

LIBRARY
Montana State University
BOZEMAN

7378
13

A MULTI-STRUCTURE FOR MOUNT ELLIS ACADEMY
BOZEMAN, MONTANA

Part I

Undergraduate Thesis in Architectural Design

By 441

Seiss Ertel Wagner, Jr.

Submitted to the School of Architecture as partial fulfillment of the
requirements for the degree of Bachelor of Architecture

at

Montana State University

Bozeman, Montana
March, 1969

~~720.6~~
~~119.6~~
W124

CAU
1192540

LETTER OF TRANSMITTAL

Box 603
Bozeman, Montana
March 15, 1969

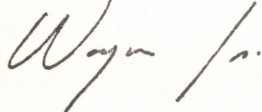
Mr. James D. Gough, Jr., Director
School of Architecture
Montana State University
Bozeman, Montana

Dear Sir:

I am submitting this research data as partial fulfillment of the requirements of an undergraduate thesis.

I have chosen this project to explore because it involves more than just the architectural study of function and form. The design for Mount Ellis Academy is more than just a building for protection from the elements and an environment for education. Mount Ellis Academy and the beliefs of the Seventh-day Adventists are a total and all encompassing way of life. It is this way of life that the design of Mount Ellis Academy should express.

Respectfully submitted,



Seiss Ertel Wagner, Jr.

ACKNOWLEDGMENTS

I am deeply indebted to Mr. John Sipkens, M. A., principal of Mount Ellis Academy and Mr. Arthur W. Robinson, M. A., treasurer of Mount Ellis Academy, both of whom have been most generous with their contributions of time and information without which this project would have been impossible. I would also like to express deep gratitude to my wife, Elizabeth, for her untiring and efficient help in preparing this manuscript.

PROLOGUE

"A man may know all about the rocks and his heart remain as hard as they. He may know all about the winds and be the sport of passions as fierce as they.

"He may know all about the sea and his soul resemble its troubled waters, which cannot rest.

"A man may know how to rule the elements, yet fail to have dominion over his own life.

"He may know how to turn aside the flashing thunderbolt, but not the wrath of God from his own guilty head.

"He may know all about the stars and be as a meteor whose end, after a brief and brilliant career, is to be quenched in the eternal night."

"According to the Seventh-day Adventist philosophy of education, the acquisition of knowledge is vital, but the formation of character is even more so. 'Character building is the most important work ever entrusted to human beings.'" (14, 1966:21-2)

CONTENTS

SEVENTH-DAY ADVENTISM

A Brief Outline of Seventh-day Adventist

General	2
Beliefs	2
Organization	3
History	4

SPECIAL CHARACTERISTICS OF EDUCATION

Scope of Education Work

General	5
-------------------	---

Philosophy of Education

General	5
Bible Teaching and Study	6
Study of Physiology	7
Temperance and Dietetics	7
Recreation	9
Manual Training	10
Education and Character	12
Methods of Teaching	13
Deportment	14
Relation of Dress to Education	14
The Sabbath	15

DUTIES OF A STUDENT

Philosophy of Work Education

General	16
Student Employment	16
Academy Life	16

DESIGN CONSIDERATIONS

Influences of Seventh-day Adventism

General	19
-------------------	----

CONDITIONS CREATING A NEED

Existing Conditions

General	21
Necessity	21

SITE AND LOCAL CONDITIONS

Site Conditions

General	24
Adjacent Surroundings	24
Topography	24

Soil Analysis	25
Zoning Regulations and Code Requirements	25
Availability of Utilities	25
Local Conditions	
General	26
Temperatures	26
Killing Frost	27
Precipitation	27
Winds	27
Sun Angles	28

FUNCTIONAL REQUIREMENTS

Building Description	
General	30
The School	
Chapel	30
Auditorium	31
Gymnasium	31
Playing Fields	32
Administrative Offices	32
Teachers' Workroom	33
Student Offices	33
Bookstore	33
Classrooms	34
Laboratory rooms	34
Industrial Arts Rooms	35
Library	37
The Dormitory	
Students' Rooms	37
Bath Facilities	38
Student Chapels	38
Student Kitchens	38
Student Lounges	38
Student Laundries	39
Infirmarys	39
Trunk Room	39
Ski Storage Rooms	39
Dean of Boys' and Dean of Girls'	40
Staff Apartments	40
Dining Room	40
Kitchen	40
Laundry	42
Barber Shop	42

SUMMARY

REFERENCES

Miscellaneous

Guest Apartments	42
Garage	43
Parking	43
Roads	43
Fire Protection	43
Power Plant	44
Janitor Closets	44
Public Toilets	44
Maintenance Shop	44

The Farm

General	44
Farm Machinery Storage	45
Farm Machinery Repair	46
Gasoline Storage	46
Feed Storage	46
Calf Barn	46
Greenhouse	46

AESTHETIC CONSIDERATIONS

Pertinent Influences

Traditions	48
Form	48
Scale	49
Materials	49
Color	49
Symbolism	50

ECONOMICS

Building cost

General	52
Cost Estimates	52
Financing	53

PROGRAM

Sources

General	56
-------------------	----

Exit Ways

General	57
-------------------	----

Square Footages

The School	58
The Dormitory	59
The Farm	60

SUMMARY	62
-------------------	----

REFERENCES	64
----------------------	----

SEVENTH-DAY ADVENTISM

WHAT IS SEVENTH-DAY ADVENTISM?

Seventh-day Adventism is a Protestant sect that relies on the Bible as its only authority. To believe that the second coming of Christ is approaching and that it will be on the seventh day of the week, Saturday. The Seventh-day Adventist membership includes more than 1.5 million members, with an additional two million younger members in Sabbath Schools.

Seventh-day Adventists believe that Christ is the second person of the Godhead, and that His birth and essential life of Christ are: 1) His virgin birth, 2) His sinless life on earth, and 3) His atoning death for man. They believe in His bodily resurrection to heaven and in His ultimate return to earth at an undisclosed time. The Seventh-day Adventists emphasize the personal and imminent nature of this second advent of Christ. They believe that the prophetic outlines of the Bible are approaching their climax. An end to the present age impends.

Seventh-day Adventists believe that SEVENTH-DAY ADVENTISM faith in Christ and that good works and obedience are a result of salvation, rather than a means to it. They regard that in mortality will

SEVENTH-DAY ADVENTISM

A BRIEF OUTLINE OF SEVENTH-DAY ADVENTISM

General

Seventh-day Adventism is a Protestant sect that relies on the Bible as their sole rule of faith. They believe that the second coming of Christ is approaching and they observe the seventh day of the week, Saturday, as the Sabbath. The current total membership includes more than 1.5 million baptized adults with an additional two million younger members in Sabbath Schools.

Beliefs

Seventh-day Adventists believe that Christ is the second person of the God-head. Other beliefs, basic and essential, of Christ are: 1) His virgin birth, 2) His sinless life on earth, and 3) to His atoning death for man. They believe in His bodily resurrection to heaven and in His ultimate return to earth, at an undisclosed time. The Seventh-day Adventists emphasize the personal and imminent nature of this second advent of Christ. They believe that the prophetic outlines of the Bible are approaching their climax. An end to the present age impends.

Seventh-day Adventists believe salvation is to be found solely through faith in Christ and hold that good works and obedience are a result of salvation, rather than a means to it. They regard that immortality will

be bestowed upon the righteous by Christ at His second coming. Evolution of man is a rejected principle. The Sect believes in the necessity of spiritual regeneration of man's faith and in the practice of adult baptism by immersion. Seventh-day Adventists stress healthful living, total abstinence from alcohol and tobacco, as well as from certain meats and foodstuffs. Their diet is basically vegetarian in nature.

