darkrooms), commercial cooking (kitchen-1056 square feet, tearoom-1056 square feet), and mechanical drawing - 1056 square feet.

d. In addition, the following must be provided for the above shops where applicable:

(1) Tool rooms - 48 square feet

(2) Storage rooms - 48 square feet

(3) Finishing rooms (Fire resistant space shall be provided for

flammable materials) - 400 square feet

(4) Lumber rooms - 200 square feet

(5) Car painting for auto body shop - 288 square feet

(6) Change-locker room for mechanical shops with 60 lockers

(7) Toilet facilities, if not otherwise convenient

16. Office space

a. Each school plant of eight to ten teachers shall provide at least 300 square feet of floor area for office space.

b. Schools with more than ten teachers shall have proportionately larger office space.

c. Adequate facilities for records, equipment, and textbooks shall be provided.

17. Guidance suite

A guidance suite with a waiting room, individual counseling rooms, and adequate storage space shall be provided.

18. Clinic

In schools having eight or more teachers, separate space shall be provided for clinical services.

19. Auditoriums

a. Auditorium area including seating space, stage, and dressing rooms shall be figured at 9 square feet times the desired seating capacity.

b. All auditoriums shall be located on the ground floor, or first floor.

20. Chalkboards

a. A minimum of 20 linear feet of chalkboard with a reflection factor of not less than 15 per cent shall be provided in each regular classroom.

b. The amount of chalkboard in special classrooms shall vary according to need.

21. Tackboards or bulletin boards

a. At least 48 square feet of bulletin board shall be provided in each classroom.

b. The amount of bulletin board in special classrooms shall vary according to need.

22. Storage space

a. Storage space for teaching material shall be provided in each classroom.

b. Lockers, wardrobes, cloak rooms, or shelves and hook strips shall be provided for pupils' wraps.

c. There shall be no storage space under any stair.

d. Adequate storage space shall be provided for janitorial supplies and equipment.

23. Cafeteria

Space Requirements in Square Feet

	0–100	101–200	201–300	301–400	401–500	501–600	601–700	701–800	801–900
Kitchen and Refrigeration Area		270	305	395	435	610	685	800	1005
Dry Storage		60	100	135	170	200	240	270	300
Nonfood Storage		20	30	30	30	30	30	30	30
Serving Area (Kitchen)		80	120	120	160	200	200	300	300
Dish Washing Area		50	75	100	125	150	175	200	225
Service Sink and Cleaning Area		30	30	30	30	30	30	30	30
Office		30	30	40	40	40	40	40	40
Rest Rooms		45	45	45	60	60	60	70	70
Total Kitchen Area	350	585	735	895	1050	1320	1460	1740	2000
Dining Area	400	800	1200	1600	2000	2400	2800	3200	3600

Note: To arrive at total kitchen space needed for schools with enrollments above 900 pupils, calculate space needed on specifications below:

Kitchen area - 1 square foot per meal served
Dry storage - 1/3 square foot per meal served
Serving area - 120 square feet per serving line
Dishwashing - 1/4 square foot per meal served

a. Cafeterias shall not be placed in basement rooms unless the floor on at least two sides is above finished grade.

b. Cross ventilation and/or mechanical ventilation shall be provided. There shall be a vented hood or canopy over all cooking, baking or dishwashing equipment with mechanical exhaust ventilation - minimum requirements six air changes per hour.

c. Outside openings to the kitchen, dining area, and storeroom shall be screened. Self-closing doors will be approved without screens. Flychaser fans may be used at dining room entrances in lieu of screened doors.

d. Each cafeteria shall be provided with a rest room for workers and with lockers or storage space for uniforms and other personal belongings of workers.

e. Each kitchen shall have a handwashing lavatory containing hot and cold water with a foot operated faucet.

f. Each cafeteria shall be provided with enclosed and screened garbage area. There shall be outside can washing facilities.

g. Storage shall be provided with natural ventilation through louvered or screened security sash, and louvered doors, or positive mechanical ventilation, day and night, with not less than four air changes per hour.

(1) Storage shall be free of hot water pipes, water heaters, chimneys or other heat producing devices, and refrigeration condensing units

(2) Well supported shelves shall be provided for storage, with at least one-inch clearance at wall for ventilation.

h. Floors of kitchens shall have some type of floor covering. Quarry tile, terrazo, or vinyl tile is acceptable.

i. Schools participating in the National School Lunch Program shall meet the following standards on sinks in kitchen area:

(1) A three-compartment sink for dish washing, with hot and cold water available at each compartment. A dish washing machine may be used in place of the three-compartment sink for dish washing. If such a dish washing machine is used, it shall be provided with a prerinse sink and a hose with a force valve or other mechanical prerinse device. Water shall not be less than 140 degrees F. for washing and not less than 180 degrees F. for rinsing.

(a) Each compartment of this sink shall be at least 24"x24"x14" deep.

(b) Drain boards and a 10" splash board shall be integral parts of this sink.

(2) Cafeterias serving 200 or more shall have a combination three-compartment pot and vegetable sink (in addition to the three-compartment sink for dish washing) with hot and cold water provided at each compartment.

(a) Each compartment of this sink shall not be smaller than 24"x24"x12" deep. The recommended size of each compartment of this sink is 24"x30"x12" deep.

(b) Drain boards and rear splash back shall be integral parts of the sink.

(3) Cafeterias serving 400 or more shall have a two or more compartment vegetable sink (in addition to the three compartment sink for dish washing and the combination three-compartment pot and vegetable sink) with hot and cold water provided at each compartment.

(a) Each compartment of this sink shall not be less than 24"x24"x12" deep.

(b) Drain boards and a rear splash back shall be integral parts of this sink.

(4) Each cafeteria shall have a mop or service sink with hot and cold water available.

(5) Cafeterias serving 200 or more shall have a service sink in a separate storage area for mops and cleaning supplies.

24. Interior finish

Ceilings shall be finished flat with at least 85 per cent reflectance; walls flat, 50 per cent to 70 per cent reflectance; wainscot same as walls, or slightly darker with flat or semi-gloss; trim, natural, flat or semi-gloss, 35 per cent to 60 per cent reflectance; floors 30 to 40 per cent reflectance, and furniture 30 to 50 per cent. When concrete floor slabs occur on grade, there shall be specific provision for drainage beneath the subfloor such as tile, rock, or gravel fill; and there shall be adequate precautions against penetration of moisture through the slab on account of seepage, capillary action, or hydrostatic pressure.

25. Lighting

a. Natural lighting shall be supplemented by shadow and glare free artifical lighting in amounts that provide at least 30 foot candles on desk top. Special areas shall be lighted in accordance with recommended standards.

b. The head of windows, except vision strip windows, shall not be more than 12" below the ceiling.

c. Classroom windows, except those facing north, shall be equipped with venetian blinds, window shades of translucent material, or other approved means to control natural light.

d. When light is provided in classrooms, libraries, or study halls through skylights there shall be a positive and effective means of controlling glare, heat radiation, and the amount of light admitted through such skylights.

e. Every classroom, unless it has a door opening directly to the outside of the building with a minimum glass area of 24"x30", shall have at least one outside window with one panel at the bottom of the window which can be opened from the inside without the use of tools. This window shall provide a clear opening of not less than 24 inches wide and 32 inches high to be usable in an emergency, with the bottom of the opening not more than 32 inches above the floor. Approval of plans for classroom fenestration will be considered only after plans for ventilating and lighting such rooms have been approved. Approval of plans for lighting in air conditioned buildings will be on an individual basis.

f. Regular classrooms shall have at least three convenient electrical outlets. One outlet shall be located on each of three walls. Special classrooms shall have additional outlets as needed.

g. All stairs shall be lighted with artifical illumination which will provide not less than 10 foot candles of light and be controlled from a central switch.

26. Ventilation

All space in school buildings shall be designed for natural ventilation, gravity ventilation, mechanical ventilation, or a combination of these methods. If natural ventilation is provided, classrooms shall be designed with vents or breeze windows. These vents or breeze windows shall be manually operated without the use of tools. When mechanical ventilation is used, classrooms shall be provided with manually operated vents of not more than 4 square feet in area. Open flame space heaters shall not be used in classrooms. When gas heaters are used in classrooms, such heaters shall be provided with air for combustion taken from the outside of the classroom. Gas heaters shall be of a vented type connected to an effective chimney or gas vent which shall extend above the eaves or parapet wall at least 18 inches.

27. Major repairs

Major repairs of school buildings of a capital outlay nature, including such items as complete new floors, new heating plant, complete interior and exterior decoration, and other changes, replacements, and installations, shall conform to applicable minimum standards for new school buildings.

28. Equipment

Equipment for school buildings shall be of a permanent nature necessary to the operation of a school. Expendable teaching aids and supplies do not meet the above standard permanency. Only equipment meeting the standard of permanency enunciated above shall be paid for out of capital outlay or from bond funds supported by capital outlay funds.

29. Architectural barriers

All school construction will conform with Article VIII, Section 791 to insure that buildings financed with state funds are so designed and constructed as to be accessible to the physically handicapped.

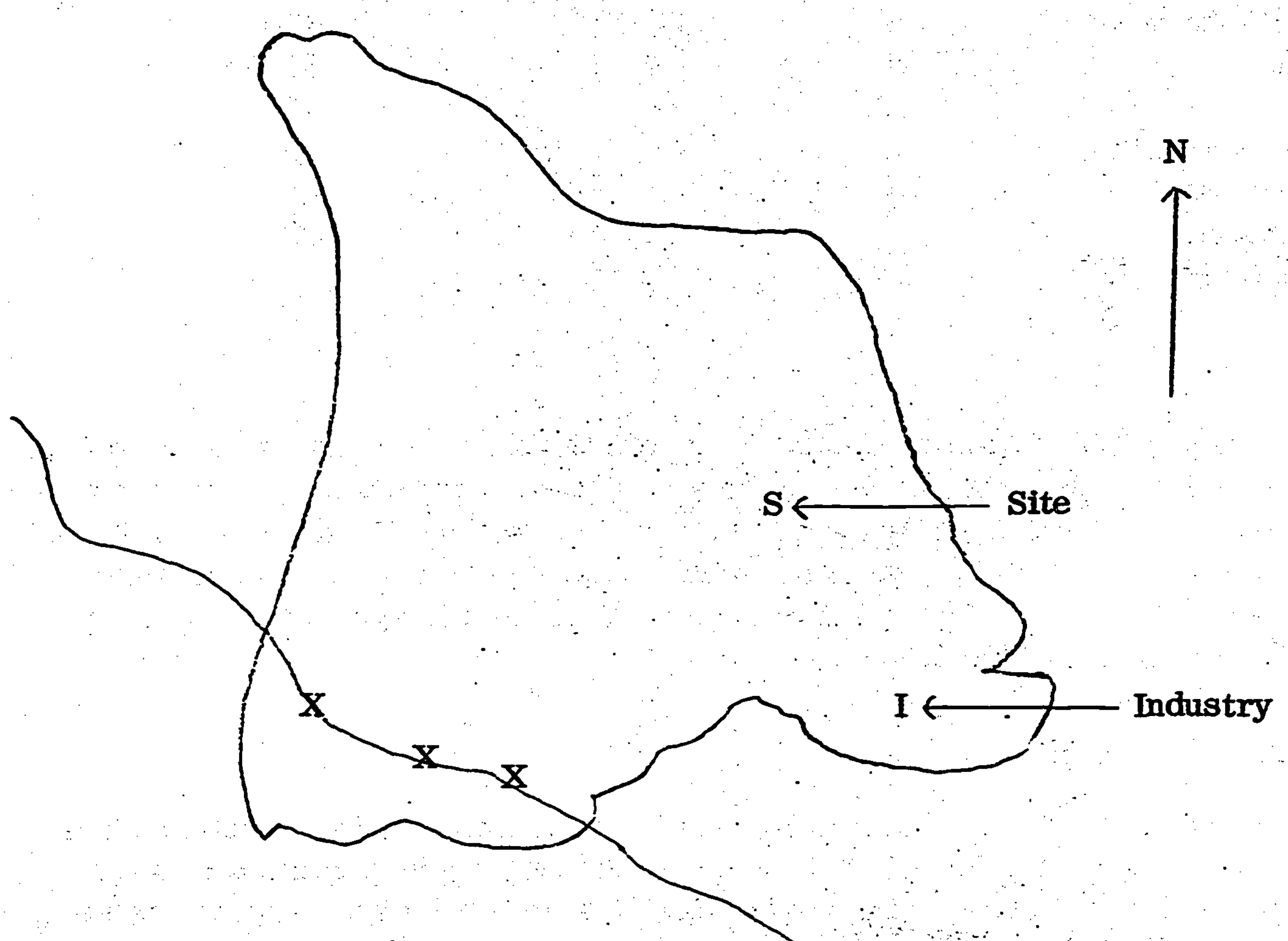
30. Waivers

The State Commissioner of Education is hereby authorized to grant waivers of any of these standards if in his discretion it seems advisable because of factors which might improve the facilities for the children to be housed within them.

Noster

Geography

Noster is an incorporated city located 25 miles to the east of the state capital. The boundaries of the city encompass an area of approximately 30 square miles. A river bisects Noster in the southern portion of the city with three bridges (x) available for both vehicle and pedestrian crossing.



The general topography can best be described as flat. The average January temperature is 29 degrees while in July it is 75 degrees. Annual precipitation is 39 inches. A table of average temperatures and precipitation in selected states is presented below for reference.

Average Temperatures and Precipitation in Selected States Throughout the U.S.

State	January	July	Precipitation (Inches)
Alabama	48	82	50
Arizona	49	87	7
California	52	68	16
Colorado	28	72	15
Georgia	45	79	47
Illinois	26	75	33

State	January	July	Precipitation (Inches)
Kansas	32	80	28
Louisiana	55	82	63
Maryland	35	76	44
Minnesota	12	72	25
North Carolina	42	78	43
Ohio	27	72	35
Oklahoma	37	82	31
Pennsylvania	32	75	42
Tennessee	40	80	45
Vermont	16	69	33
West Virginia	35	75	39

Population

The present population of Noster is 88,000 people producing an average population density of 2,933 persons per square mile. Noster, like many formerly rural-suburban communities has been growing at a rapid rate. In 1959 there were 62,000 people in the community and projections indicate that in the next decade an additional 20,000 persons will become residents. At present there are approximately 23,000 families living within the city limits.

Income and Employment

Approximately 25% of the working population is employed in industry while another 50% are white collar workers. Many of the latter group commute to the state capital for work. The median income for Noster is $4,800. Approximately 20% of the population is considered low income earning less than $3,000 a year. Two-thirds of the residents own their own homes and over half the population received high school or more education with the median number of years of school completed being 10.1.

City Government

Since Noster is an incorporated city, it must by law have a mayor and council which are elected every four years. Operating as part of the city government are departments of health, welfare, recreation, transportation, zoning and others usually found in city government. The annual budget for the city is $20,741,000.

County Government

Noster also serves as the seat of the county government. The county system is directed by an elected board of supervisors and an appointed manager. Many of the functions provided by the city agencies are also supplied to the county by similar agencies. The zoning board, for example, reviews all public construction that occurs in the county including the city. The county office of education operates primarily as an extension of the state and provides such specialized services as special education, vocational education, data processing, etc. to districts that wish to purchase the services. The county office is directed by a board representing the entire county and a superintendent appointed by the board.

Education

The Noster City School District is operated by a six person elected board of education and a board appointed superintendent. Board elections are conducted every two years for two seats with a full term of office being six years. At present, the district provides for 22,198 children in 21 elementary schools (approximately 10,200 children), six middle schools (approximately 4,800 children), two high schools (approximately 4,000 children) and one community college for 3,000 students. The community college, one high school, two middle schools and six elementary schools were constructed within the past six years. The total city budget for education in the last fiscal year was $11,026,000. Because of the high rate of construction in the district, there is employed within the Division of School Construction an engineer who serves as the major liaison between the school district and architects. A permanent three board member subcommittee acts to select architects and oversee the development of facilities.

Special Education

Under state law, special classes are required for the educable mentally retarded, crippled, speech, hard of hearing, and visually handicapped. The state provides to each school district maintaining one or more approved special classes for handicapped children state aid at the rate of $2,500 for each class maintained and $300 per year for each child receiving home instruction.

The Division of Special Education within the State Department of Public Instruction is administered by a director and a single consultant for each of the following areas: educable mentally retarded (EMR), trainable mentally retarded (TMR), deaf and hard of hearing, blind and visually handicapped, special learning disabilities, and emotionally disturbed, physically handicapped, and federal programs. A Division of School Planning also operates at the state level and all school renovations and construction in the state must be cleared through it. No one on the staff of that department is specifically familiar with special education and when review is sought, the counterpart special education division is contacted.

The state also provides financial aid for the transportation of handicapped children from the district to and from school. Although a specific formula has been established, depending upon the type of carrier used, the average amount of reimbursement to the district is approximately $.17 per mile traveled.

Special Education in Noster

Within Noster there is a Director of a Division of Special Education with equal status to the Director of Pupil Personnel Services and the Director of Curriculum. He reports to the Superintendent through an Assistant Superintendent of Instructional Services. The present director was formerly a school psychologist employed by a county program in a neighboring state.

At present the special education program operates special class programs for the educable and trainable mentally retarded, physically handicapped, emotionally disturbed, and hard of hearing. Itinerant services operate for the homebound and hospitalized and for some severely disturbed children. Resource room programs are provided for the visually handicapped while the blind and deaf are sent to private or public programs in the nearby city or in the state residential centers. Speech therapy is also offered through the Division of Special Education. One consultant-supervisor is employed for the program in mental retardation, another for the physically handicapped and emotionally disturbed program, and a third for the hard of hearing, visually handicapped, and speech therapy. Social work and school psychology are provided by pupil personnel services.

Presently, the number of exceptional children served by the Noster City School District is as follows:

	Children	Classes	Teachers
Educable Mentally Retarded	360	25	
Trainable Mentally Retarded	144	9	
Physically Handicapped	242	22	
Emotionally Disturbed	90	11	
Hard of Hearing	38	4	
Homebound and Hospitalized	200 (annually)		3
Itinerant Emotionally Disturbed	150 (annually)		3
Visually Handicapped	20 (annually)		1
Speech Therapy	300 (annually)		2

Plant Planning

Recognition of the need for the construction of school buildings and their spiraling cost led the state legislature to provide funds which, under certain conditions, can be used by local districts for construction. The major condition of eligibility is that a school district be bonded to the extent of ninety percent of capacity. If this condition is met, then the amount of aid granted by the state may not exceed fifty percent of the cost of the project. Since the Noster City School District has reached this level of indebtedness, they are eligible for these funds.

Participation in this grant program requires that the following review and approval procedure be followed.

The Commissioner of Education shall approve all plans and the state and provides such specialized services as special education, vocational education, data processing, etc. to districts that wish to purchase the services. The county office is directed by a board representing the entire county and a superintendent appointed by the board.

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Special Education

Under state law, special classes are required for the educable mentally retarded, crippled, speech, hard of hearing, and visually handicapped. The state provides to each school district maintaining one or more approved special classes for handicapped children state aid at the rate of $2,500 for each class maintained and $300 per year for each child receiving home instruction.

The Division of Special Education within the State Department of Public Instruction is administered by a director and a single consultant for each of the following areas: educable mentally retarded (EMR), trainable mentally retarded (TMR), deaf and hard of hearing, blind and visually handicapped, special learning disabilities, and emotionally disturbed, physically handicapped, and federal programs. A Division of School Planning also operates at the state level and all school renovations and construction in the state must be cleared through it. No one on the staff of that department is specifically familiar with special education and when review is sought, the counterpart special education division is contacted.

The state also provides financial aid for the transportation of handicapped children from the district to and from school. Although a specific formula has been established, depending upon the type of carrier used, the average amount of reimbursement to the district is approximately $.17 per mile traveled.

Special Education in Noster

Within Noster there is a Director of a Division of Special Education with equal status to the Director of Pupil Personnel Services and the Director of Curriculum. He reports to the Superintendent through an Assistant Superintendent of Instructional Services. The present director was formerly a school psychologist employed by a county program in a neighboring state.

At present the special education program operates special class programs for the educable and trainable mentally retarded, physically handicapped, emotionally disturbed, and hard of hearing. Itinerant services operate for the homebound and hospitalized and for some severely disturbed children. Resource room programs are provided for the visually handicapped while the blind and deaf are sent to private or public programs in the nearby city or in the state residential centers. Speech therapy is also offered through the Division of Special Education. One consultant-supervisor is employed for the program in mental retardation, another for the physically handicapped and emotionally disturbed program, and a third for the hard of hearing, visually handicapped, and speech therapy. Social work and school psychology are provided by pupil personnel services.

Presently, the number of exceptional children served by the Noster City School District is as follows:

	Children	Classes	Teachers
Educable Mentally Retarded	360	25	
Trainable Mentally Retarded	144	9	
Physically Handicapped	242	22	
Emotionally Disturbed	90	11	
Hard of Hearing	38	4	
Homebound and Hospitalized	200(annually)		3
Itinerant Emotionally Disturbed	150(annually)		3
Visually Handicapped	20(annually)		1
Speech Therapy	300(annually)		2

Plant Planning

Recognition of the need for the construction of school buildings and their spiraling cost led the state legislature to provide funds which, under certain conditions, can be used by local districts for construction. The major condition of eligibility is that a school district be bonded to the extent of ninety percent of capacity. If this condition is met, then the amount of aid granted by the state may not exceed fifty percent of the cost of the project. Since the Noster City School District has reached this level of indebtedness, they are eligible for these funds.

Participation in this grant program requires that the following review and approval procedure be followed.

The Commissioner of Education shall approve all plans and specifications for construction.

In order that the State Commissioner of Education may determine whether minimum school building standards are being met, the following procedures shall be observed:

1. Approval of preliminary plans and outline specifications.

   The preliminary plan shall identify and give size of spaces, show possibilities of flexibility and future expansion. A map of the site showing the proposed location of the building shall be a part of the preliminary plan.

   Outline specifications shall include such information as type of walls, floors, roof, heating, ventilating, lighting, windows, doors, etc.

2. Approval of final plans and complete specifications including alternates. The final plans and complete specifications must be approved by the State Commissioner of Education prior to the advertisement for bids.

3. Approval of all change orders which affect space al'otment, structure, or health and safety prior to the time contractors are advised to make changes.

4. The superintendent of schools shall be responsible for submitting plans and specifications to the State Commissioner of Education for approval.

Facility for the Multiply Handicapped

The Sociology Department at the Noster Community College elected to undertake, as a project, the identification of all multiply handicapped children in the city. The Department applied a definition usually used for school aged exceptional children and protected it downward where it seemed indicated. Children who because of their disability could be placed between two or more standard classifications of disability were considered multiply handicapped. Random sampling techniques were applied to the census and the finally determined figure was that approximately 1% of the children between 0 and 21 were multiply handicapped. The census teams noticed great numbers of these children in the immediate pre-school category and attributed this to the rubella epidemic of a few years ago.

As knowledge about the survey filtered to the community through the newspaper and other media, a number of parent-teacher association groups held informational meetings with physicians, public health administrators and others. Eventually, it was revealed that although the Noster City Schools had a fairly comprehensive program for exceptional children, no program existed for the multiply handicapped.

Expectedly, the pressure on the board for the establishment of a program reached a crescendo and resulted in the board establishing a policy to create such a program for the following fall in a building totally assigned for that purpose. The Director of the Division of Special Education was given the task of developing the program, hiring staff, writing curriculum and working with the architect on a building. The time alloted for the entire process was six months.

Site

Since neither time nor funds permitted the construction of a new building, an abandoned 70 year old 8 classroom building was made available along with $100,000 for renovation. The $100,000 was also to cover furniture and equipment. The site is located in the main downtown area near the river and the heavily industrialized section of Noster. (See map on following page)

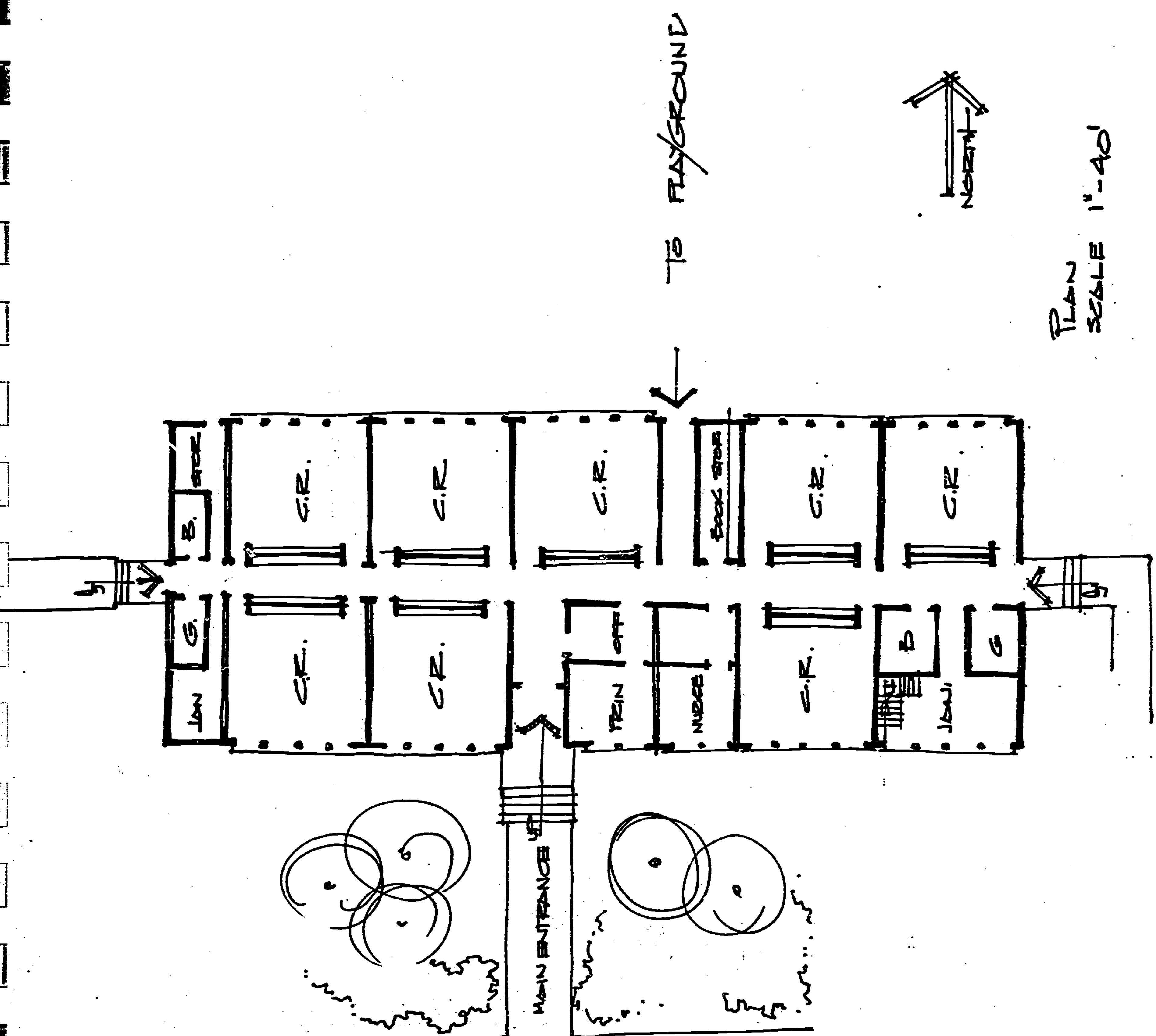
School Population and Program

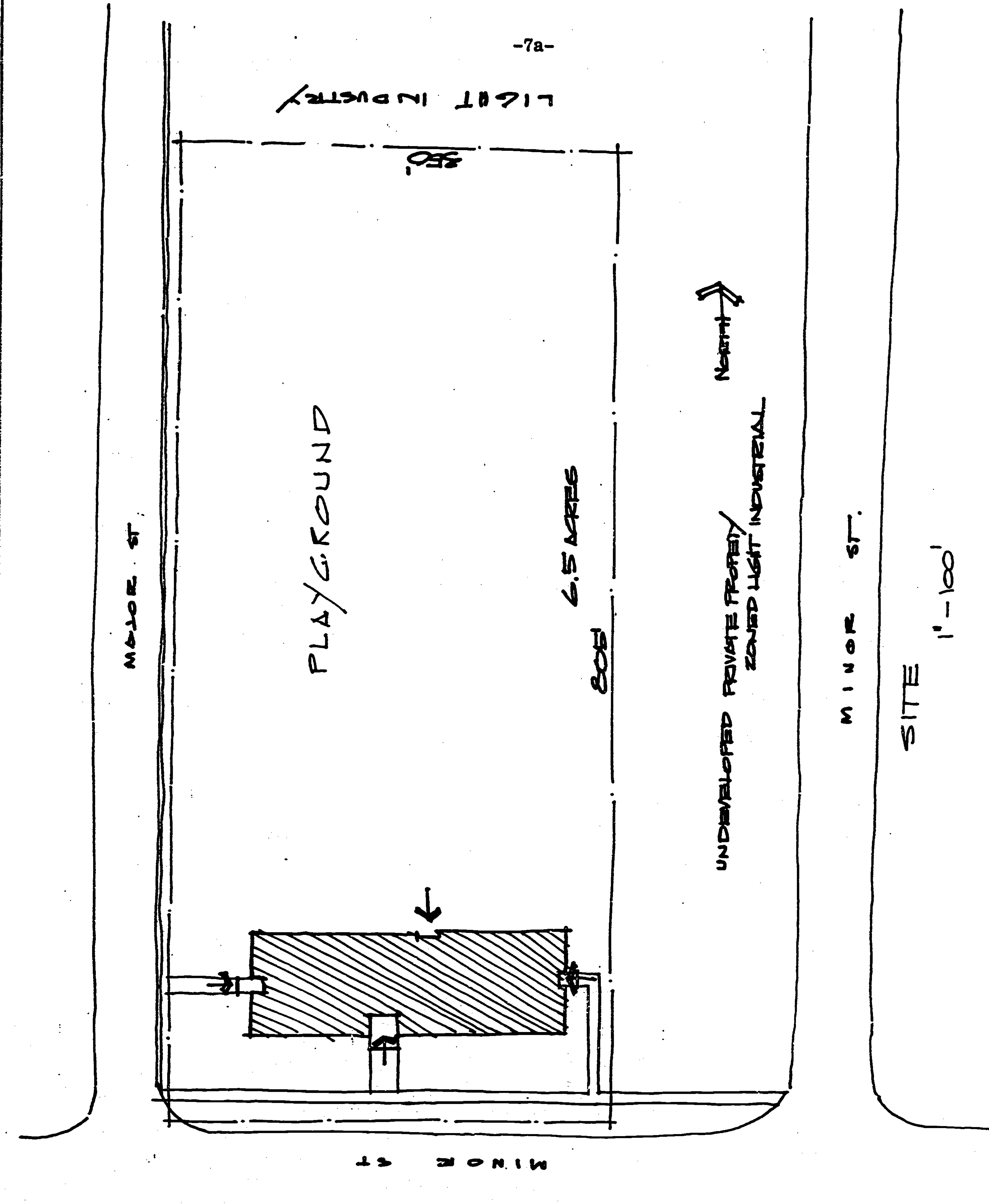
The Director of Special Education decided that the most important focus should be on multiply handicapped children from 2 to 7 and that the most children that could be adequately handled in the building was 60. Although it was not possible to precisely describe the disabilities presented by these children, the most expected combinations were:

1. Hearing and vision handicaps
2. Mental retardation, hearing and/or vision handicaps
3. Mental retardation and physical handicap
4. Any combination of 1, 2, 3 and emotional disturbance.

Because very little information is available about educational programs for these children, the Director of Special Education and the teacher committee working with him presented the limited program indicated below to the architect.

1. One aide and one teacher would be assigned to every group of children.
2. Extensive diagnosis would occur to specifically identify the child's strengths and weaknesses, particularly directed toward identifying the modality(ies) which could best be used for instructional purposes.


TO PLAYGROUND
NORTH
PLAN
SCALE 1"-40'
C.R.
C.R.
C.R.
BOOK STOR
C.R.
C.R.
B.
STOR
G.
JAN
C.R.
C.R.
OFF
PRIN
NURSE
C.R.
JAN
MAIN ENTRANCE
UP


LIGHT INDUSTRY
350'
MAJOR ST.
PLAYGROUND
6.5 ACRES
805'
UNDEVELOPED PRIVATE PROPERTY/ ZONED LIGHT INDUSTRIAL
NORTH
MINOR ST.
SITE 1"-100'
MINOR ST

3. Extensive work with parents would occur to assist them in coping with and effectively stimulating their children.

4. Children would attend school only for the period of time that was considered to be meaningful, but not longer than half a day.

5. The physical environment would include provisions for highlighting or depressing single or groups of stimuli depending on the usable modality paths of individual children.

6. Numerous spaces that can rapidly be expanded or made smaller must be provided for the large amount of individual teacher-child work that will occur.

7. As much equipment as possible will be purchased or modified for portability so that it can be used throughout the program with a minimum of difficulty.

8. Every learning space will have available a toilet and additional equipment that can be used for cleaning children that have toilet accidents.

