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Part I

Undergraduate Thesis in Architectural Design

by

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proposal

PROPOSAL

It is the intent of this portion of my Architectural Thesis to analyze a proposed architectural project. This thesis consists of the reseach and preliminary concept involved in the design of a nursing home for Glasgow, Montana and Valley County.

Extensive research by city and county officials as well as the nursing home board has already gone into the feasability of this project. This report gathers these scattered bits of research information into one volume.

abstract

ABSTRACT

This study consists of an analysis of the conditions creating a need for the new nursing home, the local conditions, the site conditions, the economic conditions, the aesthetic considerations, the function of the building, and the proposed building program.

introduction

INTRODUCTION

In recent years, medical care programs for the management of patients with chronic disabilities or long-term illness have been directed toward a state of restoring them to a state of optimum usefulness to themselves and society. Although the availability of therapeutic facilities in the community is essential to medical care programs for many chronically ill patients, continued hospitalization in institutions that furnish highly specialized expensive care is not required in most cases. Yet, such patients often require more care than can properly be given in the home.

The nursing home is a type of facility which has emerged to serve this group. Based on present trends and the forecast for the future in the chain of medical services, the primary purpose of the nursing home is to provide skilled nursing care for patient with chronic disabilities or long-term illness when hospitalization and intensive medical care is not indicated. When this skilled nursing care can not be given in the home, the nursing home serves as the intermediary facility between the hospital and the patient's home.

conditions

creating a need

CONDITIONS CREATING A NEED

As the science of medicine has advanced, with its increasingly effective method of combating disease, there has been, and will continue to be, a continuing of life expectancy. It is estimated that there are now approximately 14 million persons in the country who are 65 years of age or over and that approximately 400,000 more are being added each year.

Concurrent with lengthening the span is an increasing population with chronic disability and long-term illness. It is estimated that in 1959, 5.3 million people in the United States were afflicted with diseases of impairment causing long-term disability.

Chronic illnesses are not limited to older people - 60 per cent of the 5.3 million people referred to were under 65 years of age. Yet, because they are more prevalent among older people, the care of patients with chronic disease and disability is among the foremost medical problem in our aging population.

Up until 1958 Valley County operated and maintained an old folks home supported by the taxpayers. Residents of the county supported home consisted of people with no means of support,

no one to care for them, and no other place to live.

In 1958 the State Board of Health condemned the old folks home forcing its abandonment. Reasons cited for such a decision were, that the home built in 1903 and housing 30 persons, was structurally unsound, overcrowded, obsolete, and a fire hazard.

With little or no means of support, few could afford expensive hospitalization, and few needed it. Many having no other place to go were moved into private homes throughout the county. In all cases, the private homes lacked the facilities to care for a person with a chronic disability or a long-term illness. At present there are 50 such cases of patients living in private homes.

Results of surveys made and maintained by the State Board of Health indicate that there is a need for 60 to 68 nursing beds in Valley County. This figure is based on a ratio of 3 beds per 1000 population for Valley County. This figure does not include the men and families stationed at Glasgow Air Force Base because there is a hospital at the base where airmen and their dependents receive free medical care.

A nursing home for Valley County would provide the persons who genuinely need special attention with a facility where

they could receive the skilled care they require. It would also take most of the person suffering chronic disabilities or long-term illness out of the private home where they now reside.

Table 1. shows the increase in number of persons needing nursing care in Valley County from 1940 to 1965.

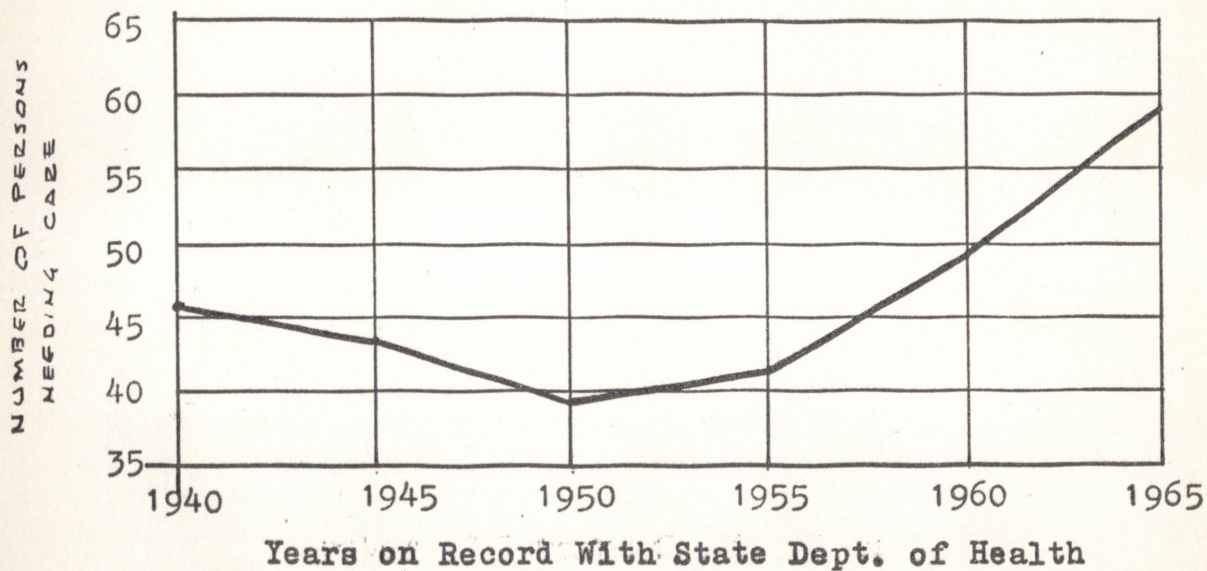


Table 1.

local conditions

LOCAL CONDITIONS

Geographical

Glasgow, Montana, is located in the Northeastern corner of the state in the Milk River Valley. Glasgow is the county seat of Valley County on United States Highway number 2 a major east-west artery, 60 miles from the Canadian border, 300 miles north of Billings, Montana, 275 miles east of Great Falls, Montana, and 120 miles from the North Dakota border. Valley County, the largest county in Montana, has an area of 4,961 square miles.

Glasgow is at 48.2° north latitude, 106.6° west longitude, and the elevation is 2,208 feet above sea level, rising to 2,280 feet in the surrounding bench land

Glasgow is surrounded by plains and rolling hills. The only vegetation other than brush on the prairie is in water drainages, such as creeks, rivers, sloughs, and resivours.

Climatic Conditions

The climate of Valley county is characterized by its hot summers, cold winters, slight precipitation, and low relative humidity. It is not unusual for the winter temp-

erature to reach -50° F., or for summer temperatures to reach $+100^{\circ}$ F. During some of the recorded summer storms of the past, gusts of wind up to 90 miles per hour have been recorded, with steady winds of 50-60 miles per hour prevalent. Climatic data for Glasgow, Montana, is given in table 2.