Organization

Seventh-day Adventists follow a representative form of church government. There are more than 14,000 local congregations, each electing its own deacons and church officers.

In addition to free will offerings, members practice tithing for the support of the ministry. Their collective offerings exceed \$127,000,000 annually.

Around the world, 4,900 schools are maintained by the Seventh-day Adventists. In North America, they operate eighty academies, twelve colleges, and two universities. They have 128 sanatoriums and hospitals, and 165 clinics.

Because the Seventh-day Adventists believe their special mission to be the complete preparation of all mankind for Christ's return, they are deeply involved in missionary work throughout the world. Their word is carried internationally over 1,000 radio stations and about 231 television channels. They operate forty-three publishing houses and issue over 300 periodicals yearly.

History

Seventh-day Adventism originated in the early nineteenth century with a world wide awakening of the Bible prophecies that herald the approaching end of the age with the second advent of Christ. This movement reached its climax in about 1840 through 1844. But its offspring, the Seventh-day Adventists, have continued to be a dominate and inspiring force in the Protestant missionary movement today.

The largest school system in the United States is that of the Roman Catholic Church, second the Lutherans, and third, the Seventh-day Adventists. However, on a per capita basis, Adventists lead with one teacher in their schools for every 7.3 church members. Roman Catholics are second, with one for every 9.4 members.

PHILOSOPHY OF EDUCATION

General

In the 1840's Ellen G. White wrote in her book, Education, "The school-room should be just as much as is the church building." "True

SPECIAL CHARACTERISTICS

OF EDUCATION

SCOPE OF EDUCATIONAL WORK

General

Seventh-day Adventist schools have become an indispensable part of the Denomination's world program of missionary work.

In the entire world, the Church has 4,900 schools, staffed with 10,500 teachers and 300,000 students enrolled. In addition, it operates 2 universities, and 450 colleges and secondary schools involving 5,000 teachers and 75,000 students. The Church has an investment of \$150,000,000 in educational buildings and equipment. In the United States, Adventists have three times as many college graduates on a percentage basis as does the population in general.

The largest parochial school system in the United States is that of the Roman Catholic Church, second the Lutherans, and third, the Seventh-day Adventists. However, on a per capita basis, Adventists lead with one student in their schools for every 7.3 church members.

Roman Catholics are second, with one for every 9.4 members. — Source?

PHILOSOPHY OF EDUCATION

General

In the 1890's, Ellen G. White wrote in her book, Education, "The schoolroom is needed just as much as is the church building." "True

education means more than the pursual of a certain course of study. It means more than a preparation for the life that now is. It has to do with the whole being, and with the whole period of existence possible to man. It is harmonious development of the physical, the mental, and the spiritual powers. It prepares the student for the joy of service in this world, and for the higher joy of wider service in the world to come." (1, 1966:25)

The following sections will present a brief outline of the educational philosophy and principles of the Seventh-day Adventists. This outline will be composed of the words of Ellen G. White.

Bible Teaching and Study

"In childhood, youth, and manhood, Jesus studied the Scriptures. As a little child He was daily at His mother's knee taught from the scrolls of the prophets. In His youth the early morning and the evening twilight often found Him alone on the mountainside or among the trees of the forest, spending a quiet hour in prayer and the study of God's word. During His ministry His intimate acquaintance with the Scriptures testifies to His diligence in their study. And since He gained knowledge as we may gain it, His wonderful power, both mental and spiritual, is a testimony to the value of the Bible as a means of education." (15, 1952:185)

"The Bible is its own expositor. Scripture is to be compared with scripture. The student should learn to view the word as a whole, and to see the relation of its parts. He should gain a knowledge of its grand

central theme, of God's original purpose for the world, of the rise of the great controversy, and of the work of redemption." (15, 1952:190)

Study of Physiology

"Since the mind and the soul find expression through the body, both mental and spiritual vigor are in great degree dependent upon physical strength and activity; whatever promotes physical health, promotes the development of a strong mind and a well-balanced character.

"In the study of physiology, pupils should be led to see the value of physical energy and how it can be so preserved and developed as to contribute in the highest degree to success in life's great struggle.

"Every school should give instruction in both physiology and hygiene, and, so far as possible, should be provided with facilities for illustrating the structure, use, and care of the body." (15, 1952:196)

Temperance and Dietetics

"Every student needs to understand the relation between plain living and high thinking. It rests with us individually to decide whether our lives shall be controlled by the mind or by the body. The youth must, each for himself, make the choice that shapes his life; and no pains should be spared that he may understand the forces with which he has to deal, and the influences which mold character and destiny.

"Intemperance is a foe against which all need to be guarded. The rapid increase of this terrible evil should arouse every lover of his

race to warfare against it. The practice of giving instruction on temperance topics in the schools is a move in the right direction. Instruction in this line should be given in every school and in every home. The youth and children should understand the effect of alcohol, tobacco, and other like poisons in breaking down the body, beclouding the mind, and sensualizing the soul. It should be made plain that no one who uses these things can long possess the full strength of his physical, mental, or moral faculties.

"Anything that disorders digestion, that creates undue mental excitement, or in any way enfeebles the system, disturbing the balance of the mental and the physical powers, weakens the control of the mind over the body, and thus tends toward intemperance. The downfall of many a promising youth might be traced to unnatural appetites created by an unwholesome diet.

"Tea and coffee, condiments, confectionery, and pastries are all active causes of indigestion. Flesh food also is harmful. Its naturally stimulating effect should be a sufficient argument against its use; and the almost universally diseased condition of animals makes it doubly objectionable. It tends to irritate the nerves and to excite the passions, thus giving the balance of power to the lower propensities.

"Those who accustom themselves to rich, stimulating diet, find after a time that the stomach is not satisfied with simple food. The delicate coating of the stomach becomes irritated and inflamed until the most stim-

ulating food fails of giving relief. A thirst is created that nothing but strong drink will quench.

"In the instruction of the youth, the effect of apparently small deviations from the right should be made very plain. Let the student be taught the value of a simple, healthful diet in preventing the desire for unnatural stimulants. Let the habit of self-control be early established. When such instruction is faithfully given, the results will extend far beyond the youth themselves. Influences will reach out that will save thousands of men and women who are on the very brink of ruin." (15, 1952:202-4)

Recreation

"There is a distinction between recreation and amusement. Recreation, when true to its name, recreation, "(re-creation)" tends to strengthen and build up. Calling us aside from our ordinary cares and occupations, it affords refreshment for mind and body, thus enables us to return with new vigor to the earnest work of life. Amusement, on the other hand, is sought for the sake of pleasure and is often carried to excess; it absorbs the energies that are required for useful work and thus proves a hindrance to life's true success." (2, 1952:207)

"Exercise in a gymnasium, however well conducted, cannot supply the place of recreation in the open air, and for this our schools should afford better opportunity.

"Some of the most popular amusements, such as football and boxing, have become schools of brutality. They are developing the same character-

istics as did the games of ancient Rome. The love of domination, the pride in mere brute force, the reckless disregard of life, are exerting upon the youth a power to demoralize that is appalling.

"Other athletic games, though not so brutalizing, are scarcely less objectionable because of the excess to which they are carried. They stimulate the love of pleasure and excitement, thus fostering a distaste for useful labor, a disposition to shun practical duties and responsibilities. They tend to destroy a relish for life's sober realities and its tranquil enjoyments. Thus the door is opened to dissipation and lawlessness, with their terrible results.