9. All barriers between spaces must be designed to permit constant observation of the children.

10. Water must be readily accessible to all learning spaces.

11. Adequate storage must be available to permit as obstruction free visual, auditory, and mobility paths as possible.

12. Devices and systems that will encourage the child to function independently should be included whenever possible. (Visual and auditory fire alarms)

13. All architectural barriers will be eliminated.

14. A communications system that allows instantaneous teacher-office, office-teacher and teacher-teacher use will be placed throughout the building.

15. An indoor recreation-creative arts-dramatic play area will be provided.

16. The potential for the use of the newest electrical equipment will be provided throughout the building (induction loop systems, closed circuit tv, reinforcement machinery, etc.).

17. Provision will be made for the safest and most efficient loading and unloading of children and movement of station wagons, buses, mini-buses, taxis and private vehicles.

Staff

Ten teachers and ten aides will serve as the basic instructional staff but they will be supported by one psychologist, one diagnostic teacher, one administrator and one secretary, five matrons, one social worker, one speech teacher, and one instructional materials specialist.

The Problem

As educators and architects working on the multiply handicapped renovation in Noster, you are now faced with beginning the design process that hopefully will result in the creation of an efficient and effective building. The total task of planning a facility is obviously one that cannot be completed during this meeting. For this reason, your deliberations should be directed to providing at a minimum, the following at 12:00 p.m. on the final day of the conference.

1. A description of the type of activities that will occur with consideration of spatial needs.

2. A bubble diagram indicating the relationships that should occur between all needed spaces in the building.

3. A listing of specific elements which would be requirements for this building.

4. Optional - if time - a preliminary floor plan.

5. Optional - if time - a preliminary "learning space".

The results of your work should be presented on 8-1/2"x11" paper (provided to you) for duplication and distribution to all conferees.

Facility Guidelines

The following specific guidelines must be adopted or rationales for changes must be indicated when designing the building.

1. Height of building - type of construction

   All buildings of frame construction shall be only one story high. All two story buildings shall have at least fire-resistant corridors and fire-resistant stairways with non-skid treads, and all buildings of three or more stories shall be of fire-resistant material except doors, windows, floor covering, and roofing.

2. Ceiling height

   The ceiling height in each classroom shall average at least 10 feet, provided a minimum ceiling height of 9 feet may be used in classrooms with approved forced air ventilation and fluorescent lighting. Ceiling heights in shops shall be governed by the purpose for which the shop is to be used.

3. Safety

   a. Exits

      All buildings, except one classroom schools, shall have at least two exits remote from each other, and the total exit facilities of any school building shall be at least 22 inches in width for each 100 people to be housed at any one time. No single exit door shall be less than 36 inches wide.

   b. Glass

      No glass other than fixed wire glass shall be used in any interior door or interior corridor wall. Walls between rooms and other rooms such as view windows in libraries, laboratories, and shops shall be wire glass, laminated glass, tempered glass or approved plastic sheet. Glass in the lower two-thirds of any exterior door or within 4'6" of the floor of exterior corridor walls or a landing shall be one of the above listed types of safety glass. No glass in any building shall be larger than 1400 square inches unless it be an approved safety glass of one of the above types.

   c. Handrails

      Every stairway and outside steps with four or more risers (3 steps) shall have handrails as follows:

(1) One handrail if the stairway is 44" or less in width

(2) One handrail on each side if the stairway is more than 44" in width

(3) When the required width of a flight of stairs exceeds eighty-eight inches there shall be an intermediate handrail continuous between landings. The handrail shall be substantially supported, terminating at the upper end with newels or standards at least six feet high with no projections.

(4) Change of direction of stairways shall be by landing. (No winders)

d. Doors

All classroom and exit doors shall open outward. All exit doors shall be equipped with panic hardware, except doors in one or two classroom building which open directly outside from classrooms.

No lock shall be placed on any classroom door which requires a key for egress.

4. Toilets

Toilet rooms for each sex shall be provided, and there shall be at least one water closet of appropriate height for each 30 girls and one for each 40 boys. In addition, there shall be a urinal of appropriate height for each 40 boys. Lavatories shall be provided in all toilet rooms or immediately adjacent to the toilet rooms in the ratio of one fixture for each 50 pupils. The sewage disposal system used shall meet standards set up by the State Department of Public Health. If septic tanks are used, a minimum of 10 linear feet of drainage tile per child shall be provided. (This means 10 feet per child to be housed in any particular building.) A percolation test satisfactory to the State Department of Public Health shall be run before locating a disposal field. Floor drains shall be provided in all toilet rooms.

5. Drinking water

A protected source of drinking water shall be provided which meets sanitary requirements for purity as set up by the State Department of Public Health. One drinking fountain bubbler shall be provided for each 60 pupils enrolled, with not more than two bubblers placed at one location.

6. Corridors

All primary corridors in buildings containing 10 or more rooms shall be at least 10 feet wide, net, exclusive of lockers, except that a 6-foot corridor will be accepted if it is single-loaded and if the adjoining classrooms have outside exits. No double-loaded corridor, primary or secondary shall be less than 8 feet wide. All corridor ceilings shall be at least 8 feet high. No dead end corridor shall extend more than 20 feet beyond a stairway or other means of exit therefrom.

7. Classrooms

Regular classrooms in all schools embracing grades 1-8 or any combination of these grades shall contain at least 748 square feet, net, exclusive of cloak room or locker space. Regular classrooms in all schools embracing grades 7-12 or any combination of these grades shall have a minimum floor space of 22 square feet per pupil exclusive of cloak or storage rooms. If mathematics laboratories are provided, these laboratories shall contain a minimum of 30 square feet per pupil.

8. Science laboratories

Science laboratories for general science and biology shall have a minimum floor space of 30 square feet per pupil. If used as a combination laboratory-lecture room, the furniture and equipment shall be designed to accommodate the pupils for these purposes. Science laboratories for chemistry and physics shall have a minimum floor space of 30 square feet per pupil. Combination laboratory-lecture rooms shall have a minimum floor space of 45 square feet per pupil. Storage space shall be provided in addition to the floor space requirement mentioned above.

9. Homemaking laboratories

Combination homemaking laboratories shall have a minimum floor space of 45 square feet per pupil, and in addition to this requirement, there shall be, in connection with the homemaking department, a living room-dining room, a rest room, and storage closets. In a school with an enrollment of 100 or fewer pupils, a living area in one end of a laboratory 45 feet long may substitute for the living room-dining room.

10. Commercial rooms

In all commercial suites, there shall be a minimum floor area of 24 square feet per pupil. In office practice laboratories, there shall be 34 square feet per pupil. Additional floor space shall be provided for storage.

11. Art rooms

In all art rooms, there shall be a minimum floor space of 30 square feet per pupil. Additional floor space shall be provided for storage.

12. Music rooms

A vocal music room shall have a floor area of 15 square feet per pupil for the largest class accommodated; instrumental music rooms shall have 20 square feet per pupil. Additional area for storage shall be provided for sheet music, instruments, and uniforms. Additional areas for individual practice rooms shall be provided.

13. Library

In all schools embracing grades 1-8 or any combination of these grades having 15 teachers or more, a library shall be provided to seat the largest class, plus 15 pupils. This space shall be computed on the basis of 20 square feet per pupil. Additional space shall be provided for storage of instructional materials and a workroom with running water, shelves, and cabinets. In all schools embracing grades 1-12 and in all schools embracing any combination of grades 7-12, a library shall be provided large enough to house 15 per cent of the enrollment. This space shall be computed on the basis of at least 20 square feet per pupil to be accommodated. Additional space shall be provided for a conference room, storage space for magazines, audio visual materials and equipment, and a workroom supplied with running water, shelves, and cabinets. Each of these rooms shall contain at least 120 square feet. The conference room and workroom shall be separated from the library and each other with a vision strip to facilitate supervision.

14. Physical education facilities

Every school shall be provided with an area for physical education consisting of a well drained, smooth, playground, and one of the following:

a. A play room with a minimum of 35 square feet per pupil taking physical education during the peak load (1800 square feet minimum); or

b. A gymnasium with a minimum floor space of 35 square feet per pupil taking physical education during the peak load (2400 square feet minimum); or

c. A hard surface outside area with a minimum space of 35 square feet per pupil taking physical education during the peak load.

Note 1: Handwashing and toilet facilities shall be made available to all children taking physical education.

Note 2: Wherever gymnasiums are built for pupils in grades 7 to 12, facilities for dressing and showering shall be provided according to the following minimum standards:

(a) 12 square feet of floor space per pupil in peak load in any class

(b) 12 square feet of floor space for each shower head

(c) There shall be one shower head for every five pupils, based upon the peak load in the largest class.

15. Industrial arts and/or vocational trade and industrial shops

If included in the school program, these shops shall conform to the following space requirements based on a minimum of 20 pupils per class:

a. Auto mechanics - 2400 square feet

b. Building trades, bricklaying, plastering, painting, and decorating, home mechanics, machine shop, general metals, general shop, foundry, welding, printing, power sawing, sheet metal, and woodworking - 1920 square feet

c. Electricity, radio-T. V. repair, electronics, industrial chemistry, shoe repair, leather craft, handicraft, cosmetology, drafting, commercial art, commercial photography (including shop and darkrooms), commercial cooking (kitchen-1056 square feet, tearoom-1056 square feet), and mechanical drawing - 1056 square feet.

d. In addition, the following must be provided for the above shops where applicable:

(1) Tool rooms - 48 square feet

(2) Storage rooms - 48 square feet

(3) Finishing rooms (Fire resistant space shall be provided for

flammable materials) - 400 square feet

(4) Lumber rooms - 200 square feet

(5) Car painting for auto body shop - 288 square feet

(6) Change-locker room for mechanical shops with 60 lockers

(7) Toilet facilities, if not otherwise convenient

16. Office space

a. Each school plant of eight to ten teachers shall provide at least 300 square feet of floor area for office space.

b. Schools with more than ten teachers shall have proportionately larger office space.

c. Adequate facilities for records, equipment, and textbooks shall be provided.

17. Guidance suite

A guidance suite with a waiting room, individual counseling rooms, and adequate storage space shall be provided.

18. Clinic

In schools having eight or more teachers, separate space shall be provided for clinical services.

19. Auditoriums

a. Auditorium area including seating space, stage, and dressing rooms shall be figured at 9 square feet times the desired seating capacity.

b. All auditoriums shall be located on the ground floor, or first floor.

20. Chalkboards

a. A minimum of 20 linear feet of chalkboard with a reflection factor of not less than 15 per cent shall be provided in each regular classroom.

b. The amount of chalkboard in special classrooms shall vary according to need.

21. Tackboards or bulletin boards

a. At least 48 square feet of bulletin board shall be provided in each classroom.

b. The amount of bulletin board in special classrooms shall vary according to need.

22. Storage space

a. Storage space for teaching material shall be provided in each classroom.

b. Lockers, wardrobes, cloak rooms, or shelves and hook strips shall be provided for pupils' wraps.

c. There shall be no storage space under any stair.

d. Adequate storage space shall be provided for janitorial supplies and equipment.

23. Cafeteria

Space Requirements in Square Feet

	0-100	101-200	201-300	301-400	401-500	501-600	601-700	701-800	801-900
Kitchen and Refrigeration Area		270	305	395	435	610	685	800	1005
Dry Storage		60	100	135	170	200	240	270	300
Nonfood Storage		20	30	30	30	30	30	30	30
Serving Area (Kitchen)		80	120	120	160	200	200	300	300
Dish Washing Area		50	75	100	125	150	175	200	225
Service Sink and Cleaning Area		30	30	30	30	30	30	30	30
Office		30	30	40	40	40	40	40	40
Rest Rooms		45	45	45	60	60	60	70	70
Total Kitchen Area	350	585	735	895	1050	1320	1460	1740	2000
Dining Area	400	800	1200	1600	2000	2400	2800	3200	3600

Note: To arrive at total kitchen space needed for schools with enrollments above 900 pupils, calculate space needed on specifications below:

Kitchen area - 1 square foot per meal served
Dry storage - 1/3 square foot per meal served
Serving area - 120 square feet per serving line
Dishwashing - 1/4 square foot per meal served

a. Cafeterias shall not be placed in basement rooms unless the floor on at least two sides is above finished grade.

b. Cross ventilation and/or mechanical ventilation shall be provided. There shall be a vented hood or canopy over all cooking, baking or dishwashing equipment with mechanical exhaust ventilation - minimum requirements six air changes per hour.

c. Outside openings to the kitchen, dining area, and storeroom shall be screened. Self-closing doors will be approved without screens. Flychaser fans may be used at dining room entrances in lieu of screened doors.

d. Each cafeteria shall be provided with a rest room for workers and with lockers or storage space for uniforms and other personal belongings of workers.

e. Each kitchen shall have a handwashing lavatory containing hot and cold water with a foot operated faucet.

f. Each cafeteria shall be provided with enclosed and screened garbage area. There shall be outside can washing facilities.

g. Storage shall be provided with natural ventilation through louvered or screened security sash, and louvered doors, or positive mechanical ventilation, day and night, with not less than four air changes per hour.

   (1) Storage shall be free of hot water pipes, water heaters, chimneys or other heat producing devices, and refrigeration condensing units

   (2) Well supported shelves shall be provided for storage, with at least one-inch clearance at wall for ventilation.

h. Floors of kitchens shall have some type of floor covering. Quarry tile, terrazo, or vinyl tile is acceptable.

i. Schools participating in the National School Lunch Program shall meet the following standards on sinks in kitchen area:

(1) A three-compartment sink for dish washing, with hot and cold water available at each compartment. A dish washing machine may be used in place of the three-compartment sink for dish washing. If such a dish washing machine is used, it shall be provided with a prerinse sink and a hose with a force valve or other mechanical prerinse device. Water shall not be less than 140 degrees F. for washing and not less than 180 degrees F. for rinsing.

(a) Each compartment of this sink shall be at least 24"x24"x14" deep.

(b) Drain boards and a 10" splash board shall be integral parts of this sink.

(2) Cafeterias serving 200 or more shall have a combination three-compartment pot and vegetable sink (in addition to the three-compartment sink for dish washing) with hot and cold water provided at each compartment.

(a) Each compartment of this sink shall not be smaller than 24"x24"x12" deep. The recommended size of each compartment of this sink is 24"x30"x12" deep.

(b) Drain boards and rear splash back shall be integral parts of the sink.

(3) Cafeterias serving 400 or more shall have a two or more compartment vegetable sink (in addition to the three compartment sink for dish washing and the combination three-compartment pot and vegetable sink) with hot and cold water provided at each compartment.

(a) Each compartment of this sink shall not be less than 24"x24"x12" deep.

(b) Drain boards and a rear splash back shall be integral parts of this sink.

(4) Each cafeteria shall have a mop or service sink with hot and cold water available.

(5) Cafeterias serving 200 or more shall have a service sink in a separate storage area for mops and cleaning supplies.

24. Interior finish

Ceilings shall be finished flat with at least 85 per cent reflectance; walls flat, 50 per cent to 70 per cent reflectance; wainscot same as walls, or slightly darker with flat or semi-gloss; trim, natural, flat or semi-gloss, 35 per cent to 60 per cent reflectance; floors 30 to 40 per cent reflectance, and furniture 30 to 50 per cent. When concrete floor slabs occur on grade, there shall be specific provision for drainage beneath the subfloor such as tile, rock, or gravel fill; and there shall be adequate precautions against penetration of moisture through the slab on account of seepage, capillary action, or hydrostatic pressure.

25. Lighting

a. Natural lighting shall be supplemented by shadow and glare free artifical lighting in amounts that provide at least 30 foot candles on desk top. Special areas shall be lighted in accordance with recommended standards.

b. The head of windows, except vision strip windows, shall not be more than 12" below the ceiling.

c. Classroom windows, except those facing north, shall be equipped with venetian blinds, window shades of translucent material, or other approved means to control natural light.

d. When light is provided in classrooms, libraries, or study halls through skylights there shall be a positive and effective means of controlling glare, heat radiation, and the amount of light admitted through such skylights.

e. Every classroom, unless it has a door opening directly to the outside of the building with a minimum glass area of 24"x30", shall have at least one outside window with one panel at the bottom of the window which can be opened from the inside without the use of tools. This window shall provide a clear opening of not less than 24 inches wide and 32 inches high to be usable in an emergency, with the bottom of the opening not more than 32 inches above the floor. Approval of plans for classroom fenestration will be considered only after plans for ventilating and lighting such rooms have been approved. Approval of plans for lighting in air conditioned buildings will be on an individual basis.

f. Regular classrooms shall have at least three convenient electrical outlets. One outlet shall be located on each of three walls. Special classrooms shall have additional outlets as needed.

g. All stairs shall be lighted with artifical illumination which will provide not less than 10 foot candles of light and be controlled from a central switch.

26. Ventilation

All space in school buildings shall be designed for natural ventilation, gravity ventilation, mechanical ventilation, or a combination of these methods. If natural ventilation is provided, classrooms shall be designed with vents or breeze windows. These vents or breeze windows shall be manually operated without the use of tools. When mechanical ventilation is used, classrooms shall be provided with manually operated vents of not more than 4 square feet in area. Open flame space heaters shall not be used in classrooms. When gas heaters are used in classrooms, such heaters shall be provided with air for combustion taken from the outside of the classroom. Gas heaters shall be of a vented type connected to an effective chimney or gas vent which shall extend above the eaves or parapet wall at least 18 inches.

27. Major repairs

Major repairs of school buildings of a capital outlay nature, including such items as complete new floors, new heating plant, complete interior and exterior decoration, and other changes, replacements, and installations, shall conform to applicable minimum standards for new school buildings.

28. Equipment

Equipment for school buildings shall be of a permanent nature necessary to the operation of a school. Expendable teaching aids and supplies do not meet the above standard permanency. Only equipment meeting the standard of permanency emunciated above shall be paid for out of capital outlay or from bond funds supported by capital outlay funds.

29. Architectural barriers

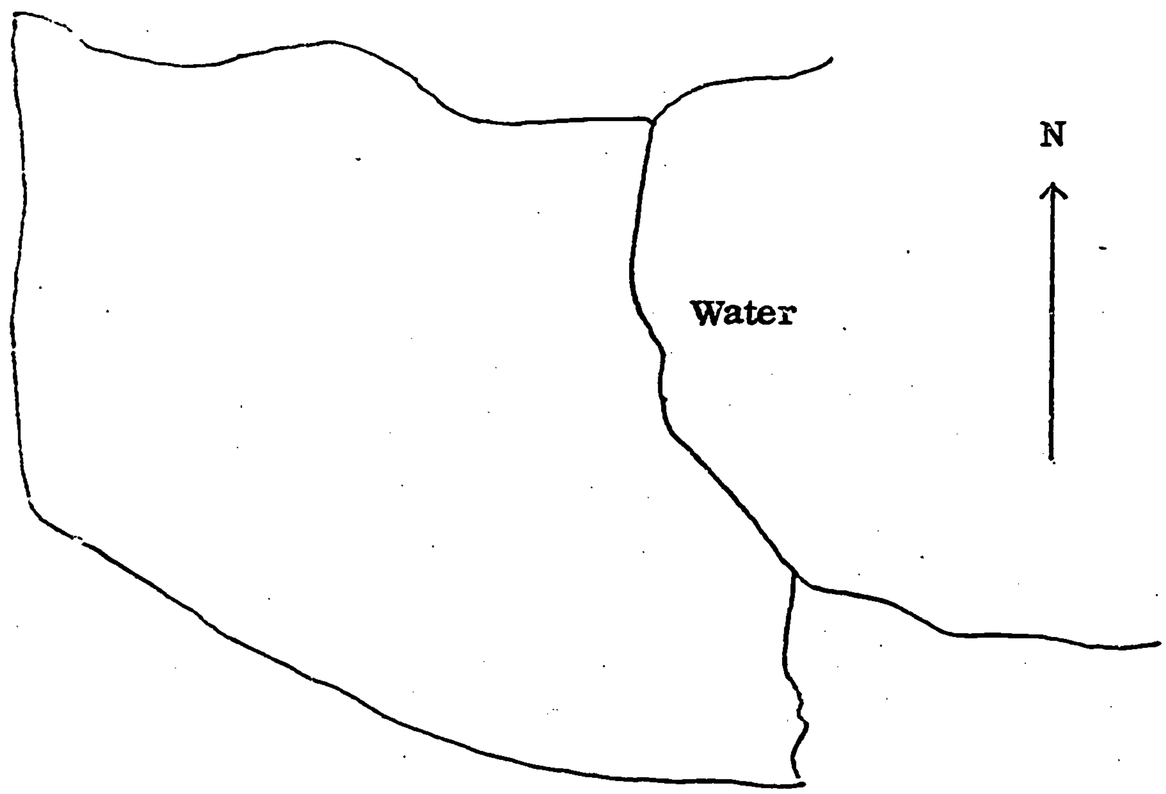
All school construction will conform with Article VIII, Section 791 to insure that buildings financed with state funds are so designed and constructed as to be accessible to the physically handicapped.

30. Waivers

The State Commissioner of Education is hereby authorized to grant waivers of any of these standards if in his discretion it seems advisable because of factors which might improve the facilities for the children to be housed within them.

Geography

Kwash County has a land area of 362 miles. The county borders on a large lake and has a gentle elevation ranging from 400' above sea level at the western edge to sea level by the lake. There are a number of small streams located in the county.



The average temperature in January is 53 degrees and in July is 82 degrees. Annual precipitation is about 68 inches. The following chart of average January and July temperatures and annual precipitation for selected states is provided as reference information.

Average Temperatures and Precipitation in Selected States Throughout the U.S.

State	January	July	Precipitation (Inches)
Alabama	48	82	50
Arizona	49	87	7
California	52	68	16
Colorado	28	72	15
Georgia	45	79	47
Illinois	26	75	33
Kansas	32	80	28
Louisiana	55	82	63
Maryland	35	76	44
Minnesota	12	72	25
North Carolina	42	78	43

State	January	July	Precipitation (Inches)
Ohio	27	72	35
Oklahoma	37	82	31
Pennsylvania	32	75	42
Tennessee	40	80	45
Vermont	16	69	33
West Virginia	35	75	39

Population

Kwash County has a population of 48,408 persons located on 362 square miles producing a population density of 134 people per square mile. During the 1950-1960 decade there was a 45% population increase in the county. Growth is expected to continue at a 10% rate for the next decade. In 1960, 10,936 families lived in the county.

Income and Employment

In 1959 the aggregate income of the population living in the county was 77 million dollars. Although the median income is $4,840 per family, almost 20% of the families earn less than $3,000. About a third of the county's work force is employed in white collar positions, with another third working in manufacturing. Approximately 70% of the residents of the county live in their own homes. Fifty-six percent of all land in the county is utilized for farming and about 3500 households are, to some degree, dependent on farming for income. Four out of every ten people in the county completed high school or additional schooling while 7% of the residents completed less than 5 years of school. The median number of school years completed is 10.4 grades.

Renn County Government

The majority of governmental services operating in Kwash County are provided by local towns. This includes police and fire protection, welfare, health, road maintenance, and zoning. The county government is primarily concerned with coordinating functions and, for example, operates the police and fire communications centers. County zoning, health, and road maintenance agencies operate in a similar manner.

Education

In recent years, there has been a trend within the county for local school districts to consolidate for the provision of basic school services. As a result, 20 communities operate their own elementary school systems. However, four consolidated districts have been created to provide junior high and secondary programs. Additionally, operating at the county level is a Department of Education that provides specialized services to the consolidated and local districts that include vocational education, data processing, special education, some federally administered programs such as Headstart, recruitment programs for the entire county and in-service programs.

Direction for the county's educational program is provided by a board of elected persons representing all areas of the county and an appointed Superintendent. The county Superintendent of Schools has three assistants on his staff including a Director of Vocational Education, Director of Special Education, and a Director of Data Processing who also serves as the grant writer and federal program administrator. Approximately 800 children participate in the vocational program on a half day basis since instruction in non-vocational coursework occurs in the home school.

Data processing services available to the consolidated districts include report cards, attendance, all standardized test grading and some grading of teacher made tests. A small headstart program for 50 children is currently being operated in the county seat.

The superintendent's office is in the county office building while the Director of Vocational Education who also serves as the principal of the ten year old vocational high school occupies an office there. The Director of Data Processing has his office in a two year old high school in the Delta District.

At present, there are over 10,000 county children enrolled in public education programs. The chart below indicates the number of children that are channeled from local districts to placement in the consolidated school districts.

District	K-6	7-9	10-12	Total
Alpha	1170	715	600	2485
Beta	1000	710	575	2285
Chi	800	550	559	1909
Delta	1765	1070	665	3500

Since the special education program is operated totally by the county, the references below to consolidated districts merely indicates that classes are located in schools that are included in those districts. Placement of special education children is not limited to the existing boundaries of consolidation.

District	Type Program	Classes	Children
Alpha	Elementary Educable Mentally Retarded	1	15
Beta	Elementary Educable Mentally Retarded	1	15
Chi	Elementary Trainable Mentally Retarded	3	30
	Intermediate Trainable Mentally Retarded	2	22
	Elementary Physically Handicapped	5	50
	Intermediate Physically Handicapped	2	30

District	Type Program	Classes	Children
Delta	Elementary Educable Mentally Retarded	2	30
	Intermediate Educable Mentally Retarded	2	34
	Elementary Trainable Mentally Retarded	1	12
	Elementary Physically Handicapped	1	10
	Elementary Visually Handicapped	1	8
	Elementary and Intermediate Auditory Handicapped	1	8

Frequently the decisions about the placement of classes is made on the basis of the availability of space. The Delta Consolidated School District and feeding communities have been the most rapidly growing and have been including facilities for exceptional children in all their school construction. On the other hand, the programs in the Chi area are all located in the sixty year old Lincoln School. The Lincoln School building also serves as the office for the county Director of Special Education who doubles as the principal of the building. Two speech therapists also employed by the county are based in this building along with a small instructional materials center.

Finance

There are no mandatory requirements for the provision of special education services in the state. However, some financial aid is provided from the state to local districts that provide special education programs. An excess cost of not more than $300 per year per exceptional child is paid for all eligible children. Children defined as exceptional include physically handicapped, speech and hearing handicapped, visually handicapped, emotionally disturbed, and educable mentally retarded. There also is provision for conducting experimental programs that are eligible for state reimbursement. In Kwash County, the consolidated and local districts purchase special education services from the county. All personnel are hired, paid and supervised by the county office. Space is rented by the county from local districts.

Transportation reimbursement is provided on a range of $.07 to $.30 per mile depending on the type of carrier used. All transportation in Kwash County is handled by the consolidated districts. Small school buses are most frequently used for transporting handicapped children.

State Department of Education

A small understaffed State Department of Education, organized under an elected superintendent, tries to administrate the educational program for the state. The state special education program is administratively responsible to the Assistant Superintendent for Pupil Personnel Services. Two professional persons with the job title of Supervisor have total responsibility for administering the state special education program.

Operating under the Assistant Superintendent for Plants is a staff of five persons, three trained as educators, one as a businessman, and the fifth an architect. This staff has the responsibility for assisting local districts in planning, reviewing all plans, and acting for the superintendent. On the infrequent occasions when special education facilities have been planned in the state, there has been no conversation between the department and the state supervisors of special education.

Although districts are already eligible for state construction aid, a bill that would permit districts to be reimbursed an additional 25% of the cost of constructing special education facilities has narrowly failed in each of the last two sessions of the legislature. It is rumored that the regulating of the proposed law would be assigned to the Department of Plants where plans would be closely examined for conformity with existing building guidelines. It is expected that this bill will become law in the next session.

Private Agencies

Up until five years ago, a local Easter Seal Society Center for Crippled Children and Adults operated an outpatient diagnostic and an educational program for 35 crippled children in a rented church basement. However, due to difficulty in both financial and community support, the program was phased out. Since that time diagnostic services have been available only in a city 100 miles away. There is at present no organized group that is concerned about educational programs for the physically handicapped.

A different situation exists with the trainable mentally retarded, however, for an active parents group affiliated with the ARC (Association for Retarded Children) is operating a pre-school and activities center for children not being served by the school. These parents are most volatile and outspoken when the conditions of the Lincoln Special School in Chi are discussed.

Within the past two years another parents group has formed that has been very concerned with the absence of educational programs that are available for their children who they indicate have learning disabilities. Although the group has been loosely organized, they have become increasingly vocal. Their complaints have, for the most part, been directed to local district officials but more recently have been exploring their potential power at the state capitol.

Lincoln School

While few facilities specifically for handicapped children have been constructed in the county, the sixty year old Lincoln School in the Chi District is the most inadequate facility that is being used. The most severe of the many deficiencies in the building is the presence of a multitude of barriers that prevent the trainable children and more markedly, the physically handicapped children from functioning at all independently. The basic inadequacies of the multi-story building are made more severe because of the large number of children that are placed in it.

The problems in the building were brought to public attention three months prior to a bond issue prepared by the county for an addition to the vocational education facility. A fire in the heating unit in the basement of the school caused the immediate evacuation of all the children. However, ten minutes were required to disperse all the children. Fortunately, the volunteer fire company responded quickly and the minor damage that occurred was limited to the basement.

Building for the Physically Handicapped

When news of the fire and dangerous situation that existed at the Lincoln School reached the residents of the county, pressure began to be applied to the county board, local districts, and the consolidated districts to provide better housing for these children. After a number of months of meetings and increasing pressure, a bond issue for $400,000 for the construction of a new building for the physically handicapped was taken to and passed by the people. It was decided by the board that other arrangements would also have to be made in the near future for the trainable retarded but that for the time being they would occupy only the first floor of the Lincoln School.

As soon as the bond issue was passed, the Director of Special Education began talking with his teachers to begin to define some of the information that needed to be communicated to the architect who was to be employed. It was recognized by the planners that only some of the information could be indicated prior to meeting with the architect. What was developed is listed below.

1. The building will house 100 physically handicapped children (10 classes) between the ages of 5-18, with varying intellectual levels from gifted to moderate retardation. Wherever and whenever possible, children would be transferred to regular classes in regular schools.

2. The program will stress developing academic, social and behavioral independence to as great a degree as possible. This development should be promoted by the physical environment with as great a frequency as possible.

3. Adjunctive programs provided in the building will include speech, physical and occupational therapy, adaptive physical education, recreation, parent counseling and a twice-a-month diagnostic clinic. Some psychology and social work service will originate from the building. Office space will be provided for the Director of Special Education-Principal and a secretary.

4. A summer school program emphasizing recreation experiences plus some learning activities will occur.

5. All efforts possible will occur to make the building as accessible and the children as mobile as possible through the elimination of barriers.

6. One aide for every two classrooms will operate within the building.

7. Spaces for arts and crafts, creative arts and assemblies and eating will be provided.

8. Because all children are to be transported to the building, specially designed loading and unloading vehicle areas and equipment must be provided.

9. Since this building will not provide educational facilities for all the physically handicapped children in Kwash County, provision should be made in the basic design to support additions.

10. Traditional classroom groupings will not occur as all children in the school will be periodically and frequently regrouped depending on the activity to be undertaken.

11. Some provision for protected play space that can be used during inclement weather will be made.

Building costs for this type of building in this county are estimated at between $24-26 per square foot.

Site

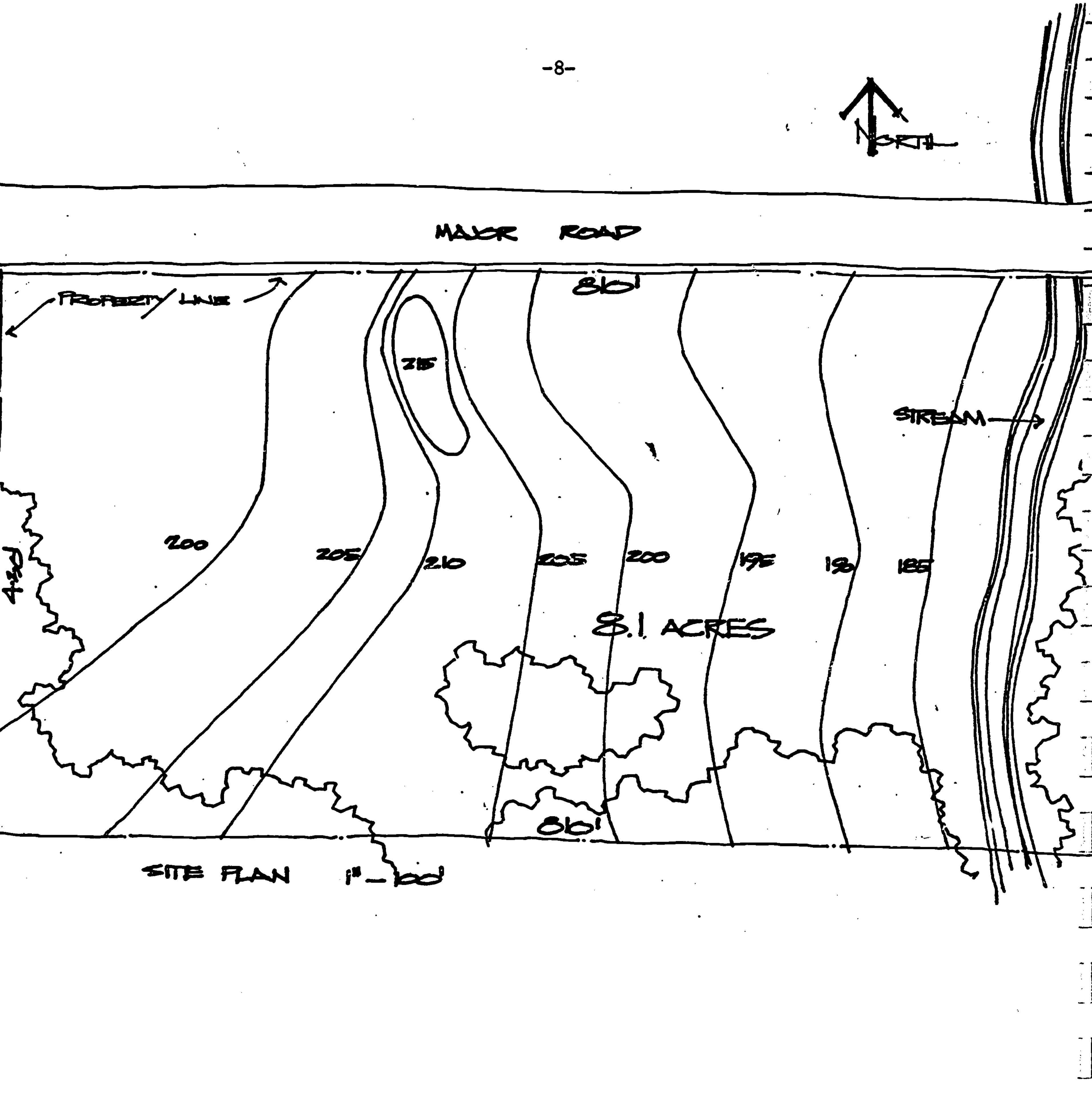
The site selected for the new building is a large rolling area with some trees and a stream on the eastern edge of the property. Dimensions of the site are 430' x 810'. One heavily traveled road provides vehicle access to the site. This particular site was chosen because of its geographic center in Kwash County. It is located in a town that is included in the Delta Consolidated School District. (See drawing on following page.)