Population

Glasgow and Valley County have grown from a combined population of 11,200 residents, to 22,000 residents, just in the last 35 years, as shown in table 3.

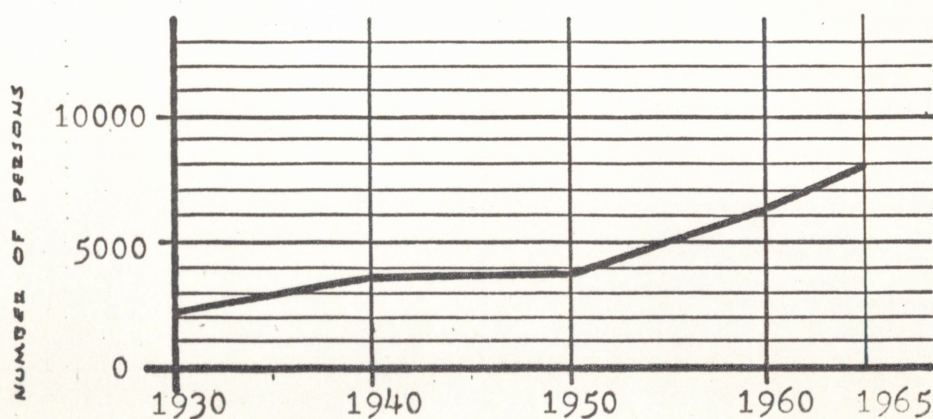


Table 3. Population, Glasgow, Mont.

The population growth of Glasgow is shown in table 4.

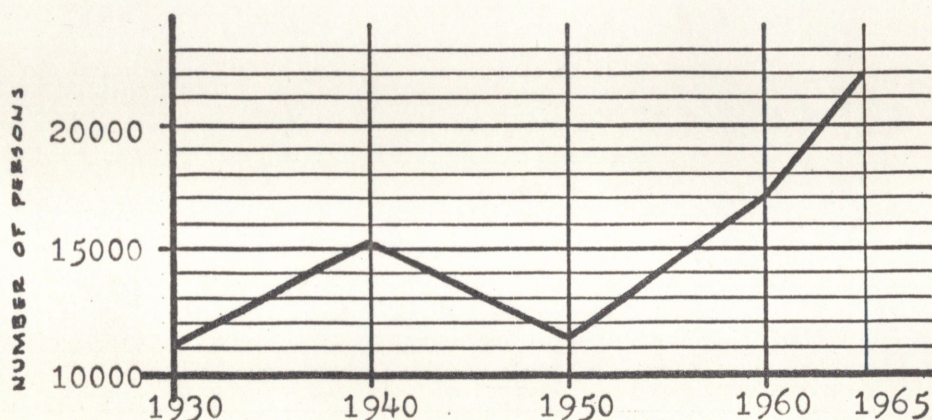


Table 4. Population, Valley County

In 1950 Valley County had an urban population of 3,821, and a rural population of 7,532, or a combined density of 2.3 persons per square mile. By 1960, urban population had grown to 6,398 and rural to 10,682, or a combined density of 3.4 persons per square mile.

Historic

The Glasgow area was the scene of roaming buffalo herds in the late 1870's, but as the herds were diminished by hunters, they were replaced by cattle on huge ranch spreads. In October of 1887, Jim Hill's, St. Paul, Minneapolis, and Manitoba Railroad, later renamed the Great Northern Railroad, reached what is now Glasgow, Montana. In the beginning, Glasgow was called siding 45, meaning it was the 45th siding west of Minot, North Dakota. Names of many towns along the new transcontinental route were picked out of the atlas, and Glasgow was no exception. The real era of homesteading began in 1913, when the Fort Peck Indian Reservation was thrown open to homesteading. Homesteaders by the hundreds flocked into the Glasgow land office to claim a section of land. Ranching and farming were the mainstay of Glasgow's economy until 1933, when the Army Corps of Engineers chose old Fort Peck as the site to build a large dam for flood control just 15 miles southeast of Glasgow. Needless to say this project

brought millions on new dollars to Valley County giving rise to many new businesses, and also bolstered the agricultural economy of the community.

The latest boon to the Glasgow area was the building of a multi-million dollar Air Force Base, which again brought millions of dollars to Glasgow, and inspiring new businesses, and industry.

Economic

The economy of Glasgow and Valley County today is based primarily on agriculture.

Glasgow Air Force Base, with its million dollar payroll, contributes substantially to the economy. Not only do the Air Force personnel spend in Glasgow, but the Air Force spends millions of dollars annually for construction purposes. But now that the Air Base has been ordered closed, the Glasgow area will have to rely on farming, ranching, and any industry that remains to uphold the community's economy

The construction of a nursing home will add to the community's economy in construction dollars, and in payroll dollars, with the several new jobs it will create.

Social

For a community of 10,000 people, Glasgow has done quite well socially, primarily because of the progressive attitude maintained by local officials and businessmen.

Glasgow boasts one of the top ten school systems in the state; maintaining three Grade Schools, one Junior High School, and one High School. The Glasgow school district also maintains two Grade Schools, and a Junior High School at the Air Force Base.

Several times each year, Glasgow is the location of top entertainment. Such noted speakers as Paul Harvey have appeared in Glasgow, not to mention several community concerts each year.

Each year, organizations such as the Elks, Shriners, Kiwanis, and Jay Cees have conventions in Glasgow.

T A B L E 2.

CLIMATE DATA FOR GLASGOW, MONTANA													
Climate Condit.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.	Annual
Avg. Snowfall	5.5	4.2	.6.4	2.4	0.1	-	-	-	0.2	1.7	3.7	5.6	29.8
Avg. Percip.	.57	.46	.85	.96	2.24	2.81	1.40	1.17	1.13	.76	.51	.57	13.4
Avg. Temp.	8.0	11.8	24.5	44.2	54.9	63.6	70.5	68.2	56.5	43.8	27.4	14.4	40.6
Avg. Max.Temp	20.3	24.8	37.0	58.0	69.4	77.8	86.6	84.6	72.1	58.3	39.9	26.3	54.6
Avg. Min.Temp	-4.2	-1.2	12.0	30.4	40.4	49.4	54.4	51.8	40.9	29.2	14.8	2.4	26.7
High Temp.	62	63	81	90	98	109	113	110	100	89	76	62	113
Low Temp.	-56	-54	-45	-19	15	24	36	28	14	-8	-41	-47	-56
Prevlg Winds	W.	W.	W.	W.	W.	W.	W.	W.	NW.	W.	W.	W.	W.

site conditions

SITE CONDITIONS

Orientation

The site selected, Hoyt Park, is now owned and maintained by the city of Glasgow. It is bordered on the north by the Glasgow Civic Center and swimming pool, on the east by a flood retaining dike, on the south by Fifth Avenue South and the existing hospital, and on the west by Third Street South and the south side residential district. Views looking across the site are shown in pictures on the following pages, and keyed to the map of the site. A map of Glasgow shows the site in relation to the rest of the city. Also shown on the city map are clinics, doctor's residents, and other key buildings.