"As ordinarily conducted, parties of pleasure also are a hindrance to real growth, either of mind or of character. Frivolous associations, habits of extravagance, of pleasure seeking, and too often of dissipation, are formed, that shape the whole life for evil." (15, 1952:210-1)

"It would be a great aid in educational work could every school be so situated as to afford the pupils land for cultivation and access to the fields and woods." (15, 1952:212)

Manual Training

"At the creation, labor was appointed as a blessing. It is a source of happiness and development. And it is a safeguard against temptation. Its discipline places a check on self-indulgence, and promotes industry, purity, and firmness. Thus it becomes a part of God's great plan for our recovery from the Fall.

"The youth should be led to see the true dignity of labor. Show them that God is a constant worker. All things in nature do their allotted work. Action prevades the whole creation, and in order to fulfill our mission we, too, must be active.

"The youth need to be taught that life means earnest work, responsibility, care-taking. They need a training that will make them practical men and women who can cope with emergencies. They should be taught that the discipline of systematic, well-regulated labor is essential, not only as a safeguard against the vicissitudes of life, but as an aid to all-around development.

"Since both men and women have a part in homemaking, boys as well as girls should gain a knowledge of household duties. To make a bed and put a room in order, to wash dishes, to prepare a meal, to wash and repair his own clothing, is a training that need not make any boy less manly; it will make him happier and more useful. And if girls, in turn, could learn to harness and drive a horse, and to use the saw and the hammer, as well as the rake and the hoe, they would be better fitted to meet the emergencies of life." (15, 1952:214-7)

"As a relaxation from study, occupations pursued in the open air, and affording exercise for the whole body, are the most beneficial. No line of manual training is of more value than agriculture. A greater effort should be made to create and to encourage an interest in agricultural pursuits." (15, 1952:219)

"An education derived chiefly from books leads to superficial thinking. Practical work encourages close observation and independent thought. Rightly performed, it tends to develop that practical wisdom which we call common sense. It develops ability to plan and execute, strengthens courage and perseverance, and calls for the exercise of tact and skill." (15, 1952:220)

"One great reason why physical toil is looked down on is the slipshod, unthinking way in which it is so often performed. It is done from necessity, not from choice. The worker puts no heart into it, and he neither preserves self-respect nor wins the respect of others. Manual training should correct this error. It should develop habits of accuracy and thoroughness. Pupils should learn tact and system; they should learn to economize time and to make every move count. They should not only be taught the best methods, but be inspired with ambition constantly to improve. Let it be their aim to make their work as nearly perfect as human brains and hands can make it." (15, 1952:222)

Education and Character

"True education does not ignore the value of scientific knowledge or literary acquirements; but above information it values power; above power, goodness; above intellectual acquirements, character. The world does not so much need men of great intellect as of noble character. It needs men in whom ability is controlled by steadfast principle.

"Character building is the most important work ever entrusted to human beings; and never before was its diligent study so important as now. Never was any previous generation called to meet issues so momentous; never before were young men and young women confronted by perils so great as confront them today." (15, 1952:225)

Methods of Teaching

"For ages education has had to do chiefly with the memory. This faculty has been taxed to the utmost, while the other mental powers have not been correspondingly developed. Students have spent their time in laboriously crowding the mind with knowledge, very little of which could be utilized. The mind thus burdened with that which it cannot digest and assimilate is weakened; it becomes incapable of vigorous, self-reliant effort, and is content to depend on the judgment and perception of others.

"The education that consists in the training of the memory, tending to discourage independent thought, has a moral bearing which is too little appreciated. As the student sacrifices the power to reason and judge for himself, he becomes incapable of discriminating between truth and error, and falls an easy prey to deception. He is easily led to follow tradition and customs." (15, 1952:230)

"Every youth should be taught the necessity and the power of application. Upon this, far more than upon genius or talent, does success depend. Without application the most brilliant talents avail little, while with rightly

directed effort persons of very ordinary natural abilities have accomplished wonders." (15, 1952:232)

"So long as the great purpose of education is kept in view, the youth should be encouraged to advance just as far as their capabilities will permit. But before taking up the higher branches of study, let them master the lower. This is too often neglected. Even among students in the higher schools and the colleges there is great deficiency in knowledge of the common branches of education." (15, 1952:234)

Deportment

"Cheerfulness and courtesy should especially be cultivated by parents and teachers. All may possess a cheerful countenance, a gentle voice, a courteous manner, and these are elements of power.

"True courtesy is not learned by the mere practice of rules of etiquette. Propriety of deportment is at all times to be observed; wherever principle is not compromised, consideration of others will lead to compliance with accepted customs; but true courtesy requires no sacrifice of principle to conventionality." (15, 1952:240)

Relation of Dress to Education

"No education can be complete that does not teach right principles in regard to dress. Without such teaching, the work of education is too often retarded and perverted. Love of dress, and devotion to fashion, are among the teacher's most formidable rivals and most effective hindrances.

"For breaking the spell of fashion, the teacher can often find no means more effective than contact with nature. Let pupils taste the delights to be found by river or lake or sea; let them climb the hills, gaze on the sunset glory, explore the treasures of wood and field; let them learn the pleasure of cultivating plants and flowers; and the importance of an additional ribbon or ruffle will sink into insignificance.

"Lead the youth to see that in dress, as in diet, plain living is indispensable to high thinking. Lead them to see how much there is to learn and to do; how precious are the days of youth as a preparation for the life-work. Help them to see what treasures there are in the world of God, in the book of nature, and in the records of noble lives." (15, 1952:246-8)

The Sabbath

"Since the Sabbath is the memorial of creative power, it is the day above all others when we should acquaint ourselves with God through His works. In the minds of the children the very thought of the Sabbath should be bound up with the beauty of natural things.

"As a means of intellectual training, the opportunities of the Sabbath are invaluable. Let the Sabbath-school lesson be learned, not by a hasty glance at the lesson scripture on Sabbath morning, but by careful study for the next week on Sabbath afternoon, with daily review or illustration during the week. Thus lesson will become fixed in the memory, a treasure never to be wholly lost." (15, 1952:251-2)

DUTIES OF A STUDENT

PHILOSOPHY OF WORK EDUCATION

General

"According to the Seventh-day Adventist philosophy of education, the acquisition of knowledge is vital, but the formation of character is even more so. 'Character building is the most important work ever entrusted to human beings.' " (14, 1966:22)

Student Employment

Work is made available to every student who attends the Academy. The student is not required to work, but the opportunity is given and almost all students take advantage of this. The work offered at the School is considered to be a form of character building and in no way is it considered to be degrading to the students.

The students work for an hourly wage that varies from \$1.00 to \$1.16. The money that the student earns is credited to the monthly tuition payment. Students work from 20 to 65 hours a month, depending on their studies. The average student works about 45 hours a month. Work that the students perform varies from being the principal's personal secretary to washing pots and pans in the kitchen. Almost all the labor required to run the School is provided by the students.

Academy Life

The students at Mount Ellis Academy begin their day by rising at 5:45 a.m.,

after washing and dressing, they eat breakfast from 6:30 a.m. to 7:10 a.m., at which time classes begin. From 9:00 a.m. to 9:20 a.m., a chapel service is held after which the students return to their classes. From noon until 12:30 p.m., they have lunch. A student who does not have a class during a morning period will usually work. Classes continue after lunch until 2:30. From 2:30 p.m. until 5:15 p.m., the students are involved in work programs or supervised recreational activities. The dinner hour is from 5:15 until 5:45 p.m. After dinner the students are free until 7:00 when an evening church service, lasting one-half hour is conducted. The students are required to study until 9:30 when the lights are turned out for the night.

