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DESIGN THESIS 2005

TY D. GREFF

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Creating something old

CREATING SOMETHING OLD

Bringing new housing back within city limits.

Bismarck, North Dakota

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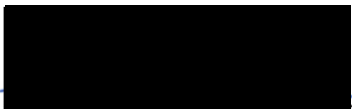
**CREATING SOMETHING OLD:
BRINGING NEW HOUSING BACK WITHIN
CITY LIMITS**

**A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University**

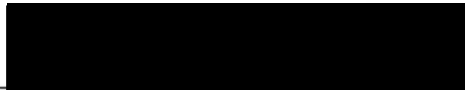
By

Ty D. Greff

**In Partial Fulfillment of the Requirements
For the Degree of
(Bachelor of Architecture)**



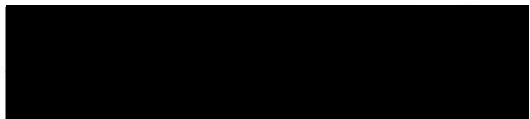
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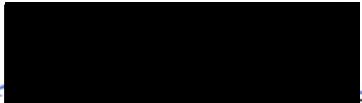
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ABSTRACT

Creating Something Old: Bringing new housing back within city limits

How long should a building last; twenty years, thirty years? What if a building is still standing? There is a better answer than demolition and forgetting. Buildings can be rebuilt, reused and recycled back into their community. A building becomes a living presence. It breathes, grows, changes and evolves. It affects things around it. Its functions might change; its form might be modified. Buildings can become smarter as their users become more aware. Green and sustainable methods can be added to and found within existing structures and forms. Potential is meant to be found and nurtured.

How about cities then? Should they have a long life span? Or should a city keep growing outward neglecting its interior, its core? Cities also change; they affect life and their surroundings. Smart design places emphasis on constantly evolving the city within before looking for quick expanding fixes. Cities can also become more responsible by becoming more sustainable. They can adapt to the needs of their populace.

There is a need for adaptive reuse design. Buildings are huge investments and are not meant to be replaced within a set period of time. This will be a research into the theory of design and redesign. This will be the redesign. An old hotel that has been abandoned and will now be turned into a housing community. It will take upon something and builds upon it. Build upon physical constraints and build upon a body of knowledge. There is a need to harmoniously blend building and city. This is that synthesis; to take a building that has no current use and to find a suitable new use. It will be reshaping the site and building both in form and function. This will be a sensitive response to macro and micro site conditions. This will be an ethically responsive design necessary for an intercity solution. It is creating something old. It will be forming and reforming an old hotel into something that can give back to the city; the synthesis of people and place to form community within.

FOREWORD

I would like to thank everyone for the help that they have provided me with during this project. I would like to thank the people of North Dakota for approving the veterans tuition fund for dependant students of war veterans. Without this help I could not have made it this far and will be forever grateful.

DEDICATION

I would like to the dedicate this project to the memory of my late friend Elijah Nies and my Grandmother Gladys Herdebu. The memories we shared will never be forgotten.

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PROJECT EMPHASIS

EMPHASIS

First and foremost, the emphasis of this project is to take and analyze a currently abandoned structure and site and develop a design that would give the space a new use and function of housing within the city of Bismarck

MAJOR POINTS OF FOCUS

In addressing a project of this nature and scale, there will be some main points that are necessary to consider and touch upon throughout the project. They are as follows.

Adaptive Reuse

This will include making design and programmatic decisions to the buildings and structures currently on the site and to their future relationship to the thesis design. This could include leaving some structures as they are, modifying them to a new use, or removing parts of them entirely for a different purpose. Also included in this is the possibility for the addition of new structures.

Completion of Site Design

The site itself is currently asphalt paving with some street lights and electric car plugs for the winter month. The site will be redesigned to fit better within the context of sharing boundaries to residential and commercial zoning as well as the river and bluffs.

Adherence to Sustainable Building Techniques

It is important both ethically and personally that I choose to establish design techniques that not only serve the users and client of this thesis, but also serve the community. I will do this by being responsible in the selection of materials. I will be responsible for the utilization of current building features to more properly utilize the further consumption of natural resources.