The Problem

As educators and architects working on a facility for the physically handicapped, you are now faced with beginning the design process that hopefully will result in the creation of an efficient and effective building. The total task of planning a facility is obviously one that cannot be completed during this meeting. For this reason, your deliberations should be directed to providing, at a minimum, the following at 12:00 p.m. on the final day of the conference.

1. A description of the type of activities that will occur with consideration of spatial needs.

2. A bubble diagram indicating the relationships that should occur between all needed spaces in the building.



SITE PLAN 1" - 100'

3. A listing of specific elements which would be requirements for this building.

4. Optional - if time - a preliminary floor plan.

5. Optional - if time - a preliminary "learning space".

The results of your work should be presented on 8-1/2"x11" paper (provided to you) for duplication and districution to all conferees.

Facility Guidelines

To obtain the approval of the Commissioner of Education of plans and specifications, the following requirements as interpreted by the Commissioner shall be complied with.

1. General

   a. Plans and specifications for the erection, repair, enlargement or remodeling of a school building, required to be submitted to the Commissioner of Education for his approval, shall be submitted in accordance with the procedure set forth by the Commissioner of Education. When approved, one set shall be placed on file in the Education Department and the other returned to the trustee or board of education, with the approval endorsed thereon. Changes in approved plans and specifications, made either before or after contracts are let, shall also be approved by the Commissioner of Education before they become effective.

   b. No construction materials shall be used and no type of construction shall be permitted which would endanger the health, safety, or comfort of the children of the school.

   c. While school building design should, as far as practicalbe, contribute to the attractiveness of the community, extravagance in materials and in planning shall be avoided.

   d. The products or commodities required to be used by such plans and specifications shall not be limited to those manufactured by any specified manufacturer.

   e. Construction details shall conform to commonly accepted standards for public work.

   f. Plans and specifications for sewage disposal systems shall be submitted to the Division of Sanitation, State Department of Health, for acceptance prior to the approval of the building plans. The approval by the Commissioner of Education of plans and specifications for a school building shall not be construed as an approval of any sewage disposal system.

   g. Exits, stairs, and corridors shall be so planned and spaced as to permit ease of pupil circulation in the building and to insure ready escape from the building in case of an emergency.

   h. Provision shall be made for facilities sufficient for carrying out all educational requirements mandated by statute or by the Commissioner's Regulations.

i. The number, type, and capacity of building facilities shall not exceed the educational need of the area to be served nor the financial ability of the district to defray the cost.

j. Contracts for school building construction shall not be entered into for amounts exceeding the architect's estimates of the cost of the building as reported on the application for the Commissioner's approval without consultation with the Education Department.

k. The architect's or engineer's specifications shall provide that mechanical trade contractors or their representatives shall instruct the board of education or their representatives in the proper operation and service of all mechanical equipment at the time of completion and before acceptance of the school building by the board of education.

2. Visual comfort and efficiency in a school building

a. Objective:

(1) The objective in providing school lighting shall be the securing of adequate levels of illumination for the visual task in an environment of balanced brightness.

b. Natural lighting:

(1) Any classroom to be occupied during the major portion of the day by the same group of children shall be oriented so as to receive sunlight for some part of the day;

(2) Daylight may be used all or part of the time as the sole source of classroom illumination or in combination with artifical light. In other words, either natural or artificial illumination may be the chief source of light;

(3) Openings admitting daylight shall be located and designed to avoid glare and objectionable shadows.

c. Artificial lighting:

(1) School buildings shall be provided with sufficient and suitable artificial light to conduct the school activities in the absence of natural light.

d. Fenestration:

(1) Each classroom shall have a principal fenestration with length equal to a major portion of the length of the window wall (or walls);

(2) Principal fenestration shall permit an unobstructed view of the exterior.

e. Ceiling height:

(1) The ceiling height of any classroom shall be properly proportioned to the size and shape of the room.

f. Interior color and finish:

(1) The color and finish of ceilings, walls, floors, furniture, and equipment shall be selected to provide a pleasing and stimulating environment and to obtain low brightness differences and freedom from glare.

3. Heating and ventilating

a. Thermal environment during the heating season:

(1) Heating systems shall be so designed and guaranteed that when properly installed and operated they will meet the following standards:

Type of Space	Design Operative Temperature[1]	Corresponding Room Air Temperature[2]
(a) Sedentary activity, as for example in classrooms, auditoriums, offices, cafeterias	70°	68°-72° (30" above floor)
(b) Moderate activity, as for example in corridors, stairways, shops, laboratories, kitchens	68°	66°-70° (60" above floor)

[1] The operative temperature represents the mean effect of the temperature of the air of a room and of its walls. Under normal conditions walls and air exert approximately equal effects; but if a room has three cold exterior walls a higher air temperature will be necessary for comfort than in the case of a room with a single exterior wall exposed to the sun but not to the prevailing winds.

[2] The lower figure of air temperature in each case is for a room with relatively warm walls; the second figure, for a room with relatively cold walls.

Type of Space	Design Operative Temperature	Corresponding Room Air Temperature
(c) Vigorous activity, as for example in gymnasiums	65°	60°–70° (60" above floor)
(d) Special cases – lockers and shower rooms	78°	76°–80° (60" above floor)
swimming pool area	83°	80°–86° (60" above floor)

(2) Maximum air temperature gradient from floor to 60" above floor shall not exceed 5° and preferably shall not exceed 3°.

(3) Air movement in zones of occupancy shall not exceed 25 linear feet per minute.

b. Thermal environment during the nonheating season:

(1) Where extensive summer use of rooms in a school building is anticipated in any area where outdoor summer temperatures are high, the Department may require the installation of air-conditioning systems designed to produce inside temperature as indicated below:

Outdoor Temperature	Inside Temperature
80°	75°
90°	78°
95°	80°

(2) As an alternative to the above, the Department may require electric fans to similar apparatus which will increase turbulent air movement within such spaces as those specified above to 100 feet per minute.

c. Atmospheric hazards and quality:

(1) In classrooms, provision for air change shall be made which, in the judgment of the Department, will provide a minimum air change of 10 cubic feet per minute per occupant when the outdoor air temperature is 35° F. or above. At outdoor air temperatures below 35° F., the minimum air change may be reduced progressively to as low as 4 c.f.m. per occupant when the design temperature is -20° F. The heating plant should not be overdesigned to meet a rarely occurring

outside temperature.

(2) In rooms planned for close assembly a minimum air change of 10 c.f.m. per occupant shall be provided in order to remove odors. Additional air change, depending largely upon wall exposure, may be required for effective thermal operation in mild weather.

(3) In rooms where there is danger of toxic substances occurring in large concentrations, or where odors are likely to be strong, or where overheating is likely to occur, special ventilating equipment adequate to relieve the situation and entirely independent of the ventilating system serving the rest of the building shall be installed.

d. Exit doors from places of assembly exceeding 1,800 square feet shall be equipped with anti-panic hardware or have no locking devices;

e. Places of assembly exceeding 2,000 square feet as well as major exitways leading from such places of assembly shall be provided with emergency lighting systems;

f. School buildings from one to six classrooms shall be provided with exit signs showing the word "EXIT" in plainly legible letters not less than 4-1/2 inches high and with the strokes of each letter not less than 3/4 inch wide. School buildings of seven classrooms or more shall be provided with illuminated signs showing the word "EXIT" as described above in auditoriums, assembly halls, gymnasiums, stairways, corridors, exits, and exitways;

g. Doors, walls, and ceilings of heater and fuel rooms shall be finished with fire resistant materials of at least 1 hour fire rating. For example: 2x4 stud partition finished on both sides with two layers of 3/8 inch gypsum board or 3/16 inch gypsum board over 3/8 inch gypsum board or 1/2 inch gypsum board with mineral wool batts between the studs;

h. Direct fired heating units shall not be used in places of pupil occupancy;

i. Unused duct space shall be sealed off at each floor level with non-combustible material;

j. School buildings from one to six classrooms shall be equipped with either a manual (hand or electric) or automatic fire alarm system which is capable of being sounded for such a period of time to insure the evacuation of all occupants of the building. School buildings of seven classrooms or more or multistoried buildings shall be equipped with a manually operated electric or automatic fire alarm which will continue to sound the alarm until the tripped station has been restored to normal operation or has completed a cycle of not less than 30 seconds;

k. Every school building in any city, village, town, or fire district having a general fire alarm station and an electrically operated fire alarm system, shall be equipped with a municipal fire alarm box (located on the site or on the school building) of the same type and character used in such city, village, town, or fire district. Wherever practicable the internal fire alarm system of a school building shall be connected with the general fire alarm system so that the setting off of the school internal fire alarm system automatically gives the alarm to the fire department affording protection to the school;

l. All school buildings of two classrooms or more shall be equipped with a telephone for emergency use;

m. Combustible attic space and space under stairs shall not be used for storage;

n. All storerooms for flammable materials shall have walls, floors, and ceilings finished in noncombustible materials;

o. Exit doors shall not be locked, chained, or otherwise rendered inoperative from the inside at any time;

p. Corridors and passageways shall be kept clear at all times;

q. Wood floors shall not be treated or finished with oil. Floors previously so finished shall be cleaned and refinished with a penetrating seal;

r. The Commissioner of Education may at his discretion require that the doors, walls, and ceilings of exitways (corridors, stairwells, vestibules, lobbies, etc.) be finished with fire retardant materials or coatings;

s. Fire extinguishers shall be so located in corridors and in areas of unusual fire hazard that no point in such area or corridor is more than 100 feet from a fire extinguisher;

t. Hazardous glass areas adjacent to doors in exitways shall be protected by railings or grilles to prevent injury to pupils;

u. The Commissioner of Education at his discretion may require that a classroom or other space of pupil occupancy be equipped with one window of such size and design to permit escape through such window.

v. Buildings of two stories or more of ordinary wood construction or with masonry exterior walls and wood interior construction shall have stairways equipped with enclosures to control the spread of smoke and fire or shall be provided with direct exits to the outside from each classroom. The doors to these stairways shall be designed to be kept normally closed and shall not be secured in the open position. All doors designed to be kept normally closed shall bear signs reading "Fire Door - Keep Door Closed" in letters not less than 3 inches high. However, stair enclosure doors may be held open if a release device is provided and so arranged that a detection of fire and/or smoke will cause an interruption of electric current and the doors will be released. The Commissioner of Education may in appropriate instances also require alternate means of egress from places of pupil occupancy through approved adjacent spaces.

Health and safety regulations for existing school buildings

1. Pursuant to the provisions of the Education Law, in order to insure the health and safety of pupils in relation to heating, lighting, ventilation, sanitation and health, and fire and accident protection, all school buildings of school districts other than city school districts of cities having 125,000 inhabitants or more shall meet the following:

   a. There shall be at least two means of egress remote from each other leading from each floor of pupil occupancy for all school buildings so that when a pupil enters into a corridor from a room of pupil occupancy, he shall have a choice of two unobstructed means of egress in different directions. Corridor pockets not exceeding one and one-half times the width of the corridor and where classroom doors within the pockets are 15 feet or more from the stairwell will be permitted. Classrooms or other spaces for pupil occupancy above the first or ground floor which are beyond stairs and do not have two optional directions of travel at the classroom door may have a door to the corridor not more than 20 feet beyond the stairway provided the following conditions are met:

      (1) The stairway shall be equipped with enclosures to control the spread of smoke and fire. The doors to these stair enclosures shall be designed to be kept normally closed and shall not be

secured in the open position. All doors designed to be kept normally closed shall bear signs reading "Fire Door - Keep Door Closed" in letters not less than 3 inches high. However, stair enclosure doors may be held open if a release device is provided, and so arranged that a detection of fire and/or smoke will cause an interruption of electric current and the doors will be released; or

(2) Each classroom or other space for pupil occupancy beyond the stairs shall be provided with a direct exit to the outside; or

(3) The building shall be provided with an automatic sprinkler system or an automatic fire and/or smoke detection system as approved by the Commissioner of Education; and

(4) In addition to any of the conditions set forth in subparagraphs 1, 2, and 3 of this paragraph the Commissioner of Education may in appropriate instances also require alternate means of egress from places of pupil occupancy through approved adjacent spaces.

b. The Commissioner of Education may at his discretion require two exits from individual rooms;

c. The Commissioner of Education may at his discretion require that certain stairways be equipped with enclosures to control the spread of fire and smoke;

d. The Commissioner of Education shall require that fire escapes be installed on school buildings when other exits are determined to be inadequate for fire safety. He shall approve the design of such escapes;

e. All pupil exterior exit doors shall swing outward and be equipped with anti-panic hardware excepting a single door near grade level serving only one or two classrooms;

f. School buildings of ordinary wood construction shall not have places of assembly above the first floor;

g. School buildings of masonry exterior walls and wood interior construction shall not have places of assembly above the first floor. An exception may be granted if adequate exit facilities are provided;

h. Exit doors from places of assembly exceeding 1,800 square feet shall be equipped with anti-panic hardware or have no locking devices;

i. Places of assembly exceeding 2,000 square feet as well as major exitways leading from such places of assembly shall be provided with emergency lighting systems;

j. School buildings from 1 to 6 classrooms shall be provided with exit signs showing the word "EXIT" in plainly legible letters not less than 4-1/2 inches high and with the strokes of each letter not less than 3/4 inch wide. School buildings of 7 classrooms or more shall be provided with illuminated signs showing the word "EXIT" as described above in auditoriums, assembly halls, gymnasiums, stairways, corridors, exits, and exitways.

k. Doors, walls, and ceilings of heater and fuel rooms shall be finished with fire resistive materials of at least 1 hour fire rating. For example: 2x4 stud partition finished on both sides with two layers of 3/8 inch gypsum board or 3/16 inch gypsum board over 3/8 inch gypsum board of 1/2 inch gypsum board with mineral wool batts between the studs;

l. Direct fired heating units shall not be used in places of pupil occupancy;

m. Unused duct space shall be sealed off at each floor level with noncombustible material;

n. School buildings from 1 to 6 classrooms shall be equipped with either a manual (hand or electric) or automatic fire alarm system which is capable of being sounded for such a period of time to insure the evacuation of all occupants of the building. School buildings of seven classrooms or more or multistoried buildings shall be equipped with a manually operated electric or automatic fire alarm which will continue to sound the alarm until the tripped station has been restored to normal operation or has completed a cycle of not less than 30 seconds;

o. Every school building in any city, village, town, or fire district having a general fire alarm station and an electrically operated fire alarm system, shall be equipped with a municipal fire alarm box (located on the site or on the school building) of the same type and character used in such city, village, town, or fire district. Wherever practicable the internal fire alarm system of a school building shall be connected with the general fire alarm system automatically gives the alarm to the fire department affording protection to the school;

p. All school buildings of two classrooms or more shall be equipped with a telephone for emergency use;

q. Combustible attic space and space under stairs shall not be used for storage;

r. All storerooms for flammable materials shall have walls, floors, and ceilings finished in noncombustible materials;

s. Exit doors shall not be locked, chained, or otherwise rendered inoperative from the inside at any time;

t. Corridors and passageways shall be kept clear at all times;

u. Wood floors shall not be treated or finished with oil. Floors previously so finished shall be cleaned and refinished with a penetrating seal;

v. The Commissioner of Education may at his discretion require that the doors, walls, and ceilings of exitways (corridors, stairwells, vestibules, lobbies, etc.) be finished with fire retardant materials or coatings;

w. Fire extinguishers shall be so located in corridors and in areas of unusual fire hazard that no point in such area or corridor is more than 100 feet from a fire extinguisher;

x. Hazardous glass areas adjacent to doors in exitways shall be protected by railings or grilles to prevent injury to pupils;

y. Every classroom, unless it has a direct exit to the outside, must be equipped with at least one window of such size and design to permit egress through such window;

z. Buildings of two stories or more of ordinary wood construction or with masonry exterior walls and wood interior construction shall have stairways equipped with enclosures to control the spread of smoke and fire or shall be provided with direct exits to the outside from each classroom. The doors to these stairways shall be designed to be kept normally closed and shall not be secured in the open position. All doors designed to be kept normally closed shall bear signs reading "Fire Door - Keep Door Closed" in letters not less than 3 inches high. However, stair enclosure doors may be held open if a release device is provided and so arranged that a detection of fire and/or smoke will cause an interruption of electric current and the doors will be released. The Commissioner of Education may in appropriate instances also require alternate means of egress from places of pupil occupancy through approved adjacent spaces.

2. The Commissioner of Education may designate an area or areas of a school building as unusable for pupil occupancy or may determine that an area or areas used for pupil occupancy may be occupied by only a certain number of pupils, when in his judgment the type, character, construction, age, and general condition of the building or any part thereof or the location of the area or areas involved, indicate that it would be detrimental to the health and safety of pupils in relation to heating, lighting, ventilation, sanitation and health, and fire and accident protection, to have such area or areas occupied by pupils or occupied by more than a certain number of pupils.

Temporary school quarters

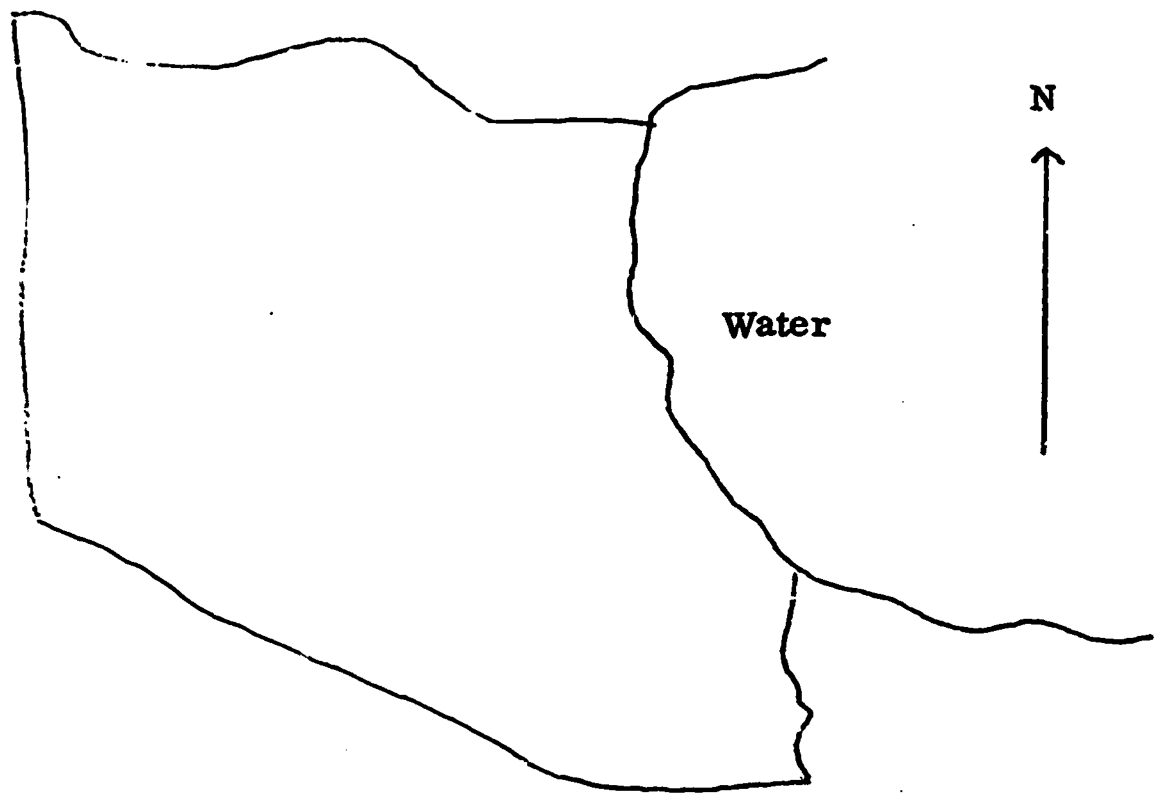
No temporary school quarters shall be used in school districts other than city school districts of cities having 70,000 inhabitants or more without the annual approval of the Commissioner of Education.

Drinking water

Every school building shall be provided with a supply of safe, potable water for drinking purposes dispensed within the building through approved sanitary drinking fountains and separate toilet rooms for boys and girls, with flush toilets and wash basins connected to an adequate water supply under pressure and a sewage disposal system if a public sewer is not available. No source of water supply nor sewage disposal system shall be used without the approval of the State Department of Health.

Geography

Renn County has a land area of 362 miles. The county borders on a large lake and has a gentle elevation ranging from 400' above sea level at the western edge to sea level by the lake. There are a number of small streams located in the county.



The average temperature in January is 53 degrees and in July is 82 degrees. Annual precipitation is about 68 inches. The following chart of average January and July temperatures and annual precipitation for selected states is provided as reference information.

Average Temperatures and Precipitation in Selected States Throughout the U.S.

State	January	July	Precipitation (Inches)
Alabama	48	82	50
Arizona	49	87	7
California	52	68	16
Colorado	28	72	15
Georgia	45	79	47
Illinois	26	75	33
Kansas	32	80	28
Louisiana	55	82	63
Maryland	35	76	44
Minnesota	12	72	25
North Carolina	42	78	43

State	January	July	Precipitation (Inches)
Ohio	27	72	35
Oklahoma	37	82	31
Pennsylvania	32	75	42
Tennessee	40	80	45
Vermont	16	69	33
West Virginia	35	75	39

Population

Renn County has a population of 48,408 persons located on 362 square miles producing a population density of 134 people per square mile. During the 1950-1960 decade there was a 45% population increase in the county. Growth is expected to continue at a 10% rate for the next decade. In 1960 10,936 families lived in the county.

Income and Employment

In 1959 the aggregate income of the population living in the county was 77 million dollars. Although the median income is $4,840 per family, almost 20% of the families earn less than $3,000. About a third of the county's work force is employed in white collar positions, with another third working in manufacturing. Approximately 70% of the residents of the county live in their own homes. Fifty-six percent of all land in the county is utilized for farming and about 3500 households are to some degree dependent on farming for income. Four out of every ten people in the county completed high school or additional schooling while 7% of the residents completed less than 5 years of school. The median number of school years completed is 10.4 grades.

Renn County Government

The majority of governmental services operating in Renn County are provided by local towns. This includes police and fire protection, welfare, health, road maintenance, and zoning. The county government is primarily concerned with coordinating functions and, for example, operates the police and fire communications centers. County zoning, health, and road maintenance agencies operate in a similar manner.

Education

In recent years, there has been a trend within the county for local school districts to consolidate for the provision of basic school services. As a result, 20 communities operate their own elementary school systems. However, four consolidated districts have been created to provide junior high and secondary programs. Additionally, operating at the county level is a Department of Education that provides specialized services to the consolidated and local districts that include vocational education, data processing, special education, some federally administered programs such as Headstart, recruitment program for the entire county and in-service programs.

Direction for the county's educational program is provided by a board of elected persons representing all areas of the county and an appointed Superintendent. The county Superintendent of Schools has three assistants on his staff including a Director of Vocational Education, Director of Special Education, and a Director of Data Processing who also serves as the grant writer and federal program administrator. Approximately 800 children participate in the vocational program on a half day basis since instruction in non-vocational coursework occurs in the home school.

Data processing services available to the consolidated districts include report cards, attendance, all standardized test grading and some grading of teacher made tests. A small headstart program for 50 children is currently being operated in the county seat.

The superintendent's office is in the county office building while the Director of Vocational Education who also serves as the principal of the ten year old vocational high school occupies an office there. The Director of Data Processing has his office in a two year old high school in the Delta District.

At present, there are over 10,000 county children enrolled in public education programs. The chart below indicates the number of children that are channeled from local districts to placement in the consolidated school districts.

District	K-6	7-9	10-12	Total
Alpha	1170	715	600	2485
Beta	1000	710	575	2285
Chi	800	550	559	1909
Delta	1765	1070	665	3500

Since the special education program is operated totally by the county, the references below to consolidated districts merely indicates that classes are located in schools that are included in those districts. Placement of special education children is not limited to the existing boundaries of consolidation.

District	Type Program	Classes	Children
Alpha	Elementary Educable Mentally Retarded	1	15
Beta	Elementary Educable Mentally Retarded	1	15
Chi	Elementary Trainable Mentally Retarded	3	30
	Intermediate Trainable Mentally Retarded	2	22
	Elementary Physically Handicapped	5	50
	Intermediate Physically Handicapped	2	30

District	Type Program	Classes	Children
Delta	Elementary Educable Mentally Retarded	2	30
	Intermediate Educable Mentally Retarded	2	34
	Elementary Trainable Mentally Retarded	1	12
	Elementary Physically Handicapped	1	10
	Elementary Visually Handicapped	1	8
	Elementary and Intermediate Auditory Handicapped	1	8

Frequently, the decisions about the placement of classes is made on the basis of the availability of space. The Delta Consolidated School District and feeding communities have been the most rapidly growing and have been including facilities for exceptional children in all their school construction. On the other hand, the programs in the Chi area are all located in the sixty year old Lincoln School. The Lincoln School building also serves as the office for the county Director of Special Education who doubles as the principal of the building. Two speech therapists also employed by the county are based in this building along with a small instructional materials center.

Finance

There are no mandatory requirements for the provision of special education services in the state. However, some financial aid is provided from the state to local districts that provide special education programs. An excess cost of not more than $300 per year per exceptional child is paid for all eligible children. Children defined as exceptional include physically handicapped, speech and hearing handicapped, visually handicapped, emotionally disturbed, and educable mentally retarded. There also is provision for conducting experimental programs that are eligible for state reimbursement. In Renn County, the consolidated and local districts purchase special education services from the county. All personnel are hired, paid and supervised by the county office. Space is rented by the county from local districts.

Transportation reimbursement is provided on a range of $.07 to $.30 per mile depending on the type of carrier used. All transportation in Renn County is handled by the consolidated districts. Small school buses are most frequently used for transporting handicapped children.

State Department of Education

A small understaffed State Department of Education, organized under an elected superintendent, tries to administrate the educational program for the state. The state special education program is administratively responsible to the Assistant Superintendent for Pupil Personnel Services. Two professional persons with the job title of Supervisor have total responsibility for administering the state special education program.

Operating under the Assistant Superintendent for Plants is a staff of five persons, three trained as educators, one as a businessman, and the fifth an architect. This staff has the responsibility for assisting local districts in planning, reviewing all plans, and acting for the superintendent. On the infrequent occasions when special education facilities have been planned in the state, there has been no conversation between the department and the state supervisors of special education.

Although districts are already eligible for state construction aid, a bill that would permit districts to be reimbursed an additional 25% of the cost of constructing special education facilities has narrowly failed in each of the last two sessions of the legislature. It is rumored that the regulating of the proposed law would be assigned to the Department of Plants where plans would be closely examined for conformity with existing building guidelines. It is expected that this bill will become law in the next session.

Private Agencies

Up until five years ago, a local Easter Seal Society Center for Crippled Children and Adults operated an outpatient diagnostic and an educational program for 35 crippled children in a rented church basement. However, due to difficulty in both financial and community support, the program was phased out. Since that time diagnostic services have been available only in a city 100 miles away. There is at present no organized group that is concerned about educational programs for the physically handicapped.

A different situation exists with the trainable mentally retarded, however, for an active parents group affiliated with the ARC (Association for Retarded Children) is operating a pre-school and activities center for children not being served by the school. These parents are most volatile and outspoken when the conditions of the Lincoln Special School in Chi are discussed.

Within the past two years another parents group has formed that has been very concerned with the absence of educational programs that are available for their children who they indicate have learning disabilities. Although the group has been loosely organized, they have become increasingly vocal. Their complaints have, for the most part, been directed to local district officials but more recently have been exploring their potential power at the state capitol.

Needed Program for Children with Learning Disabilities

For the past few years during meetings of the County Board of Education and the County Administrative Staff, discussion occurred about children that seemed to have adequate intelligence but who could not achieve and also those children that demonstrated peculiar behavior patterns, both socially and academically. Continued discussion of the problem, increasingly motivated by parent complaints, brought about the establishment of a teacher, parent and administrator committee to verify the extent of the problem and recommend possible solutions to it.

After a period of study, the committee reported to the board that a survey of county teachers indicated that approximately 200 children fell into the category of concern. As a result of surveying the literature they began to officially categorize the children as those with specific learning disabilities. Also collected from the literature was the information that some schools had been designing special facilities for these children with features that would assist them to focus on the tasks at hand by eliminating unessential stimuli, permit rapid restructuring of space, insuring acoustic integrity, and creating the potential for the use of many types of media and equipment.

The committee, based upon a year of work and study made the following recommendations to the county board:

1. Hire one diagnostic teacher for every elementary school to operate a resource room for these children.

2. Hire an additional psychologist to work with the most severe children and their teachers.

3. Hire two special education teachers who would work with the most severe children at home thus permitting their exclusion from regular classes.

4. Construct a four room addition for forty children to a regular elementary school which would house two permanent special classes and two resource rooms for these children. The addition would be staffed by county personnel and would include children from throughout the county.

5. In conjunction with 4. above, hire two itinerant teachers to identify children throughout the county needing help and to serve as a liaison between the addition and the regular classroom teacher to provide a follow-up for children rotated out of the addition.

After describing the issues and alternative answers to the problem of the learning disabled, the county board decided to adopt suggestion number four and construct an addition as soon as possible. While it was recognized that suggestion number five also should be implemented, it was to be placed into the budget for the second year after the building was opened. The board also hinted that this type of addition, if successful, would in future years occur at other schools.

The committee and board also specified that the total orientation of the program should be to return these children to regular programs. Thus, heavy emphasis will be placed on educational diagnosis and remediation directed to the specific deficits of the children. Extensive use will be made of specialized instructional devices and the flexible grouping of children. Additionally, frequent evaluation of the children will occur along with trial placement of the children in regular classes to guarantee that initial entrance to the program will not become permanent placements.

Site

Based upon the pupil population study, the board decided to locate the addition in the Delta School District. The building chosen to serve as the host for the addition was a ten year old eighteen classroom K-6 elementary school. This building was selected because the principal had obtained a M.A. in guidance and counseling and was receptive to special education and to the position that integration of special children and regular children should occur. Further, the principal viewed the program as an assist for regular education. A second and possibly more significant factor in the selection of this building was that the mechanical system that had originally been designed allowed for the possibility of an addition being constructed. The assigned budget for the addition is $78,000.