The students observe the Sabbath by attending church and Sabbath school from 9:15 until noon. The remainder of Saturday is devoted to various religious activities.

Sundays are spent at the Academy enjoying light recreational and social activities such as skiing, hiking, and school clubs. Youth Congress, the church group for teenagers, also meets on Sundays. If a student wishes, he may spend Sunday at his studies.

DESIGN CONSIDERATIONS

INFLUENCE OF SEVENTH-DAY ADVENTISM

General

The influence of Seventh-day Adventism has been concerned in a general manner with the characteristics that the Seventh-day Adventist will consider in any structure he is designing for the education of their children. It is these characteristics that will determine the final concept of the design.

From the design concept it will be possible to create a satisfactory solution to the design problem without taking into consideration the factors that make up the concept that it is to Seventh-day Adventist. If one considers these factors would create a design solution that would be in accordance with the actual philosophies of the Seventh-day Adventist. These factors could not fulfill the everyday requirements necessary to the design of education. Because many of the ideas expressed in the previous sections are abstract quantities, they cannot directly be incorporated into the design solution. However, these ideas are the foundation of the Adventist's educational philosophy and will, in an overall context, relate to the final design concept.

DESIGN CONSIDERATIONS

INFLUENCES OF SEVENTH - DAY ADVENTISM

General

The preceeding sections have been concerned in a general manner with the characteristics that Seventh-day Adventists will consider in any structure that is designed for the education of their children. It is these characteristics that will determine the final concept of the design.

In no realistic manner would it be possible to create a satisfactory solution to the design problem without taking into consideration the factors that make education the unique concept that it is to Seventh-day Adventists. To not consider these factors would create a design solution that would lack harmony with the educational philosophies of the Seventh-day Adventist. Also, such a solution could not fulfill the everyday requirements necessary to their system of education. Because many of the ideas expressed in the previous sections are abstract quantities, they cannot directly be incorporated into the design solution. However, these ideas are the foundation of the Adventists' educational philosophy and will, in an overall context, relate in the final design concept.

CONDITIONS CREATING A NEED

CONDITIONS CREATING A NEED

EXISTING CONDITIONS

General

At the present time, the buildings on the Academy grounds exist as an architecturally unrelated group of wood and masonry structures. Currently, the building policy is to build as the need arises. Additional buildings will be arranged along a central boulevard, creating a strong linear axis through the campus. The danger to the Academy in following such a plan is that eventually a campus will be created that will be out of scale with its student population which will remain stationary, with an enrollment of 200 pupils. In addition, this plan requires students to walk from building to building during the day, exposing them to the harsh elements of Montana winters and making the general operation of the school more difficult. Many of these problems could be eliminated by constructing a school complex that would consist of only one structure.

Necessity

To say that the Academy requires a new educational plant for the above reasons would be a nebulous suggestion at best. The present school with its planned future expansion will certainly serve the needs of the students. Also, destroying the existing school facilities to build a new school on the same site would be an undue financial hardship on the Academy.

The creation of a need comes not so much from the existing situation of the school as it does from what the school could be. It is hoped that by presenting this thesis that the administration of Mount Ellis Academy will see a new and different solution to their problems that will give them a different point of view in the architectural development of their school.

SITE AND LOCAL CONDITIONS

SITE AND LOCAL CONDITIONS

SITE AND LOCAL CONDITIONS

SITE CONDITIONS

General

Mount Ellis Academy is located on a 535 acre tract of land five miles east of Bozeman, Montana. The site is at the east end of the Gallatin Valley in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 2S., R. 6 E. and has a latitude of 45°12' and a longitude of 111°3'. Directly adjoining the Academy grounds to the west is a 400 acre tract of land recently purchased by the School for the use of farming.

Adjacent Surroundings

The Bridger Mountain Range is to the north of the Academy grounds, to the east are the Chestnut Mountains, turning to the south one sees the spectacular peak of Mount Ellis rising into the Big Sky of Montana to an elevation of 8,331 feet above sea level. It is this peak for which the School is named. The view to the west is of the floor of the Gallatin Valley, which extends farther than the eye can see. The close proximity to the mountains that surround the site on three sides gives the area a feeling of being sheltered and protected, free from the ravages of the world and man.

Topography

The topography of the site is generally level with a slight slope to the west and north. The land surrounding the site on the north and east sides

slopes steeply to the mountains; on the south and west sides of the site, the surrounding land is generally level.

Soil Analysis

"The topsoil is dark grayish-brown or almost black loam which in most places contains some small fragments of gneiss. This dark-colored surface layer is in general from 9 to 12 inches thick, and it overlies grayish-brown noncalcareous gravelly loam. The subsoil ranges from light-brown to yellowish-brown loam which in most places is gravelly and difficult to penetrate with an auger. Because of the elevated position, pronounced slope, and the generally porous character of the surface soil and subsoil, drainage in most places is good, and where the land is irrigated, considerable loss from run-off and seepage frequently occurs." (16, 1931:15)

Zoning Regulations and Code Requirements

No specific zoning regulations or code requirements are enforced in the area. However, it is good practice in such cases to follow a standard code such as the National Building Code.

Availability of Utilities

The utilities that connect to the site are electric, natural gas, and telephone lines. Water is obtained from an existing well on the Academy grounds that is equipped with a pump having a capacity of 90 gallons per minute. Sewage is disposed of by a field tile drain and septic tank system.

This disposal system was installed at the Academy in 1966; it has a sufficient capacity to provide for the disposal needs of the proposed new complex. Disposal of garbage is accomplished by the owner using a make-shift incinerator. This method of garbage disposal is adequate for the needs of the Academy. In the design of the new complex, an incinerator will be provided to handle the disposal of garbage.

LOCAL CONDITIONS

General

The climate of Mount Ellis Academy and vicinity is similar to that of intermountain valleys of the Northwest. The climate is continental in character and is subject to wide extremes of seasonal and daily temperatures. A daily temperature difference of 30° sometimes occurs in a 24 hour period. Due to extreme temperature variations, special attention will be given to the design of expansion joints used in the proposed structure.

Temperatures

The winters are relatively cold and severe, with an average temperature of 25° and an average low of -20° . However, temperatures up to 35° have been recorded in January and February and are not unusual.

The summers are warm and pleasant, with periods of extremely high temperatures being infrequent. Extreme temperature conditions are not unusual, but last for short periods. As a result of the summer conditions, air conditioning is unnecessary.

Killing Frost

"The last killing frost may be expected the latter part of May. The first killing frost generally occurs about the middle of September. The average frost-free season extends over a period of 114 days." (3, 1931:5)

Precipitation

The average winter snowfall is from 30 to 50 inches with the greater part of the fall between November and March. As a result, special attention will have to be given to designing of access roads and parking areas at the school site.

In the summer, uncomfortable humid conditions are rare. Precipitation falls mostly in the form of rain, with occasional hail in the months of July and August. One-half of the precipitation falls between May and July.

Winds

"Winds are variable in both movement and direction; in the daytime the winds may be prevailing from the west or southwest, and at night they very often shift to the southeast. Locally some of the coldest winds are from the east. During the winter, warm "chinook" winds are also of variable occurrence, at times causing the sudden disappearance of snow by direct evaporation." (3, 1931:5)

Sun Angles

The sun angle for the December solstice has an altitude of 21° at noon. The sun's azimuth for the December solstice varies from 180° at noon to 124° at 7:40 a.m. and 4:20 p.m.