PROJECT EMPHASIS CONT.

Relationship to both old and new bridges

The site itself has a great relationship to the old highway that ran across the northern great plains. The bridge that lies currently across the Missouri River was the last link to connect the coasts together. The design itself must take into consideration the needs of the bridges themselves and their importance not only to the site, but also to the connection of Bismarck to Mandan and the psychological connections a bridge has by definition.

The new design and modification the current structure needs to implement smart techniques used by previous local generations.

Currently there are no design principles governing design in the Bismarck area, especially in the area of housing. However both early settlers and Native Americans used principles that worked to their advantage such as smart constructability and day lighting. Such ideas have a direct place in the adaptive reuse of this project. In new design and modification of current structure, a recognition of design principles used by both the Regional Native Americans as well as the original homesteaders in the area, taking into consideration the Germans from Russia is important to this design.

Creation of a community

In some ways this idea embraces all the others. It is a main focus to make sure at all times this design becomes something that can function on its own. But at the same time it needs to also embrace the fact that it is part of the larger Bismarck-Mandan community.

USER/CLIENT DESCRIPTIONS

CLIENT

For this project the client will consist of a sole “invented” developer. The developer will be interested in creating a unique opportunity for housing in the community. The developer will also be interested in making sure that there is no focus on a certain social or income classes in this housing development and is interested in developing housing for all who are interested. In simple terms the developer is most interested in creating a living community within a city that adds to the value of Bismarck without taking anything away.

USER GROUPS

The users of this project will mainly represent those who choose to take residence within the housing community. Also this will include those who will use the auxiliary spaces on the site.

This includes but is not limited to:

- Owners
- Tenants
- Shop Owners
- Shop Tenants
- Employees
- Shop Renters
- Shop Clients
- Shop Customers
- Guests

PROJECT ELEMENTS

PRINCIPAL ELEMENTS

In considering this project, the major elements will include the current hotel tower, the large horizontal hotel element and lastly the site surrounding the project, which is currently only asphalt parking. Another element of this site is the proposed bridge that will be built with its entrance directly adjacent to the site and the historic bridge that will be taken down.

MAJOR SPACES AND FUNCTIONS

The major spaces that will be taken into design consideration on this site will be:

- Individual housing units
- Supporting spaces such as
 - Laundry
 - Parking
 - Storage
 - Relaxation
 - Group or Public meeting space
 - Exercise facilities
- The bike trail that will run on the site connecting Bismarck's recreational trail system with Mandan's trail.
- Spaces for leasing of small businesses possibly including
 - Hair stylist
 - Barber
 - Flower shop
- Restaurant
- Kiosk
- Onsite daycare

SITE INFORMATION



Fig. 11.1

SITE OVERVIEW

The site itself is in the city of Bismarck, North Dakota. Currently North Dakota has an estimated population of almost 634,000 people. Bismarck sits on the southwest central portion of the state. Bismarck, the capital of North Dakota has a population of 55,500 people. The city itself contains 24,000 housing units. Bismarck's neighboring city Mandan has a current population of 16,700 people. With outer lying developments this gives Bismarck a metropolitan size of approximately 91,000 people including both Burleigh and Morton counties.

SITE INFORMATION CONT.

This is the view from the original entrance to the hotel looking east on Main or the original Highway 10.



Fig. 12.1

This is a view of the current overhang of the entrance as well as the large sign and a glimpse of the bridge on the horizon.



Fig. 12.2

A zoomed view of the main entrance on the north side of the site.



Fig. 12.3

SITE INFORMATION CONT.

A view towards the south looking at the north façade of the original hotel showing the double façade and walkway.



Fig. 13.1

The south side looking up towards the tower addition and showing the used furniture store that sits on the southeast edge of the site.



Fig. 13.2

Another view showing in more detail the furniture store positioned with the tower in the background.



Fig. 13.3

SITE INFORMATION CONT.

A view looking at the entrance to the bar and nightclub of the hotel on the southwest edge of the site bordering the Memorial Highway.



Fig. 14.1

A view towards the east on Memorial Highway with the Site 90 degrees to the left or north.