The key factor affecting the selection of this particular site, above all others, is it's location in relation to the modern well equipped hospital. Also playing a key role in the selection of the proposed site was its location in an urban area. This location will make it convenient for friends and relatives of patients to visit, and placing patients where they are able to fit into local activities helps them feel they are part of the community itself. Also reliable transportation is more readily available to churches, librarys, shops, and recreational facilities.

By placing the home close to the adjacent hospital; duplication of some special facilities will be avoided, such as x-ray and special lab facilities.

The building may be so oriented on the site, that a common service and parking facility may be used for the nursing home and the existing hospital. The hospital and nursing home should be provided for emergency use.

There is no distant view from the site, although the Milk River runs by, 300 feet to the east; a view of it is obscured by the flood retaining dike.

Traffic

No traffic patterns or counts are available, but the site, somewhat isolated from highways and the business district, should be free of traffic disturbances. The only traffic in this area is to the hospital and the residences located in the area.

Utilities

All utilities, including water, sewer, electricity, and telephone, are readily available on Third Street with the exception of gas which is underground across the back of the site. Water and sewer are buried in the street and electricity and telephone accommodations are run on poles across the street.

No special utility services will be required as far as sewer and water are concerned. It may be desirable to bring the electric and telephone services in underground.

Topography

Although no topographic map of the site is available, a preliminary survey made with a hand level showed only 18" variation in elevation between any two points on the site.

Vegetation

The site has many large permanent trees, hedges, and shrubs located on it. The location of all these plants is shown on the map of the site. The flat site is completely covered with domestic grass. It would be desirable to save all of the trees and shrubs and as much of the grass as possible when placing the building on the site.

Soil Analysis

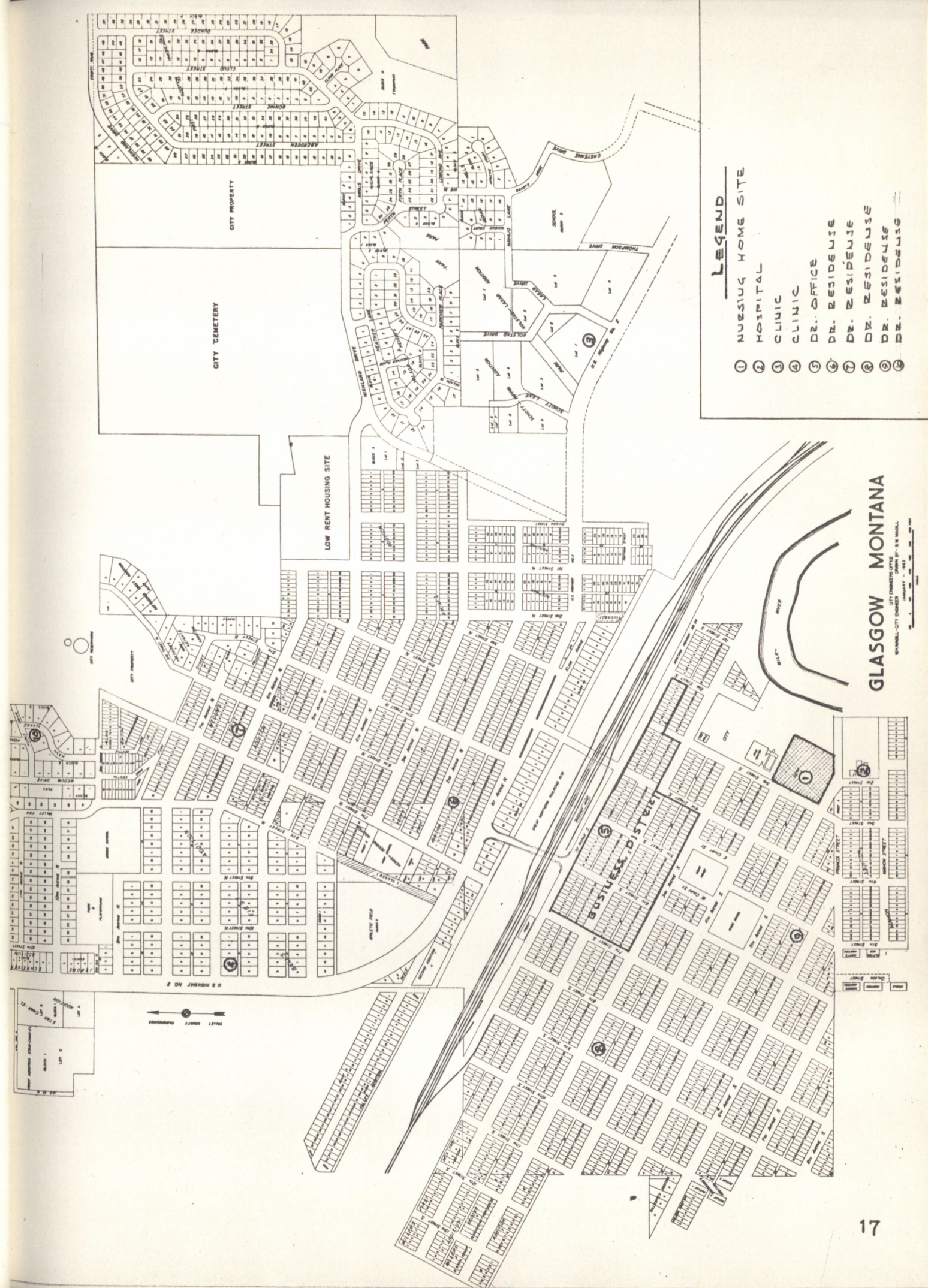
No soil analysis has been done on the site, but when the city drilled its water supply wells, they found a sandy clay to a depth of 80 feet and bedrock below that. The 80 feet of sandy clay is probably a result of the Milk River flowing by within 300 feet.

A soil testing laborator will have to balled in to make test boring and determine the load carrying capacity of the soil.

Zoning

The site is located in a class "A" zone, that is it is a quiet residential zone, free of the heavy traffic found in commercial zones and noise of an industrial zone.

The set-back requirements state that side set-backs be of a 5 foot minimum where bordering other property, 15 feet on side street, 20 feet on main street, and 10 feet on the back of the lot. Their requirements are special for this building.