The sun angle for the June solstice has an altitude of 68° at noon. The sun's azimuth for the June solstice varies from 180° at noon to 55° at 4:20 a.m. and 7:40 p.m.

The area experiences harsh sun lighting effects throughout the year due to bright clear skies in summer and the reflective surface of snow cover in winter. In the design of the proposed structure, care will be taken to reduce these harsh sun light conditions to a minimum to provide the occupants of the structure the greatest amount of comfort possible.

FUNCTIONAL REQUIREMENTS

FUNCTIONAL REQUIREMENTS

GENERAL DESCRIPTION

General:

The design for Mount Ellis Academy will contain within one structure all the necessary facilities required for the Academy to carry out its educational program of spiritual, physical, and mental training. To satisfy the above-mentioned needs, the structure shall incorporate many diverse functions, such as dormitory facilities for both boys and girls, a chapel for worship, a place of assembly, classrooms and laboratories for general education, a workshop for technical training, a gymnasium for physical education, a cafeteria for the staff, and offices for the administration. A separate building complex will be constructed close to the main structure for the training in agriculture.

THE CHAPEL

Chapel:

Mount Ellis Academy requires a chapel in which to conduct religious services daily as well as a weekly religious service on the Sabbath. The chapel should have a seating capacity of 250, to **FUNCTIONAL REQUIREMENTS** guests. The chapel should be designed to give the overall impression of being quiet and simple. The plan will be similar to that of any Protestant

FUNCTIONAL REQUIREMENTS

BUILDING DESCRIPTION

General

The design for Mount Ellis Academy will contain within one structure all the necessary functions required for the Academy to carry out its educational program of spiritual, physical, and mental training. To satisfy the above requirements, the structure shall incorporate many diverse functions, i. e., dormitory facilities for both boys and girls, a chapel for worship, a general assembly, classrooms and laboratories for general education, workshops for technical training, a gymnasium for physical education, apartments for the staff, and offices for the administration. A separate farm complex will be constructed close to the main structure for the training of agriculture.

THE SCHOOL

Chapel

Mount Ellis Academy requires a chapel in which to conduct religious services daily as well as a weekly religious service on the Sabbath. The chapel should have a seating capacity of 250, for students, teachers, and guests. The chapel should be designed to give the overall impression of being quiet and humble. The plan will be similar to that of any Protestant

church, in that it will have an apse, chancel, nave, and narthex. However, the special requirement of the chapel is that the baptistery have facilities for complete body immersion. To Seventh-day Adventists, graphics and symbolism do not give proper religious atmosphere, as such, none will be used in the design of the chapel. The orientation of the chapel should be such that it is centrally located within the school and easily accessible to the students and staff as well as to the general public.

Auditorium

The auditorium should seat 250 students, teachers, and guests. It should have a small stage for the presentation of various student functions such as band and choir performances. The stage will require a podium for speakers. Audio-visual equipment will be necessary and the operation of such equipment should be controlled from the stage. Stage lighting and other stage equipment will be minimal.

Gymnasium

The gymnasium will not require any seating for public spectators because Mount Ellis Academy does not compete in school athletics. The gymnasium's purpose is solely for the physical betterment of its students. A standard size basketball court is required. An area is needed for the use of gym apparatus, e.g., tumbling mats, parallel bars, iron horse, etc. A room will also be necessary for storage of this equipment. In connection with the gymnasium, there will be a standard size Y. M. C. A. swimming

pool. Locker and shower facilities for thirty boys and thirty girls will be provided. One office and storage closet is necessary for the two physical education teachers.

Playing Fields

The main playing field will consist of a standard one-quarter mile track. The enclosed area of the track will contain a groomed field suitable for playing touch football and soccer. Four tennis courts are required and these courts should have provisions for flooding and freezing to convert them to an ice skating rink for the winter months. Four additional multi-use secondary playing fields will be provided. Superimposed on these fields will be two softball diamonds.

Administrative Offices

One private office with an area for a secretary and for waiting is required for the principal. Adjoining the principal's office will be a conference room with one table large enough to seat ten people. The registrar and the treasurer will each have an office that opens onto a general office. This general business office will have one full time secretary, who will serve jointly the registrar and the treasurer. The general business office will also house a fireproof vault large enough to store the Academy's business and the students' records. The guidance counselor will have an office with an area for a secretary, waiting area, and file storage. A small room used for guidance testing and large enough for five students will be

located adjoining the counselor's office. Generally, the offices will be large enough for one desk and two chairs for visitors. The general business office will be provided with a counter to serve students and visitors.

Teachers' Workroom

The teachers' workroom should seat approximately ten teachers in a comfortable manner. There should be one work table and an area set aside for mimeograph work.

Student Offices

Two student offices are required. The first is the yearbook office. This room should be large enough to allow ten students to work at preparation of the publication. The room will require an area for a photographic laboratory and several work tables. The second office, needed by the students, is for the "Associated Student Body". This office need only have one large table to seat ten students. For control, both student offices should have glass walls opening to the hallway.

Bookstore

To handle the selling of text books, school supplies, and various sundries, the Academy needs to be provided with a small bookstore. This store will have one main counter over which goods will be sold. No facilities are required for the handling of money since the buying by each student is done with a charge-account.

Classrooms

A total of seven general classrooms will be required. Each of these should have a teacher's office and an area for the storage of the teacher's personal items. The classrooms will each seat, at a maximum, thirty students. Several of the classrooms will have to serve multi-purpose functions. One classroom will require storage and electrical outlets for the use of commercial business machines. Another classroom will need jacks and removable headsets at the desks for the study of languages as well as a control panel at the teacher's desk. One other classroom should have a demonstration table equipped with water and gas.

Laboratory Rooms

To provide for the study of physics, chemistry, and biology, three laboratory rooms will be necessary. Each of these rooms will have twenty students at five work tables in addition to the demonstration table for the teacher. All of the tables will be supplied with water and gas. The chemistry room will be equipped with an exhaust hood and the biology room will have a refrigerator.

One art room is needed for the use of twenty pupils. This room will have work tables and a sink. Only basic design, drawing, and tempera painting is offered.

A room for the practice of the Academy's music groups is necessary. This room should have a stepped floor and should be acoustically treated

for musical sound. Storage rooms for band instruments, music, and apparel of the groups will be provided. Eight practice rooms will be needed for students.

One home economics room to serve twelve pupils is required. Equipment for this room includes a stove, refrigerator, sink, and sewing machines.

Industrial Art Rooms

Industrial arts training will require three classrooms, one for a wood shop with twenty students, one for a metal shop with twenty students, and one for the automotive shop with ten students. The wood shop will have to have five work tables, and the following list of equipment:

1 wood lathe

1 plainer

1 belt sander

1 jointer

1 band saw

2 table saws

1 radial saw

2 jig saws

2 drill presses

This equipment list also includes various hand tools needed to work with wood. Storage areas will be provided for the hand tools. One dust proof

paint room adjoining the wood shop will also be provided. The metal shop will also have five work tables and the following equipment list:

- 1 metal lathe
- 1 milling machine
- 2 drill presses
- 1 power hacksaw
- 1 furnace - gas
- 1 squaring shear
- 1 box brake
- 1 grinder
- 1 slip roll, former
- 2 welding torches

This equipment list also includes various hand tools needed to work with metal. Storage will be provided. The automotive shop will have a two bay garage and the following equipment:

- 2 chain hoists
- 2 hydraulic lifts
- 1 welding torch
- 1 air compressor
- 1 electrical engine analyzer
- 2 oilers
- 1 arbor press

1 steam cleaner

1 honing machine

This equipment list also includes various hand tools needed to work on automobiles. And storage will be necessary.