The Addition

Although the research that preceded the decision to build the addition was quite complete, little information was identified that could immediately be placed in a program for use by an architect. Complicating this absence of information was the lack of experience that educators in the county had with either educational programs or buildings for this type of program. As a result the board and the ad hoc committee posed a number of questions which they felt could best be answered during conversations with the architect. Among these questions were:

1. What role should be assigned to the physical environment to reduce and/or control the presence of extraneous stimuli?

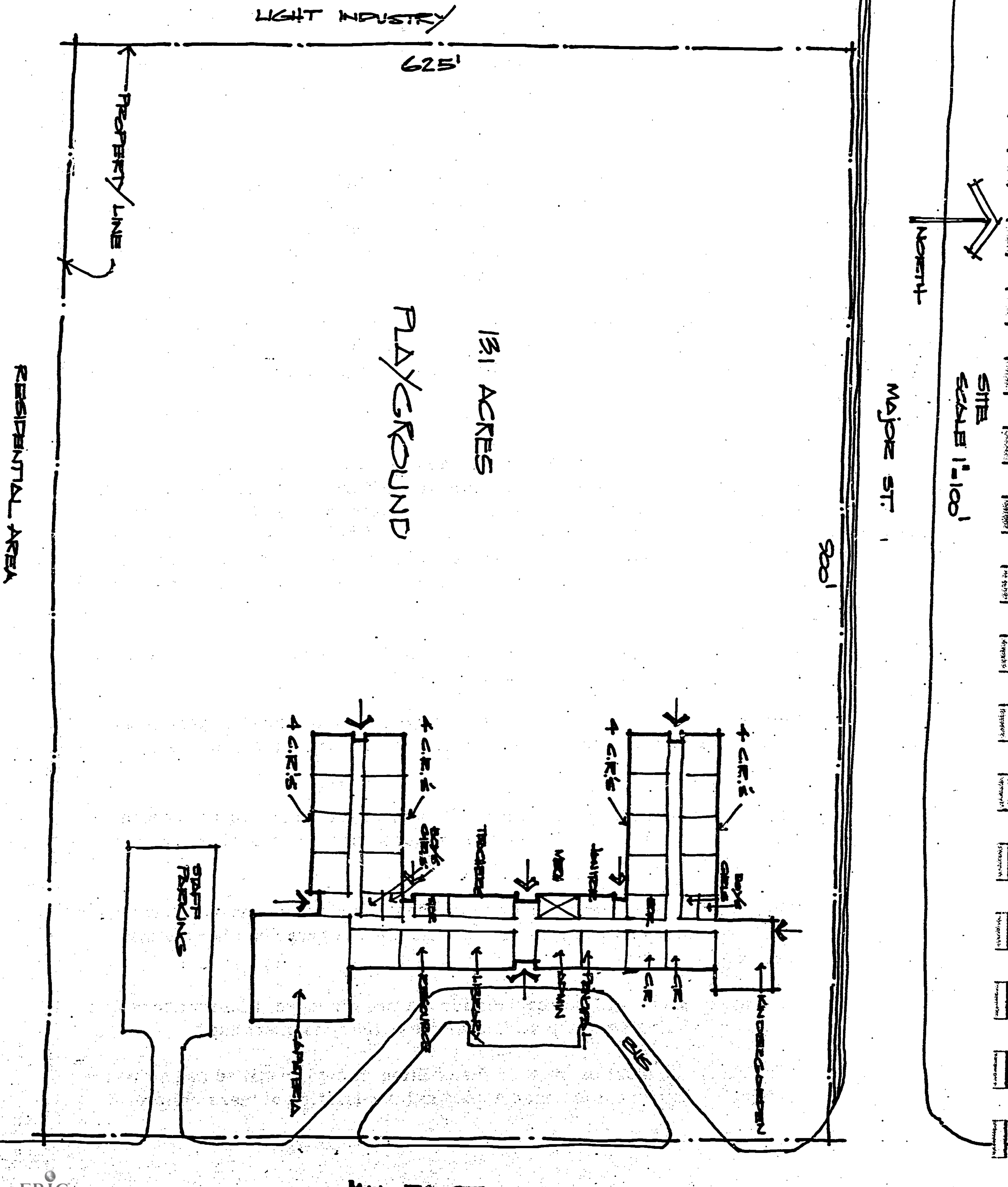
2. What provision should be made in the physical environment to permit the children to escape to private spaces and/or for the teachers to isolate children?

3. Since the children in the building will range in age from 6 to 10, how can the physical environment be used to enhance their feelings of security and well-being?

4. What provisions should be made to promote the communication and movement that occurs between the regular and special program children and teachers?

5. What space needs will be required for the two (or more) itinerant personnel expected to be added to the staff after the building is operating?

6. What provision must be made in the addition (if any) to utilize and store the materials, equipment and media used in the education of these children?


LIGHT INDUSTRY
625'
PROPERTY LINE
13.1 ACRES
PLAYGROUND
RESIDENTIAL AREA
NORTH
SITE
SCALE 1"=100'
MAJOR ST.
900'
4 C.R.'S
4 C.R.'S
4 C.R.'S
4 C.R.'S
STAFF PARKING
CAFETERIA
LIBRARY
KINDERGARTEN
BUS
C.R.
C.R.
MINOR ST.

7. Since many children will be located in the resource rooms, what potential should be built into the environment to create spaces for different uses and groups of children?

8. Because aides will be provided to the two special classes, what types of spaces should be designed for their use?

9. Since it is anticipated that some motor training activities will occur, what space in what location should be provided?

10. Given the possibility that if the resource room approach proves to be an effective strategy for assisting these children to return to the regular classroom, what provisions can occur in the design of the special room settings to make them adaptable to use as resource rooms?

11. What special lavatory provisions (if any) must be provided for these children because of their ages and handicaps?

12. Do these children have any special recreation needs that will affect the use of existing facilities?

13. Because children from throughout the county will be attending the addition, what provisions must be made to accommodate the exiting and entering of children, private vehicles and buses?

Staff

Two aides and two teachers would be permanently assigned to the special classes while the two resource room teachers would work on a resource basis with children from the host school and around the county (when transportation could be arranged). The children in the latter situation would be based in regular classes, but would go to the resource room for special work. All support personnel working with the regular school would also work with the addition personnel. One psychologist would be assigned to spend half time with this program. There is also the possibility that in addition to the aides, some volunteers will also participate in the program.

The Problem

As educators and architects working on an addition for young educationally handicapped children in Renn, you are now faced with beginning the process that hopefully will result in the creation of an efficient and effective building. The total task of planning a facility is obviously one that cannot be completed during this meeting. For this reason, your deliberations should be directed to providing, at a minimum, the following at 12:00 p.m. on the final day of the conference.

1. A description of the type of activities that will occur with consideration of

spatial needs.

2. A bubble diagram indicating the relationships that should occur between all needed spaces in the addition and the existing building.

3. A listing of specific elements which would be requirements for this building.

4. Optional - if time - a preliminary floor plan.

5. Optional - if time - a preliminary "learning space".

The results of your work should be presented on 8-1/2"x11" paper (provided to you) for duplication and distribution to all conferees.

Facility Guidelines

To obtain the approval of the Commissioner of Education of plans and specifications, the following requirements as interpreted by the Commissioner shall be complied with.

1. General

a. Plans and specifications for the erection, repair, enlargement or remodeling of a school building, required to be submitted to the Commissioner of Education for his approval, shall be submitted in accordance with the procedure set forth by the Commissioner of Education. When approved, one set shall be placed on file in the Education Department and the other returned to the trustee or board of education, with the approval endorsed thereon. Changes in approved plans and specifications, made either before or after contracts are let, shall also be approved by the Commissioner of Education before they become effective.

b. No construction materials shall be used and no type of construction shall be permitted which would endanger the health, safety, or comfort of the children of the school.

c. While school building design should, as far as practicalbe, contribute to the attractiveness of the community, extravagance in materials and in planning shall be avoided.

d. The products or commodities required to be used by such plans and specifications shall not be limited to those manufactured by any specified manufacturer.

e. Construction details shall conform to commonly accepted standards for public work.

f. Plans and specifications for sewage disposal systems shall be submitted to the Division of Sanitation, State Department of Health, for acceptance prior to the approval of the building plans. The approval by the Commissioner of Education of plans and specifications for a school building shall not be construed as an approval of any sewage disposal system.

g. Exits, stairs, and corridors shall be so planned and spaced as to permit ease of pupil circulation in the building and to insure ready escape from the building in case of an emergency.

h. Provision shall be made for facilities sufficient for carrying out all educational requirements mandated by statute or by the Commissioner's Regulations.

i. The number, type, and capacity of building facilities shall not exceed the educational need of the area to be served nor the financial ability of the district to defray the cost.

j. Contracts for school building construction shall not be entered into for amounts exceeding the architect's estimates of the cost of the building as reported on the application for the Commissioner's approval without consultation with the Education Department.

k. The architect's or engineer's specifications shall provide that mechanical trade contractors or their representatives shall instruct the board of education or their representatives in the proper operation and service of all mechanical equipment at the time of completion and before acceptance of the school building by the board of education.

2. Visual comfort and efficiency in a school building

a. Objective:

(1) The objective in providing school lighting shall be the securing of adequate levels of illumination for the visual task in an environment of balanced brightness.

b. Natural lighting:

(1) Any classroom to be occupied during the major portion of the day by the same group of children shall be oriented so as to receive sunlight for some part of the day;

(2) Daylight may be used all or part of the time as the sole source of classroom illumination or in combination with artifical light. In other words, either natural or artificial illumination may be the chief source of light;

(3) Openings admitting daylight shall be located and designed to avoid glare and objectionable shadows.

c. Artificial lighting:

(1) School buildings shall be provided with sufficient and suitable artificial light to conduct the school activities in the absence of natural light.

d. Fenestration:

(1) Each classroom shall have a principal fenestration with length equal to a major portion of the length of the window wall (or walls);

(2) Principal fenestration shall permit an unobstructed view of the exterior.

e. Ceiling height:

(1) The ceiling height of any classroom shall be properly proportioned to the size and shape of the room.

f. Interior color and finish:

(1) The color and finish of ceilings, walls, floors, furniture, and equipment shall be selected to provide a pleasing and stimulating environment and to obtain low brightness differences and freedom from glare.

3. Heating and ventilating

a. Thermal environment during the heating season:

(1) Heating systems shall be so designed and guaranteed that when properly installed and operated they will meet the following standards:

Type of Space	Design Operative Temperature[1]	Corresponding Room Air Temperature[2]
(a) Sedentary activity, as for example in classrooms, auditoriums, offices, cafeterias	70^{o}	68^{o}-72^{o} (30" above floor)
(b) Moderate activity, as for example in corridors, stairways, shops, laboratories, kitchens	68^{o}	66^{o}-70^{o} (60" above floor)

[1] The operative temperature represents the mean effect of the temperature of the air of a room and of its walls. Under normal conditions walls and air exert approximately equal effects; but if a room has three cold exterior walls a higher air temperature will be necessary for comfort than in the case of a room with a single exterior wall exposed to the sun but not to the prevailing winds.

[2] The lower figure of air temperature in each case is for a room with relatively warm walls; the second figure, for a room with relatively cold walls.

Type of Space	Design Operative Temperature	Corresponding Room Air Temperature
(c) Vigorous activity, as for example in gymnasiums	65°	60°-70° (60" above floor)
(d) Special cases - lockers and shower rooms	78°	76°-80° (60" above floor)
swimming pool area	83°	80°-86° (60" above floor)

(2) Maximum air temperature gradient from floor to 60" above floor shall not exceed 5° and preferably shall not exceed 3°.

(3) Air movement in zones of occupancy shall not exceed 25 linear feet per minute.

b. Thermal environment during the nonheating season:

(1) Where extensive summer use of rooms in a school building is anticipated in any area where outdoor summer temperatures are high, the Department may require the installation of air-conditioning systems designed to produce inside temperature as indicated below:

Outdoor Temperature	Inside Temperature
80°	75°
90°	78°
95°	80°

(2) As an alternative to the above, the Department may require electric fans to similar apparatus which will increase turbulent air movement within such spaces as those specified above to 100 feet per minute.

c. Atmospheric hazards and quality:

(1) In classrooms, provision for air change shall be made which, in the judgment of the Department, will provide a minimum air change of 10 cubic feet per minute per occupant when the outdoor air temperature is 35° F. or above. At outdoor air temperatures below 35° F., the minimum air change may be reduced progressively to as low as 4 c.f.m. per occupant when the design temperature is -20° F. The heating plant should not be overdesigned to meet a rarely oc...

outside temperature.

(2) In rooms planned for close assembly a minimum air change of 10 c.f.m. per occupant shall be provided in order to remove odors. Additional air change, depending largely upon wall exposure, may be required for effective thermal operation in mild weather.

(3) In rooms where there is danger of toxic substances occurring in large concentrations, or where odors are likely to be strong, or where overheating is likely to occur, special ventilating equipment adequate to relieve the situation and entirely independent of the ventilating system serving the rest of the building shall be installed.

d. Exit doors from places of assembly exceeding 1,800 square feet shall be equipped with anti-panic hardware or have no locking devices;

e. Places of assembly exceeding 2,000 square feet as well as major exitways leading from such places of assembly shall be provided with emergency lighting systems;

f. School buildings from one to six classrooms shall be provided with exit signs showing the word "EXIT" in plainly legible letters not less than 4-1/2 inches high and with the strokes of each letter not less than 3/4 inch wide. School buildings of seven classrooms or more shall be provided with illuminated signs showing the word "EXIT" as described above in auditoriums, assembly halls, gymnasiums, stairways, corridors, exits, and exitways;

g. Doors, walls, and ceilings of heater and fuel rooms shall be finished with fire resistant materials of at least 1 hour fire rating. For example: 2x4 stud partition finished on both sides with two layers of 3/8 inch gypsum board or 3/16 inch gypsum board over 3/8 inch gypsum board or 1/2 inch gypsum board with mineral wool batts between the studs;

h. Direct fired heating units shall not be used in places of pupil occupancy;

i. Unused duct space shall be sealed off at each floor level with non-combustible material;

j. School buildings from one to six classrooms shall be equipped with either a manual (hand or electric) or automatic fire alarm system which is capable of being sounded for such a period of time to insure the evacuation of all occupants of the building. School buildings of seven classrooms or more or multistoried buildings shall be equipped with a manually operated electric or automatic fire alarm which will continue to sound the alarm until the tripped station has been restored to normal operation or has completed a cycle of not less than 30 seconds;

k. Every school building in any city, village, town, or fire district having a general fire alarm station and an electrically operated fire alarm system, shall be equipped with a municipal fire alarm box (located on the site or on the school building) of the same type and character used in such city, village, town, or fire district. Wherever practicable the internal fire alarm system of a school building shall be connected with the general fire alarm system so that the setting off of the school internal fire alarm system automatically gives the alarm to the fire department affording protection to the school;

l. All school buildings of two classrooms or more shall be equipped with a telephone for emergency use;

m. Combustible attic space and space under stairs shall not be used for storage;

n. All storerooms for flammable materials shall have walls, floors, and ceilings finished in noncombustible materials;

o. Exit doors shall not be locked, chained, or otherwise rendered inoperative from the inside at any time;

p. Corridors and passageways shall be kept clear at all times;

q. Wood floors shall not be treated or finished with oil. Floors previously so finished shall be cleaned and refinished with a penetrating seal;

r. The Commissioner of Education may at his discretion require that the doors, walls, and ceilings of exitways (corridors, stairwells, vestibules, lobbies, etc.) be finished with fire retardant materials or coatings;

s. Fire extinguishers shall be so located in corridors and in areas of unusual fire hazard that no point in such area or corridor is more than 100 feet from a fire extinguisher;

t. Hazardous glass areas adjacent to doors in exitways shall be protected by railings or grilles to prevent injury to pupils;

u. The Commissioner of Education at his discretion may require that a classroom or other space of pupil occupancy be equipped with one window of such size and design to permit escape through such window.

v. Buildings of two stories or more of ordinary wood construction or with masonry exterior walls and wood interior construction shall have stairways equipped with enclosures to control the spread of smoke and fire or shall be provided with direct exits to the outside from each classroom. The doors to these stairways shall be designed to be kept normally closed and shall not be secured in the open position. All doors designed to be kept normally closed shall bear signs reading "Fire Door - Keep Door Closed" in letters not less than 3 inches high. However, stair enclosure doors may be held open if a release device is provided and so arranged that a detection of fire and/or smoke will cause an interruption of electric current and the doors will be released. The Commissioner of Education may in appropriate instances also require alternate means of egress from places of pupil occupancy through approved adjacent spaces.

Health and safety regulations for existing school buildings

1. Pursuant to the provisions of the Education Law, in order to insure the health and safety of pupils in relation to heating, lighting, ventilation, sanitation and health, and fire and accident protection, all school buildings of school districts other than city school districts of cities having 125,000 inhabitants or more shall meet the following:

a. There shall be at least two means of egress remote from each other leading from each floor of pupil occupancy for all school buildings so that when a pupil enters into a corridor from a room of pupil occupancy, he shall have a choice of two unobstructed means of egress in different directions. Corridor pockets not exceeding one and one-half times the width of the corridor and where classroom doors within the pockets are 15 feet or more from the stairwell will be permitted. Classrooms or other spaces for pupil occupancy above the first or ground floor which are beyond stairs and do not have two optional directions of travel at the classroom door may have a door to the corridor not more than 20 feet beyond the stairway provided the following conditions are met:

(1) The stairway shall be equipped with enclosures to control the spread of smoke and fire. The doors to these stair enclosures shall be designed to be kept normally closed and shall not be

secured in the open position. All doors designed to be kept normally closed shall bear signs reading "Fire Door - Keep Door Closed" in letters not less than 3 inches high. However, stair enclosure doors may be held open if a release device is provided, and so arranged that a detection of fire and/or smoke will cause an interruption of electric current and the doors will be released; or

(2) Each classroom or other space for pupil occupancy beyond the stairs shall be provided with a direct exit to the outside; or

(3) The building shall be provided with an automatic sprinkler system or an automatic fire and/or smoke detection system as approved by the Commissioner of Education; and

(4) In addition to any of the conditions set forth in subparagraphs 1, 2, and 3 of this paragraph the Commissioner of Education may in appropriate instances also require alternate means of egress from places of pupil occupancy through approved adjacent spaces.

b. The Commissioner of Education may at his discretion require two exits from individual rooms;

c. The Commissioner of Education may at his discretion require that certain stairways be equipped with enclosures to control the spread of fire and smoke;

d. The Commissioner of Education shall require that fire escapes be installed on school buildings when other exits are determined to be inadequate for fire safety. He shall approve the design of such escapes;

e. All pupil exterior exit doors shall swing outward and be equipped with anti-panic hardware excepting a single door near grade level serving only one or two classrooms;

f. School buildings of ordinary wood construction shall not have places of assembly above the first floor;

g. School buildings of masonry exterior walls and wood interior construction shall not have places of assembly above the first floor. An exception may be granted if adequate exit facilities are provided;

h. Exit doors from places of assembly exceeding 1,800 square feet shall be equipped with anti-panic hardware or have no locking devices;

i. Places of assembly exceeding 2,000 square feet as well as major exitways leading from such places of assembly shall be provided with emergency lighting systems;

j. School buildings from 1 to 6 classrooms shall be provided with exit signs showing the word "EXIT" in plainly legible letters not less than 4-1/2 inches high and with the strokes of each letter not less than 3/4 inch wide. School buildings of 7 classrooms or more shall be provided with illuminated signs showing the word "EXIT" as described above in auditoriums, assembly halls, gymnasiums, stairways, corridors, exits, and exitways.

k. Doors, walls, and ceilings of heater and fuel rooms shall be finished with fire resistive materials of at least 1 hour fire rating. For example: 2x4 stud partition finished on both sides with two layers of 3/8 inch gypsum board or 3/16 inch gypsum board over 3/8 inch gypsum board of 1/2 inch gypsum board with mineral wool batts between the studs;

l. Direct fired heating units shall not be used in places of pupil occupancy;

m. Unused duct space shall be sealed off at each floor level with noncombustible material;

n. School buildings from 1 to 6 classrooms shall be equipped with either a manual (hand or electric) or automatic fire alarm system which is capable of being sounded for such a period of time to insure the evacuation of all occupants of the building. School buildings of seven classrooms or more or multistoried buildings shall be equipped with a manually operated electric or automatic fire alarm which will continue to sound the alarm until the tripped station has been restored to normal operation or has completed a cycle of not less than 30 seconds;

o. Every school building in any city, village, town, or fire district having a general fire alarm station and an electrically operated fire alarm system, shall be equipped with a municipal fire alarm box (located on the site or on the school building) of the same type and character used in such city, village, town, or fire district. Wherever practicable the internal fire alarm system of a school building shall be connected with the general fire alarm system automatically gives the alarm to the fire department affording protection to the school;

p. All school buildings of two classrooms or more shall be equipped with a telephone for emergency use;

q. Combustible attic space and space under stairs shall not be used for storage;

r. All storerooms for flammable materials shall have walls, floors, and ceilings finished in noncombustible materials;

s. Exit doors shall not be locked, chained, or otherwise rendered inoperative from the inside at any time;

t. Corridors and passageways shall be kept clear at all times;

u. Wood floors shall not be treated or finished with oil. Floors previously so finished shall be cleaned and refinished with a penetrating seal;

v. The Commissioner of Education may at his discretion require that the doors, walls, and ceilings of exitways (corridors, stairwells, vestibules, lobbies, etc.) be finished with fire retardant materials or coatings;

w. Fire extinguishers shall be so located in corridors and in areas of unusual fire hazard that no point in such area or corridor is more than 100 feet from a fire extinguisher;

x. Hazardous glass areas adjacent to doors in exitways shall be protected by railings or grilles to prevent injury to pupils;

y. Every classroom, unless it has a direct exit to the outside, must be equipped with at least one window of such size and design to permit egress through such window;

z. Buildings of two stories or more of ordinary wood construction or with masonry exterior walls and wood interior construction shall have stairways equipped with enclosures to control the spread of smoke and fire or shall be provided with direct exits to the outside from each classroom. The doors to these stairways shall be designed to be kept normally closed and shall not be secured in the open position. All doors designed to be kept normally closed shall bear signs reading "Fire Door - Keep Door Closed" in letters not less than 3 inches high. However, stair enclosure doors may be held open if a release device is provided and so arranged that a detection of fire and/or smoke will cause an interruption of electric current and the doors will be released. The Commissioner of Education may in appropriate instances also require alternate means of egress from places of pupil occupancy through approved adjacent spaces.

2. The Commissioner of Education may designate an area or areas of a school building as unusable for pupil occupancy or may determine that an area or areas used for pupil occupancy may be occupied by only a certain number of pupils, when in his judgment the type, character, construction, age, and general condition of the building or any part thereof or the location of the area or areas involved, indicate that it would be detrimental to the health and safety of pupils in relation to heating, lighting, ventilation, sanitation and health, and fire and accident protection, to have such area or areas occupied by pupils or occupied by more than a certain number of pupils.

Temporary school quarters

No temporary school quarters shall be used in school districts other than city school districts of cities having 70,000 inhabitants or more without the annual approval of the Commissioner of Education.

Drinking water

Every school building shall be provided with a supply of safe, potable water for drinking purposes dispensed within the building through approved sanitary drinking fountains and separate toilet rooms for boys and girls, with flush toilets and wash basins connected to an adequate water supply under pressure and a sewage disposal system if a public sewer is not available. No source of water supply nor sewage disposal system shall be used without the approval of the State Department of Health.

PHYSICAL ENVIRONMENT AND SPECIAL EDUCATION REGIONAL WORKSHOP DISSEMINATION CONFERENCES

July 30 - August 1	Las Vegas
August 3 - August 5	Minneapolis
August 6 - August 8	Atlanta

Approximately 120 special educators, architects and educational planners attended the three conferences. The conferences were organized around a simulated problem solving. For this purpose, four distinct problems related to designing or renovating educational facilities for handicapped children were given to the conferees. The four problems treated the development of facilities for the trainable, multiply handicapped, physically handicapped, or learning disabled child. Each conferee selected a problem and groups were established to engage in the solving of the problem. To assist in the problem solving process, a project developed Planning Process Guide, which suggested the direction that the problem solving should take, was provided. The required product of each group was a bubble diagram that graphically demonstrated the relationships among the spaces which would be used for different purposes within the planned facility.

At the conclusion of the conference, all participants were asked to provide the project staff with an evaluation of the meetings. A combined summary of all the ratings for the three conferences is presented below:

Total number = 95	Most Positive 1	2	3	4	Least Positive 5
1. Gained significant information	43	35	11	5	0
2. Meaningful communication with architect (if educator), educator (if architect)	55	16	16	7	1
3. Will be able to use process guide in local situation	42	23	18	9	3
4. Simulated problem approach seemed useful	34	39	8	12	3
5. Sufficient instruction to attack simulated problems	19	27	26	15	7
6. Overall rating of the conference	35	42	12	7	0
7. Would attend another conference like this	Yes - 85			No - 10	

In addition to the numerical summaries which were received form the attendees, a section was included which asked for general comments. These comments tended to range from very positive to very negative but, for the most part, seemed to be positive. Many people seemed to feel that the workshops were extremely significant, since they provided an opportunity for interaction between representatives of two separate disciplines. Other persons felt that the opportunity to simply interact with other special educators provided a meaningful situation from which to gain significant information. A few of the negative comments were that the simulated problem approach was valueless and that the tasks required of the workshop participants were simply too large to handle in the short period of time available.

Additional evaluative information strictly limited to the use and refinement of the Planning Process Guide was also obtained from the conference participants. These items are listed below:

1. Order and sequence--Two points of view were expressed regarding the ordering of the major categories in the Planning Process Guide. One position was that the children and program should always be considered at the beginning of planning since those are by far the most significant set of variables which need to be considered. The other viewpoint was that there should be no fixed sequence since the planning strategy used by different groups will vary. For example, a planning group may wish to begin planning with a consideration of the interaction map and personnel use. The point which must be emphasized, however, is that while the sequence of attention is unimportant it is critically important to cover all areas.

2. Specific versus general directions--Criticism about the instructions about how to use the guide was essentially that the information was either too vague or too specific. Those who made the first comment felt that the absence of specificity produced confusion and wasted effort, while the other group felt a limitation on individual creativity and path finding.

3. Use of the guide--Use of the guide must not, despite refinements, ever be used as a complete, step by step program defining instrument. Rather, as its title implies, it is a guide. That some specifics are provided is true, but these are only to suggest the type of variables which need to be considered. No category in the guide, either minor or major is finite, rather each is infinite. The staff feels that the critical element in planning is identifying and utilizing the information which enables the best local decisions to be made. It is to fill local needs that all categories have as the last entry the work "other."

4. Structural revisions--Three major suggestions were mentioned by conference participants to simplify the use of the guide. First, the problem of terminology must be solved. While it is apparent that agreement about term definition can not easily be attained, certain basic definitions for use in the guide must be established to facilitate group use of the guide. While in the

future the guide will come equipped with definitions, these still must be subjected to local review. The need for this approachwas clearly indicated during the conferences, especially in those groups working on the special learning disability problems (Renn). Until definitions of the children to be served were stated and accepted by the group, no meaningful efforts toward solving the environmental problems could be made.

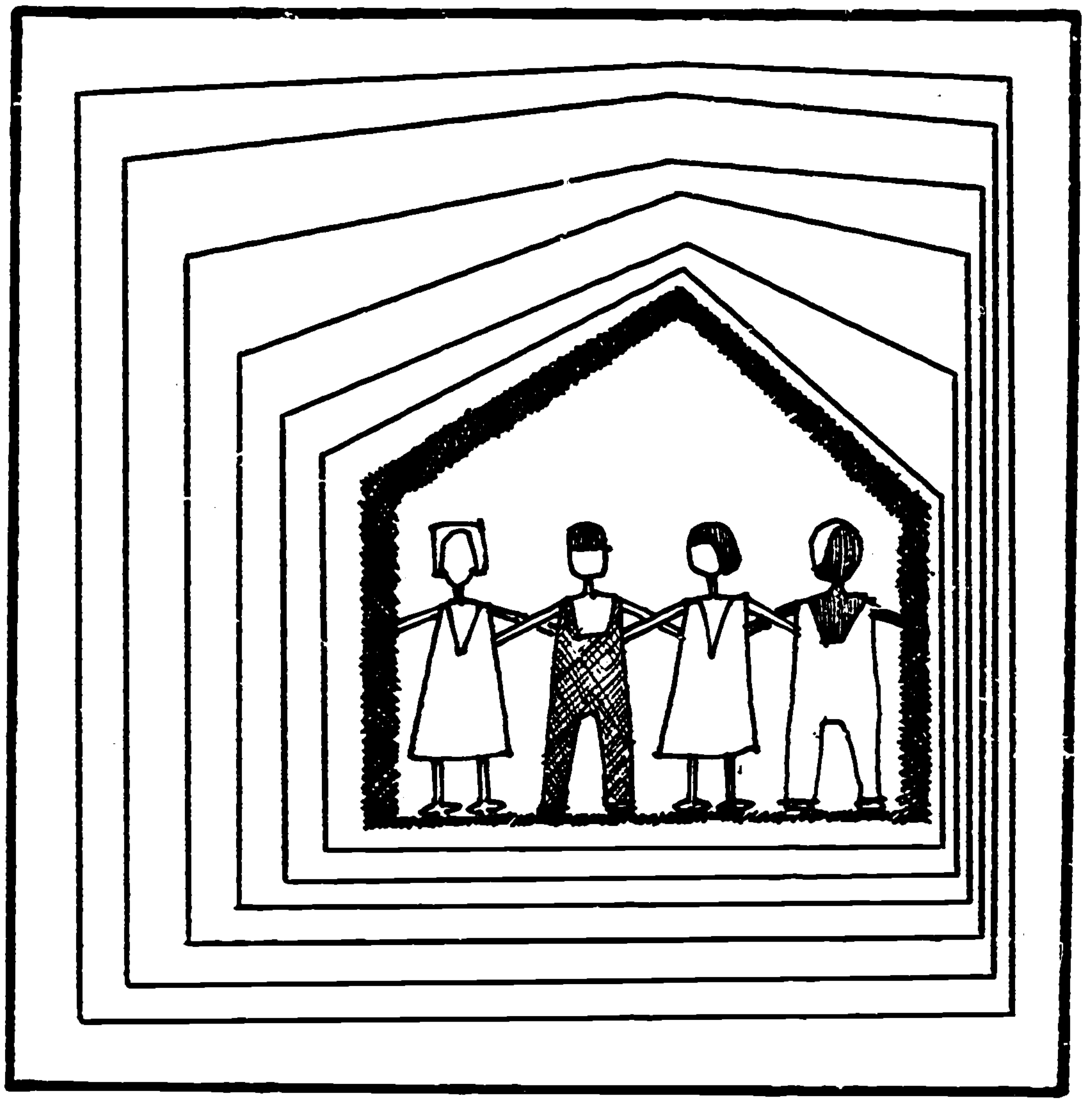
Because the guide was designed as a matrix system with many points of intersection, group members felt the need to write a response at each intersection. Since some of the intersecting points were irrelevant in solving some particular problems, use of the guide in the future will contain directions indication that the attempt to make it universally usable (automatically) means that some items do not require a response.

To make the instrument easier and more logical all variable entries on the present form will be restructured for purposes of parallel presentation.

SELECTED ABSTRACTS

PHYSICAL ENVIRONMENT & SPECIAL EDUCATION

the council for exceptional children washington d.c.



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PHYSICAL ENVIRONMENT & SPECIAL EDUCATION

July 1969

The Council for Exceptional Children, 1201 Sixteenth Street, N.W., Washington, D.C. 20036

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The work presented herein was performed pursuant to a grant from the Bureau of Education for the Handicapped, US Office of Education, Department of Health, Education, and Welfare.

CONTENTS

FOREWORD

This selected bibliography is the result of an extensive literature search relating to educational facilities and special education. Attempts were made by the staff of the CEC project, "Physical Environment and Special Education," to acquire and review as much literature relevant to this area as possible. Although the search produced approximately 200 items, careful examination revealed that the majority were not specifically related to the subject. Therefore, the items finally included in this bibliography are concerned with the planning of special education facilities and with specific elements of facilities used or related to the education of handicapped children.

The limited amount of literature presented in this document reflects the paucity of attention that has been focused on this area. This project and this bibliography represent an initial phase in a series of developments yet to come in refining all aspects of planning, designing, and evaluating facilities used to house educational programs for handicapped children.

William C. Geer, Executive Secretary

INTRODUCTION

This selected bibliography was developed as one of the activities of The Council for Exceptional Children's special project, "Physical Environment and Special Education: An Interdisciplinary Approach to Research." The project, with partial support from the Bureau of Education for the Handicapped, US Office of Education, was conducted to examine a variety of problems associated with providing efficient and effective educational facilities for handicapped children.

In addition to the development of this abstracted bibliography, the project has been actively involved in the identification of specific special education-physical environment problems and in seeking solutions to them. This was accomplished by conducting comprehensive site visits to schools in the United States, selected from a questionnaire sampling the utilization of buildings and the planning that preceded their construction. During the site visits, stress was placed on gathering information about the manner in which the facilities were planned with particular emphasis on the identification of program factors that led to effective environmental solutions. The information obtained from the site visits is available from The Council for Exceptional Children.

It was originally intended by the project staff that this collection of abstracts would contain information that was restricted to special education facilities. Shortly after beginning the project, two discoveries by the staff led to a decision to alter the contents of the bibliography. The first discovery was that the amount of modern literature concerned with this area was extremely limited. Secondly, after meeting and talking with many persons involved in the development of special education facilities, it was often evident that they were not aware of many of the sources that contain information applicable to the general design of educational facilities.

Consequently the contents of the bibliography include sources specifically related to educational facilities for handicapped children and other items concerned with specific elements of the physical environment, including light, sound, and color. Also included are some materials that reflect many of the current directions in education that have impact on the designed environment such as the use and development of media, relocatable classrooms, and windowless schools. It is hoped that this bibliography will be considered as only suggestive of the information available relating to educational facilities.

With the rapid expansion of the field of special education and the consequent demand for facilities, a great amount of interest in this area has developed. It is expected that within the near future, research will be conducted to examine the effects of stimulus free classrooms, open area learning spaces, carpeted floors, etc. Such work will be an outgrowth of attempts to more closely match educational programs and learning behavior with the educational environment. And, with these advances and new knowledge, the planning of special education facilities will begin to occur in systematic fashion.