Fig. 14.2

Looking across Memorial Highway showing the site with trees on the southern exposure.



Fig. 14.3

SITE INFORMATION CONT.

A view looking west on Memorial Highway showing the southern edge of the site and the streetscape.



Fig. 15.1

A local business across Memorial Highway to the south located right on the bank of the Missouri River Floodplain.



Fig. 15.2

A house located across the street towards the east in the housing district two family housing.



Fig. 15.3

SITE INFORMATION CONT.

The local rural and regional ambulance has an office across the street on Memorial Highway towards the south. Also in the background is the original A&W restaurant which is currently being used as a veterinarian clinic.



Fig. 16.1

Another view along Memorial Highway that runs along the southern edge of the site and shows the medium density housing that borders the southeastern edge of the site.



Fig. 16.2

This view shows the eastern border street of the site showing West St. with the hotel tower in the upper left corner of the picture.



Fig. 16.3

SITE INFORMATION CONT.

A view from West St. showing the hotel tower addition as well as the large conference and banquet hall addition.



Fig. 17.1

Another view from West St. showing the south parking spaces and the lower housing unit along with the clerestory for the pool area.



Fig. 17.2

A closer view of the tower unit.



Fig. 17.3

SITE INFORMATION CONT.

A closer view showing the banquet and conference hall as well as the large HVAC unit mounted to the roof.



Fig. 18.1

A closer view of the south side of the original hotel unit with the clerestory in the background for the indoor pool area.



Fig. 18.2

A view from Missouri Ave over looking Main Ave showing the northern side of the tower and banquet hall.



Fig. 18.3

SITE INFORMATION CONT.

Another view from Missouri Ave overlooking Main Ave showing the original hotel with main front entrance.



Fig. 19.1

A view showing the existing north façade of the building.



Fig. 19.2

A close view from Main Ave showing the Glass façade of the hotel.



Fig. 19.3

SITE INFORMATION CONT.

SITE IMPORTANCE

The significance of this site is of great importance to the city of Bismarck. Currently the city is working on the development of a new city bridge to connect Bismarck to Mandan. This will replace the memorial highway bridge that has been in operation since 1922 and was the final link connecting the Pacific and Atlantic Coast on Highway Ten. The site is seven and a half acres currently sits without use. It is within a couple of minutes of downtown Bismarck and the Missouri River.

SITE INVENTORY

ECONOMIC BASE

Currently Bismarck has about 31,000 employees in the work force. The current median household income is 39,000 dollars. The median family income is 51,000 dollars and the income per capita is 20,000 dollars. Approximately 8.5% of the population is currently below the poverty level.

DEMOGRAPHICS

The population of the Bismarck is approximately 94% White with the second largest population being Native American at 3.4%. Black or African-American and Asian populations constitute less than 1% to the total population. The rest of the population is a breakdown of other races including Pacific Islander and Latino.

LOCATION

The site itself is located where Main Ave and Memorial Highway in Bismarck meet and diverge. Across Main Ave are small two and three story office buildings as well as several car sale lots. To the South of the site is Memorial Highway and a row of small business ranging from a butchers shop to an ambulance service. To the east and southeast is all residential housing ranging from single family detached units to medium size apartment buildings three stories in height.

SITE INFORMATION CONT.

MAJOR LANDMARKS

Again, one of the most important landmarks is the current bridge set for removal after the completion of the new four lane bridge almost adjacent to the existing bridge. Also important to the Bismarck area is the State Capital, which includes the Governor's Mansion, Heritage Center and state library. Directly south of Mandan is the Mandan Indian Village and Fort Lincoln State Park.

SITE TOPOGRAPHY

The site itself is relatively flat as it has been previously developed. The area itself slopes towards the direction of the river and the embankment across memorial highway on the southern side. The highest point is the northeast corner.

VEGETATION

Currently there is almost no vegetation on the site. There are several trees that surround the building and some areas that have been planted with domesticated grasses. The river valley has some native long grasses left.

UTILITIES

The site itself is within the bounds of the city of Bismarck, so it currently has connections to water, sewer, electricity, and communications. The site itself has already been previously setup for handling water drainage.