Library

The library will contain a stationary collection of 5000-7000 volumes. Study carrels for fifty pupils are needed. In addition to the library study area, there will be an adjoining room, the curriculum research center which will allow groups of 10 or so students to study together on group projects. This room should have one large table, a vertical file, and an overhead projector. One wall of the research center will be of glass facing onto the library. The library will also have an office, a workroom, a storage room for audio-visual materials, and a storage room for bound periodicals and microfilms, and reader.

THE DORMITORY

Students' Rooms

In both the girls and boys dormitories, there will be two students to each room. Each student will have a single bed, a study table, a dresser, a closet, a shelf, and a sink. All furniture in the rooms will be built-in. The floors of the students' rooms will be carpeted.

Bath Facilities

Each dormitory will house approximately eighty students. One shower head, one water closet, and one lavatory will be allotted to every ten students. In the girls's dormitory, there will be one bath tub for twenty girls. The bathrooms will be a community facility centrally located in each dormitory. There will be two community baths on each floor so that twenty students will share a bath.

Student Chapels

Each dormitory will have a small chapel. These chapels will require seating for eighty students and a maximum of ten guests. As in the main chapel, no religious symbolism is required.

Student Kitchens

The girls' and boys' dormitories will each have a dormitory kitchen to allow the students to prepare snacks and have controlled cooking in the buildings. Each kitchen will have a sink, stove, refrigerator, and a table with four chairs.

Student Lounges

Each dormitory will have a student lounge for visitors and students. The lounges will seat about twenty people. No provisions will be made for televisions or radios since such instruments are not allowed at the Academy.

Student Laundries

The dormitories will each have a student laundry to permit the students to wash personal garments over and above that which is done in the main laundry. These laundries will have one small washer and dryer plus a wash sink, iron and ironing board. The machines will be coin operated.

Trunk Room

Each dormitory will be provided with an area for storage of foot-lockers and luggage brought to the Academy by boarding students. This room will have shelves for the storage of hand luggage.

Ski Storage Room

Since many of the students at the Academy ski, it is necessary to provide a room for the storage of skies and ski poles in each dormitory. These rooms will require special racks that will store the skies in a vertical position. The floors will have a water-proof surface.

Infirmaries

Each dormitory will have an infirmary of four beds. This room acts more as an isolation room than an infirmary since there is no doctor or nurse at the Academy. However, the infirmaries will serve as medical offices and will contain a weight scale and a medical cabinet. Also included

in the infirmaries will be a bathroom containing a lavatory and a water closet.

Dean of Boys and Dean of Girls

In each of the respective dormitories, there will be a Dean. The Deans will require an office and a two bedroom apartment in their dormitory. The office should adjoin the apartment. Outside of the Dean's office, there will also be a control desk with a public telephone and an intercom system to all students' rooms.

Staff Apartments

In addition to the apartments for the Deans, one more two bedroom apartment will be provided in each dormitory for unmarried staff members to share.

Dining Room

The dining room will provide seating for 225 students, staff and guests. The students will be served cafeteria-style and tables seating six to eight people will be provided. After the meal, all trays will be returned to a dishwashing window.

Kitchen

The dietary laws of the Seventh-day Adventists will not greatly affect the standard lay-out of the cafeteria kitchen. The only special consideration to be made is that the grill area for the kitchen need be only a small

fraction of what it would be in most cafeteria kitchens. This is because Seventh-day Adventists do not eat pork or beef. In addition, Mount Ellis Academy purchases its food needs for a school year at one time; therefore, the dry storage area, cold room, and sharp room need to be somewhat larger than normally would be expected for their size of kitchen.

The following is a list of special areas to be found in the kitchen:

receiving

dry storage

cold room

sharp room

pantry

office

toilet

garbage room

can washing room

dish washing

baking

cooking

vegetable work

salad work

Laundry

In order to clean the linens of the dormitories and to wash the clothes for its students, the Academy requires a laundry. The only special consideration in the laundry is that it needs 160 cubicles for the pick-up of the cleaned laundry by the students. The following is a list of the special equipment to be found in the laundry:

- 1 large washer
- 1 small washer
- 2 large dryers
- 3 mangles
- 4 ironing boards
- 1 sewing machine

Barber Shop

The School employs a part-time barber who visits the Academy one day a week. Because of this service, the School needs a room with one barber chair, a sink, and a waiting area accommodating five students.

MISCELLANEOUS

Guest Apartments

To provide for special guests, e. g., board members, lecturers, parents, etc., who might visit the Academy, it is necessary to have guest apartments. Three one bedroom apartments are required. These apart-

ments will not have kitchen facilities and should be located out of the general dormitory area.

Garage

Because of the heavy snows encountered in the Mount Ellis area, it is necessary that all vehicles be covered. However, the garages will not be heated. — The following is a list of the School's vehicles to be garaged:

2 sixty passenger buses

1 twenty passenger bus

1 twelve passenger bus

3 pick-up trucks

1 driver education car

4 passenger cars

Parking

To cover peak periods of visitation, i. e., commencement and the arrival of students and parents for the beginning of school terms, it is necessary for the Academy to have a parking lot that can accommodate sixty automobiles.

Roads

All roads and parking lots on the Academy grounds shall be paved!

Fire Protection

Mount Ellis Academy is located outside the Bozeman fire district.

Because of this situation, it is necessary for the Academy to provide for its own fire protection. This can be accomplished by providing a water tank with a capacity of 150,000 gallons as part of the building design or by placing a tank on one of the surrounding foothills.

Power Plant

The heating system for the Academy will be zoned hot water. No air conditioning is required.

Janitor Closets

Janitorial closets will be centrally located throughout the School building to provide adequate cleaning facilities. Students serve as janitors.

Public Toilets

Toilets will be located at areas where heavy concentrations of people exist. Each bath room will have two water closets and two lavatories.

Maintenance Shop

The industrial arts classrooms will provide the shop areas necessary for general school maintenance.

THE FARM

General

The farm is located on a 400 acre plot of land that directly joins the grounds of the Academy. The farm buildings should be designed for a

limited period of use and maximum flexibility. Nevertheless, they should give the appearance of belonging to the Academy complex.

Farm Machinery Storage

The farm machinery should be located just off of the main entrance roads to the fields. It should also be located at a sufficient distance from the School so that the noise of the machinery will not disturb the students.

The following equipment will require covered storage:

3 tractors

1 hay baler

1 swather

1 large truck

1 pick-up truck

2 hay wagons

2 plows

1 drill

1 combine

1 disk

1 spring tooth

1 drag

1 rake

1 mower

Farm Machinery Repair

The farm machinery will be repaired in the industrial art laboratories.

Gasoline Storage

The gasoline should be stored close to the farm machinery, but at the same time not so close as to present a fire hazard. The storage should be gravity-filling and there should be a main tank as well as an auxiliary tank.

Feed Storage

The feed storage should allow for the storage of alfalfa hay, straw, barley, oats and corn. It must allow mixing when it is used. The feed bins must provide for outside filling and they must be moisture-proof to prevent spoilage.

Calf Barn

The calf barn will be located close to the feed storage. It should have at least ten stalls with feeding provisions. The stalls should be off of the main entrance to the barn and concrete floors for easy cleaning.

Greenhouse

The Academy requires a greenhouse so that the students can experiment with plant life throughout the academic year. The greenhouse will have numerous shelves for cultivating plants. Ventilation and controlled heat and light are necessary in a successful greenhouse and will be included in the design. The greenhouse should also provide storage for the hand tools required in its operations as well as a sink for cleaning.