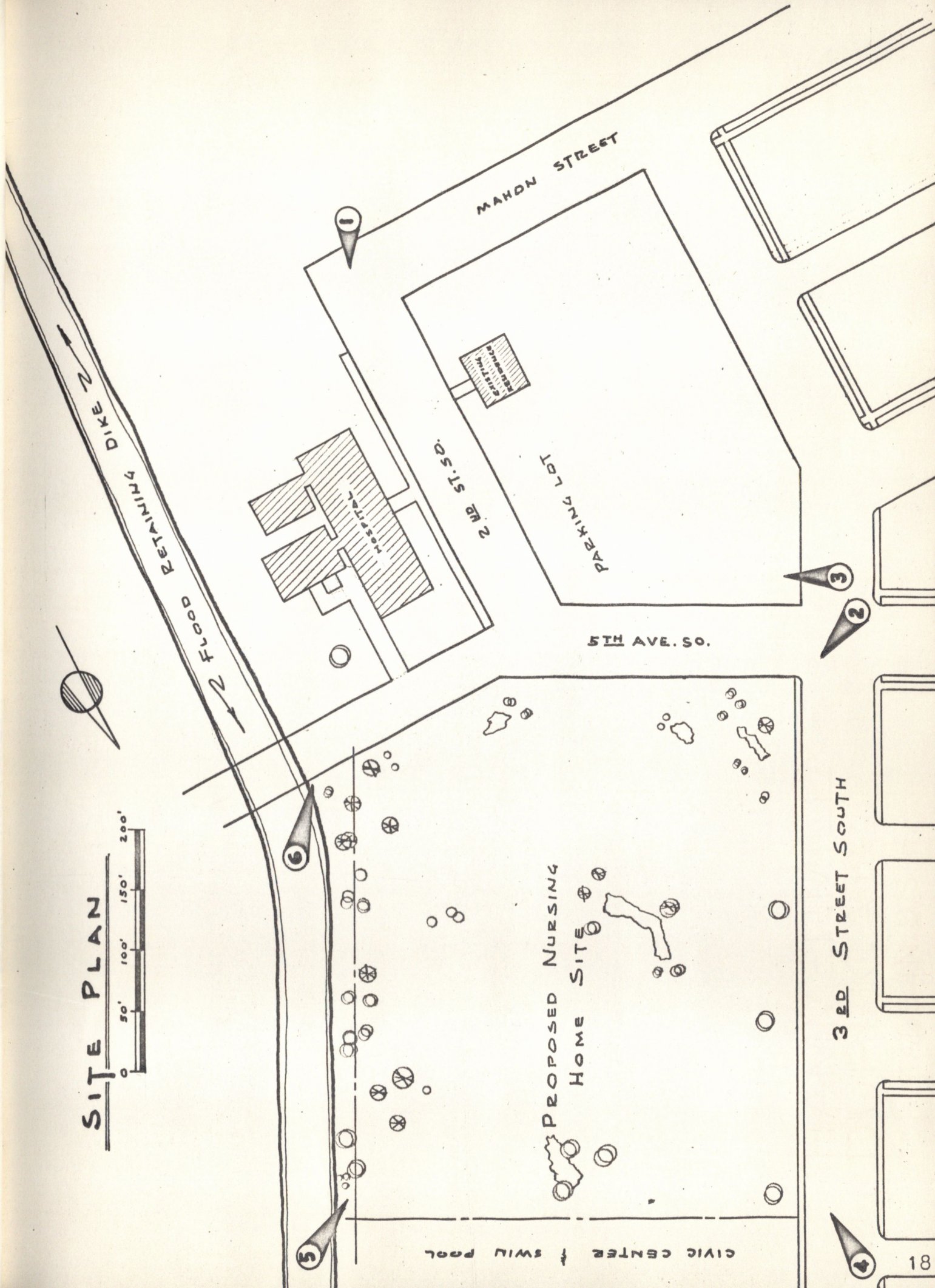
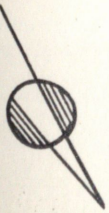
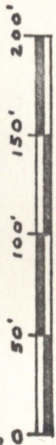


- LEGEND**
- ① NURSING HOME SITE
 - ② HOSPITAL
 - ③ CLINIC
 - ④ CLINIC
 - ⑤ DR. OFFICE
 - ⑥ DR. RESIDENCE
 - ⑦ DR. RESIDENCE
 - ⑧ DR. RESIDENCE
 - ⑨ DR. RESIDENCE
 - ⑩ DR. RESIDENCE

GLASGOW MONTANA

REYNOLDS CITY CHARTER
JANUARY 1933

SITE PLAN





View 1.



View 2



View 3 "



View 4



NOV 1965

View 5



NOV 1965

View 6

economic

considerations

ECONOMIC CONSIDERATIONS

Economic Fundamentals

The three economic fundamentals, cost, size, and quality react upon one another. Two of the factors can be predetermined, but there must be some freedom to adjust the remaining one to the others. However, this applies primarily to the initial cost, that is the cost of construction. Often over-looked, the continuing costs of operation, maintenance, and repairs are of importance, and deserve careful attention in the design stages.

Anything that can be designed into a plant which saves work on the part of the paid staff, reduces the consumption of fuel and power, or minimizes the need for refinishing and repairs, will pay dividends to the community for the useful life of the plant.

Materials and finishes should not be chosen on the basis of low initial cost alone, but rather for lowest over-all costs. In some of the larger institutions, particularly in cities, rather careful accounts are kept on the cost of operation, maintenance, and repairs. It is no accident that such institutions are also those which insist most strongly on the use of durable, high-quality materials and finishes.

Space Utilization

Productive spaces may be defined as those in which the required functions of the building take place. In a nursing home, this function is primarily patient care. Non-productive spaces, such as administration, food service, corridors, toilets, storage, and service spaces, are all essential to carrying out this primary purpose. They should be kept at a practical minimum, consistent with achieving the primary abjective of a quality care program.

Circulation spaces such as corridors, passages, lobbies, and entrances are obvious necessities, but ordinarily do little to further the care program.

Combination facilities often prove economical. Idle spaces, resulting from inability to fully schedule their use should be carefully considered in this connection. One of these combine facilities that has been used in nursing homes is the cafeteria-special-purpose room combination.

Uniformity

Repetition of the use of various components, such as structural members and windows, simplifies construction in many ways, resulting in lowered costs.. In the design stage, the adoption of a "planning module" often proves the way to con

the way to economical basic uniformity. The "planning module" is an imaginary building block of which the entire building is composed. The dimensions of the module are consistent in general through out the building, permitting repetition of a great many conditions.

Local Economics

Because of the high mill levy for Glasgow it would be difficult to pass an additional levy to provide funds for a nursing home at this time. In the case of Valley County's nursing home, Hill Burton funds are being sought; these are normally limited to 40% maximum of the cost of construction and certain equipment. Of the other 60%, the community is endeavored to raise \$235,000, and the balance will need to be borrowed or secured through bonds. The above figures are based on a preliminary estimated budget of \$715,000.

Economics of the Institution

The operating cost varies according to type of construction, arrangement for efficiency, and types of treatments available. Also a contributing factor is the rate of pay-scale found in various communities. The estimated operating cost of a nursing home in Glasgow has been set at between \$142,000 and \$144,000 per year.