TRANSPORTATION

Bismarck itself has a connection with a regional bus line that can deliver people either to Amtrak or to the closest Greyhound hub. Bismarck has a regional airport providing service to Denver and Minneapolis. The

SITE INFORMATION CONT.

city itself currently has two taxi companies. The city also recently open its own public transportation, which consists of multiple buses. The site is close to the city recreational bike line, which can also double as a means of transportation to and from the site during the warmer months. Highway 83 which runs from Canada to Mexico and I-94 which runs from New York to The Pacific also intersects in Bismarck, making it a very accessible place via automobile transportation.

VIEWS

The site in question has some spectacular views of both the city of Bismarck as well as the Missouri River and towards the bluffs and hills south of Mandan. Most of the good views come from the tower. However, from the ground on the north side, one can see the dynamic exchange of traffic on and off of the bridge.

SOLAR ORIENTATION

The southern side of the site has great opportunities to capture both light and heat. With such a large site, there is a great chance to utilize passive solar design strategies. Bismarck currently gets on average 272 sunny or partly sunny days each year.

WIND ANALYSIS

Bismarck has a low average wind speed of 9.8 mph in July and a high of 12.5 mph in May. The primary wind direction is west northwest which blows from September to April. The summer months vary with winds coming from the south southeast in May to west northwest in June and east in August.

EXISTING STRUCTURES

Currently there are two main structures existing on the site. The first is the large hotel tower and conference center. The next is the main hotel with atrium, restaurant and pool area. These two spaces are connected by a glass walkway.

SITE INFORMATION CONT.

ACOUSTIC ENVIRONMENT

The site does receive a large amount of noise from the Main Ave traffic which is loudest during both rush hours. The south and southeast sides of the site are well sheltered from noise by the residential area and existing buildings. The South side directly adjacent to memorial highway has some noise from traffic, but not at the level of a commercial street. There is also a train within a few city blocks that may need to be accounted for on the northern portion of the building.

WEATHER

AVERAGE TEMPERATURES

	J	F	M	A	M	J	J	A	S	O	N	D
High Temperature (F/C)	20 / -7	26 / -3	38 / 4	55 / 13	68 / 20	77 / 25	84 / 29	83 / 28	71 / 22	59 / 15	39 / 4	24 / -4
Low Temperature (F/C)	-2 / -19	5 / -15	18 / -8	31 / -1	42 / 6	52 / 11	56 / 14	54 / 12	43 / 6	33 / 0	18 / -8	3 / -16
Snow (in / cm)	6 / 14	6 / 14	6 / 16	2 / 6	trace / trace	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	3 / 8	9 / 22
Wind Speed (mph / kmh)	10 / 17	10 / 17	11 / 18	12 / 19	12 / 19	10 / 17	9 / 15	10 / 15	10 / 16	11 / 17	10 / 15	10 / 16
Wind Direction (from the)	WNW	NW	NW	ENE	SSE	SSE	SSE	SSE	WNW	WNW	WNW	WNW
Cloud Cover (out of 8)	5.5	5.6	5.6	5.4	5.3	4.8	4.0	4.0	4.4	4.9	5.6	5.4

Table. 23.1

SITE INFORMATION CONT.

HUMIDITY

City	Time	J	F	M	A	M	J	J	A	S	O	N	D	Yr.
Bismarck	Mid	70	74	74	69	70	76	74	70	73	68	73	72	72
	6A	71	74	76	77	77	83	82	79	82	76	75	73	77
	12N	65	68	61	52	48	54	48	43	49	46	58	65	55
	6P	67	69	58	46	44	49	44	38	45	45	60	68	53

Table. 24.1

SUNSHINE

Station	Month												Year
	J	F	M	A	M	J	J	A	S	O	N	D	
Bismarck	55	56	60	59	62	62	76	73	65	61	46	48	62%
	*159	248	357	431	536	571	607	522	384	269	159	124	364

Table. 24.2

CLEAR DAYS

Station	Sky	MONTH												Year
		J	F	M	A	M	J	J	A	S	O	N	D	
Bismarck	C	7	5	5	6	6	7	12	12	10	10	6	7	93
	PC	8	8	9	9	11	10	12	11	9	8	7	6	108
	CY	16	15	17	15	14	13	7	8	11	13	17	18	164

Table. 24.3

SITE INFORMATION CONT.