AESTHETIC CONSIDERATIONS

Introduction

When the design of an aesthetic character will largely be determined by the character of the Church to which the Seventh-day Adventist Church. The traditions of the Church are very important to the function of the School. It is on the basis of these traditions that the School was founded. These traditions are the basis of the Academy for the purpose of preparing the youth to enter the service of God.

The design of the Church will not determine the final form of the building but will act only as a basic framework by which the design can be guided to its final character and form.

Design

The design of the School must reflect the modesty, utility, and high moral character which each student takes upon himself when entering the Academy. These qualities can best be expressed by simple geometric forms that illustrate the character of spiritual life. The overall expression of the structure should convey a feeling of the presence of God and His children.

AESTHETIC CONSIDERATIONS

Cooperation, the final structure should harmonize with its surrounding site. It should not only reflect the strength of God, but also the cleanness and strength of the Bridger Mountain peaks that over-look the site.

AESTHETIC CONSIDERATIONS

PERTINENT INFLUENCES

Tradition

Mount Ellis Academy's aesthetic character will largely be determined by the traditions established by the Seventh-day Adventist Church. The traditions of the Church are very important to the function of the School because it was on the basis of these traditions that the School was founded. These traditions guide each student at the Academy for the purpose of engaging him with a closer contact with God.

The traditions of the Church will not determine the final form of the design, but will act only as a basic framework by which the design can be guided to its final character and form.

Form

The form of the School must reflect the modesty, utility, and high moral conduct that each student takes upon himself when entering the Academy. These qualities can best be expressed by simple geometric forms that illustrate the character of spiritual life. The overall expression of the structure should convey a feeling of "oneness", the union of God and His children.

Generally, the final structure should harmonize with its surrounding site. It should not only reflect the strength of God, but also the cleanness and strength of the Bridger Mountain peaks that over-look the site.

Scale

The scale of the Academy should not appear to be monumental nor should it be over bearing. Its scale should be human, expressive of man's humbleness to God. The School is for children and as such should attempt to nourish their hearts and minds in the living hands of God and not to frighten them from His wisdom.

Materials

The materials used in the construction of this structure should embody the same principles of thought already expressed. They should appear simple, honest, and forthright. Concrete is often used to express these qualities, but concrete also has a way of being very monumental, an undesirable characteristic in this instance. A more reasonable choice of material would be brick. Its very shape and size lends itself to the human scale; yet, at the same time, its physical make-up is much like that of stone or concrete in expressing a humble, honest, and earthy character.

Wood and glass both work well with brick. Wood has a warmth that lends itself easily to the human scale of brick. Glass on the other hand, blends well with brick because they both create flat hard planes symbolizing simplicity and endurance.

Color

Color for the majority of the structure, will be earthy browns and grays as found in the materials brick, wood, and glass. However, in

small selected areas, colors of bright pure hues shall be used to break up the drabness of earth colors and provide a degree of human excitement.

Symbolism

Seventh-day Adventists feel that the use of symbolism distracts from the true feeling of Christ. As such, no symbolism will be required in the design of the structure.

ECONOMICS

ECONOMICS

BUILDING COSTS

General

The initial cost of a structure is often considered the most important cost by the owner because it governs the size and quality of the structure as well as the initial capital outlay of funds that will have to be made. However, operational costs, maintenance, and repair costs will often exceed the original cost of a building during its life span. The special problems of operation, maintenance, and repair deserve consideration during the design so as to minimize their economic effect on the future life of the building. Any equipment or design innovations incorporated into the structure that will minimize the effects of maintenance, operation, and repair may increase the initial cost, but the dividends received from this careful designing will minimize the future costs as well as increase the life of the structure.

Cost Estimates

Square foot costs for different types of buildings and the types of construction by which they are built can be determined by using the Marshall Valuation Service booklet. However, this booklet does not list a structure as proposed in this thesis project. This deficiency was resolved by making

comparative square foot consisting of various buildings listed in the booklet that closely resemble portions of the multi-structure. Using this method, it was determined that the proposed structure would cost approximately \$15.00 per square foot. This cost is for the basic building only and does not include special equipment such as furniture or laboratory tools that the Academy will require.

Based on the estimate of \$15.00 per square foot, the main structure for Mount Ellis Academy should cost in the neighborhood of \$1,112,000. The farm buildings and the parking pavement will add an estimated \$135,000, making the total cost of the structures \$1,247,000. This total cost estimate includes a 5% architect's fee and a 2% insurance cost.

FINANCING

Seventh-day Adventists follow the practice of tithing. This means that every Seventh-day Adventist family in Montana and the world, is expected to give one-tenth of their total income to their respective home church. The churches in Montana give one-tenth of their annual income to the Montana Conference of Seventh-day Adventists. The Montana Conference, in turn gives one-tenth of its income to the Northern Pacific Union of Seventh-day Adventists. The Northern Pacific Union follows suit and gives one-tenth of its income to the General Conference of Seventh-day Adventists, which is the Church's world body.

To finance its school complex, Mount Ellis Academy would have to appeal to the Northern Pacific Union for funds. If sufficient funds could not be found there to finance the total project, a request would be made to the General Conference to supply the remaining monies. In the event that neither of these two sources could supply the needed financing, a second alternative for financing remains.

In addition to tithing, Seventh-day Adventists believe in "free will offerings". This means that in addition to their responsibility of giving one-tenth of their annual income to the Church, they also give to a general collection during the Sabbath service. Every thirteen weeks, a special world-wide offering is collected called the "Sabbath Offering". This offering is used to finance special projects that the Church considers worthy of supporting. The congregation is informed at the time of the offering as to what project the money will be used for. Many Seventh-day Adventists schools, hospitals, and clinics have been financed in this manner.

Seventh-day Adventists believe in a strong separation of church and state; consequently, they accept no financial aid from the Federal Government.

PROGRAM

SOURCES

General

The space requirements for the program were arrived at by the use of several sources. One method used was to consult various architectural programs presented in the section References. In many cases, these figures were used as a basis for determining the minimum square footages required for the various areas, e.g., bath and shower facilities, classrooms, exhibit areas, etc. In addition, areas were used as a basis for comparison with these architectural sources, an actual check of existing areas were made. Where existing areas seemed to be adequate, no increase in square footages were made. In other cases, increases were made in area requirements were recommended by the staff of the Academy. These recommendations were followed. Some areas were a category of not being solvable by either the architectural sources or the staff of the Academy. On such cases, an estimate was based on information gathered from both sources.

PROGRAM

SOURCES

General

The square footages for the program were arrived at by the use of several methods. One method used, was to consult various architectural handbooks that are listed in the section, References. In many cases, these handbooks gave formulas for determining the minimum square footages required for standardized areas, e. g., bath and shower facilities, classrooms, athletic areas, kitchen and cafeteria areas, and the areas used for assembly. In conjunction with these architectural sources, an actual survey of the existing areas were made. Where existing areas seemed satisfactory, no changes in square footages were made. In other cases, increases or decreases in area requirements were recommended by the staff of Mount Ellis Academy. These recommendations were followed. Some areas fell into a catagory of not being solvable by either the architectural handbooks or by the staff of the Academy. On such cases, an estimate was based on information gathered from both sources.

EXIT WAYS

General

Each floor of the proposed structure will have two exit stairways. These stairways will be located at a maximum of 100 feet from any point on the floor and will be a minimum of 44 inches wide.