Patients who reside in a nursing home pay for their own care, and if they are unable to provide their own funds, they must seek help through welfare programs.

Cost Comparisons

Two common cost comparisons are: 1. Cost per square foot
2. Cost per patient.

Practically every new nursing home is subjected to comparison with others already built, or in the planning stage. Many persons in making such comparisons, overlook the fact that such institutions have been built at different times and places, of various materials, and by different methods under various regulations, and often for differing purposes. The basic cost factors must all be computed and no comparisons of different nursing homes can be valid unless these factors are computed the same way in each case, and adjustments made for variations in certain qualitative factors.

Statistics furnished by the State Board of Health based on figures taken on a material scale for nursing homes already built, provided two methods of cost estimating. These two methods are cost per square foot and cost per bed.

Based on cost for building and fixed equipment these figures are: 1. \$19.25 per square foot
2. \$9,207. per bed.

Figures based on the cost of the project are: 1. \$23.06
per square foot
2. \$11,030. per bed.

The Marshall Stevens Evaluating Services also provides two methods of estimating cost, one of which gives examples of the type of materials that can be used to obtain the particular type of building for the cost is given. The types of building classified by construction are given in table 5.

The first figure based on cost per bed gives the following figures.

<u>TYPE OF CONSTRUCTION</u>	<u>COST</u>
A & B	\$10,500-\$15,000
C & D	\$8,500-\$12,000

The second method, suggesting materials, gives the cost of nursing homes in dollars per square foot and dollars per cubic foot, based on type of construction and quality of construction. These figures are given in table 6.

Table 5.

CLASSES OF CONSTRUCTION				
Class	Frame	Floor	Roof	Walls
A	Structural stl. columns and beams fireproofed with masonry, concrete, plaster, or other incombustible mat.	concrete or concrete covered steel deck, fire proof.	Formed concrete, precast slabs, concrete or gypsum on steel deck, fireproofed	Non-bearing cavity or curtain walls, concrete, metal, masonry, stone
B	Reinforced concrete columns and beams	Concrete or concrete covered steel deck, fireproofed	Formed concrete, precast slabs, concrete or gypsum on steel deck, fireproofed	Non-bearing cavity or curtain walls, stone, metal, masonry, concrete
C	Masonry or concrete load bearing walls, with pilasters. Masonry or concrete walls with steel, wood or concrete frame	Wood or steel floor joists, or slab on grade	Wood or steel joists, wood or steel deck	Brick or concrete block masonry, tilt up formed concrete

Table 6. Cost Data

Class	Type	Exterior	Interior	Lighting, Plumbing & mechanical	Heat	Cost/c.f.	Cost/s
A-B	Good	Face brick, good metal, and glass architectural concrete and some trim	Plaster, vinyl asbestos, some carpet and ceramic tile	Good lighting, alarm system & plumbing	Zoned A.C.	\$2.05	\$20.46
A-B	Average	Brick, concrete, metal and glass, little ornamentation	Plaster, acoustical tile, asphalt tile some carpet	Good lighting, alarm system & plumbing	Hot water	\$1.60	\$18.30
C	Good	Steel frame, good masonry, metal and glass, and some trim	Plaster, vinyl asbestos, some carpet, and ceramic tile	Good lighting, alarm system & plumbing	Hot water	\$1.71	\$17.06
C	Average	Masonry, concrete panels, little ornamentation	Plaster or dry-wall, acoustical tile, asphalt tile	Adequate lighting and plumbing	Forced Air	\$1.54	\$15.5

aesthetic
considerations

AESTHETIC CONSIDERATIONS

There are three general areas of aesthetic consideration which are involved. They are:

1. Relation of the patient to the nursing home
2. Creation of an atmosphere conducive to good spirits and high moral.
3. Expression of materials and character.

Relation of Patient to Nursing Home

The building should be designed so that each individual patient feels he is a part of the institution. Since each person may have a different disability, and will therefore be an individual and not part of a large group, each must experience human scale. One of the problems with sick or disabled persons is the sensation of loneliness and insecurity in relation to the rest of the world. There should be a basic concept or form to give the patient a sense of security and belonging. This sense of security and belonging can help overcome the patients lonely depressed feeling and enable him to live a more pleasant life and possibly aid in a speedy recovery.

Creation of an Atmosphere

It may be advantageous to have large areas of glass to

let in light and to let the patient take advantage of a well planned view, but at certain times the glare and heat from the sun could be a problem. If the view warrants the use of glass, then probably some system of sun control must be considered.

The building should express the honest use of materials. The fact is, that to establish a strong character and aesthetically fine design does not necessarily increase the cost but is dependent on the sensitivity of the designer. The material should be warm and cheerful, yet; they should be permanent and durable in color and character.

Creativity, imagination, invention - these are essential to design of any good building regardless of what the function of the building is to be.

Expression of Materials and Character

Glasgow has no strong defined character in its buildings and the choice of materials has been restricted by transportation facilities. There are no local materials except concrete and the cement for that must be imported to the area. The closest manufacturers of materials would be in the Billings and Great Falls area, both of which are 300 miles away. The choice then is not one of conformity to local character or restriction of materials, but one of relation to site, sensitive honest expression

of materials, and expression of the mood that is being created.

Such functions as patients' rooms, cafeteria, and recreation room should express an individual character because of their varying function, yet there should be an overall unity. This unity can be accomplished through unity of materials and similar expression of structures, details, and ornament.

function &
building program

FUNCTION OF THE BUILDING AND BUILDING PROGRAM

Before discussing function, it would be appropriate to look at the definition of a nursing home, which has been rather generally accepted, it is as follows:

A nursing home is a facility for the accommodation of convalescents or other persons who are not actually ill, and not in need of hospital care, but who require skilled nursing care and related medical services.

Ideally, the nursing home should be planned according to community needs, and provided with facilities and services to accommodate the specific health care requirements of the kind of patients for which the institution is intended.

To assume the nursing home's functioning as a community health facility requires planning in which provision is made for services that are essential to an over-all health program, adequate patient care, and the proper and economical utilization of health facilities in the community. For purposes such as these, plans for coordination of the nursing home's services with those of other health agencies in the community, are of prime importance.

Patient Needs

The nursing home must be capable of providing skilled nursing care and related medical services. These services

should be a part of the total community program including prevention and early diagnosis, treatment and follow-up and rehabilitation. All such services in the home should be under the general direction of persons licenses to practice medicine or surgery in the state. Personal physicians should be available to visit the patients periodically and should be on call for emergency care.

Affiliation with a hospital carries with it certain advantages. Through this arrangement better medical care is possible through the use of the medical staff and the diagnostic and treatment can be immediately transferred to the hospital for treatment and, likewise, long-term patients can be easily moved when hospital services are no longer required.