Organization of the Bibliography

The main sections of the bibliography include *Abstracts, Subject Index,* and *Author Index*. These Abstracts have been stored on the main computer file of the CEC Information Center and are arranged in the order they were selected from the file. There is no other arrangement or classification of abstracts. Therefore it is necessary to consult the *Subject Index* to identify abstracts dealing with particular concepts. By matching abstract numbers entered under several index terms, it is possible to search for very specifiic information. For example, Abstracts 22 and 41 are concerned with environmental influences, space utilization, and the mentally handicapped.

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Alan Abeson

ABSTRACT 1

EC 000 422 ED pending
Publ. Date Sep 66 4p.
Dale, D.M.C.
Units for Deaf Children.
London University Institute Of Education, England
EDRS not available
Volta Review; V68 N7 P496-9 Sept 1966
Reprint From The Times Educational Supplement, London.

Descriptors: exceptional child education; aurally handicapped; classrooms; class size; classroom design; economic factors; social factors; teaching methods; team teaching; regular class placement; special classes

Integration of deaf and normally hearing children in the schools is considered. An experiment in New Zealand which provides a small room for six to eight deaf students adjacent to a regular class is described; provisions of the program include two teachers, combined classes for most subjects, and special help in communication skills for the deaf. Advantages mentioned are the social benefits to the children and the economic advantages of having the children live at home rather than in a boarding school. A floor plan of the classrooms is provided. (RP)

ABSTRACT 2

EC 001 441 ED pending
Publ. Date Jun 65 6p.
Gorton, Chester E.; Hollis, John H.
Redesigning a Cottage Unit for Better Programming and Research for The Severely Retarded.
Parsons State Hospital And Training Center, Kansas;
Kansas University, Lawrence, Parson(s) Research Project
National Institute Of Mental Health, Bethesda, Maryland
EDRS not available
Mental Retardation; V3 N3 P16-21 Jun 1965

Descriptors: exceptional child research; mentally handicapped; behavior change; custodial mentally handicapped; institutionalized (persons); institutional facilities; design needs; self care skills; attendant training; perceptual motor coordination; stimulus behavior; institutional research

To meet needs evident at the state hospital and training school, a system of care, treatment, and training for the severely mentally handicapped was developed. Subjects were 18 girls, aged 6 to 12, with IQ's less than 25. The cottage unit in which the girls lived was modified from a single large room, which appeared to limit social interaction between the girls and the aides, to provide environmental structure and control. A cubicle system was designed, but later abandoned to facilitate monitoring; an operant area with three large tables was then established and found successful in keeping the subjects off medication and out of diapers. A 12-session training program was conducted for the aides in methods of observation, reinforcement, and grouping; interaction increased and personnel turnover decreased. Feeding training was also given the subjects, nine of whom did not spoon feed themselves; after 18 months, all 18 achieved self feeding. Additional progress was made in other self care skills over 3 years of the study. Studies were also conducted concerning perceptual motor skills, effects of social and nonsocial stimuli on behavior, communication behavior, social dominance, and differential responses to social stimuli. Three figures and two photographs present the architectural modifications. (JD)

ABSTRACT 3

EC 002 818 ED pending
Publ. Date Jun 66 68p.
Haring, Norris G.; Whelan, Richard J.
The Learning Environment: Relationship to Behavior Modification and Implications for Special Education. The University of Kansas Symposium.
Kansas University, Lawrence, School Of Education
Office Of Education (DHEW), Washington, D. C.
EDRS not available
Kansas Studies In Education; V16 N2 Jun 1966

Descriptors: exceptional child research; mentally handicapped; achievement; behavior change; experimental programs; educable mentally handicapped; arithmetic; reading; academic achievement; reinforcement; classroom design; language arts; handwriting; classroom arrangement; behavior problems; individualized instruction; classroom environment; educational facilities

In the second year of a 4-year project, 17 mentally handicapped children, eight of whom were carry overs from the first year, participated in an experimental classroom. Their chronological ages ranged from 7-10 to 13-8, mental ages from 4-2 to 8-11, and IQ's from 50 to 72; their reading achievement scores ranged from 0 to 1.6 grade (mean .3), arithmetic scores from 0 to 1.8 (mean .5). Former teachers described their classroom behavior as marked by refusal to study or follow instructions, by tantrums, pouting, or poor attention. A classroom-laboratory which held from five to seven students at a time was designed with three study carels, two work and three writing tables, six desks, a quiet room, an observation room, and a waiting room. All students received individualized instruction and had their time in the classroom increased as they learned to work productively. Reinforcement and programs following programed instruction principles were given. Tests at the end of the year indicated gains in reading skills (range 0 to 1.3, median .6 grade) and arithmetic (range .3 to 1.4, median .8). All could work productively along for an hour or more and could engage in appropriate school conduct. Additional findings and implications are presented. (JD)

ABSTRACT 4

EC 002 861 ED 024 189
Publ. Date (65) 55p.
Vanston, A. Rorke And Others
Design of Facilities for the Mentally Retarded; Diagnosis and Evaluation, Education and Training, Living Units. Hospital and Medical Facilities Series.
Public Health Service (DHEW), Washington, D. C., Division Of Hospital And Medical Facilities
EDRS mf
PHS-1181-C-1
Superintendent Of Documents, U. S. Government Printing Office, Washington, D. C. 20402 ($0.35).

Descriptors: exceptional child services; mentally handicapped; program planning; facilities; physical facilities; facility guidelines; day care programs; residential programs; sheltered workshops; architectural programing; ancillary services; construction costs; clinical diagnosis; medical services; residential care; educable mentally handicapped; trainable mentally handicapped; custodial mentally handicapped

Elements of architectural planning of new physical facilities for the mentally retarded detailed include programing and writing the project program. Design concepts are considered, and the following are specified: types of physical facilities with sample floor plans; elements of physical facilities, such as staff offices, activity areas, living units, and ancillary areas; basic planning consideration; and construction costs. A chart treats four levels of retardation; tables suggest areas for various facilities and recommend lighting levels. A bibliography cites 23 items. (LE)

ABSTRACT 5

EC 002 942 ED 022 315
Publ. Date 65 14p.
Abeson, Alan; Ackerman, Paul
An Architectural-Educational Investigation of Education and Training Facilities for Exceptional Children (National Education Association, Washington, D.C., September 9-10, 1965).
Council For Exceptional Children, Washington, D. C.
EDRS mf,hc
The Council For Exceptional Children, NEA, 1201 16th Street, N. W., Washington, D. C. 20036.

Descriptors: exceptional child education; environmental influences; educational needs; interdisciplinary approach; handicapped children; design needs;

building design; classroom design; flexible facilities; architecture; school buildings; school design; student needs; research needs; facilities; furniture; equipment; conference reports

The proceedings of a conference called to institute a dialogue between the architectural and educational professions are summarized. Areas considered include deterrents to efficient dialogue, the need for research, parameters of research (foundational questions; flexibility; furniture, materials, hardware, and teaching equipment; information transmission), 23 suggested educational needs of exceptional children with as many suggested architectural solutions, and building designs for these children following and resulting from the conference. (Author|JD)

ABSTRACT 6

EC 003 656 ED n.a.
Publ. Date 68 261p.
Designing Instructional Facilities for Teaching the Deaf: The Learning Module; Symposium on Research and Utilization of Educational Media for Teaching the Deaf (4th, Lincoln, Nebraska, February 5-7, 1968).
Nebraska University, Lincoln, Department Of Educational Administration;
Midwest Regional Media Center For The Deaf, Lincoln, Nebraska
Office Of Education (DHEW), Washington, D. C., Captioned Films For The Deaf Branch
EDRS mf,hc
OEC-3-7-000199-0199(019)

Descriptors: exceptional child education; aurally handicapped; facilities; audiovisual instruction; deaf; instructional technology; acoustics; educational facilities; design needs; architectural programing; facility requirements; lighting; classroom furniture; multimedia instruction; school planning; educational specifications; environmental design; classroom design

Eleven conference papers treat designing learning modules, or complete instructional facilities for the deaf. The following aspects are considered: the changing classroom, a multimedia approach to teaching American history, a project design for a special school, and educational implications of architecture for the deaf. Further topics are acoustical design of classrooms for the deaf, the use of amplification in educating deaf children, furnishings in the workshop classroom, and lighting in the learning module. Creating environments for learning, providing through architecture for social needs, and planning the deaf child's complete formal education are also discussed; a report from Captioned Films for the Deaf, conference and discussion summaries, foreword, and introduction are provided. Appended are the program and roster of participants. (JD)

ABSTRACT 7

EC 003 657 ED pending
Publ. Date May 66 124p.
Salmon, F. Cuthbert; Salmon, Christine F.
Sheltered Workshops; An Architectural Guide.
Oklahoma State University, Stillwater, School Of Architecture
Vocational Rehabilitation Administration (DHEW), Washington, D. C.
EDRS not available

Descriptors: exceptional child services; sheltered workshops; facilities; facility guidelines; handicapped; building design; building materials; work environment; design needs; architecture; physically handicapped; facility requirements; vocational rehabilitation; physical facilities; community services; site selection; program planning; program design; special services; architectural programing

Based on the observation of 24 sheltered workshops of diverse types and sizes, the guide presents information on architectural programing and planning. The role of the sheltered workshop, community needs, site considerations, and the program are described. In addition, planning principles, work principles, and the physical plant are discussed and graphically illustrated. An appendix provides the following: a checklist for planning and construction; an analysis of materials and methods of construction; a glossary of commonly used terms; American Standard Specifications for making buildings and facilities accessible to and usable by the physically handicapped; and a list of workshops studied. (JD)

ABSTRACT 8

EC 003 807 ED pending
Publ. Date Oct 55 5p.
Foote, Franklin M.
Classrooms for Partially Seeing Children.
National Society For The Prevention Of Blindness, New York, New York
EDRS not available
Exceptional Children; V22 N1 P318-20, 41-2 Oct 1955

Descriptors: exceptional child education; visually handicapped; partially sighted; educational facilities; classrooms; equipment; classroom furniture; illumination levels; classroom design; classroom arrangement

Aspects of special classrooms or resource rooms for partially sighted children are described, including type and placement of furniture, special equipment, storage, illumination of the room, and dimensions of the sight conservation room. (JD)

ABSTRACT 9

EC 003 808 ED pending
Publ. Date 60 15p.
Nugent, Timothy J.
Design of Buildings to Permit Their Use by the Physically Handicapped; A National Attack on Architectural Barriers.
National Society For Crippled Children And Adults, Chicago, Illinois;
President's Committee On Employment Of The Physically Handicapped, Washington, D. C.
EDRS not available
Reproduced From New Building Research, Fall 1960, Publication No. 910
Building Research Institute, National Academy Of Sciences, National Research Council.

Descriptors: building design; facilities; facility guidelines; facility requirements; physically handicapped; cerebral palsy; orthopedically handicapped; visually handicapped; aurally handicapped; research reviews (publications); research projects; environmental influences; special programs

Concerned with the nonambulatory disabled, the semi-ambulatory, the sight and hearing handicapped, and the cerebral palsied and other neurologically impaired, the paper considers the increased numbers of those so handicapped and describes the need for facilities they can use. Basic research and development projects reported include both research reviews and experiments assessing materials, design, and handicapped persons in normal environments. Two programs are surveyed: the University of Illinois rehabilitation-education program and the adaptation and construction of facilities at the University; and the American Standards Association Project to make buildings and facilities accessible and usable to the physically handicapped (ASA Project A-117). An appendix provides a work outline for the ASA Project which lists specifications for several types of facilities. (JD)

ABSTRACT 10

EC 003 809 ED pending
Publ. Date Apr 67 4p.
Hay, Louis; Cohen, Shirley
Perspectives for a Classroom for Disturbed Children.
New York City Board Of Education, New York, Junior Guidance Classes Program
EDRS not available
Exceptional Children; V33 N8 P577-80 Apr 1967

Descriptors: exceptional child education; emotionally disturbed; educational facilities; classrooms; student characteristics; behavior patterns; classroom design

Characteristics of disturbed school children and their implications for classroom planning are discussed, including poor motor coordination, hyperactivity, disorientation in space, need to withdraw from the group, distractability and poor impulse control, lack of initiative and independence, and distorted or poorly developed social relations. Suggestions involve design, furniture arrangement, and materials. Components of the room are also considered, as follows: location, size, shape, sound control, furniture, use of wall space, and color and light. (JD)

ABSTRACT 11

EC 003 810 ED pending
Publ. Date (66) 6p.
A Model Setting for a Re-Ed School.
Tennessee Re-Ed Program, Nashville

EDRS not available
Tennessee Re-Ed Program, 3409 Belmont Boulevard, Nashville, Tennessee 37215.

Descriptors: exceptional child education; emotionally disturbed; site selection; residential schools; facilities; educational facilities

The ideal site of Re-Ed schools for disturbed children is described as being both residential and near to a university center for consultation and personnel purposes; present sites are discussed. Cottages to hold eight children are proposed as living units; their components and spaces are listed. Eating arrangements, classrooms, and additional school facilities are also described. (JD)

ABSTRACT 12

EC 003 811 ED pending
Publ. Date 62 23p.
Carter, John Harvey
Educational Environment for the Orthopedically Handicapped Including the Cerebral Palsied.
California State Department Of Education, Sacramento, Bureau Of Special Education
EDRS not available
John Harvey Carter, 417 20th Street, Sacramento, California 95814.

Descriptors: exceptional child education; physically handicapped; cerebral palsy; orthopedically handicapped; facilities; educational facilities; equipment; educational specifications; facility guidelines; learning characteristics; units of study (subject fields); educational programs; curriculum; school services; physical therapy; occupational therapy; speech therapy; learning activities; recreational facilities; classrooms; school architecture

Prepared as a guide to planners and administrators, the report considers architectural problems in the design of educational facilities for orthopedically handicapped and cerebral palsied children. Factors influencing the learning process and selection of instructional materials are discussed; and daily programs suggesting subject areas, activities, equipment, and schedules are provided for the preprimary, primary, and advanced groups. Further aspects considered include therapy facilities, shop, speech, physical and occupational therapy activities, kitchens, resting rooms, and classrooms and suggested classroom equipment. Also described are special equipment requirements and sizes, controls for lights and so on, braille identification of facilities, hazards, walks, ramps, toilet rooms, playground facilities and equipment, color, floor materials, storage, and access. Nine references are cited. (JD)

ABSTRACT 13

EC 003 812 ED pending
Publ. Date Apr 52 5p.
Birren, Faber
The Emotional Significance of Color Preference.
American Occupational Therapy Association, New York, New York
EDRS not available
American Journal Of Occupational Therapy; V6 N2 Mar-Apr 1952

Descriptors: color planning; building design; environmental influences; physical environment; psychotherapy; individual characteristics; emotionally disturbed; therapeutic environment

Relationships between color preference and personality are presented; the range of the spectrum from red (warm, exciting), to blue (cold, subduing) is discussed. Attitudes toward color are related to moods; love of color is connected with a responsive personality and interest in the world while preference for form is connected to inner directedness. The effect of color is described for the mentally ill, psychotics, epileptics, neurotics, and hysterical persons. Specific colors of red, yellow, green, blue-green, blue, brown, orange, purple, maroon, and pink are linked to personality traits. The psychotherapeutic value of color and its diagnostic and therapeutic use in buildings are considered. (RP)

ABSTRACT 14

EC 003 813 ED pending
Publ. Date Sep 67 5p.
Birren, Faber
Color It Color.
EDRS not available
Reinhold Publishing Corporation, 430 Park Avenue, New York, New York 10022.
Progressive Architecture; V48 N9 P129-33 Sept 1967

Descriptors: color planning; design needs; lighting; psychological design needs; visual stimuli; illumination levels; task performance; physical environment; physiology

A discussion of the world of color considers the sources of color, light, color production in the brain, and the effects of different kinds of light and color on man, animals, plants, insects, fish, and birds, especially in growth and sexual activity. Brilliant light and warm colors are said to produce increased muscular tension, attraction to the stimulus, automatic arousal, and increased cortical activity. The effects of dim light and cool color are presented: relaxation of muscles, withdrawal from stimulation, and a drop in respiration rate, heart action, and blood pressure. The visual aspects of color described are the amount of light necessary for sight, glare, and abuse of the eyes; color laws are suggested for designers. Included in the psychological aspect of colors are the influence of specific colors, reactions of the mentally ill, and practical applications of research. Conclusions stated are the use of light and warm colors to produce outer directed behavior and the use of softer light and cooler hues to reduce distraction and direct action inward. (RP)

ABSTRACT 15

EC 003 873 ED pending
Publ. Date 65 111p.
The Effect of Windowless Classrooms on Elementary School Children; An Environmental Case Study.
Michigan University, Ann Arbor, Architectural Research Laboratory
Educational Facilities Laboratories, Inc., New York
EDRS not available
The University Of Michigan, Department Of Architecture, Architectural Research Laboratory, Ann Arbor, Michigan 48104.

Descriptors: exceptional child research; windowless classrooms; attitudes; building design; classroom design; teacher attitudes; parent attitudes; student attitudes; photographs; educational facilities; school architecture; elementary schools

To investigate environmental effects on teachers and children three case studies were undertaken; one during a school year when classrooms had windows, one during a year with no windows, and one during a 1|2 year with windows restored. Teachers interviewed pupils individually and conducted a questionnaire survey to gather student opinions on their scholastic performance. After one year in windowless classrooms all teachers except one reported that she liked her room very much. The one exception did not object to lack of windows but to her room location. Reasons for liking the rooms were less distraction, more even heat, more flexibility in seating and furniture arrangement, and increased wall space. Results of parent questionnaires indicated that the minority who opposed the study at the beginning continued to oppose it while those who were favorable felt the same way at the end. Children appeared to be indifferent to lack of windows and did not often comment on this to teachers, but the majority said they had wished for windows when asked. Comparisons of achievement for pupils in windowless rooms with pupils who had windows showed no significant differences in learning; what effect there was seemed to depend on whether or not a group was task oriented. Conclusions were that it is not likely that children will be adversely affected by the elimination of windows. Floor plans, section drawings, pictures of the school, results of questionnaires, teacher ratings, and absentee rates are included. (RP)

ABSTRACT 16

EC 003 875 ED pending
Publ. Date 67 95p.
Benet, James And Others
SCSD: The Project and the Schools.
Educational Facilities Laboratories, New York, New York
EDRS not available
Educational Facilities Laboratories, 477 Madison Avenue, New York, New York 10022.

Descriptors: exceptional child education; school architecture; component building systems; building design; educational specifications; flexible facilities; lighting; acoustics; ventilation; heating;

ceilings; movable partitions; air conditioning; structural building systems; construction costs; school design; equipment manufacturers; space utilization

A discussion of the School Construction Systems Development project (SCSD), conducted in California and responsible for 11 schools built or under construction, mentions the consultant role of the staff, the role of local school districts, the development of component parts used in the schools, financial costs, the origins of the project, specifications, and the cooperation of manufacturers in developing the components. Educational requirements, flexibility, school organization, environmental requirements, structure, acoustics, fire ratings, roofing and tolerances, heating, air conditioning, ventilating, lighting, ceilings, performance criteria, partitions, casework and cabinets, and lockers are described, and diagrams are provided; also provided are pictures of the components in use, floor plans, and names, addresses, and construction data on the schools involved. Technical consultants are listed. (RP)

ABSTRACT 17

EC 003 876 ED pending
Publ. Date 66 207p.
Green, Alan C., Ed. And Others
Educational Facilities with New Media. Final Report.
National Education Association, Washington, D. C., Department Of Audiovisual Instruction;
Rensselaer Polytechnic Institute, Troy, New York, Center For Architectural Research
Office Of Education (DHEW), Washington, D. C.
EDRS not available
National Education Association, 1201 Sixteenth Street, N. W., Washington, D. C. 20036 (Stock No. 071-02302, $4.50).

Descriptors: exceptional child education; educational facilities; architectural programing; building design; classroom design; flexible facilities; resource centers; studio floor plans; lighting; climate control; acoustical environment; classroom furniture; projection equipment; audiovisual aids; mass media; instructional technology; educational specifications; educational innovation; planning; educational needs

An overview of learning media introduces a guide for policy makers on educational facilities and new media. Concerns and directions in contemporary education, the role of media in innovations, status and trends in learning media, implications for planning, and programing and defining building needs are considered. A guide for the design professions provides information on learning media and facilities, general principles for planning schools, nine categories of facility types: independent study, small group, medium group, large group, flexible group, renovated classrooms, resource facilities, production and support facilities, and new building types; a design criteria is also provided. Technical concerns discussed are lighting, acoustics, climate, furniture, projection systems, and other equipment. An appendix lists resumes of three meetings on facilities and meeting participants. (RP)

ABSTRACT 18

EC 003 877 ED pending
Publ. Date May 66 187p.
Bailey, Roger And Others
Mental Health Facilities for Inpatient Adolescents.
Architectural Psychology Interdepartment Program, Salt Lake City, Utah
National Institute Of Mental Health, Bethesda, Maryland;
Utah University, Salt Lake City, Department Of Architecture;
Utah University, Salt Lake City, Department Of Psychology
EDRS not available
PH-43-65-1068

Descriptors: exceptional child research; emotionally disturbed; adolescents; institutional facilities; psychiatric hospitals; architectural programing; building design; educational facilities; special services; administration; personnel; site selection; admission criteria; educational programs; group living; occupational therapy; recreational programs; psychiatric services; design needs; regional programs; community services

Interviews with consultants and visits to institutions are analyzed to determine present practices and trends in treating adolescent mental patients. Information gathered concerns philosophy of treatment and program, the adolescent, and facilities. Three schemes for living areas and architectural character are considered, and suggestions are made and specifications offered for site, admitting and screening, administration and staff living areas, therapy areas, educational program and facilities, and ancillary and utility areas. Findings indicate that plans for facilities are dependent upon the staff-patient ratio and upon regional climactic and social problems, that adolescents require more space than adults; that facilities should be located convenient to the community they serve; and that they should be regarded as a residential school which also provides vocational education. Additional findings concern the ineffective nature of short term help, the need for a continuum of services and facilities within the community, and the use of additional and varied services to lessen the load placed on inpatient facilities. (JD)

ABSTRACT 19

EC 303 878 ED pending
Publ. Date 18 Apr 68 8p.
Colvin, Ralph W.
The Design Process in Special Education Facility Planning Applied to a Day and Residential Facility for the Emotionally Disturbed and Brain Injured.
Child Welfare League Of America, New York, New York
EDRS not available
Paper Presented At The Annual Convention Of The Council For Exceptional Children (New York, New York, April 18, 1968).

Descriptors: exceptional child education; emotionally disturbed; educational facilities; residential centers: residential schools; flexible facilities; classrooms; corridors; offices (facilities); building design

The development of a residential treatment center for emotionally disturbed children considers the need for a flexible structure, the number of children that can best be cared for, and the preferable size of educational, recreational, or living groups. The teacher's needs are discussed in terms of small groups and the nearness of offices of supportive staff members. Suggestions are made for consultation with technically knowledgeable people in areas for research and professional training which involve problems of sound and light control, air conditioning, observation areas, and audiovisual equipment. Planning for privacy in bathrooms and bedrooms, classroom size, and nonstimulating decor are discussed. Also discussed is the provision of attractive surroundings as a means of introducing the child to beauty. (RP)

ABSTRACT 20

EC 003 879 ED pending
Publ. Date Oct 67 4p.
Maier, Henry W.
Designing Residential Living Units for Persons with Mental Retardations.
Washington University, Seattle, School Of Social Work
EDRS not available
Paper Presented At The Architectural Conference On Mental Retardation Facilities (Portland, Oregon, October 16-17, 1967).

Descriptors: exceptional child services; mentally handicapped; institutional facilities; design needs; self care skills; group living; attendants; community involvement

Residential living units for the mentally handicapped are discussed. The following suggestions are made and elaborated upon: the unit is an arena for a program in daily living; such an arena requires space for multiple activities; and the unit needs to be planned for what the residents can do. Also considered in terms of design needs are the importance of the attendant and teamwork; of contact with the ordinary community life; and of small groups that the residents themselves can manage. (JD)

ABSTRACT 21

EC 003 880 ED pending
Publ. Date Oct 64 82p.
Salmon, F. Cuthbert; Salmon, Christine F.
The Blind, Space Needs for Rehabilitation.
Oklahoma State University, Stillwater
Vocational Rehabilitation Administration (DHEW), Washington, D. C.
EDRS not available

Descriptors: exceptional child services; visually handicapped; rehabilitation centers; facility requirements; blind; site selection; site development; program planning; architectural programing; equipment; medical services; visually handicapped orientation; visually handicapped; mobility; ancillary services; personnel needs; design needs; administration; communication skills; occupational therapy; homemaking education; vocational education; recreational facilities

Based on the observation and analysis of 14 rehabilitation centers for the blind, the report presents to both architect and administrator the following environmental considerations: geographical location; community features, site considerations, site development, program development, planning principles, and environmental experience. Areas of rehabilitation activity explained for the architect include medical services, psychological and social services, mobility and orientation, physical conditioning, communications, occupational therapy, techniques of daily living, vocational evaluation, recreation, residential centers, administration and general activities, and staff-client space estimate. Thirty-five illustrations and 23 references are provided. (JD)

ABSTRACT 22

EC 003 881 ED n.a.
Publ. Date 67 58p.
Bayes, Kenneth
The Therapeutic Effect of Environment on Emotionally Disturbed and Mentally Subnormal Children; A Kaufmann International Design Award Study, 1964-66.
EDRS not available
Kenneth Bayes, 37 Duke Street, London W1, England.

Descriptors: exceptional child research; emotionally disturbed; mentally handicapped; environmental influences; architectural programing; therapeutic environment; space utilization; visual perception; behavior; building design; corridors; furniture arrangement; color planning; research needs; tactual perception; flexible facilities; research reviews (publications)

Environmental influences on emotionally disturbed and mentally handicapped children and the relationship between environment and therapy are investigated. The nature of space and of perception, animal and human behavior, and architectural psychology are described; also described are subjects relating to planning and form: planning for social relationships, transition between areas, avoidance of ambiguity, architectural character and scale, consideration of the size of groups, corridors and circulation, room size and shape, flexibility, child participation, pattern and visual stimuli, furniture, and staff needs. Topics relating to color examined are color perception, the psychophysiological effect of color, color preferences, color schemes, and color and form. Sound, texture, temperature, time, smell, and symbolic significance are other sensory perceptions discussed; research methods and problems and research needs are suggested. A list of persons and institutions visited or consulted about environmental therapy is provided. (RP)

ABSTRACT 23

EC 003 840 ED n.a.
Publ. Date Jan 68 52p.
Goforth, E. Jack
Suggestions and Guidelines for Development of Television Facilities in Schools for the Deaf.
Southern Regional Media Center For The Deaf, Knoxville, Tennessee
Office Of Education (DHEW), Washington, D. C., Captioned Films For The Deaf Branch;
Tennessee University, Knoxville, College Of Education
EDRS mf,hc

Descriptors: exceptional child education; aurally handicapped; audiovisual instruction; instructional technology; educational television; instructional television; closed circuit television; open circuit television; deaf; educational specifications; media technology; models; systems analysis; equipment; estimated costs; classrooms; campuses; regional programs; national programs; personnel; educational facilities

The various combinations of television equipment suitable for use in deaf education are described in terms of the systems used. The classroom system would consist of two cameras, a videotape recorder, a special effects generator for captioning, and a monitor of sufficient size for classroom viewing. The campus system would have the same capabilities but would be of broadcast quality, requiring a full time manager. The regional system would necessitate establishment of a regional captioning center as an interim project, to be manned by professional staff which would create needed program packages and engage in research and design of software. The national system would provide for electronic captioning for open circuit television. For all the above systems, technical aspects are considered, and operating and equipment costs are estimated. Staff requirements are specified for campus and regional systems, and equipment layouts are provided for all but the national system. (JD)

ABSTRACT 24

EC 003 882 ED pending
Publ. Date Jan 65 4p.
Singer, Ellis
How Gallaudet Sounds Out Deafness in Ideal Acoustical Environments.
American Hearing Society, Washington, D. C.
EDRS not available
Hearing News; V33 N1 P9-12 Jan 1965

Descriptors: exceptional child services; aurally handicapped; facilities; auditory evaluation; audiometric tests; acoustical environment; facility requirements; construction (process); testing; research

Acoustical chambers designed to control ambient noise are described. Both the research and testing for which the chambers are used are discussed as well as the evolution of the facilities, some of the first soundproof rooms. Details of the construction and design of the facilities and the noise attenuation specifications are given. Four figures are included. (JD)

ABSTRACT 25

EC 003 884 ED n.a.
Publ. Date Jui 67 27p.
Bair, Howard V.; Leland, Henry
The Utilization and Design of Physical Facilities for the Rehabilitation of Mentally Retarded. Final Project Report.
Parsons State Hospital And Training Center, Kansas
Vocational Rehabilitation Administration (DHEW), Washington, D. C.
EDRS mf,hc
VRA-RD-1319-G-64

Descriptors: exceptional child research; mentally handicapped; institutional facilities; architectural programing; audiovisual aids; closed circuit television; flexible facilities; movable partitions; space utilization; classrooms; controlled environment; rehabilitation programs; building design; professional education

To investigate the appropriate design and utilization of physical facilities being constructed as a rehabilitation center, a variety of centers was examined. Conclusions were that flexibility in construction of the physical plant, including nonpermanent walls and fixtures was necessary; program planning should be included in architectural discussions to avoid later modifications; facilities should be designed with the concept of a teaching hospital in mind; equipment and materials for program development, especially technical aids and audiovisual facilities, should be acquired on an experimental basis; design must be based on changing community needs; and the service, research, professional training, and demonstration areas should overlap and flow into and out of each other. Consideration was given to the role of the staff and the kinds of areas they would need, classrooms for training programs, a television studio and control room, advanced planning for installation of audiovisual equipment, varied use of the same space, and facilities for behavior modification training. (Author|RP)

ABSTRACT 26

EC 003 960 ED n.a.
Publ. Date Jan 67 29p.
Architectural Considerations for Classrooms for Exceptional Children.
Texas Education Agency, Austin, Division Of Special Education
EDRS mf,hc

Descriptors: exceptional child education; handicapped children; educational facilities; classroom design; visually handicapped; physically handicapped; blind; partially sighted; learning disabilities; minimally brain injured; aurally handicapped; mentally handicapped; deaf; educable mentally handicapped;

trainable mentally handicapped; speech handicapped; emotionally disturbed; facility requirements; educational specifications

Definitions are provided of the following exceptionalities: blind, partially sighted, physically handicapped, minimally brain injured, deaf, educable mentally retarded (primary, junior, and senior high levels), trainable mentally retarded, speech handicapped, and emotionally disturbed. Architectural guidelines specify classroom location, size, acoustical treatment, heat and light, ventilation, electrical outlets, bulletin boards and chalkboards, floors, and drinking fountain, sink, and counter space. Additional specifications are given for certain exceptionalities. (JD)

ABSTRACT 27

EC 003 961 ED pending
Publ. Date 68 7p.
Abeson, Alan
The Design Process in Special Education Facility Planning.
Council For Exceptional Children, Washington, D. C.
EDRS not available
Council For Exceptional Children, NEA, 1201 Sixteenth Street, N. W., Washington, D. C. 20036.
Symposium Held At Annual International CEC Convention (46th, New York City, New York, April 14-20, 1968).

Descriptors: exceptional child education; educational facilities; school planning; interdisciplinary approach; architects; teacher role; design needs; classroom design; evaluation needs; handicapped children; professional personnel

Factors which affect the quality of planning for special education facilities and the effectiveness of the educational program are considered. The problem of presenting the needs to the architect in sufficient detail is described and suggestions are made for bringing educators and architects together. The need for educators to clarify terminology and the need for architects to visit the schools and interview staff members and members of the planning committee are cited. Also discussed is the usefulness of thorough evaluation in determining real needs and desires rather than requiring popularized concepts which may not be used. (RP)

ABSTRACT 28

EC 003 962 ED pending
Publ. Date 63 129p.
Fitzroy, Daniel; Reid, John Lyon
Acoustical Environment of School Buildings.
Educational Facilities Laboratories, Inc., New York, New York
EDRS not available
TR-1
Educational Facilities Laboratories, Inc., 477 Madison Avenue, New York, New York 10022.