The hallways on each floor will be a minimum of 36 inches wide and will not have a dead-end more than 50 feet from an exit stairway. Doorways leading to the hallways will be a minimum of 28 inches wide.

SQUARE FOOTAGES

SQUARE FOOTAGE

THE SCHOOL

SQUARE FOOTAGE

Chapel	
Nave	2,000
Baptistery	200
Chancel	800
Narthex	200
Auditorium	
Stage	700
Seating	2,000
Gymnasium	
Basketball court	1,000
Apparatus area and storage	700
Swimming pool	2,000
Locker rooms and office	1,000
Playing Fields	
Main playing field	40,000
Secondary fields	30,000
Tennis courts	7,000
Administrative offices	
Principal's office	250
Secretary	50
Waiting area	100
Conference	300
Treasurer's and registrar's offices	150
General business office	250
Storage vault	50
Guidance counselor's office	200
Secretary	50
Waiting area	100
Testing	200
Teachers' workroom	500
Students' offices	
Yearbook office	400
Associated Student Body office	300
Bookstore	600

SQUARE FOOTAGE

Classrooms	
General classrooms	800
Offices	150
Laboratory rooms	
Science room	700
Art room	800
Band and choir room	700
Music practice rooms	50
Home economics room	700
Industrial arts rooms	
Wood shop	2,300
Metal shop	1,850
Automotive shop	2,000
Library	
Book stacks	300
General study	1,500
Curriculum research	400
Office and control desk	300
Work room	250
Audio-visual storage	150
Periodical storage	100

THE DORMITORY

Student rooms	200
Bath facilities	250
Student chapels	800
Student kitchens	200
Student lounges	350
Student laundry	150
Infirmaries	250
Dean of Boys' and Dean of Girls'	
Offices	150
Apartments	650
Staff apartments	650
Dining room	2,000

SQUARE FOOTAGE

Kitchen

General cooking	400
Dry storage room	400
Cold room	240
Sharp room	150
Pantry	240
Office	100
Garbage room and can washing	100
Dish and pot washing	250

Laundry room	600
Barber shop	150
Trunk room	250
Ski Storage room	150
Guest Apartments	200
Garage	1, 500
Parking	12, 000
Power plant	500
Janitor closets	25
Public toilets	200

THE FARM

Machinery storage	1, 600
Gasoline storage	200
Feed storage	1, 000
Calf barn	1, 000
Greenhouse	800

SUMMARY

SUMMARY

SUMMARY

Seix

SUMMARY

A school whether it is for the Seventh-day Adventists or any other group of people should provide a total and complete environment for the training of the mind and body. A direct expression of this idea is the multi-structure concept employed in the design of this school complex. In the multi-structure concept, all elements within the program are grouped together under one roof and integrated. An important consideration of integration of all functions under one roof is segregation of the functions into generally similar areas such as noise area, public area, living area and classroom area. This principle of segregation-integration has been used extensively in the solution of this problem.

The overall appearance of the structure is institutionally rigid and orderly. This character is desirable in that it reinforces and reflects the puritanical nature of Seventh-day Adventism.

REFERENCES

Books

1. Alexander, Tony H. Seven Standards: A Handbook of Architectural Design. New York: McGraw-Hill Book Co., 1964.
2. Alexander, Tony H. Architectural Design for Billings, Montana. Billings: Billings Architectural Design, Bozeman, Mont., 1967.
3. Seven Standards. New York: Grange, New York: Kinshart, 1937.
4. Seven Standards: The Seventh Day: The Story of the Seventh-day Adventist. New York: McGraw-Hill Book Co., 1960.
5. Architectural Training Building for the Pine Hills School. Billings: Billings Architectural Design, Bozeman, Montana, 1967.
6. Building Research Data for a Circular Monastery. Undergraduate Thesis Project. Bozeman, Montana, 1964.
7. Marshall Valuation Service. Los Angeles: Marshall and Stevens Publication Company.
8. National Building Code. New York: Board of Fire Underwriters, 1933.
9. The Midnight Cry. Washington, D.C.: Review and Herald Publishing Company, 1944.
10. Architectural Graphic Standards. New York: John Wiley and Sons, Inc., 1955.
11. Seventh-day Adventist. Collier's Encyclopedia. New York: Crowell-Collier and Macmillan, Inc., 1967.
12. Seventh-day Adventist. Encyclopedia Britannica. Chicago: Encyclopedia Britannica, Inc., 1965.
13. Building Planning and Design Standards. New York: John Wiley and Sons, Inc., 1955.

REFERENCES

REFERENCES

Books

1. Callender, John H. Editor. Time-Saver Standards: A Handbook of Architectural Design. New York: McGraw-Hill Book Co., 1966.
2. Ferguson, James H. An Elementary School for Billings, Montana, Undergraduate Thesis in Architectural Design. Bozeman, Mont.: 1967.
3. Garson, Gerald. Cornflake Crusade. New York: Rinehart, 1957.
4. Herdon, Booton. The Seventh Day: The Story of the Seventh-day Adventists. New York: McGraw-Hill Book Co., 1960.
5. Hiers, Bob. A Vocational Training Building for the Pine Hills School for Boys, Undergraduate Thesis in Architectural Design. Bozeman, Montana: 1968.
6. Keller, Larry Jay. Building Research Data for a Cistercian Monastery of the Strict Observance, Undergraduate Thesis Project. Bozeman, Montana: 1964.
7. Marshall Stevens Company. Marshall Valuation Service. Los Angeles: Marshall and Stevens Publication Company.
8. National Board of Fire Underwriters. National Building Code. New York: National Board of Fire Underwriters: 1955.
9. Nichol, Francis David. The Midnight Cry. Washington, D.C.: Review and Herald Publishing Company, 1944.
10. Ramsey, Charles George, and Harold Reeve Sleeper. Architectural Graphic Standards. New York: John Wiley and Sons, Inc., 1956.
11. "Seventh-day Adventist." Collier's Encyclopedia New York: Crowell-Collier and Macmillan, Inc., 1967.
12. "Seventh-day Adventist." Encyclopedia Britannica. Chicago: Encyclopedia Britannica, Inc. 1965.
13. Sleeper, Harold Reece. Building Planning and Design Standards. New York: John Wiley and Sons, Inc. 1955.

14. Utt, Richard H. A Century of Miracles. Mountain View, California: Pacific Press Publishing Association, 1966.
15. White, Ellen G. Education. Mountain View, California: Pacific Press Publishing Association, 1952.

16.

Pamphlets

16. DeYoung, William and Smith, L.H. Soil Survey of the Gallatin Valley Area, Montana. Washington, D.C.: Bureau of Chemistry and Soils, United States Department of Agriculture #16, Series 1931.
17. Mount Ellis Academy Bulletin 1968-69. Bozeman, Montana: 1968.
18. Student Handbook for Intermediate and Secondary Schools. Portland: Department of Education, North Pacific Union Conference of Seventh-day Adventists, revised 1967.
19. General Student Policies. A pamphlet for the students, Bozeman, Mont.

Interviews

20. Dick, Warren H. Treasurer, Montana Conference of Seventh-day Adventists, Bozeman, Montana.
21. Sipkins, John. Principal, Mount Ellis Academy, Bozeman, Montana.
22. Robinson, Arthur W. Treasurer, Mount Ellis Academy, Bozeman, Mont.

MONTANA STATE UNIVERSITY LIBRARIES
stks 720.6.M76W124
A multi-structure for Mount Ellis Academ CA

3 1762 00159183 1

720.6
M76W124
A multi-structure for Mount Ellis Academ CA

~~REF. USE ONLY~~