In addition to coping with the medical aspects of long-term care, the nursing home must be prepared to help the patient meet his problems in a way which preserves his right to maximum self-determination, privacy of person, and personal dignity. Thoughtful planning is required to provide the necessary facilities, properly arranged, to carry out the complete programs of nursing homes as well as to safeguard the individuality and basic rights of the patients.

Unlike most patients in general hospitals the patients in

nursing homes are predominantly long-term residents. They have left their homes for an extended period of treatment and to all intents and purposes, have moved to a new home, usually for a substantial period of time. The nursing home must not only supply the necessary medical and nursing care directed to the improvement and maintenance of health, but must be able to meet the patients' needs for affection, emotional security, social contacts, recreation, spiritual devotion, education, rehabilitation and congenial work or creative activities.

Requirements of Physical Plant

The nursing home above all should approximate the homelike atmosphere as closely as possible. A somber, institutional character must be avoided.

One means of approach to a homelike quality is to keep the nursing home as small as is consistent with the economical maintenance of essential services and quality of care.

Homes with capacities of 25-60 beds are considered to be of the most practicable size. This range has advantages from the administrative standpoint in that small units are easier to operate to give individualized service.

Regardless of the size initially selected, consideration should be given to the possible need for future expansion.

Such expansion should be capable of being accomplished expediently, economically and with as little interference with the operation of the nursing home as possible.

It is recommended that nursing homes be of only one story. Several advantages are inherent in the use of the one-story scheme. Stairways and elevators are eliminated; the movement of patients, staff, equipment and supplies from one part of the building to another is considerably eased; direct access from indoors to outdoors is easier, and the danger from fires is considerably reduced. An informal, domestic character is much more readily achieved in a one-story building, and finally, one-story buildings generally lend themselves more readily to future expansion than multistory buildings. A ceiling height of 8 feet is generally considered to be minimum in patient areas.

It should be possible to minimize institutional character in nursing homes through open informal planning, taking advantage of natural light, air, outlook and other outdoor activities, and through the provision of generous areas for patients' lining and recreation. Color, decoration, harmonious furnishings and landscaping, thoughtfully used, can be most valuable in achieving informality. Soundproofing, acoustical treatment, light and temperature control, agreeable lighting, comfortable furniture, and other amenities relating to the patients' comfort should

be installed.

Exterior Design

The exterior of the building should fit into the topography and landscaping of the site, should be pleasant to look at, and domestic in character. Landscaping usually enhances design and setting, and, in addition to planting, should include terraces, recreational ground and garden areas.

The main entrance should be inviting to approach and should lead to a public lobby designed and decorated to give a pleasing first impression and gain the confidence of patients, their families and visitors. The use of steps or steep ramps leading to entrances should be avoided.

Interior Arrangement

The use of wide corridors, introduction of natural light to corridors where possible, keeping corridor lengths short, and eliminating dark or congested areas are all desirable features. It is not considered necessary, as is the case in general hospitals, to keep visitors' and patients' areas and traffic isolated and to exclude patients from so many areas of the buildings. Since the idea is to make the patient feel at home, he should feel free to meet his visitors where he likes, to mix at will with other patients and the visiting public, or at least to

observe without restriction their coming and going. He should be allowed the freedom of the building or grounds as long as it does not interfere with the actual well-being of himself or other patients, or seriously detract from the efficiency of operation of the home.

Sufficient space to accommodate wheelchairs should be allowed in dining rooms, recreation rooms, prochess, toilets, baths, telephone booths and the like. Doors to patients' rooms, treatment rooms, recreation rooms should be at least 3 feet 8 inches wide (3 feet 10 inches preferably). All other doors through which wheelchairs will pass should be at least 3 feet wide. Such furnishings as dressing tables, dining tables, worktables, desks, lavatories and drinking fountains should be designed for the accommodation of patients in wheelchairs.

It is important that the window sills in areas used by patients be low enough so that the view of the patient in the wheelchair is not interfered with.

Administrative Area

Lobby ----- 800 sq. ft.

The public lobby need not be very spacious because traffic will be minimal. Some waiting space should be provided in or off the lobby.

- Offices-----
1. One administrative office-200 sq. ft.
 2. One consulting office-----150 sq. ft.

Office space must be provided for administration, medical records, general business, admitting, social service, medical and other consultation. Preferably, offices should open off the lobby and waiting area. Since the services of physicians and social service workers will, in most cases, be on a part-time basis and admitting will not be the continuing process common to the general hospital, multiple use of at least one of the offices seems indicated.

- Toilets & Telephones---
1. One men's toilet-----70 sq. ft.
 2. One women's toilet-----90 sq. ft.
 3. Two telephone booths---24 sq. ft.

Public toilet facilities, and a telephone booth for both visitors and patients, should be provided near the lobby. The telephone booth must be large enough for the use of a patient in a wheelchair.

Ancillary Facilities

The medical care program of nursing homes should keep pace with advances in medical science. The extent of facilities for these services will vary widely, depending upon the administrative policy, affiliation with the hospital and other medical services in the community, and the size

of the nursing home.

A minimum of one multipurpose consultation room should be provided. This room would be used by physicians for consultation with patients, nursing staff, and relatives of patients. It may also be used by the nursing staff, visiting medical specialists, social workers, clergy and volunteers.

Physical Therapy---- Treatment room-400 sq. ft.

Physical therapy is an essential service in the treatment of some types of long-term illness and disabilities. As a minimum, massage, thermotherapy and hydrotherapy treatments may be given in the medical treatment room. This limited type of program would require a mobile arm, leg, and hip therapy tank, infrared lamp, and other thermotherapy equipment as required by the program.

A generous sized storage closet located adjacent to the treatment room should be provided for the storage of this equipment when not in use. The patients' rooms, corridors and one of the day-rooms may be used for physical therapy exercises. The day-room used for physical therapy exercises may be provided with papallel bars, recessed in the wall so that they can be concealed when not

in use. A mirror should be secured to the wall between the bars. An additional wall mirror would be desirable. Wall space and anchors may be provided for a shoulder wheel, shoulder ladder and pulley weights. An anchor in the ceiling may also be provided to secure a head sling. A closet located adjacent to the day-room for storage of equipment is desirable.

Occupational Therapy-----

Occupational therapy of a functional nature is also essential in the treatment of some types of disabilities and important as recreational therapy for long-term patients. As a minimum the patients' rooms, dayrooms, and recreation room may be used for this type of therapy. Specialized major pieces of equipment would not be required for this kind of program.

Recreation Area--- 1000 sq. ft.

Social contact and recreation are so much a part of making people feel emotionally secure and at home that facilities for those activities should be particularly well planned so that they can become the social and recreational hub of the nursing home.