Descriptors: acoustics; acoustical environment; building design; interior space; flexible facilities; administrator attitudes; school buildings; movable partitions; corridors; spatial relationship; photographs; elementary schools; secondary schools; colleges; design needs; student attitudes; teacher attitudes; classroom design flooring

To study the trend in interior design toward more openness and the resulting acoustical problems, students, teachers, and administrators were interviewed to determine the minimum acoustical separation necessary to allow a group to work effectively; Field tests were conducted in the rooms of 35 elementary and secondary school and in two colleges to measure noise reduction between rooms. None met the criteria of 40 decibels of noise reduction. Floor plans of the rooms were drawn up with noise reduction levels for the door open or closed and for the class in session or silent. Conclusions were that classrooms are less satisfactory when a high articulation index and a reverberant environment are present, even when noise reduction is high; when a room was near optimum reverberation environment, lower noise reduction was acceptable. Recommendations are made for flexible room arrangements, use of absorptive floor coverings, better insulation around music and gym rooms, careful attention to sound level when using audio equipment, and higher sound interception in the lower grades. (RP)

ABSTRACT 29

EC 003 963 ED pending
Publ. Date 65 94p.
Workshop on Educational Facilities for Exceptional Children (May 14-15, 1965).
American Institute Of Architects, Washington, D. C., Committee On School And College Architecture
Educational Facilities Laboratories, Inc., New York, New York
EDRS not available

Descriptors: exceptional child education; incidence; educational needs; legislation; federal legislation; educational facilities; mentally handicapped; physically handicapped; emotionally disturbed; handicapped children; educational specifications; architectural specifications; architectural programing; flexible facilities; school design; classrooms; classroom design; design needs; public schools

The proceedings include Kathryn Dice's remarks on the incidence and educational needs of exceptional children and on the impact of federal legislation upon facilities. A subsequent question-and-answer period is transcribed, with Dr. Dice and the participants considering environmental design and its educational and psychological implications. Panel discussions with the same concerns as the question-answer session treat the mentally retarded, the physically handicapped, and the emotionally disturbed. (JD)

ABSTRACT 30

EC 003 964 ED pending
Publ. Date 67 7p.
Berenson, Bertram
Architecture for Exceptional Children.
Hampton Institute, Virginia, School Of Architecture
EDRS not available
Hampton Institute, Division Of Architecture, Hampton, Virginia 22369.

Descriptors: exceptional child research; handicapped children; building design; environmental influences; visual stimuli; interdisciplinary approach; behavior change; teaching machines; teacher role; research reviews (publications); facilities

The dichotomy between research results and the architect's design is discussed, and two projects are described, one which used red and green slides to teach moderately retarded young adults about traffic signals and another which porvided mirrors for emotionally disturbed girls. The Hawthorne studies on environmental criteria are also described, including experiments in the learning rate of the retarded when taught by regular teachers or by machines, the reduction of visual stimuli, and modification of room shape. The need for architects to communicate with other disciplines, flexibility to allow for future modification, and the need for designers to understand the nature of exceptionality are discussed. (RP)

ABSTRACT 31

EC 003 965 ED pending
Publ. Date Dec 67 14p.
Wolf, James M.
Physical Facilities Guidelines for Handicapped Children. Fitting Facilities to the Child, Part Three.
EDRS not available
Editor, School Management, 22 West Putnam Avenue, Greenwich, Connecticut 06830.
School Management; V11 N2 P40-54 Dec 1967

Descriptors: exceptional child education; educational facilities; educational specifications; facility guidelines; educational equipment; classroom design; physically handicapped; aurally handicapped; visually handicapped; partially sighted; blind; mentally handicapped; educable mentally handicapped; trainable mentally handicapped; emotionally disturbed; speech therapy; physical therapy; occupational therapy; equipment; school services; psychological services

Synthesized from the recommended standards of the only eight states that have them, the guidelines list the variations needed in classrooms and other physical facilities for the handicapped. Areas considered include the physically handicapped, the deaf and hard of hearing, the partially sighted, the blind, the educable mentally retarded, the trainable mentally handicapped, and the emotionally handicapped. Also treated are physical and speech correction programs, psychological examination programs, and occupational therapy programs. For each, location, size, construction, and equipment are specified. Photographs of the equipment and facilities at the Human Resources School in Albertson, New York, are included. (JD)

ABSTRACT 32

EC 003 966 ED pending
Publ. Date Nov 64 3p.
Bryant, Daniel C.
Designing for the Mentally Handicapped.
National Society For Crippled Children And Adults, Chicago, Illinois
EDRS not available
Rehabilitation Literature; V25 N11 P391-2,40 Nov 1964

Descriptors: exceptional child education; mentally handicapped; custodial mentally handicapped; trainable mentally handicapped; lighting; climate control; flooring; ceilings; sheltered workshops; classroom design; color planning; environmental influences; design needs; sanitary facilities; crafts rooms; movable partitions

Creating a physical environment for the mentally retarded at a school and training center is discussed. Designing facilities for the custodial retarded focuses on the need for heated floors, a work height counter and nearby sink with a spray nozzle, a storage cupboard, a playroom or classroom of modest living room size, and a heating and ventilating system that provides above average amounts of air. Extra toilets for trainable retardates with counters and sinks nearby, and control of distractions such as lighting, color, windows, and noise in classrooms are suggested. Also suggested are a living-dining room and a craft room with sturdy tables, counters, and water supply. Recommendations for a workshop include block or brick walls, concrete floor, skylights, acoustically absorbent ceiling, uniform lighting, many electrical outlets, ceiling outlets, compressed air, a heating system with ventilation from outside, flexible shelves, movable partitions, a central control station, and truck size door openings. (RP)

ABSTRACT 33

EC 003 967 ED n.a.
Publ. Date Mar 69 101p.
Bednar, Michael J.; Haviland, David S.
The Role of the Physical Environment in the Education of Children with Learning Disabilities. A Position Paper.
Rensselaer Polytechnic Institute, Troy, New York, Center For Architectural Research
Educational Facilities Laboratories, New York, New York
EDRS mf,hc

Descriptors: exceptional child education; learning disabilities; environmental influences; school design; handicapped children; perceptually handicapped; mentally handicapped; psychomotor skills; emotionally disturbed; incidence; socially maladjusted; minimally brain injured; lighting; color planning; acoustics; design needs; architectural programing; self concept; educational programs; spatial relationship; climate control; research needs

Concerned with the role of physical environment in the education of exceptional children, this position paper reviews the general problem and the roles of architects and educators in it. Exceptionality is discussed; learning disabilities are considered as a criterion for educational grouping instead of medical classifications; and the exceptionalities mental retardation, brain injury, social maladjustment, and emotional disturbance are categorized as learning disabilities. A portrait of a brain injured child is provided, and learning disabilities are further classified as perceptual (including sensory hyperactivity, reduced attention span, short memory and poor recall, perseveration, dissociation, and figure-background reversal) motor related (motor hyperactivity and poor motor skills), or psychosocial (poor self concept), distorted body image, and aggravation by social pressure. Special education programs and methods are described; the role of environment is discussed. The following are then presented: environmental variables, including space, light, color, clutter, sound, texture, climate, and shape; environmental characterizations, including space-time identity, ambiguity, articulation, transition, decisions and alternatives, consistency, scale, and sociopetal-sociofugal, privacy, territoriality, useability, movement, and character; and program factors, including changeability, educational tools, flexibility, the site, and integration and segregation of exceptional children. Directions are proposed for future environmental research in special education. (JD)

ABSTRACT 34

EC 003 968 ED pending
Publ. Date 68 3p.
Berenson, Bertram
The Planned Environment: An Educational Tool.
Council For Exceptional Children, Washington, D. C.
EDRS not available
International Journal Of Educational Science; V2 P123-5 1968

Descriptors: environmental influences; classroom environment; classroom design; corridors; multisensory learning; individual needs; flexible facilities; behavior change

Manipulation of the environment to produce behavior change is discussed in terms of the influence of the physical properties surrounding the learner. The concept of special spaces for special activities focuses on the use of hallways as a resource device. Caution is suggested in the area of flexibility as constancy can be beneficial. Ken Isaac's learning box, in which all six sides contained information, is described and recommended as a classroom resource center audiovisually and kinesthetically producing information which can be ordered and structured to meet individual needs. (RP)

ABSTRACT 35

EC 003 969 ED pending
Publ. Date Apr 69 13p.
Abeson, Alan
The Physical Environment: A Brave New World.
Council For Exceptional Children, Washington, D. C.
EDRS not available
The Council For Exceptional Children, 1201 Sixteenth Street, N. W., Washington, D. C. 20036.
Paper Presented At The Annual CEC Convention (Denver, Colorado, April 1969) And Published In CEC Selected Convention Papers, 1969.

Descriptors: exceptional child education; handicapped children; educational facilities; flexible facilities; school design; space utilization; design needs; corridors; educational equipment; physical environment

The failure of classrooms to reflect educational programing and the inadequacy of facilities for exceptional children are cited. Needs in the planning and design of facilities for such children are enumerated as follows: to accommodate change in methods, materials, and equipment; to create expansible, convertible, versatile, and malleable space; to adjust to the child's changing needs as he grows; to involve practitioners in planning so they will utilize the potential of the space designed; and to articulate educational programs upon which to base the environment. Presented as analytical systems for assessing the physical environment-special education relationship are the strictly environmental and strictly educational systems and the system of environmental conceptualizations, which are described, include privacy, scale, consistency, transition, useability, and movement. Solutions demonstrated by slides collected by The Council for Exceptional Children's special project on Physical Environment and Special Education are reviewed, including multipurpose corridors, womb (or quiet) rooms, equipment modifications, storage areas, and architectural character. Physical environment is, in closing, envisioned as a teaching tool which may well advance education for exceptional children. (JD)

ABSTRACT 36

EC 003 970 ED pending
Publ. Date Nov 66 22p.
Spivack, Mayer
Some Psychological Implications of Mental Health Center Architecture.
Harvard Medical School, Cambridge, Massachusetts, Laboratory Of Community Psychiatry;
Medical Foundation, Inc., Boston, Massachusetts
Permanent Charities, Inc., Boston, Massachusetts;
National Institute Of Mental Health, Bethesda, Maryland
EDRS not available
PH43-66-1150
Paper Presented At The Annual Meeting Of The New England Psychological

Association (6th, Boston, Massachusetts, November 11-12, 1966).

Descriptors: exceptional child services; mental health clinics; environmental influences; space utilization; behavior patterns; visual perception; lighting; building design; corridors; acoustics; design needs

The lack of alternative design models for comprehensive community mental health centers and the need for planners to produce information are discussed. The following conceptual positions are thus offered to define research problems: particular behavior settings result in standing behavior patterns; physical environment exists as a cultural and social artifact displaying messages about its users; social and personal spaces affect communication; a need exists for possession of territory, a piece of the physical environment; and physical environment exists as a sensory stimulus field. Implications of the above positions considered include the undifferentiated behavior settings of flexible or dayroom space and of corridors to the use of indestructible finishing materials, and the territorial behavior of assorted animals. Photographs are explained illustrating the problems discussed. (JD)

ABSTRACT 37

EC 003 971 ED pending
Publ. Date (67) 21p.
Johnson, Warren E.
Some Considerations in Designing Facilities for the Deaf.
Portland Center For Hearing And Speech, Oregon
EDRS not available

Descriptors: exceptional child education; aurally handicapped; deaf; hearing aids; auditory training; lipreading; tactual perception; acoustical environment; acoustics; design needs; classroom environment; building materials; building design; construction needs; lighting; fire protection; flooring; loop induction systems

Dependence upon the use of hearing aids, auditory training, speechreading or lipreading training, and tactile channels of learning are presented for consideration in designing facilities for the aurally handicapped. Conditions which change sound are listed: shape and size of room, whether or not room is furnished, materials of walls and ceiling, kinds of furnishings, and position of the listener. Reflection of sound from room surfaces and the level of sound pressure are discussed. Also discussed is the problem of reverberation, monaural hearing aids, speech intelligibility, and the treatment of reverberation. Different types of noises, noise carriers, and insulation are described; also considered are the sound level of noise, planning facilities for the deaf, and electrostatic shielding or ground systems. (RP)

ABSTRACT 38

EC 003 972 ED pending
Publ. Date 63 95p.
Seagers, Paul W.
Light, Vision and Learning.
Better Light Better Sight Bureau, New York, New York
EDRS not available
Better Light Better Sight Bureau, 750 Third Avenue, New York, New York 10017.

Descriptors: exceptional child education; visually handicapped; vision; ophthalmology; eyes; anatomy; light; lighting; illumination levels; physics; safety; visual perception; classroom environment; identification; environmental influences; glare

Designed for use in teacher education, the text describes perceptual and visual development in the growing child, the anatomy and physiology of the eye, and eye care and protection. The physics of light and the relationship of light and seeing are discussed; environmental recommendations are made for home, school, and classroom. Accompanying the text are 28 figures and one table, a glossary of 96 terms, a bibliography with 86 citations, and a list of 18 agencies which provide information and materials. (JD)

ABSTRACT 39

EC 003 973 ED pending
Publ. Date 28 Apr 67 25p.
Izumi, K. And Others
Some Architectural Considerations in the Design of Facilities for the Care and Treatment of the Mentally Ill.
American Schizophrenia Foundation, Ann Arbor, Michigan
EDRS not available

Descriptors: exceptional child services; emotionally disturbed; facilities; psychological design needs; architectural programing; psychiatric hospitals; therapeutic environment; sanitary facilities; psychological patterns; interior space; space utilization; flexible facilities; spatial relationship; professional personnel; visual perception

The problems of architectural design of facilities for the mentally ill are presented, along with considerations related to architectural articulation which seem desirable regardless of the psychiatric program. An unpublished paper by H. Osmond is reviewed which stresses the need for an environment modified to enhance the supportive psychosocial structure and to meet the perceptual anomalies of the mentally ill. Architectural solutions detailed include those which provide privacy, social interaction, and adaptability as well as alternative movements and arrangements and distinctive space-time relationships and forms and functions. The solutions are explained in both psychiatric and architectural terms. A bibliography for architects cites 19 references. (JD)

ABSTRACT 40

EC 003 974 ED pending
Publ. Date Spr 64 59p.
Relocatable School Facilities.
Educational Facilities Laboratories, New York, New York
EDRS not available
Educational Facilities Laboratories, 477 Madison Avenue, New York, New York 10022.

Descriptors: educational facilities; classroom design; classroom arrangement; mobile classrooms; flexible facilities; construction costs; interior space; architectural programing; structural building systems; component building systems; prefabrication; photographs; school planning; enrollment trends; lighting; climate control; classroom furniture

The support that fluctuating school enrollments and the shortage of classrooms lend to the need for relocatable facilities is discussed; the development of these facilities is considered. Guides for planning relocatable structures include the following: four basic types and adequate space, appearance of the units, and the relationship of the units to the main buildings; portable facilities and size limitations, structural system, limits to moving, and foundation; size limits, structure, and foundation of mobile, divisible, and demountable facilities. Factors to consider in calculating costs, a checklist of items relevant to moving the facilities, and an estimate of demounting costs are provided. Case studies of movable classrooms in 21 cities give specifications and photographs of the facilities. New developments in portable units and a plan for the future are included. (RP)

ABSTRACT 41

EC 003 975 ED n.a.
Publ. Date May 67 66p.
Architectural Contributions to Effective Programming for the Mentally Retarded. Conference Report of the Architectural Institute (Denver, Colorado, May 15-16, 1967).
American Association On Mental Deficiency, Washington, D. C.;
American Institute Of Architects, Washington, D. C.
Rehabilitation Services Administration (DHEW), Washington, D. C., Division Of Mental Retardation;
National Association For Retarded Children, New York, New York
EDRS mf,hc
National Associaton For Retarded Children, 420 Lexington Avenue, New York, New York 10017.

Descriptors: exceptional child services; institutional facilities; architectural programing; design needs; mentally handicapped; building design; administration; architects; program planning; space utilization; residential programs; environmental influences; taxonomy; educable mentally handicapped; trainable mentally handicapped; custodial mentally handicapped

Conference participants consider the role of the architect and the programer in planning and constructing facilities for the mentally handicapped. David Rosen discusses the design problems of state institutions with particular reference to the Woodbridge State School in

New Jersey; Gunnar Dybwad describes the need of the programer for the architect; and Arnold Gangnes treats the need of the architect for the programer. The architectural program is defined as a means of communication with the client by Edwin Cromwell, and the programing process is detailed by John Garber. Also provided are David Ray's and John Truemper's consideration of the programer and architect in action and J. Eugene McKee's treatment of planning for community facilities. Two forewords, excerpts from informal discussions, and a list of registrants are included. (JD)

ABSTRACT 42

EC 003 976 ED n.a.
Publ. Date Apr 67 34p.

Outdoor Recreation Planning for the Handicapped. Bureau of Outdoor Recreation Technical Assistance Bulletin.

Department Of The Interior, Washington, D. C., Bureau Of Outdoor Recreation;
National Recreation And Park Association, Washington, D. C.
EDRS mf
Superintendent Of Documents, U.S. Government Printing Office, Washington, D. C. 20402 ($0.40).

Descriptors: handicapped children; exceptional child services; recreational facilities; design needs; multiply handicapped; recreation; physically handicapped; special health problems; individual characteristics; playgrounds; swimming pools; camping; agency role; visually handicapped; natural sciences; sanitary facilities; state agencies; volunteer agencies; private agencies; aurally handicapped; mentally handicapped; emotionally disturbed

The requirement that the handicapped be given special consideration as prerequisite to state participation in the Land and Water Conservation Fund Program is stated, and the following groups of handicapped are specified: the physically, visually, and aurally handicapped, and those persons with special health problems; the mentally retarded, the emotionally disturbed, and the multiply handicapped. Their limitations and what can be done in general and in research to help are discussed; modification of playgrounds, swimming facilities and equipment, camping and fishing and boating; national, state and private agencies in several areas which can help are mentioned and their addresses are given. Case histories are provided of a self guiding nature trail in Aspen, Colorado, camping in San Francisco, California, and adaptation of recreation facilities in New York State (including park planning, access, toilet facilities, swimming pools, picnic areas, play areas, and miscellaneous facilities). Sixty-four references are cited. (JD)

ABSTRACT 43

EC 003 977 ED n.a.
Publ. Date Jul 67 40p.

Making Facilities Accessible to the Physically Handicapped.

New York State University, Albany, Construction Fund
Vocational Rehabilitation Administration (DHEW), Washington, D. C.
EDRS mf,hc
651-T-67
State University Construction Fund, 194 Washington Avenue, Albany, New York 12210.

Descriptors: exceptional child education; handicapped children; design needs; educational facilities; campus planning; college buildings; facility guidelines; dormitories; sanitary facilities; building design; physically handicapped; visually handicapped; aurally handicapped; parking facilities; fire protection

Guidelines on performance criteria for the State University of New York consider two main types of handicapped: the ambulant and semi-ambulant, including some physically handicapped, the visually and aurally handicapped, and persons with cardiac conditions; and persons confined to wheelchairs. The handicapped and planning for them are discussed. Specifications are detailed for the following aspects of exterior design: entrances, ramps, stairs. doors, walks, intersections, gratings and manholes, parking, and bus service. Interior design criteria cited are for general university facilities, restrooms, bedrooms, stairs, elevators, doors, conveniences, and fire protection. Persons involved in or contributing to the study are named, and 19 references are listed. (JD)

ABSTRACT 44

EC 003 978 ED pending
Publ. Date 65 765p.

School Environment Research Publication No.1; Environmental Abstracts.

Michigan University, Ann Arbor, Architectural Research Laboratory
Educational Facilities Laboratories, Inc., New York, New York
EDRS not available

Descriptors: environmental influences; visual stimuli; auditory stimuli; learning characteristics; lighting; color planning; climate control; illumination levels; equipment standards; group behavior; abstracts; research reviews (publications); acoustics; task performance; social environment; individual characteristics; behavior; environmental research; group dynamics; annotated bibliographies

Annotated abstracts are presented of selected documents which describe the relationships linking environment with human behavior. Each abstract provides bibliographic information and a summary of the document; some abstracts state the document's conclusions and comments. The bulk of the literature abstracted is from periodicals and is either research or reviews of research. The abstracts are arranged in five categories. The first category, Environment and the Human Senses, includes abstracts on stimulus through the visual, auditory, or olfactory sensory channel, on collateral stimulus through several channels, and on equipment design; the second, Behavior and the Atmospheric Environment, annotates documents on problems related to the atmosphere in general, behavioral problems related to temperature only, and problems related to temperature and humidity. Behavior and the Luminous Environment, the third category, contains problems related to illumination in general and to intensity of illumination, influence of chromatic differentials, and illumination systems and intensity standards; the fourth, Behavior and the Sonic Environment, ranges over the effect of sound on behavior, physiological and psychological reactions to sonic variations, and communication and task performance in relation to sound; and Behavior and the Social Environment, the final category, consists of characteristics of group composition, the individual in relation to group situations, task performance related to individuals or groups, and learning related to the individual and the group. (JD)

ABSTRACT 45

EC 003 979 ED pending
Publ. Date 65 23p.

Larson, C. Theodore; Paraskevopoulos, Stephen C.A.

School Environments Research Publication No. 3; Environmental Analysis.

Michigan University, Ann Arbor, Architectural Research Laboratory
Educational Facilities Laboratories, Inc., New York, New York
EDRS not available

Descriptors: environmental research; environmental influences; hearing processes; individual characteristics; data collection; research methodology; information services; information storage; information retrieval; design needs; school design; taxonomy

A discussion of the effects of the environment on behavior begins with the frame of reference of the environment as a stimulus field of which the subject is an intrinsic part. Cosmic, human, and cultural factors which compose the environment are listed as are categories in these areas: intelligence, welfare, control, production, and a range of characteristics and factors belonging to learners. Also mentioned are particular learning categories and the specification of environmental case studies. Proposals for processing information include a consideration of the generation and flow of information, three aspects of questionnaires, development of a unified information service, three examples of processing information on file cards, and mechanized storage and retrieval of data. Implications for environmental design include the concept of development, design continuum, learning environments, and suggested standards. (RP)

ABSTRACT 46

EC 003 995 ED pending
Publ. Date Nov 68 7p.
Clouser, Richard A.
The Changing Classroom.
EDRS not available
American Annals Of The Deaf; V113 N5 P1008-14 Nov 1968

Descriptors: exceptional child education; aurally handicapped; deaf; classroom design; climate control; acoustics; lighting; windowless rooms; classroom arrangement; electronic equipment; flexible facilities; movable partitions; carrels

The well designed classroom for the deaf is discussed; and climate control, lighting, and sound control are considered. Windowless classrooms are recommended, although not for younger hearing impaired students. Specifications are made for classrooms for three groups of students: ages 1 to 6, 7 to 11, and 11 to graduation. Programed learning areas, common to all classrooms, are described, and flexibility in classroom design is considered. (JD)

ABSTRACT 47

EC 003 996 ED pending
Publ. Date Nov 68 6p.
Niemoeller, Arthur F.
Acoustical Design of Classrooms for the Deaf.
Central Institute For The Deaf, St. Louis, Missouri
Nebraska University, Lincoln, Teachers College, Department Of Educational Administration;
Office Of Education (DHEW), Washington, D. C., Captioned Films For The Deaf
EDRS not available
American Annals Of The Deaf; V113 N5 P1040-5 Nov 1968

Descriptors: exceptional child education; aurally handicapped; deaf; classroom design; acoustics; acoustical environment; flooring; ceilings; ventilation; site selection

Acoustical design of classrooms for the deaf is discussed, with its objectives of providing both large signal and low noise levels. Aspects described include reverberation time, noise criteria, location of the classrooms, and location of the school building. For each, building details and finishing materials are prescribed; acoustical data are specified when relevant. Two figures and three references are provided. (JD)

ABSTRACT 48

EC 003 997 ED pending
Publ. Date Mar 67 8p.
Hewett, Frank M.
Educational Engineering with Emotionally Disturbed Children.
California University, Los Angeles, Neuropsychiatric Institute
EDRS not available
Exceptional Children; V33 N7 P459-67 Mar 1967

Descriptors: exceptional child education; emotionally disturbed; behavior change; teacher role; operant conditioning; classroom design; classroom arrangement; reinforcement; student evaluation; teaching methods; classroom furniture; classroom environment

An engineered classroom is presented as a behavior modification model for emotionally disturbed chidren, in both institutional and public schools. The ways in which it provides a setting for implementation of a hierarchy of educational tasks, meaningful rewards for learning, and an appropriate degree of teacher structure are explained. The classroom layout, the students, classroom operations, and interventions are described; implications of the engineered classroom design are also discussed. (Author|JD)

ABSTRACT 49

EC 003 998 ED pending
Publ. Date Feb 67 4p.
Kimbrell, Don L. And Others
Institutional Environment Developed for Training Severely and Profoundly Retarded.
Abilene State School, Texas;
Austin State School, Texas
EDRS not available
Mental Retardation; V5 N1 P34-7 Feb 1967

Descriptors: exceptional child research; mentally handicapped; custodial mentally handicapped; institutionalized (persons); behavior problems; females; institutional facilities; toys; swimming pools; athletic equipment; sanitary facilities; furniture; sensory training; self care skills; institutional environment

A habit training program was given to 20 profoundly retarded girls, aged 6 to 18, with a basal mental age below the 2-year level on the Stanford Binet and a mean social age of 13.5 on the Vineland Scale. Some of the girls were physically abusive; a majority of them lacked self care skills. As part of the program, units of 10 residents each were constructed; the physical environment was further modified. Toys and equipment were constructed to promote socialization and basic self care skills. No accident occurred with these toys or equipment during 7 months of training. Descriptions are provided of the following: swings and sandboxes, swimming pool, tricycles, rocking swans, tumble tubs, staircases, blackboards and chalk and other apparatus to develop finger dexterity for dressing, special dining tables and other eating apparatus, and toilet seats. Also included are descriptions of materials and activities providing outlets for destructive urges, training sensory areas, allowing limited freedom of movement, and establishing verbal communication. (JD)

ABSTRACT 50

EC 003 999 ED pending
Publ. Date Apr 67 29p.
McMahan, Marie
Educational Media Center; The Library's New Book.
Western Michigan University, Kalamazoo, Educational Resources Center
Nebraska University, Lincoln, Teachers College, Department Of Educational Administration;
Office Of Education (DHEW), Washington, D. C., Captioned Films For The Deaf
EDRS not available
Paper Prepared For Symposium On Research And Utilization Of Educational Media For Teaching The Deaf (Lincoln, Nebraska, April 10-12, 1967).

Descriptors: exceptional child services; aurally handicapped; instructional materials; deaf; instructional materials centers; school libraries; audiovisual aids; equipment evaluation; cataloging; library services; equipment maintenance; equipment storage; equipment utilization; library facilities; library circulation; library technical processes

The use of the educational media center in the education of the deaf is discussed. Supportive services of such a center are described, including selecting materials and equipment for purchase and classifying and cataloging, storing, scheduling, distributing, maintaining, and processing and inventorying materials and equipment. Utilization of instructional materials as another service of the center is discussed in terms of helping teachers and pupils select and utilize material, and also helping them produce media. Center facilities listed include reading areas, storage spaces, independent learning areas, office space for members of the media staff, and areas for work, circulation, teacher preview, equipment, production, and classroom-workshop. A table is provided summarizing the major quantitative standards for school library programs. (JD)

ABSTRACT 51

EC 004 000 ED pending
Publ. Date Apr 67 16p.
Jackson, William D.
Media Production Facilities in Schools for the Deaf.
Tennessee University, Knoxville, Southern Regional Media Center For The Deaf
Nebraska University, Lincoln, Teachers College, Department Of Educational Administration;
Office Of Education (DHEW), Washington, D. C., Captioned Films For The Deaf
EDRS not available
Paper Prepared For Symposium On Research And Utilization Of Educational Media For Teaching The Deaf (Lincoln, Nebraska, April 10-12, 1967).

Descriptors: exceptional child education; aurally handicapped; instructional materials; audiovisual aids; educational needs; special schools; books; films; deaf; school libraries; instructional materials centers; material development; photography; display panels; educational equipment; library services

Past and present inadequacies of instructional facilities are reviewed with emphasis placed upon present facilities and recent relevant federal legislation for the deaf. Commercially produced materials are criticized and the need for modification and production of media is presented. Characteristics of schools for the deaf to be considered in developing a framework for local production are listed; three phases are then proposed for the development of facilities for media production, including preplanning, setting up, and implementing the program. Specifications are given for the facilities themselves, and the following production techniques are explained: illustration, preservation, identification, duplication, photography, and display. (JD)

ABSTRACT 52

EC 004 001 ED pending
Publ. Date Nov 68 10p.
Berenson, Bertram
The Educational Implications of Architecture for the Deaf.
Hampton Institute, Virginia, Division Of Architecture
Nebraska University, Lincoln, Teachers College, Department Of Educational Administration;
Office Of Education (DHEW), Washington, D. C., Captioned Films For The Deaf
EDRS not available
American Annals Of The Deaf; V113 N5 P1030-9 Nov 1968
Paper Prepared For The Symposium On Research And Utilization Of Educational Media For Teaching The Deaf (Lincoln, Nebraska, February 5-7, 1968).

Descriptors: exceptional child education; classroom design; design needs; aurally handicapped; classroom furniture; emotionally disturbed; learning disabilities; architects

The problem of architecture and the exceptional child and a number of questions regarding the critical human variables are posed by an architect. The physical environment is considered as an aid to learning; means of adapting the environment and of compensating for sensory loss and impairment are discussed. The architect's task in determining what type of architecture is necessary is treated, along with the possibility of providing facilities which are partially disposable and will thus not outlive their usefulness. The work of The Council for Exceptional Children's special project on Physical Environment and Special Education is reviewed, both in surveying the state of the art and in testing the environment. Four models are then presented: a classroom for deaf children, a classroom for children with learning disabilities, furniture sized to children, and part of a classroom for emotionally disturbed children. (JD)

ABSTRACT 53

EC 004 002 ED pending
Publ. Date (65) 12p.
Some Organizational Considerations of Elementary Classrooms for Educable Mentally Retarded.
Kansas State Department Of Public Instruction, Topeka, Division Of Special Education
EDRS not available
Descriptors: exceptional child education; mentally handicapped; educable mentally handicapped; classroom design; space utilization; classroom furniture; space dividers; equipment storage; display panels; trainable mentally handicapped; skill centers; elementary grades; secondary grades; electrical appliances; classroom arrangement

Organizational considerations are outlined for classrooms for the educable mentally retarded at the elementary and secondary levels and for the trainable retarded at the children's and teenagers' levels (these two levels are not distinguished). Aspects detailed include instructional areas, space needs, location or accessibility, traffic circulation and areas of pupil concentration, and furniture and equipment. Also covered for the educable classroom at the secondary level and the trainable are special utility needs, storage, physical and psychological environmental needs, and other considerations. (JD)

ABSTRACT 54

EC 004 006 ED pending
Publ. Date Mar 67 32p.
Caudill, William
What Works and What Fails in School Design.
EDRS not available
Nation's Schools; V79 N3 Mar 1967

Descriptors: gymnasiums; dining facilities; classroom design; flooring; movable partitions; flexible facilities; library facilities; ceilings; climate control; glass walls; school design; school planning; educational facilities; corridors; classroom arrangement; school space; space utilization; building materials; lighting; architectural elements

One hundred and ten innovations and design features are presented with sketches and descriptions. Commentary includes the advantages or disadvantages of the features and is intended to provide those interested in school planning or construction with some idea how projects did or did not work or how they were or could be modified to be more valuable. (RP)

SUBJECT INDEX

AUTHOR INDEX

Appendix # 16

THE DESIGN PROCESS IN SPECIAL EDUCATION FACILITY PLANNING

46th Annual International CEC Convention
April 14-20, 1968
New York City

Alan Abeson

The intent of conducting this symposium is to examine an approach to the planning of special education facilities. The members of the symposium panel will be addressing themselves to describing their own planning as it is currently occurring and as it has occurred in the past, to result in the design of physical facilities which permit the effective implementation of special education programs.

However, before these presentations are made I would like to briefly discuss a few of the major factors which can operate to reduce not only the quality of the planning, but ultimately the effectiveness of the educational program that occurs in the completed building.

Let me begin by talking about the phrase "design process". This phrase was used in the title of the symposium because it implies that the derivation of a design for a facility is not merely a matter of having an architect or designer produce predetermined designs of classrooms. Rather, the term implies that the derivation of a design occurs through a lengthy data gathering and assessing process that is centered upon an analysis of the behaviors and activities that will occur in the new environment. More will be said about data gathering by the panel, but let me indicate that the first step is precisely determining your philosophy as it applies to the education of the particular children of concern. Dr. J.G. Benedict expresses this concept with sufficient importance as he indicates that "The philosophy and the carriers of the philosophy be on hand well before new structures are constructed or designed'.[1]

In the past, educators have been approaching the design process when they have engaged in the preparation of the educational specifications. Particular attention is devoted to listing the furnishings and equipment that are needed. The problem, however, is that the specifications are rarely prepared with sufficient precision or completeness to be of great use to the architect. This is particularly true in describing many of the seemingly unimportant events which occur daily. Children take drinks, walk to the blackboard, stand at their seats. Unimportant perhaps but nevertheless of concern for the architect may see implications for design which will facilitate the realization of many such activities. Of course, such an approach by the architect requires his appreciation of the positive effects which can be transmitted or reinforced by the environment. Consider an example: most classrooms and schools are designed to admit children directly into the classrooms from the hall or outdoors. Boots, coats, lunches, etc. are deposited in the main classroom and "arrival behavior" occurs there as well. Thus, some time must be taken by the teacher to stop that behavior and prepare the children for the learning activities of the day. What if an anteroom, separated by some type of barrier from the learning space, were available and the children entered this larger area knowing that "now it is time to learn and we start by coming into this space". Would it make a difference in their mood or behavior? I do not know, but that mood and attitude can be influenced by environment is known. I ask you to simply think of a "romantic dinner" and what that brings to your mind in terms of the environment.

This brief discussion then leads me to the specific problems likely to be faced in the implementation of the design process. Few educators have the experience to completely assess the capabilities of the environment and equally true is that few architects can completely grasp the functioning of the educational process. The obvious need is to bridge this gap by bringing the designer and educator together for the exchange of meaningful information. In fact, what is required is the much maligned "interdisciplinary" effort. Included in this effort must be not only the educator, but also the full complement of ancillary and support personnel that assist the classroom teacher. As you well know, in special education this ideally involves "an army" of specialists from the speech therapist to the rehabilitation counselor, including classroom aides and dietary staff.