OBSTRUCTIONS TO VISIBILITY

Station	P1	J	F	M	A	M	J	J	A	S	O	N	D	Yr.
Bismarck	30	1	2	2	1	*	1	1	1	1	1	1	1	12

Table. 25.1

WIND

Month	Bismarck		
	Mean Speed	Prevailing direction	Fastest Mile
January	10.2	WNW	54
February	10.2	WNW	54
March	11.4	WNW	65
April	12.8	WNW	63
May	12.5	SSE	66
June	11.3	WNW	66
July	9.8	SSE	72
August	10.0	E	72
September	10.5	WNW	66
October	10.4	WNW	61
November	10.6	WNW	67
December	9.8	WNW	61
Year	10.8	WNW	72
Yrs. of record	30	14	30

Table. 25.2

SITE INFORMATION CONT.

FROST PENETRATION

Station	Penetration	
	Average (feet)	Extreme (feet)
Bismarck	4.5	7.0
Devils Lake	3.5	6.5
Dickinson	4.0	6.0
Ellendale	4.0	6.0
Fargo	4.5	6.0
Grand Forks	4.5	7.0
Jamestown	4.5	6.0
Minot	4.0	6.5

Table. 26.1

THUNDERSTORMS

Station	P ¹	J	F	M	A	M	J	J	A	S	O	N	D	Yr.
Bismarck	30	0	0	*	1	4	9	10	8	3	1	*	0	36

Table. 26.2

BLIZZARDS

State	Colorado Low	Alberta Low	Other	Total frequency of occurrences
North Dakota	8	13	3	24

Table. 26.3

SITE INFORMATION CONT.

PHOTOGRAPHY AND VISUALIZATION

AERIAL PHOTOGRAPHY



Fig. 27.1

32 METER RESOLUTION

SITE INFORMATION CONT.

AERIAL PHOTOGRAPH



Fig. 28.1

16 METER RESOLUTION

SITE INFORMATION CONT.