The recreation room should be as centrally located as possible with respect to the patients' bedrooms. Location near the lobby would be convenient for those patients who would enjoy viewing the activities in and around the main entrance. It would also be convenient for visitors and in many cases for supervision of the nurses' station. The recreation room should be ample in scale, well lighted and decorated, and arranged to serve the recreational and occupational needs of the various patients. It should also be convertible to use for religious services. It should look out on scenes of interest and activity and, if possible, have direct controlled access to outdoor recreational areas. An additional, smaller room would be desirable for those patients who like a less active environment than that found in the main recreation room. Furnishings for recreation rooms should be carefully chosen to meet the needs of the patients and any requirements of programs run by the home. They could include attractive draperies, easy chairs and couches, reading lamps, radios, television sets, phonographs and record storage, bookshelves, occasional tables, worktables and chairs, and any other specialized furniture of sturdy construction which cannot be easily over-turned. Storage space for equipment should be provided adjacent to the recreation room.

Dining Area---

1600 sq. ft.

It is recommended that the dining space for patients be located adjacent to the recreation room and separated by a folding partition. Dining space should be provided at the rate of 25 square feet per bed for 75% of the total number of beds. Provision of 25 square feet per person is considered minimal for this type of patient. The nursing home program should reflect its attitude toward the use of the dining area. For example, if the best use of this space is to made, patients will be encouraged to eat in the dining room as regularly as possible for reasons of companionship. The dining room can also be used for serving between-meal nourishments or afternoon tea to enhance the home-like atmosphere. If it is adjacent to the recreation room and separated by folding partitions, it can also be used for large group meetings such as chapel service, movies, or speakers. A staff dining room should be provided. Staff members, because they are in constant contact with their patients in a nursing home, will benefit by having a quiet place of their own to eat their meals. They will eat in shifts and therefore the seating capacity need not provide for the entire staff. The total area for recreation, occupational activities, and dining should not be less than 50 square feet per bed for 75% of the bed count.

Patients' Laundry Facilities--- 100 sq. ft.

Some patients in nursing homes will wear their own clothing and will have personal items of clothing which they will not wish to send to a commercial laundry. The provision of laundry facilities for the use of patients, particularly women, will be an important part in the program of helping the patients feel useful and at home. Laundering also might well be a part of the activities of daily living which are taught to some patients. Minimum equipment would consist of an automatic washing machine and dryer, laundry tub, iron, and ironing board. If it is the policy of the nursing home to launder certain items of patients' clothing such as shirts, dresses and underwear, facilities for this type of service could very well be included in the patients' laundry.

Nursing Unit

The nursing unit, because of its size and the necessity for making it compact to facilitate a concentration of nursing service, is most likely to become institutional in appearance and character. The patients' bedroom should approach the domesticity of bedrooms at home and should afford all possible amenities for intimate living.

The nursing unit should be located conveniently for effective patient care and supervision by the nursing staff, ease of service from kitchen and storage areas, facility of movement between bedrooms and recreational areas, and for patients' visitors. Orientation of the nursing unit should take into consideration not only the basic factors of light and air, but also those of view, patients' interests, and ease of access to outdoor areas.

It is the general feeling that patients' bedrooms should contain no more than two beds. Careful programming will determine individual home needs for an occasional bedroom for four. No ideal ration of one-bed and two-bed has been established. Two-bed rooms are adequate for the needs of most patients. However, one-bed rooms are needed for medical isolation and for personality problems and at least two single bedrooms should be provided.

It would be desirable to have one of the single rooms finished to provide maximum security and safety for the occasional disoriented patient. The room should be acoustically treated, and structural projections, sharp corners and exposed piping should be avoided. Detention screens on the windows of this room are recommended.

Patients' Bedrooms---- 7,200 sq. ft.

Bedrooms should be large enough to allow for movement of patients on wheelchairs, walkers canes or crutches, comfortable arrangement of furniture and

for some graciousness of living and entertainment of visitors. A highly desirable room plan is one which permits the placing of each bed at a window. In multiple bedrooms privacy must be provided by proper placement of screens or curtains. Nurses call, night lights and outlets should be provided in all bedrooms. Telephone jacks in patients' rooms are desirable and should be included wherever economically feasible. Gas outlets should not be permitted. Minimum floor areas of 100 square feet per bed in rooms with two or more beds and 125 square feet in one-bed rooms should be provided. Beds should be placed at least 4 feet apart with a minimum of 3 feet from adjacent walls, wardrobes or other fixtures. Doors to patients' rooms should be at least 3 feet 8 inches wide and should swing into the room. It is desirable that all patients' beds be of the variable height type. Where cost prohibits, at least half should be variable height and the remainder of the standard convalescent bed height with gatch springs. Suitable devices should be used to prevent movement while the patient is getting in or out of the bed. Comfortable chairs should be provided for each patient and for visitors although they should not be so deep that patients would have difficulty getting out of them. Chairs and tables which can

be easily tipped should be avoided. Each bedroom should have a lavatory to encourage self-care and personal hygiene and for convenient use by the nursing home staff in care and treatment of the patient. Nursing home patients are long term, are often up and active, indoors and out, for at least part of the time and tend to accumulate personal possessions. They need more clothing than most hospital patients. To provide for these items, ample storage space is required in the bedrooms. Clothes rods and shelves should be adjustable for the convenience of wheelchair patients. Sliding doors with locks are desirable on lockers. Additional drawer and shelf space should also be provided.

Central Storage for Patients' Possessions-100 sq. ft.

In addition to the extra space provided in the bedrooms for personal possessions, conveniently located storage space should be provided for bulky possessions such as trunks and other luggage, seasonal changes of clothing and like.

Toilet Facilities----

800 sq. ft.

The provision of toilets adjacent to each patients' bedroom is recommended for the convenience of both patients and staff. Adjacent toilets have thera-

peutic value and also save the time of the staff in the disposal of bedpans and urinals. For this purpose a bedpan flushing attachment should be installed at each water closet. The toilet rooms should be large enough to permit the easy entrance of wheelchairs and transfer of patient from wheelchair to water closet. Continuous grab rails should be provided on the walls adjacent to the water closet assist the patient in this transfer. The door of the toilet should be 3 feet wide with metal kick-plates on both sides and should swing out. An in-swinging door could be blocked if the patient should meet with some accident inside the toilet and fall in front of the door. Central toilet facilities are acceptable but it is felt that the saving effected by their use does not offset the resulting inconvenience. If central toilets are provided, they should be on the basis of one water closet to each five beds. These facilities would be needed for each nursing unit and should be located as centrally within the unit as possible. Toilet stalls should be 3 feet wide with grab rail, curtain at front instead of door, and no return at face of stall. At least one toilet arranged to facilitate the training of patients in maneuvering from wheelchairs to water closets should be provided near the center of each

nursing unit. Such toilets should be large enough to accommodate wheelchairs and to provide room for staff members to instruct patients in proper technics. Space is required in front and at least on one side of the water closet for the movement of the wheelchair and instructor.