Inherent in the creation of a multidisciplinary effort in this arena are three formidable obstacles. The first of these is overcoming the barriers to communication that may exist between the designer-architect and the educator. Designers frequently admit that they prefer graphic to verbal expression. Because educators live their entire lives using verbal expression, an immediate problem is evident. The extent of this incompatability may extend from uses of the words "program" to "research". Studer and Stea express the predicament of the designer most graphically, "Finally, he (the designer) must make highly complex design decisions with linguistic (conceptual) tools which are both inappropriate and clumsy".[2] Studer, speaking about the inability of the designer to assimilate the results of behavioral research into design criteria, issues a case for alterations of the language of the designer which permits the incorporation of other information.[3]

While it may appear that what has been said thus far places the burden of fault upon the architect, this is not intended. After all, educators have similarly been successful at creating a highly specialized vocabulary which not only locks out other "specialists" but also causes internal confusion. The terms team-teaching, grouping and experience unit teaching are but a few examples. By conveying the demands of the environment in educational terms to the architect, the educator will be forced to clarify each concept demand to permit design decisions to be most accurately made. The educator can no longer say to an architect, "we need a 24 classroom school with the usual facilities" nor can he and his staff prepare a set of educational specifications for delivery to an absentee architect at a later date.

Another question that must be raised at the juncture is how much time can the architect economically afford to spend with the planning of your facility. Since this must be limited, carefully drawn plans should precede the arrival of the architect to insure that his maximum contribution is obtained. Perhaps the architect should meet initially with the educational staff or committee that will develop the specifications to indicate some of the information he requires. The committee should, upon completing the specifications, interpret them for the architect. This should be coupled with the architect spending time in the schools, seeing what occurs, what the children are like, the multiple uses of space, etc. Perhaps the architect and representatives of the committee could interview staff to obtain individual information not contained in the summary educational specifications. Certainly, an effective working relationship between the architect and educational staff will prove valuable later when reaction to the preliminary sketches are needed. Therefore, the educational agents have a responsibility to plan the use of the architect's time with them so that the greatest amount of workable data can be generated for consideration in the preparation of the preliminary sketches.

The third problem in addition to communication and economy of effort is that of discovering with the architect what it is that you don't know. I like to express this thought as "knowing what you don't know". Let us consider the plight of the small community that is in the midst of planning a new building and wishes to include as an integral portion of it, an instructional materials center. As the time comes to derive specific plans, it is up to the educator and architect, either apart or in tandem, to seek the aid of information and/or specialists.

While I have approached this discussion of facilitating the design process through interdisciplinary planning as beset by three distinct major problems, the three are closely interrelated. To create communication, the feeling must be that both educators and architects have a contribution which can only be made effectively through interaction. The attempt to achieve interaction results in a clarification of vocabulary objectives and areas of competency. This clarification process is furthered by joint planning by the architect and educator to insure that the former is exposed with guidance, to the maximum opportunities for the collection of information to be absorbed prior to the production of the design.

It is unfortunate that we have such a short time to discuss this topic for it is obviously impossible to even dent the surface, and in fact, the information transmitted is not only fragmentary but possibly appears over simplified. Consequently, I would like to close with consideration of two final points. First, beware of accepting popularized concepts as requirements for your buildings. An example of this occurring is that many programs submitted to architects include a request for the provision of "maximum flexibility". My question and I hope yours is if it is needed, where should it occur, and how? Many classrooms now are constructed with the capability for connecting through the removal of a variety of types of temporary walls. However, we asked many of the teachers in these rooms how often they exercised the potential and the majority indicated rarely or never. Thus, another point has been scored for engaging in the careful preparation of individual programs.

The act of asking the teachers referred to above about the use of their rooms is a simple form of evaluating the environment. Thus, my final point is to encourage you to engage in as complete an evaluation as possible of your existing and new facilities. A most effective means of accomplishing this objective is to compare the teacher's reactions of the environment to the originally stated objectives in the program given to the architect. However, once the evaluation is completed, the results must not be filed away, but should be incorporated in the program for the next facility.

1. Personal communication.

2. Richard G. Studer and David Stea, "Architectural Programming, Environmental Design, and Human Behavior", Journal of Social Issues, 1966, 22, 130.

3. Raymond G. Studer, "On Environmental Programming", Arena, 1966, 81, 291.

CEC Convention - Denver, Colorado
April, 1969
The Physical Environment: A Brave New World
By Alan Abeson

Toward the end of Brave New World Revisited, Aldous Huxley asks "do we really wish to act upon our knowledge?"[1] He poses this question in relation to preventing the development of the type of society that was created in Brave New World where conditioning and hypnopaedia or sleep teaching took the place of education as we know it, and where physical but not psychological freedom characterized mankind. Huxley's Brave New World is a rather pessimistic statement but one can use the same phrase to preface a discussion of the physical environment which, if imaginatively and functionally designed, will complement imaginative and meaningful educational programming.

If we could borrow one of the agile helicopters owned by a Brave New World Alpha and could take a rapid tour of schools across the country, we would see from the sky as Harold Gores, President of the Ford Foundation Educational Facilities Laboratory[2] indicates, large boxes, and then when on the ground and in the school would find little boxes that are called classrooms. Entering the building we would embrace a bowling alley corridor which serves as a traffic chute for access to the classrooms which are placed side by side and opposite each other resembling the pattern of a large egg carton. The classrooms themselves are sterile and again using

Gores' language, resemble a kitchen with a kitchen floor, kitchen furniture and hard pale wall. One wonders if the planners of such buildings were aware that children were going to be housed in them. But, in fact, we know they knew, but that because of choice or desire, concentrated on providing for economy, maintenance, and permanence.

Although these classrooms have been designed primarily for non-exceptional children, they frequently become the home that is also provided for the late to arrive class for handicapped children. It is common knowledge, moreover, that historically and still today, the education of handicapped children also occurs in abandoned schools, churches, barely modified basements, and renovated offices or custodial quarters. However, this situation is undergoing rapid change as more and more handicapped children are provided with special education and associated services. Estimates indicate that 3-1/2 million handicapped children are not as yet receiving any special service. To translate this to facility demands, as was recently done by the Office of Education, indicates that 2,358,000 student stations or 19% of the total demand for educational facilities is needed for the handicapped.[3] The demand for information pertaining to the programming and design of classrooms for exceptional children is confirmed by the more than two hundred inquiries received by The Council for Exceptional Children project, "Physical Environment and Special Education".

The question facing the educators and architects who are becoming involved with planning facilities for exceptional children is, are they going to duplicate what has already been done, or are they going to step forward and begin to design a physical environment that is based on educational and child related variables? While this sounds like a tall order, which it is, the process may start as Huxley suggested, by considering various levels of knowns. Initially, there are broad knowns that apply generally to the planning and design of facilities for exceptional children.

1. If there is any one statement about education that can be unequivocally treated as a known, it is that methods, materials, equipment, etc. will change. While in Huxley's world change was prevented from occurring, it is within our society and particularly in the educational sphere, that it is encouraged, if not demanded. Therefore, school buildings must be designed in a manner that will enahnce the effectiveness of new programs. The dramatic degree to which these changes are occurring is exemplified by focusing attention on not only the amount of instructional materials that are available but even more significantly on the wide variety. Similarly, attempting to describe the media demands of today's classroom is next to impossible and yet such a step is clearly required for obtaining the greatest use of tomorrow's learning spaces.

2. While the need to accomodate change is relatively well recognized, a second known is that the use of the word flexibility to describe this need lacks the necessary precision to be meaningful. A recent publication of the Educational Facilities Laboratory, Educational Change and Architectural Consequences, indicates that the term flexibility " . . . has become a catchword and architects complain that too often it allows educators to shift educational problems to them without indicating the solutions."[4] To get away from this "catchword" architect William Caudill proposes four distinct terms and definitions which will add clarity to this concept.

a. Expansible space that can allow for ordered growth.

b. Convertible space that can be economically adapted to program changes.

c. Versatile space that serves many functions.

d. Malleable space that can be changed "at once and at will".[5]

3. That children will learn, grow and consequently change is another known factor. Thus, the school must be adjustable to meet the changing needs of the child during his growth. For exceptional children this may be described as initially

providing a supportive environment and gradually adjusting it to more closely resemble components of the real world such as are found in regular schools and places of employment.

4. A fourth known applied to change is that while space can be provided that has the potential for restructuring, there is no guarantee that it will be used in that manner by the educator. To achieve the intended use, the planning of the building should involve the practitioners who will be operating in that building to a degree that is perceived as significant by them. This is becoming increasingly important for the trends to develop schools that are based upon large open spaces without walls, corridors, or doors are something of a shock to traditionalists. What a waste of effort occurs when teachers move into such a space and then arrange their teaching area (which can no longer be called a classroom) with three rows, nine desks across, for the remainder of their teaching life. Equally sad is when movable walls remain permanently open or closed. The cry is not to allo[illegible] ly Alphas or Betas to plan facilities, but to involve the Deltas and Gammas as well.

5. The last on this list of broad knowns which is of no less

importance and closely related to the others is that in the absence of a systematic educational program, the nature of the physical environment is meaningless. In fact, without an educational program that is reasonably well stated, an appropriate physical environment cannot be created, for the objective of facilities creation is to match the program with the facility. It is obvious that basing environment on an ambiguously stated program will produce an ambiguous environment.

In Brave New World, the nurturing, or perhaps more appropriately stated, the manufacturing of standardized people was able to occur because the elements of the human system were factored out and manipulated, depending upon predetermined goals.

When considering a similar analysis of the physical environment as it may relate to special education, great difficulties are encountered because the absence of knowns in each field are magnified when they are dealt with in unison. Some attempts, however, have and are being made to develop analytical systems that will permit the production of an increasing number of knowns.

The first of these systems is strictly environmental and employs terms such as color, light, texture, and shape. Another approach is strictly educational in that the terms used are based primarily on the major activity clusters associated with the operation of the day-by-day educational program. Some of the terms employed under this scheme include:

in and pre-service education
feeding
grouping
toileting, and
supervision

Neither of these systems could be used apart, but rather would require that one or the other become an overlay on the other.

Another approach has recently been proposed by two architects working at Rensselaer Polytechnic Institute which utilizes terminology that is described as "environmental conceptualizations". These include:

scale
transition
privacy
consistency
usability
movement, and others.[6]

These terms imply more than those used in either of the two earlier systems and express something more than either the strictly environmental or strictly educational approach allows. Consider, for example, some of the concepts implied.

Privacy — There are times during the process of learning or teaching or in dealing with human beings that the child or teacher has a need to be secluded from the immediate situation. Isn't this notion supported by the behavior of nursery school or kindergarten children when they play or look at books under tables in the corners of their rooms?

Scale — If one were to study the factors related to the success of tree or playhouses as measured by frequency of child use, it could be hypothesized that child versus adult sizes of the space would be a critical variable. Should such considerations be applied to time-out rooms?

Consistency — Casual observation of persons forced to move from one office to another indicates that some time must be allowed for acclimation to the new space. Is a similar disruption in functioning in children caused when elements of their learning space are rapidly and frequently restructured?

Transition — Many school districts find it necessary to bus groups of special children to schools to form large enough concentrations of children to form classes. The stimulation which the children are exposed to on the bus is intensified when they join the main traffic stream in the building causing some loss of instructional time until the children quiet down. Is there a need for the development of new approaches to transporting and delivering children to their schools and classrooms?

Usability — As expressed by the authors, this term suggests that the entire building and all equipment should be usable by the children. How frequently does the standardized furniture and hardware in buildings used by exceptional children violate this concept?

Movement — With the multiplication of services that are increasingly being provided to support special education programs, a corresponding number of special use spaces in expanded facilities are required. What devices can be employed to assist handicapped children in locating spaces with which they are concerned?

The point of this is that when facilities for exceptional children are planned, there are a certain number of knowns that can be stated. None of these analytical schemes are perfect, nor should they be used in an either/or fashion. Their purpose is to indicate the first step in problem solving, stating the known need.

While much of this discussion has been directed to the identification and ordering of information for planning, a few slides collected during travel conducted by the staff of the CEC project, "Physical Environment and Special Education", demonstrate solutions to a few known needs.

1. The high cost of construction, plus the apparent limited use that can be obtained from corridors has led to a demand for the creation of corridors which are more than corridors. Another factor bearing on this need is that traditionally used

bowling alley corridors are often viewed as causing disorientation for many exceptional children. Two examples of non-corridors demonstrate their feasibility. Both are used as multi-purpose areas, with the carpeted space used for more sedentary activities plus occasional single class physical activities while the other non-carpeted area serves as an assembly and indoor play space. Note how both of these also serve a major corridor function.

2. The need for rooms to achieve privacy or escape from excessive stimuli has resulted in spaces called quiet rooms, explosion areas and womb rooms. Conversations with teachers have indicated that the usefulness of these rooms varies with particular groups of children and also that they are at times used for various purposes, the most frequent being storage. Consider that even within these spaces there are demands for flexible usage.

3. Earlier, mention was made of the conceptualization, usability. Some examples of design for usability include a table made especially heavy to prevent tipping, adjustable for different sized children, and with a lip at the back edge to prevent objects from falling off. Other examples include chalkboards that are mounted away from the wall, sometimes on an angle

and sometimes vertically adjustable for use with children in wheelchairs, doors that permit use by children in wheelchairs because of a dual handle.system and also long vertical glass panels in the doors that permit the children to see what is happening on the other side.

4. The design of storage elements requires that adequate provision be provided for a variety of items such as wheelchairs, instructional materials, individual projects, and childrens' coats and boots. The lack of adequate storage is a most frequently mentioned statement by teachers when asked for critical comment about their teaching spaces. The first set of slides illustrates the advaniage of a storage room adjacent to the basic classroom. Not only does it provide for increased storage capacity, but with appropriate counters can serve as an additional teacher and/or child work area. This slide of an arts and crafts room demonstrates that storage compartments can be well integrated into available space. These containers for yarn and material roll out to leave vertically adjustable surfaces which can be used by children in regular chairs or wheelchairs. The large open compartments in this wood shop are economical in terms of construction, energy required for use, floor space utilized and

the ease with which particular projects can be found. Built into this corridor are special pockets which are used for wheelchairs, and long areas above with sliding doors for cots that remove the potential for clutter often seen in schools for the physically handicapped. For the childrens' coats, this space was designed to be low and accessible to children in wheelchairs as well as aesthetic pleasing when closed. A difficulty, however, is that the hooks are too close together for ease of use.

5. Difficult to define but easy to feel is the characteristic of the physical environment that is referred to as character. In this school, a stated requirement in the program was that the building be home-like. To achieve this, spring loaded chalkboard units were used rather than permanent walls, carpeting is used throughout the building, and a home living room suite and an outdoor court was included. Another school utilized a small exterior court in the middle of the building and erected a child designed, but artist executed sculpture. A third building in a warm climate included an easily reached patio to permit the children rapid access to the outdoors.

While attempting to talk about knowns up to this point, I would like to conclude by focusing on an unknown. It is clear that the role of the physical environment is not to serve as a teacher, but rather to be available as a teaching tool or catalytic agent to enhance the educational process. To what degree this does or can occur is not known for the science of environmental psychology is as yet in a primitive stage of development. The increasing sophistication of this field will lead to increasing attention placed upon the learning space as an experimental variable which can effect learning. And since much of Huxley's fictional world occurred as a result of experimentation, I think that it is accurate to say that the physical environment as applied to the education of exceptional children truly can be a brave new world.

[1] Huxley, Aldous. Brave New World Revisited. New York: Harper and Row, 1958. p. 116.

[2] Gores, Harold. "The Congenial School". Educate, 1969, 2, 24-31.

[3] "Projections of Public School Facility Needs". U.S. Office of Education, Department of Health, Education and Welfare, 1968.

[4] Educational Change and Architectural Consequences. New York: Educational Facilities Laboratories, 1968. p. 15.

[5] Ibid.

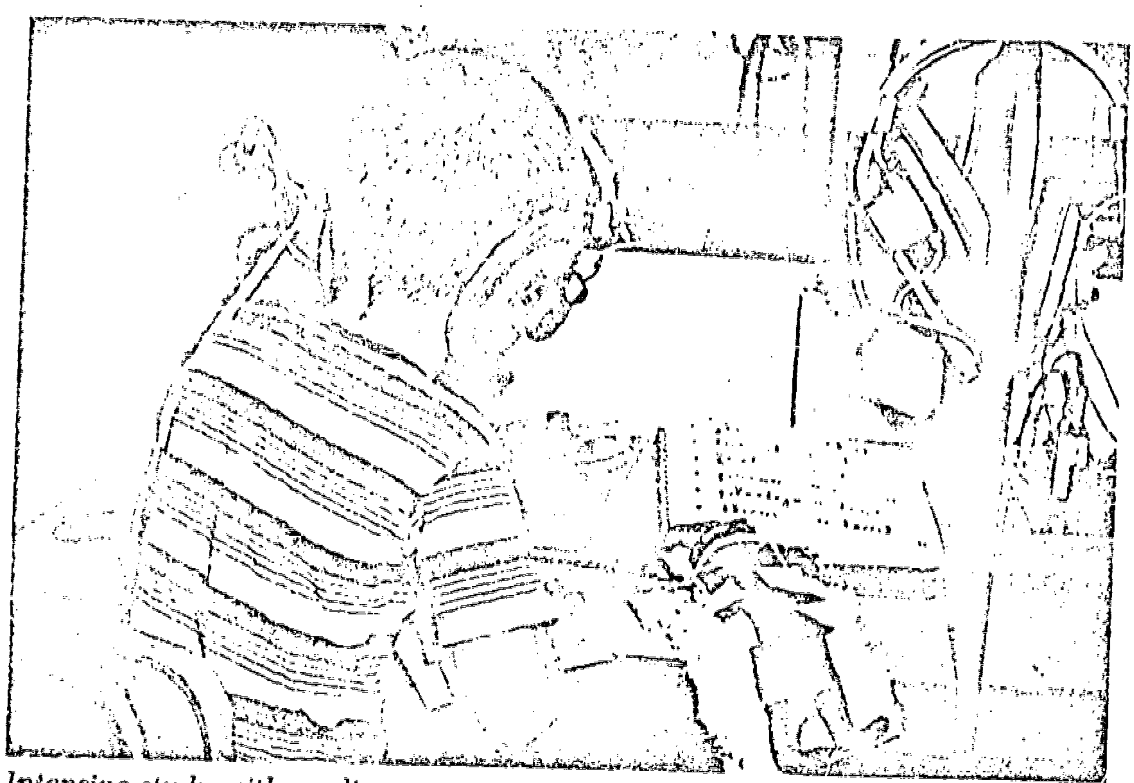
[6] Haviland, D.S., and Bednar, M.J. The role of the physical environment in the education of children with learning disabilities. Troy, New York: Center for Architectural Research, Rensselaer Polytechnic Institute, 1969. (ditto)

[7] Huxley, Aldous. Brave New World. New York: Bantam, 1968.

gether with his tape assignments, reading level, reading interest, and daily activities. The student listens to enrichment tapes and may watch filmstrips.

Teachers fill out behavior checklists after three weeks, the end of the program, and at the end of each semester. This data is sent back to the Center and, on alternate weeks, the aide goes to the Center to discuss students in her care.

The program does not terminate for the student at a specific date. It is designed to be an ongoing effort until the objectives have been reached. Some students, explained Mrs. Armstrong, have been with the program over a year.



Intensive study with reading tapes is part of the Phoenix plan, which identifies communication difficulties as a core problem behind disruptive behavior.

Facilities must support, not stifle

by Alan Abeson and Bert Berenson

The following recommendations, drawn from a just completed CEC/USOE research project, show how school environments can — and must be — planned to efficiently and effectively support handicapped education programs.

General: Reduce stimuli. To increase the ability of handicapped children to concentrate on learning tasks, extraneous stimuli should be kept to a minimum. Carpets should be provided in all areas except those in which wet activities occur. Hard bright surfaces which are reflective should be eliminated for both visual and acoustical purposes. Audible motor noises from clocks and intercom systems should be avoided. Many handicapped children work effectively within a learning carrel or cubicle, and adequate space for the use and storage of these units should be provided.

Circulation: Keep it simple. Since many handicapped children are easily distracted and confused, circulation patterns, as well as the buildings themselves, should be orderly and direct. To assist the children in reaching the correct space, color coding in the form of stripes on the floor or color on the walls can be used. Areas of heavy internal traffic, such as corridor intersections, may be differentiated by another color or special symbols. Similar devices can be provided with textured materials to ease the movement of visually handicapped children. Since many of these children have balance problems, carpets in the corridors reduce the effects of falling. Care, however, must be taken to select carpets that are relatively soft to avoid burns. For similar reasons, the coating on corridor walls should be of a relatively smooth texture. Sharp corners on doorways should be eliminated and strips of rubber or other soft material should be applied to them. Door openings into corridors should be recessed both for reasons of safety and to provide a transition space or entry. Finally, lighting in corridors should be evenly distributed thereby reducing shadow and allowing for the illumination of displays attached to wall surfaces.

Classrooms: Allow for storage. Since special education teachers often have immediate need for materials, storage units should be well organized and readily available. Arts and crafts activities are often part of special education programs and require wet areas that include a sink, counters and sufficient space in which to work. The extensive use of educational media and other electrical equipment (such as amplification equipment for the hearing handicapped and typewriters for the physically handicapped) in the learning area requires an adequate number of electrical outlets throughout the learning space.

Furniture and equipment that has been designed for the needs of

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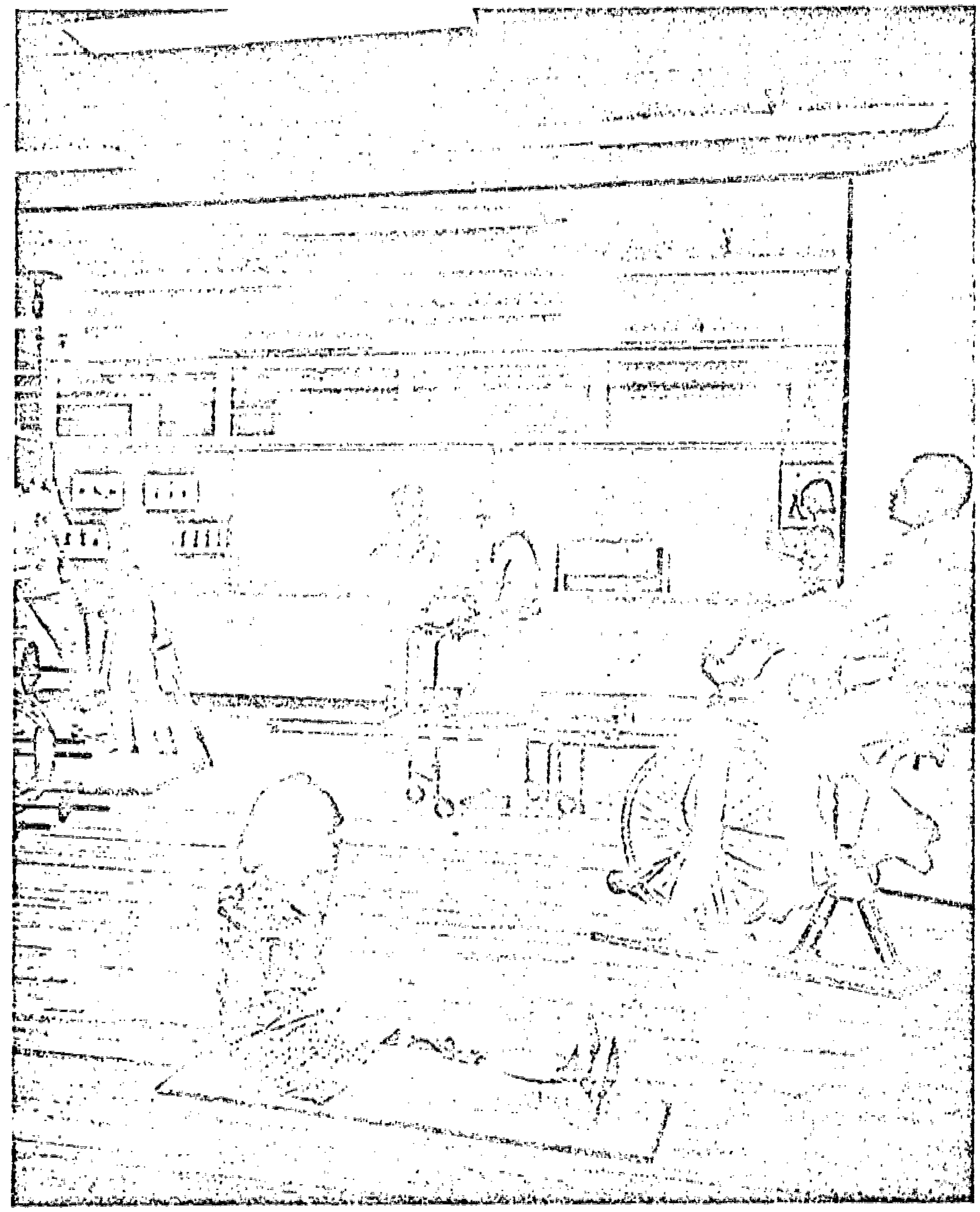
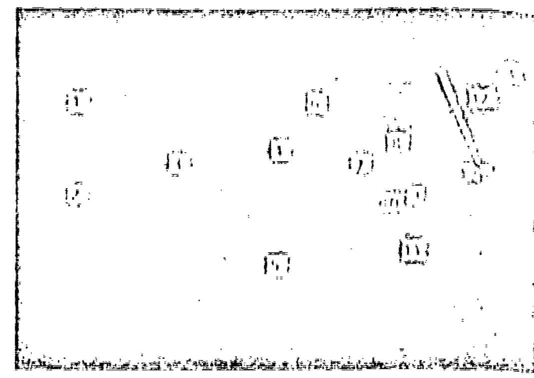
Mr. Abeson and Mr. Berenson are respectively coordinator and director of "Physical Environment and Special Education," a study sponsored by the Council for Exceptional Children and supported in part by the U.S. Office of Education's Bureau of Education for the Handicapped. A detailed report on the study will be published early next year.



Exercise area at Joseph Pomeroy Widney High School for the Handicapped, Los Angeles, is placed in a special classroom, divisible for privacy.

these children will enhance the teaching/learning process. Chalkboards projected from the wall and vertically adjustable are essential in classes for the physically handicapped, as they permit children in wheelchairs to use them from a sitting position. Work surface both on desks and in learning carrels should have both vertical and horizontal adjustment capabilities. Since the development of independence is a significant educational goal, all hardware should be an appropriate size and in an appropriate location for the use of all children.

Toilets: Promote independence. Toilet facilities should receive special attention. Some of the problems that must be considered in this area are related to the emotional and physical functioning of the child. Lavatories for the physically handicapped should be equipped with hardware that permits the child to function as independently as possible. This may include a grab bar arrangement surrounding the commode and wheelchair parking space next to it as well as a curtain that can be drawn by the child to assure his privacy. An awareness of the child's social and emotional needs dictates providing a washup and changing area in programs for trainable and other children who have inadequate toilet control. The availability of this type of area permits removal of the child from a highly embarrassing



Where to get help in setting up special education programs

Fourteen Instruction Materials Centers (IMCs) for Handicapped Children, established since 1967 on a regional basis across the country, have an important mission in improving instruction of the handicapped. This U.S. Office of Education funded project provides a resource network to all professionals in special education, furnishes materials for review and pilot use by classroom teachers, and makes personnel available for consulting, diagnostic and inservice training functions. Schoolmen interested in getting help to start or improve special education programs should write to the Center serving their region. Specialized help for deaf programs is available from the appropriate Regional Media Center for the Deaf.

1. Dr. Wayne Lance, N. W. Regional Special Education IMC, University of Oregon, 1612 Columbia St., Eugene Ore., 97403, (503) 342-1411, ext. 2021.

2. Dr. Charles A. Watts, IMC for Special Education, University of Southern Califor..., 2120 W. Eighth St., Los Angeles, Calif., 90057, (213) 380-1230.

3. Dr. Tony Vaughan, Rocky Mountain Special Education IMC, Colorado State College, Greeley, Colo., 80631, (303) 351-2681.

4. Dr. Robert Ridgeway, Special Education IMC, University of Kansas, 1115 Louisiana, Lawrence, Kan. 66044, (913) 864-4158.

5. Dr. Claude H. Marks, Special Education IMC, University of Texas, 301 W. 15th St., Austin, Tex., 78701, (512) 471-3145, ext. 5722.

6. Dr. LeRoy Aserlind, Special Education IMC, University of Wisconsin, 415 W. Gilman St., Madison, Wis., 53706, (608) 262-4910.

7. Mrs. Lenore E. Powell, IMC for Handicapped Children, 726 S. College St., Springfield, Ill., 62706, (217) 525-2436; Miss Gloria Calovini, IMC, 410 S. Michigan Ave., Chicago, Ill., 60605, (312) 427-5387 (Chicago), (217) 525-4552 (Springfield).

8. Mrs. Lou Alonso, USOE/MSU IMC for Handcapped Children, 213 Erickson Hall, Michigan State University, East Lansing, Mich., 48823, (517) 353-7810.

9. Dr. A. Edward Blackhurst, University of Kentucky Regional Special Education IMC, 641 S. Limestone St., Lexington, Ky., 40506, (606) 258-9000, ext. 2764.

10. Mr. Carl W. Lappin, IMC, American Printing House for the Blind, 1839 Frankfort Ave., Louisville, Ky., 40206, (502) 895-2405.

11. Dr. John Shadgett, S. E. IMC, University of South Florida, Apartment 44, Tampa, Fla., 33620, (813) 988-4131, ext. 815.

12. Mr. Raphael Simches, State Director, Mr. Maurice D. Olsen, Coordinator, Special Education IMC, N. Y. State Dept. of Education, 800 N. Pearl St., Albany, N.Y., 12204, (518) 474-3995 (Simches), 474-7690 (Olsen); Mrs. Elizabeth L. Ayre, Regional Director, Special Education IMC, State University College at Buffalo, 1300 Elmwood Ave., Buffalo, N. Y., 14222, (716) 862-5506, ext. 5507; Dr. Gloria F. Wolinsky, Regional Director, Regional Special Education IMC, Hunter College, Box 563x, 695 Park Ave., N.Y., N. Y., 10021, (212) 360-2304.

13. Dr. Raymond Cottrell, Mid-Atlantic Special Education IMC, George Washington University, 820 20th St., N.W., Washington, D. C., 20006, (202) 676-7200.

14. Dr. Harold Ruvin, New England IMC, Boston University, 704 Commonwealth Ave., Boston, Mass., 02215. (617) 353-3266.

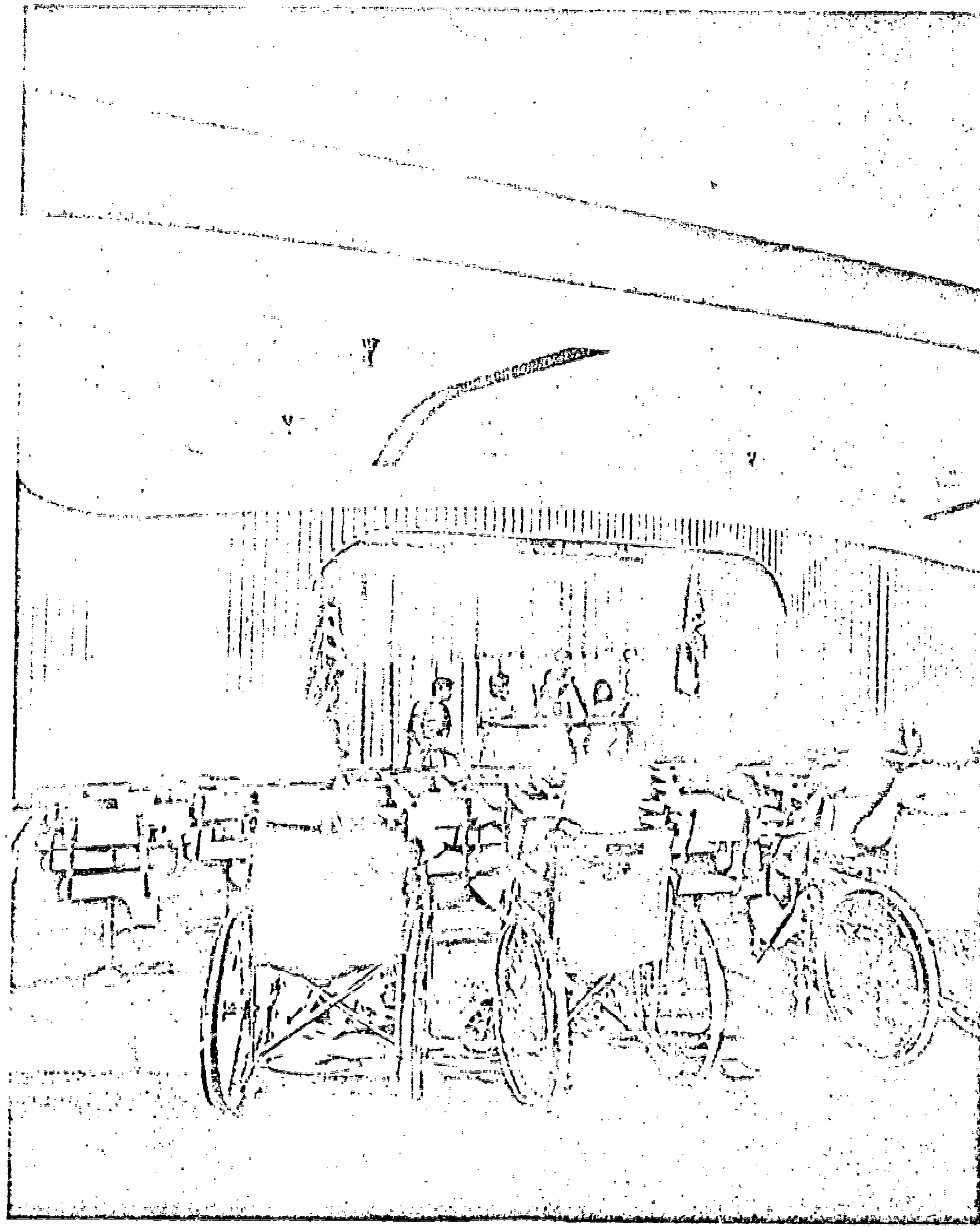
Regional Media Centers for the Deaf

Dr. Robert Stepp, *Midwest* RMC for the Deaf, University of Nebraska, Lincoln, Neb., 68508, (402) 472-2058.