AERIAL PHOTOGRAPHY

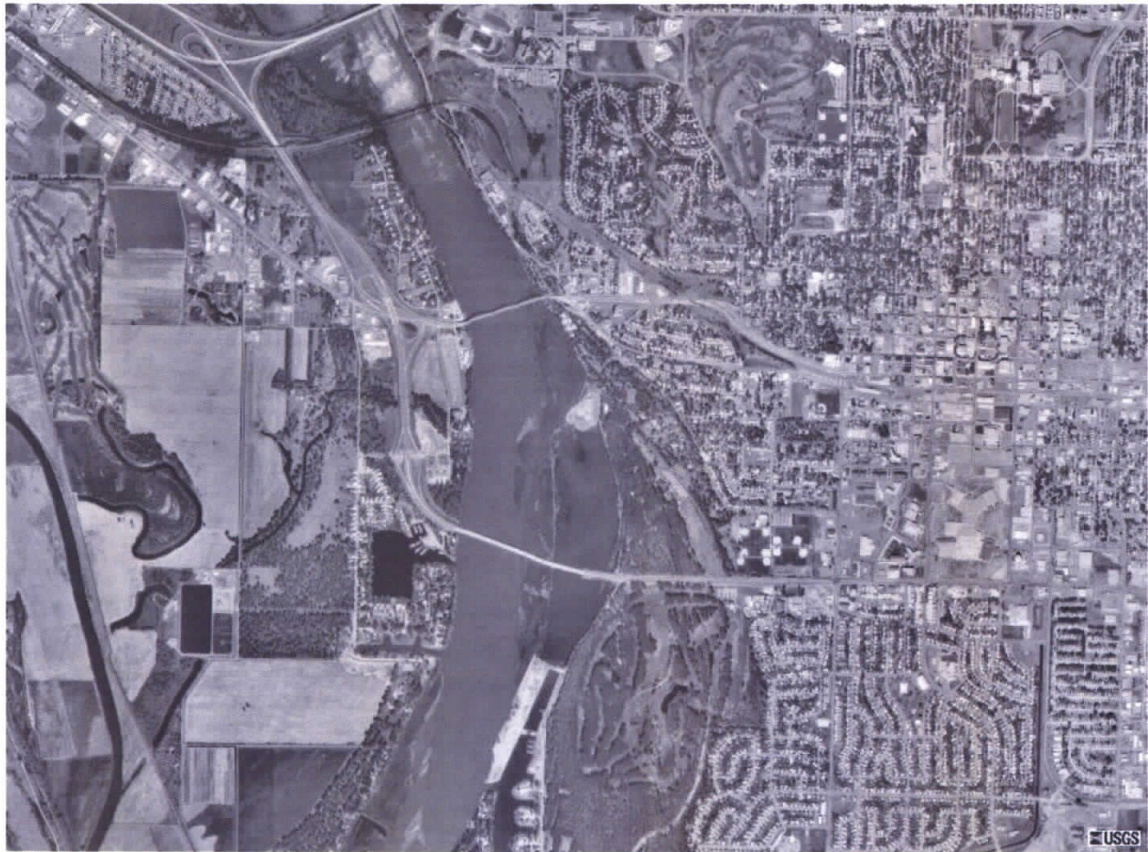


Fig. 29.1

8 METER RESOLUTION

SITE INFORMATION CONT.

AERIAL PHOTOGRAPHY



Fig. 30.1

4 METER RESOLUTION

SITE INFORMATION CONT.

AERIAL PHOTOGRAPHY



Fig. 31.1

2 METER RESOLUTION

SITE INFORMATION CONT.