Bath Facilities----- 1000 sq.ft.

Central facilities should be created where most convenient to serve all patients. Bathrooms should be large enough to permit maneuvering of patients in wheelchairs. Bathtubs should be set on the floor. It is recommended that the tub be accessible from both sides and one end for the convenience of both patients and staff. Showers should be about 4 feet square and should have handrails and curtains. Flexibility in the use of showers can be provided through the installation of two shower heads in each shower with the heads valved for independent use. One of the heads should be placed in a low position for the use of a seated patient; the other to be located normally. The floors of shower stalls and adjacent areas should be flush and without an intervening curb but may be slightly dished toward the drain. Water at all fixtures which are used by patients should be thermostatically controlled to provide a temperature of

not more than 110° F. at the tap. Additional self-help equipment used for toilet and bathing activities such as seats, benches, tubs and mats is available commercially. Emergency call buttons should be provided in all toilet and bath rooms.

Nurses' Station----- 80 sq. ft.

A nurses' station will be required for the nursing unit. It should be located to conserve nurses' time and steps and to afford the most effective control of the nursing areas. Equipment should include the minimum necessary for nurses' call, charting and storage. A medicine preparation and drug storage room opening off the nurses' station should be provided.

Treatment Room----- 150 sq. ft.

A treatment room should be provided for use by physicians to perform complicated examinations and treatments which cannot be carried out in the patient's room. It should be centrally located with respect to patients' rooms. In most cases, the treatment room can be of the minimum size required to accommodate a treatment table, lavatory, instrument table and storage cabinets.

Utility Room----- 100sq.ft.

The utility room should be situated to conserve nurses' time and steps, preferable close to the

nurses' station. Such facilities should consist of a clean and dirty area and be large enough to contain a small electric pressure sterilizer, non-pressure utensil sterilizer, with booster; clinical sink, double compartment sink, with drainboards, counter and storage cabinets.

Stretcher and Wheel-Chair Storage----- 60 sq. ft.

A storage area for stretchers should be located in the general area of the nurses' station. The patients' bedrooms should be large enough to allow the patients to keep their wheelchairs in their rooms.

Linen Supply and Equipment Storage--- 100 sq. ft.

Linen and supply storage should be provided. Additional storage space would be required for equipment especially needed for this type of institution, such as bedside occupational activity equipment, books, crutches, and the like.

Service Department

Kitchen----- 500 sq. ft.

The kitchen should be located so that it can easily serve the patients' bedrooms. It should also be convenient to the service entrance for food deliveries

and garbage and trash collection. It is recommended that the dishwashing area be separated from the kitchen and that it be adequately lighted and ventilated for desirable working conditions. Kitchen layout should be based on efficient work flow. Adequate space and facilities for storage, preparation, serving and proper sanitation should be provided. Equipment such as ranges, refrigerators and garbage grinders should be heavy duty quality to withstand constant and regular use. Size of pots and pans should be standardized to the size of ovens, refrigerators and shelving in order to bring about the greatest utilization of equipment.

Janitor's Closet---- 70 sq. ft.

The number of janitor's closets will vary with the size of the home. At least one janitor's closet would be required for the smallest.

Boiler Room---- 500 sq. ft.

In planning the boiler room, consideration must be given to the heating function, heating domestic hot water, and the furnishing of steam if required for sterilizing, cooking and laundry. A workbench to handle general repairs should be included in the boiler room. The provision of a separate shop room may be practical in some cases.

Employees' Facilities----- 400 sq. ft.

The minimum facilities required for employees would be a locker room and toilet for each sex.

Central Storage----- 1000 sq. ft.

For central storage a minimum of 15 square feet per bed should be provided and 20 square feet per bed is recommended. Central storage should be near the delivery entrance, convenient to all areas of the home where internal deliveries of supplies are made. Storage should be provided for outdoor maintenance and recreational equipment and outdoor furniture.

Patient's Safety and Comfort

Because of their feebleness and infirmities, it is difficult to evacuate patients in nursing homes and the need for adequate fire prevention and fire protection measures cannot be over-stressed. The buildings must have slip-resistant floors, corridors with handrails on both sides, handrails in water closet enclosures, baths and showers and flush thresholds. Steps or ramps, to take care of minor changes in floor elevation, or ramps from floor to floor, are hazards which should not be built into nursing homes. Where unavoidable, short flights of steps with platforms between are safer than long flights. Because of the activity of patients in wheelchairs, on canes and

crutches, the floors, walls, doors and trim of nursing homes will be subjected to heavy wear. Materials that will stand up under such usage with a minimum of maintenance should be specified despite higher costs.

Finishes and Materials

A durable and attractive wainscot should be provided for all interior wall surfaces for protection against damage by wheelchairs, stretchers and carts. The use of color for interior finishes and equipment is, of course, highly desirable. Paint used should have high qualities of durability and ease of cleaning and should be easily matched. Floor materials in areas used by patients must be slip-resisting. For dry areas, a resilient floor material should be selected on the basis of its slip-resistant qualities and its resistance to permanent indentation resulting from concentrated loads of equipment. Heavy duty prepolished vinyl flooring has proved satisfactory for this use. A hard tile floor with slip-resisting surface may be specified for toilet and wet areas. Other finishes and materials should be similar to those recommended in general hospitals.

Heating

The heating system should be designed to provide a temperature of 75° F. for all areas used by patients. The

avoidance of drafts and cold spots is of particular importance. The following factors must be considered in designing a system for this type of facility: avoidance of drafts, maintenance of constant uniform temperatures, odor control, and reduction of the spread of respiratory infections. A hot water system of ceiling panel, base-board or convector design will overcome the objectionable factors and will probably best provide constant uniform temperatures, ease of regulation and zoning, and quietness of operation with low operating and maintenance costs.

Air Conditioning

Air conditioning for comfort is fast becoming commonplace in American life. This familiarity with air conditioning has led to its acceptance as standard residential equipment in many localities. Medically it is beneficial to certain clinical conditions and has merit as a psychological factor in therapy. Climatic conditions will dictate its use in most localities although common usage in other areas may set a pattern which cannot be ignored.

As abrupt temperature changes are not recommended in the care of patients, air conditioning systems where installed should serve all areas of the hospital used by patients.

Where circulated air is used as the medium of heating and cooling, the system design should incorporate filters to control odors and reduce the possibility of the spread of respiratory infections. In colder climates, air systems may require supplementation with direct radiation.

Emergency Power System

For protection against interruption of power service, a minimal emergency power system should be provided in all nursing homes. The system should provide lighting for all exits, exit direction signs, stairs, corridors in patient areas, nursing stations and passageways used for evacuating the building, and power for fire alarms and nurses' call systems.

The source of emergency power may be either a battery or generator, or a second utility service. The emergency service should be connected through an automatic transfer switch, interlocked to prevent normal and emergency service from being connected together through the operation of the switch.

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