Dr. Raymond Wyman, *Northwest* RMC for the Deaf, University of Massachusetts, Amherst, Mass., 01003, (413) 545-2457.

Dr. William D. Jackson, *Southern* RMC for the Deaf, College of Education, University of Tennessee, Knoxville, Tenn., 39716, (615) 974-3308.

Dr. Marshall S. Hester, *Southwest* RMC for the Deaf, New Mexico State University, P. O. Box 3AW, Los Cruces, N.M., 88001, (505) 646-1017.



Widney's little theater has wide, open rear area for wheelchair access. Widney was cited for design excellence by several national groups in 1968.

situation to a place where he can be efficiently cleaned, dressed and possibly counseled prior to his return to the classroom.

Reception: Accommodate transport. The physically handicapped child whose mobility frequently depends on wheelchairs, crutches or other prosthetic devices, and assistance by school personnel dramatically emphasizes the problem of reception. Since these children are often transported in a variety of vehicles including regular school buses, mini-buses, station wagons, taxis and private vehicles, the loading dock must be carefully considered. Climatic control devices, such as overhangs that allow some protection during inclement weather, are needed. Adjustable or multilevel loading docks, to allow accessibility for most vehicles, should be provided, along with ramps from the sidewalk or driveway to the loading platform itself. The slope of the ramps must be great enough to allow the safest and easiest movement of children with or without the assistance of school personnel. Guide rails, easily seen, must also be included for safety purposes on ramps and loading platforms. Alignment of vehicles with loading platforms may be achieved through guidelines painted on the driveway surface, curb feelers, or windshield talons similar to those used in parking jet aircraft in newer airport terminals. #

Physical Environment and Special Education Workshop Dissemination Conferences

As a portion of the concluding activity of The Council for Exceptional Children's special project,

renovation for young multiply handicapped children. Small groups consisting of educators and architects examined each problem by applying a "planning process guide" developed by the project specifically for planning educational facilities for handicapped children. Each of the groups produced "solutions" which concentrated primarily on defining the functions of spaces, relating spaces to each other, and describing specific environmental elements associated with each problem.

"Physical Environment and Special Education," three regional workshop dissemination conferences were held this past summer in Las Vegas, Minneapolis, and Atlanta. A total of approximately 120 persons representing the fields of special education, educational facilities planning, and architecture attended the conferences.

Structure for the conferences was provided through use of simulated facilities problems. The four problems investigated included a new building for the physically handicapped, a new building for trainable mentally retarded children, an addition for children with special learning disabilities, and a

Through the use of the simulated facilities problems, it was possible to realize the three major objectives of the conferences. The first and primary objective was to create an atmosphere which required special educators, architects, and facilities planners to effectively communicate. Through the use of the instruments and direction provided by the staff, the lack of communication that often occurs among these groups was at least partially overcome. The process of overcoming the communication problem led directly to achieving the two other major conference goals of creating an awareness of the multiple elements that must be considered in planning and, equally significant, the identification of the numerous sources of relevant information available to the educational facilities planner.

Project Publications

Much of the work of this 2½ year project which was supported jointly by The Council for Excep-

tional Children and the Bureau of Education for the Handicapped has been reported in two documents. The first of these is *Selected Abstracts: Physical Environment and Special Education*, a collection of abstracts related to the design of educational facilities. The major intent of this document was similar to one of the objectives of the conferences—to create an awareness of where information is available. These abstracts also suggest many of the specific areas that should be considered when planning special education facilities. Another document developed by the project staff contains more general problems of special education facilities, along with suggested solutions to some of these. This second document is entitled *Process and Purpose: A Study of Educational Environment for Handicapped Children.* Both of these publications are available from CEC Headquarters.

Physical Environment and Special Education—A New CEC Project

EDUCATORS involved in the continually increasing number of programs offering educational services to exceptional children have recognized many of the shortcomings of placing these children in facilities designed for normal children. Many of these educators recognize that significant environmental modifications are necessary to maximize the educational efforts directed at these children. While this interest exists, there is little substantive material available to guide special educators who wish to move in these directions.

In response to this situation, The Council for Exceptional Children has undertaken a special project, supported by the US Office of Education, that will attempt to determine the most effective environment for the education and training of exceptional children. This project, Physical Environment and Special Education: An Interdisciplinary Approach to Research, will employ the services of representatives of the behavioral sciences, education, and architecture to examine a number of educational and architectural variables related to the common problem of designing educational facilities for special children. It is the ultimate goal of this project to formulate a series of research-based statements that will aid both architects and special educators in the design of an appropriate environment for special education.

The initial activity of the project will be a national survey to identify situations in which design planning and construction are occurring. The survey will also collect information regarding the achievement of educational needs which educators visualize as being potentially facilitated by use of thoughtfully designed environments. On completion of this phase of activity, the project staff will translate these needs into verbally stated designs. An architect will then attempt to convert the verbal designs to architectural specifications. At the same time, an experimental research methodology will be devised for evaluation of existing innovative facilities, as well as those constructed with the help of the project staff. At the present time, the following publications are planned: (a) a compilation of assessed environmental educational needs; (b) suggested designs for use in field testing architectural innovations; (c) results of the survey indicating existing practices in the nation regarding architectural educational evaluations; (d) a self-help guide to aid schools in instituting field experimentation within their own facilities; and (e) a final report of all findings of the project.

Specific goals of the project are:

1. To establish an effective dialogue between the architect and special educator, which will permit each to understand the problems and solutions each discipline brings to bear on the design of educational environments for exceptional children. This dialogue will recognize that while the architect is the ultimate designer of the facility, the design must answer the needs and goals of the educator.
2. To engage in a delineation of the uses of space in terms of its educational function. In creating environmental solutions to educational problems, consideration must be devoted to the way in which space is utilized in the educational setting. Within this context, thought must be devoted to the development of children and associated needs—the strengths and weaknesses that characterize children with particular disabilities—and the proper use of space for full realization of curriculum objectives.
3. To establish parameters of flexibility that will permit teachers or children to define their needed educational space. Such flexibility may involve creating a series of small, private areas for use by acting out children or adjunctive personnel; joining of spaces to accommodate large group activities; establishment of individual, one to one teaching stations; and division of areas to permit a number of small groups to work independently.
4. To attempt to develop prototypic educational facilities which will permit the employment of the latest advances in technological equipment. Included will be multichannel input and output systems, ceiling transmission equipment, receptacles to permit the articulation of computer assisted instructional aids, and full electrical and audio systems to permit the use of audiovisual equipment.

The concerns stated above are merely suggestive of some of the areas that will be under the scrutiny of the project staff. As numerous educators throughout the nation become involved in the project, new questions and concerns will be advanced that will be incorporated into the research program. The entire scope of this project can be placed in its proper perspective if it is considered as the first attempt to systematize the similarities and differences between the disciplines of architecture and education to effect the necessary synthesis for effective change—change which must ultimately benefit all handicapped children.

The director of this project is Bertram Berenson, and Alan Abeson is the administrative coordinator.

LEARNING AND PHYSICAL ENVIRONMENT: THE NECESSITY FOR RESEARCH AND RESEARCH DESIGN

William M. Cruickshank, The University of Michigan, and
Herbert C. Quay, Temple University[1]

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[1]The article is written in connection with the Architecture and Special Education Project of the Council for Exceptional Children pursuant to a grant from the Bureau for Handicapped Children, U. S. Office of Education, Department of Health, Education and Welfare. Dr. Quay served as a member of the Advisory Committee to the Project; Dr. Cruickshank, as Research Consultant.

Introduction

On the surface, the history of school planning and construction appears always to have been embedded in research design and to have drawn on carefully defined educational, architectural, and construction models. Construction materials used in school building are carefully selected on the basis of durability, fire resistence, economy and related factors essential to contemporary design problems. The concept of a standard classroom insofar as size, cubic footage, and lighting is accepted into architectual practice through rigid state education department standards for school construction, school health and safety. Air circulation, at a specified number of times per hour, is regulated by departments of health and these specifications are incorporated into building and en-

The work presented or reported herein was performed pursuant to a grant from the U. S. Office of Education, Department of Health, Education, and Welfare.

gineering plans. Architects and school officials vie with one another to incorporate into school-building plans innovative concepts which will set new school building apart from others and which will call attention both to the school system and to the architect. As a result many beautiful schools exist, and millions of children are receiving an education in them. Since construction per se generally makes use of research-developed materials and concepts one would expect that the same would also apply to education and environmental design.

The relationship of design to day-to-day educational operations with children is quite another thing. Few school buildings are conceptualized, designed and constructed in such a way as to meet the learning needs of the children for whom the structure is intended. Doorknobs, for example, may be of such a size and the doors of such a weight that a five-year old child cannot enter into the educational scene with ease. In his initial efforts to adjust to his teacher, school, and the educational process the child is confronted by physical factors which may make even the entry to school difficult. Windows may be placed for adult usage, or at a level where small children cannot easily view the world and learn from this viewing. The characteristics of a classroom are infrequently conceived in terms of the actual learning needs of the children and of the teacher who will use the learning environment which has been provided. What should this area be? How should it be used? What are its needed dimensions and structure in terms of the learning program and the ages of the children who will be in it? Some will say that answers to these questions are known; others, that structure is dictated by program. If indeed these replies are correct, the research which supports either of these positions is not easy to come by.

Recently one of the authors had occasion to visit a new school building which will receive children for the first time in the fall. It is a strange-looking building, not at all like the traditional school. It includes six large rooms, each capable of housing approximately 150 children. The school is to be operated on the basis of an ungraded structure with five or six teachers in each classroom at all times, working with smaller groups of children extracted from the larger group. Each room has been constructed to include study areas, sunken or depressed areas in the floor in which group activities can be carried out. The entire room is covered with wall to wall carpeting. The room is air conditioned; thus it is windowless. On first examination each room appears to include everything which might be needed in the education of children.

What is the research basis on which this school and these rooms have been designed? The superintendent of schools replied that the rooms were designed in terms of the "philosophy of the ungraded program" and on the basis of careful planning and consideration by his administrative staff, teachers and the architects. Few if any studies have been undertaken to determine that children can learn better together under this or any other philosophy as opposed to a smaller or larger number. Little, if anything, is known about the capacity of six adults with different personalities, with somewhat different training, and with different interpretations of the term "ungraded" to be able to function together in a common teaching arena. The capacity to function in a team teaching situation is not an innate trait of educators. If this is true, what antecedents have preceded the actual delivery of services to the child consumers which pre-determine success of this teaching group and this teaching method in this type of teaching situation? Is the standard classroom merely multiplied by six the environment which is essential to learning for more than a hundred children? The visitor was assured that it was: air circulation had been carefully assessed; lighting was of the latest specifications; teaching stations were carefully plotted within the area; water, toilets, and work areas had been delineated. But little is known about the capacity of children to learn in such a situation. Less is known about the capacity of teachers to adjust to other teachers over a long-term period in a common teaching area and at the same time deliver high-quality education to children. Research is lacking regarding the fatigue factor in learning for both children and teacher when seated for long periods of time on steps in a depressed floor arena. Much is yet to be understood regarding the social dynamics of large groups and sub-groups within such a large group of children which would be important to adults in structuring the learning situation. These factors play a role in the development of environmental structure or design. A decade hence if the program is found unworkable, it will not be the physical structure itself on which the blame will be laid. The teachers, the architect among others, will share the blame. What programmatic research will be the basis for changing the educational structure and design if the original one is found lacking is some or all respects?

Examples of this nature could be duplicated in dozens of other communities. A rehabilitation center in one community has been constructed with four floors. From the first to the fourth floor, apartments in which physically handicapped and mentally handicapped adults will live become progressively less adapted to the presumed needs of the handicapped, on the premise that as the individual moves upward from floor to floor he will have learned through the center's educational program to deal more adequately with "normal living conditions." Absolutely no research is available to support this predetermined educational philosphy and hope, nor to support the architectural changes from floor to floor which are presumed will bring the handicapped person by degrees into a living situation which is "normal." Before occupation by the first client, some staff members have pointed out problems with structure. This does not appear to have been wise educational or architectural planning.

If general education is remiss in bringing to architectural programming the best in research design, special education for handicapped children is typified by an even less scientific approach. Special education for decades has been characterized by emotional attitudes in planning for handicapped children and by supposed modifications of what is good for normal children. But indeed what are the learning needs of handicapped children? For example, deaf children and those with lesser degrees of hearing loss who should at all times be able to see the teacher's face for speech reading development, are placed at desks and in chairs which during the majority of the school day provide excellent knee-view of their teachers but an extraordinarily poor face-view of the learning area from which most speech reading will be learned. Schools and classes for deaf children are being constructed almost continuously. Few schoolrooms, however, are constructed in which these children are raised in their desks and chairs to eye-level with their teacher. This example of lack of programmatic and architectural research could be replicated many times in the education of most types of handicapped children. Educators complain that deaf children progress slowly and are down-graded in terms of social age and school achievement. This is due not to the nature of the child but to the nature of the learning environment which has been predetermined for him on the basis of little or no research.

There are many schools which have been built for so-called "crippled children." Bringing children to the point where they can become independently ambulatory either with or without crutches or wheel chairs is a generally accepted goal of physical therapy and education and much of the child's educational program in these schools and classes is directed to this end. The ability of a child to become mobile is attitudinal as well as physical. To move with assurance and with independence requires that the "mover" anticipate his moves and what his moves will entail and encounter. He needs to be able to anticipate obstacles, traffic and new spatial areas. Crutches and wheel chairs usually require the user to get into the flow of traffic before the individual can see what the new spatial area requires of him. But very little research has been done to design and construct schools for physically handicapped children so that there will be no corners in hallways, so that classroom doors will not be recessed and so that vision will be unobstructed for the individual entering into a new spatial area. If schools cannot be built without corners, then it could be possible to construct corners with unbreakable glass in order to give unobstructed views of oncoming traffic and thereby support the child. Such environmental modification could well enhance the psychological development of the child. There is no validated research to demonstrate the value of the traditional concept or of the innovative suggestion which is made here. Before the latter is incorporated into practice, research must be undertaken.

Special education and general education make claims about their needs which are translated into architectural concepts and actual construction which neither profession has ever submitted to experimental design nor for the most part has even field-tested. This is a situation which we can ill-afford to continue. With the tremendous tax expenditure which is being made for school buildings by communities, crash programs privately or federally supported should be immediately undertaken to submit educational philosophy, supposition, and theory to architectural and construction design research to determine within a generation of children if the educational concept and the architectural interfaces are compatible.

The preliminary Architecture and Special Education Project sponsored by the Council for Exceptional Children under a grant from the U. S. Office of Education is perhaps as thorough a national survey as has ever been made on this topic. The information which has been collected is indeed disturbing. Lack of local planning, lack of definitive research to support many educational or architectural decisions, agreements between architect and educator based on supposedly educated hunches, and planning primarily on the part of business or administrator-type educators on the basis of site visits to other recently constructed buildings is in evidence throughout the survey. Billions of dollars in school construction are being invested by the nation through local boards of education with practically no research data reflecting the known interface between environmental design and the needs of the learning situation and the learner.

Two elements, slighted in the findings of the CEC Architectural and Special Education Project, must precede research design or actual construction with or without research on which construction is based. These are the issues of (a) a program narrative and (b) an architectural narrative.

The program narrative constitutes a description, not of rooms and hallways, but of a carefully developed statement of what the educational program actually is. Nothing should be assumed to be understood. The statement should be inclusive of everything which will be done educationally between teacher and children during the program. The program narrative must be developed by the users of the building, namely the teachers, not by administrators or educational planners who assume that they know what the program is but in fact may have a very inaccurate understanding of it. The program narrative must be detailed and specific in every aspect. To use again the earlier example of teaching children with impaired hearing, it is not enough to merely state that lip reading is going to be taught. The teacher must describe the circumstances under which it should be taught well: the physical relationship between the child and the teacher, the physical and visual needs of the child, and all other similar factors which may have an effect on physical structure. As another example, it has been stated that in the education of hyperactive children most of the educational experiences between teacher and child should be carried on within arm's reach. How are the implications of this statement for physical structure translated by the educator into a meaningful program narrative? These are examples of the detail which must be accumulated in terms of every aspect of every educational program.

Out of the program narrative developed by the educators, the architect will develop an architectural narrative as the basis for endeavoring to translate program into the realities of construction. It is at this point that the educational program becomes concrete in terms of rooms, dimensions, room placement, inter- and intra-room relationships, equipment, and persons using the facilities. It is at this point that research which is focused on the type of physical structure which will implement to the maximum the program narrative is lacking. We do not know under what type of an educational setting children of given age, physical characteristics, intellectual and perceptual characteristics, and with known and specified learning needs most easily and most effectively assimilate instruction and respond positively to teaching.

These comments point to an area which has not been subjected to the type of controlled research which is required. Research relating educational theory, concept and program, and to the specifics of environmental structure and design may have some special considerations and indeed does. This in itself, however, is not unlike research in dozens of other areas. Essentially, the criteria of a good research design appropriate to any or all fields of investigation are also applicaple to the area of our concern. Such matters as the control of variables inherent in teacher and pupil personalities is a difficult issue, but it must be accounted for in any reasonable design. The design itself must relate to the subject of the investigation. Problems of measurement, validity and reliability of the measurements obtained, the statistical processes which are utilized, analysis of the data which are collected, are each and all important problems. Each of them requires careful planning and appropriate decision. The issue of evaluative criteria, too often overlooked in much research, is an element in this area of investigation which cannot be ignored and must be built into the initial conceptualization of the design. These significant factors will be considered in greater detail in the paragraphs which follow.

Evaluation of the effects of environmental design

Selection of evaluative criteria. The first task which must be faced is that of deciding which aspects of learning and social behavior should be expected to change as a function of the particular environmental design or modification chosen. Clearly, both the educator and the architect should have some hypotheses before embarking upon the classroom design or introducing the environmental change. However, there is a frequent and understandable tendency to think about possible effects in global terms such as "improving learning" or "increasing social adjustment."

These global concerns must be reducible to more specific (and measurable) aspects of classroom behavior and performance if they are to serve as evaluative criteria in the scientific, experimental sense. Thus, one is forced to choose some specific aspect or aspects of a more general concern. Illustrative examples might include the choice of attending behavior as an index of performance in a group of hyperactive children or the use of completion of a series of lessons in a programmed text as performance measures in a group of unmotivated children.

While these examples might be considered to be measures of learning participation - in the sense that both should be related to actual knowledge acquisition - actual acquisition of the usual academic skills might be made the criterion. The latter criterion is more or less traditional in the school setting and has an inherent appeal to the educator despite some limitations in measurement and specificity.

If social adjustment criteria are to be used, they too must be specified. One might hypothesize, for example, that controlling temperature and humidity might lessen instances of physical agression in acting-out children, or that space arrangments might positively influence the amount of cooperative contact in withdrawn youngsters. But whatever the choice of evaluative criteria, some specificity must be introduced at this point in order that adequate measurement as a reliable index of change can occur.

Measurement techniques. Once the variables to be used as evaluative criteria have been chosen, techniques must be defined for their measurement. A multitude of techniques may already be available, such as would be the case in the measurement of gross academic skills on the basis of standardized tests. On the other hand, the variable of crucial concern may not have a ready-made measure waiting in the wings.

What should not be overlooked is the extent to which many educationally relevent variables which may well be susceptible to change by environmental modification are measureable by simple observation. Such observations can result in an actual count of instances of behavior which then may be expressed as a ratio of the frequency of the behavior to the unit of time of observation for purposes of analysis. In our examples above, both attending behavior and aggression can be successfully measured in this way (Hewett, Taylor and Artuso, 1969; Werry and Quay, 1969). Certain performance criteria may be measured as an inherent element, as in the example of completion of the frames of a programmed lesson.

It goes without saying that the researcher must satisfy himself that the measures he has chosen have the necessary attributes of reliability and validity. Measures with poor reliability are especially useless as indices of change while measures of dubious validity may leave one in the position of knowing that something may have changed but not knowing exactly what.

A word of caution. Too frequently variables are chosen for research because there is a readily available technique for their measurement. The field of psychology has frequently been subject to flurries of research on certain topics simply because a new technique was developed for their meas ement.

Research design. The purpose of a research design is to help answer the question as to whether or not the environmental modification did in fact have an effect and to attempt to ascertain the degree to which the effect may be generalized to other children, teachers and schools. In the terminology of Campbell and Stanley (1963) the first is a question of internal validity and the second a question of external validity. Different factors can operate as threats to internal and external validity (Campbell and Stanley, 1963, pp. 175-176). A consideration of each of these factors as they may relate to particular research designs is obviously beyond the scope of this paper. Our discussion will be limited to a relatively few designs which would appear, all things considered, to be reasonably appropriate for our purposes.

The classical control group design. In brief, this design involves the use of equivalent groups, one of which gets the treatment and one of which does not, and for both of which all other factors which may influence the criteria are constant. The problems with meeting the assumptions of this design, held to assess the effect of environmental changes, may well be insurmountable. It is unlikely that in the practical situation we can provide equivalent groups of exceptional children in experimental and control classes let alone assure ourselves of the equivalence of teachers, instructional methods and the like. We may try to approach these ideals, but to the extent that we do not succeed, our results, either positive or negative, may be due to differences in extraneous factors rather than to the effects of our environmental variables.

The use of quasi-experimental designs. When full control over either subjects, treatments or other influencing variables is lacking, other less controlled designs may be used. The researcher must keep in mind, however, the weaknesses of the particular design in terms of both threats to internal and external validity. At the same time, even relatively weak designs may provide useful information insofar as their use enables the researcher to reject alternative explanations for the result he wished to ascribe to his treatment. (Campbell and Stanley, 1963, pp. 204-207).

These quasi-experimental designs can involve the use of only one group and may involve the use of repeated measures taken before, during and after the treatment. A design of this type which could serve our purpose is the equivalent time-samples design (Campbell and Stanley, 1963, pp. 213-214) wherein the treatment is introduced, measurement taken, treatment removed, measurement taken, treatment re-introduced, measurement taken, etc. In circumstances where the environmental modification could be easily introduced, withdrawn and then re-introduced, this design could be used. Of course, the effect of the first introduction should not be a lasting one on the criterion measures employed or the effects of withdrawal and subsequent re-introduction would be obscured. Details of this design and suggestion for the statistical analysis of the data may be found in Campbell and Stanley (1963, pp. 213-216).

An additional quasi-experimental design which might be considered is the multiple time-series design. Criterion data are collected in a number of time periods both before and after the introduction of the environmental change in both the experimental group and a nonequivalent, but hopefully similar, control group. If the measures were easily obtained, but the environmental modification not subject to easy removal and replacement, this design could substitute for the more rigorous equivalent control group method. However, even within this design, equivalence in other factors such as instructional method between the two groups must be approximated. Again, details are available in Campbell and Stanley

(1963, pp. 225-227).

Finally, we offer as a possible design one which is an adaptation of 'he single subject contingency - reversal design used in research in operant conditioning (,

In its original form the design involves: 1) determining the frequency of the desired behavior in the natural setting, 2) introducing a reinforcing stimulus following this behavior which is hypothesized to increase its frequency, 3) determining the frequency of the behavior under these conditions, 4) changing conditions so that the same reinforcing stimulus is made contingent upon some response incompatible with the desired behavior, 5) again measuring frequency, 6) reintroducing the condition wherein the reinforcer is made contingent upon the desired behavior, and 7) remeasuring frequency under this condition. A graphic representation of this process in a hypothetical case may be found in Figure 1.

The logic of this design is that the treatment (contingent reinforcer) is producing the effect since it can be shown to both increase and decrease the frequency of the criterion behavior below its natural level. Obviously, the use of the single case does not permit generalization to other subjects with much confidence but generalization may not be at issue.

An analogue of this design for evaluating the effect of environmental modification is suggested for use in a situation where two environmental modifications, theoretically expected to produce opposite effects, can be introduced one after the other. For example, if one theorized that a certain temperature-humidity range would increase attention whereas another range would increase motor activity (a behavior incompatible with attention), this design could provide a test of this hypothesis. Figure 2 presents hypothetical results graphically.

This method permits one to reject the alternative hypothesis that changes in attending were due to factors other than the environmental

Figure 1

Hypothetical frequency of walking in a nursery school child in contingency-reversal procedure.

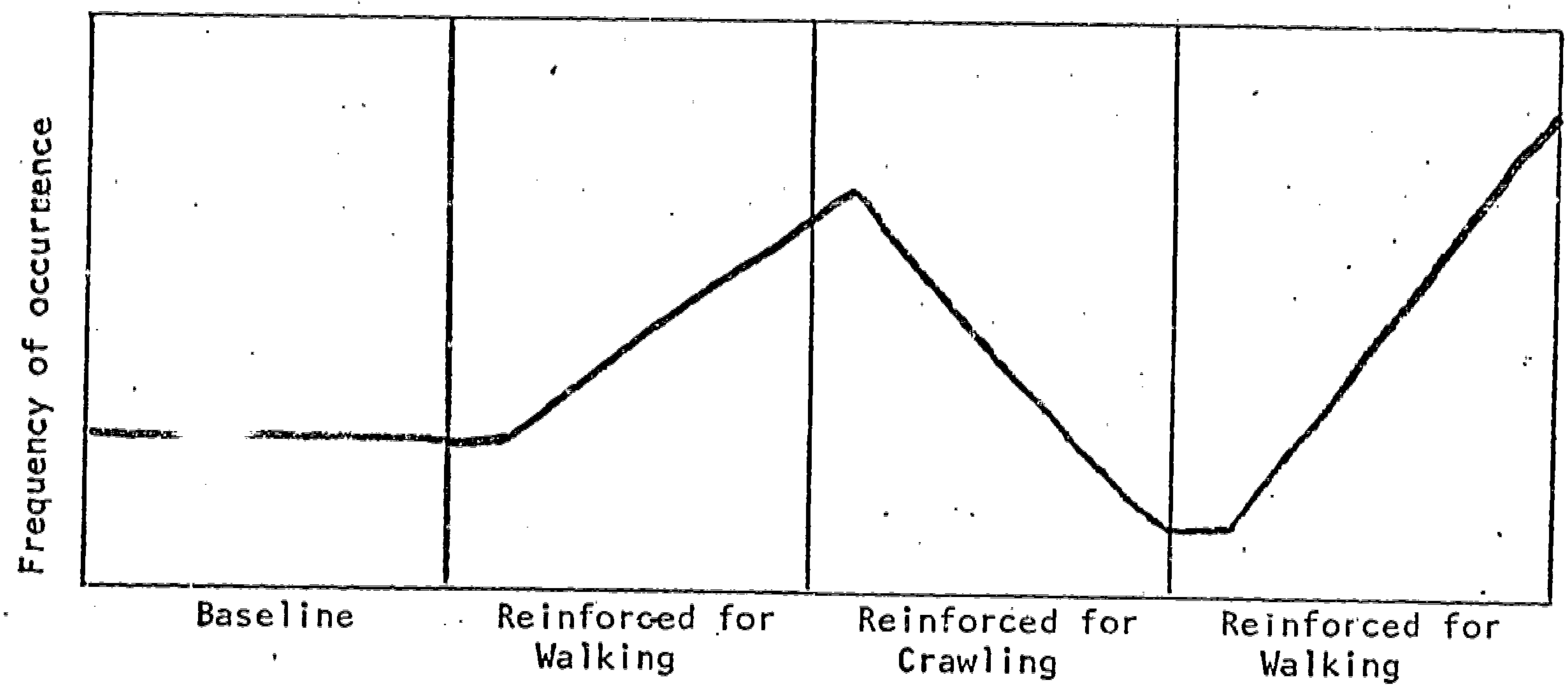
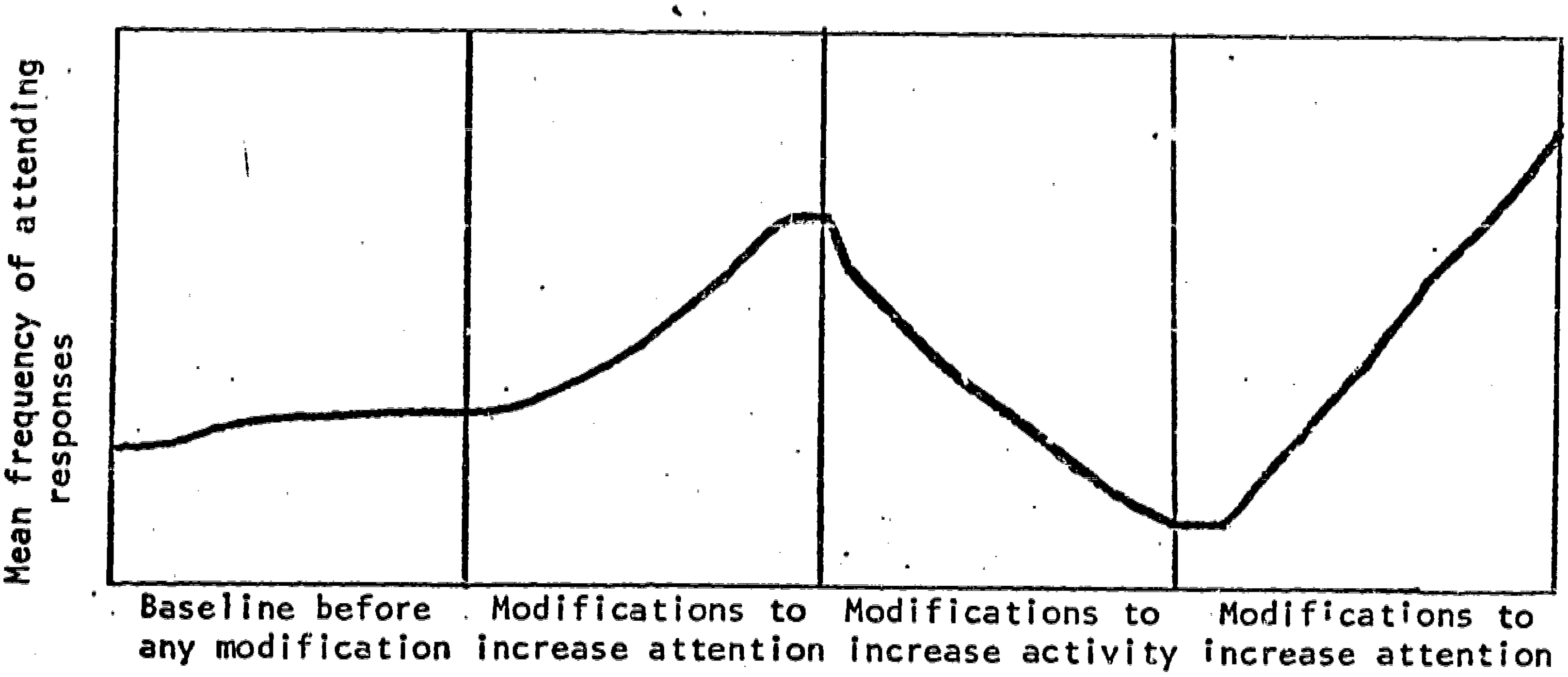


Figure 2

Hypothetical means of attending responses in a class of children under two conditions of temperature - humidity.



changes with considerable certainty, but generalization to other children, teachers and schools is uncertain. Of course, it may be adequate for one's purpose to demonstrate an effect with one class before being concerned with problems of generality.

Concluding Statement

A serious situation exists in facility planning and construction which has a detrimental impact on the education of children. It should not be permitted to continue unabated. The authors in this paper have not tried to be definitive. There has been an attempt to point up the problem, to accentuate some of the issues which are germane to educational and architectural planning of a nature different to that which has been followed in the past, and to accentuate by examples some of the problems which result from inadequate planning. From this there has been an attempt to suggest ways in which various design models could be applied to research in architecture and special education. This paper is presented as a stimulus to the further examination of a significant problem. Each of the factors stressed herein requires further thought and exploration. Each could be put to the test of a formal research project. The issue as a whole is sufficiently important in all dimensions so that it should become a major concern of research-oriented persons and agencies.

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