AERIAL PHOTOGRAPHY

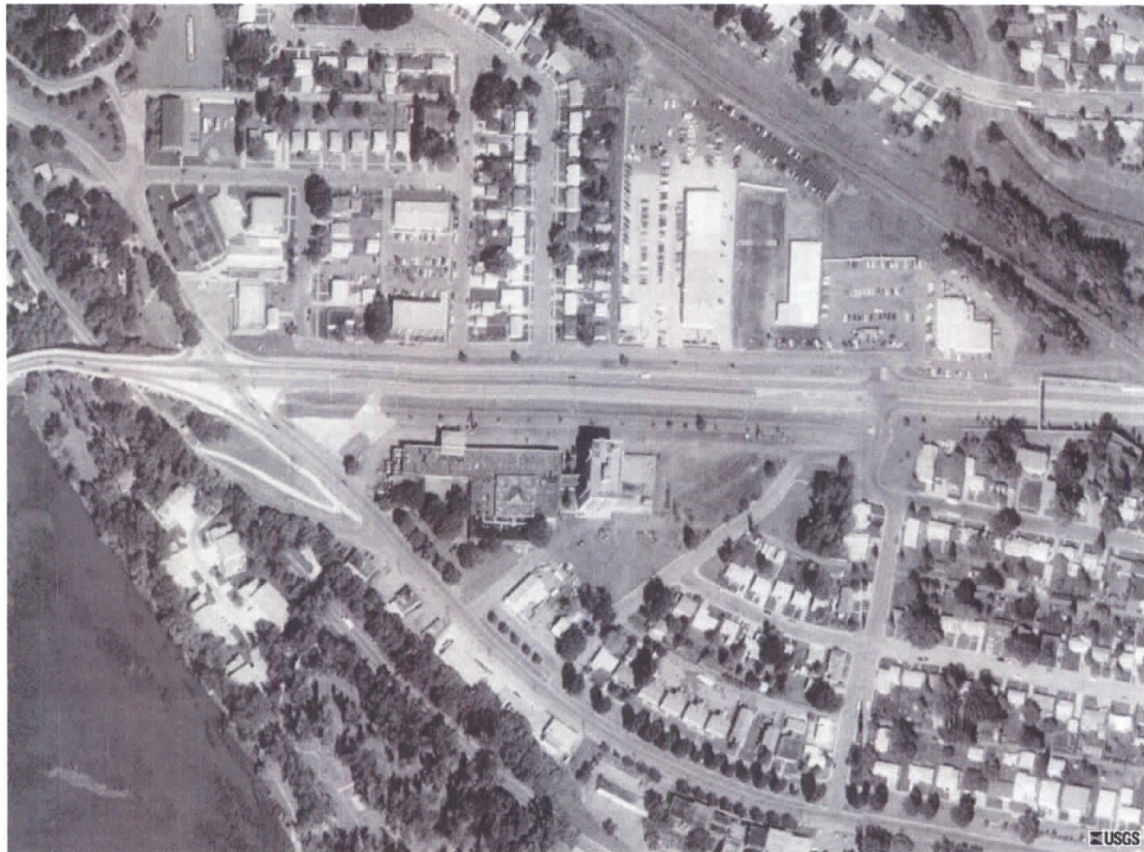


Fig. 32.1

1 METER RESOLUTION

SITE INFORMATION CONT.

MAP



Fig. 33.1

SITE INFORMATION CONT.

SOILS

The site itself sits in an area designated to the Temvik-Mandan-Werner association. It is said to be terrain that ranges from nearly level all the way to steep. It is also well-drained, medium textured and resides on uplands and terraces.

The soil on the site is named Mandan Linton silt loams and is characterized as undulating. The slope is mild at between three and six percent slope. The make up is 55% Mandan silt loam and then 45% Linton silt loam.

In regards to water the soil has a medium level of runoff. Mandan-Linton silt loams are also high in water capacity and fertility. The soil is most capable of growing small grains, corn and alfalfa. The Department of Agriculture reports however that some of the soil must be irrigated.

Erosion control is a huge necessity with this soil type as blowing is bound to exist if there isn't vegetation covering the soil. Water erosion is also a major factor on this site. It is also important to watch for erosion on soils that have been dug for row cropping.

(All previous soil information was taken directly from A Soil Survey of Burleigh Country, North Dakota, 1974)

WATER

The site itself is just high enough to be out of the 100 year flood plain and is quite out of danger from any flooding. However there is a small occurrence of receiving torrential rain storms and surface flash flooding has to potential of existing. The site itself was paved first in the early 1960's and repaved with the expansion of the hotel to include the tower and hall of ports (banquet and reception hall). The site is connected to the Bismarck sewer and water lines and has no water issues requiring special attention.

SITE INFORMATION CONT.

VISUAL FORM

The existing hotel comprises the entirety of the visual form on the site. The rest of the site consists of some trees places around the edge of the site and in places adjacent to the building. The site is paved completely with the exception of some small grass areas around the site. The visual form

PLANT COVER

The plant cover currently on the site consists of the boundary trees on the site as well as the grassed areas adjacent to the site. Currently there are some foreign invasive species of plants and vines that have started growing around the building and through the cracks in the paving surface.

SITE CHARACTER

The site itself currently has the potential for an enormous amount of character. The building was previously a nice looking building that showed the modern edge of Bismarck as travelers would pass through the memorial bridge from Mandan looking for a place to stay. The site itself has some unique character derived from its slightly triangular form. The site also pulls a lot of character from being so close to the Missouri River. It is also worth noting the future importance of the site. With a new bridge being planned and a new link of recreational trails in the area, the site has some great responsibility as a currently uninhabited site in Bismarck.

SITE INFORMATION CONT.

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CASE STUDIES

CASE STUDY #1

Housing Community at Hedebygade, (Copenhagen, Denmark)

INFORMATION

Hedebygade (1998-2004)

Ydre Vesterbro

Created by SBS Byfornyelse



Fig. 37.1

In 1998 the city of Copenhagen took an entire city block and decided to create a new ecological housing project. The old block consisted of housing units dating back to the start of the 20th century and had many units that were currently unfit for occupancy for reasons ranging from lack of sanitation or size. The ministry of Housing and Urban Affairs in Denmark as well as the City of Copenhagen and the SBS Byfornyelse took on the project. The aim of the project was to create an ecological housing project that would work both to educate the new renters of the benefits of ecological housing as well as educate the general public. It was also meant to be a visible showpiece of the current options one has in an urban setting.

The project itself took on twelve subprojects each focusing on unique aspects of ecology and how it relates to either an individual housing unit or the entire site. The projects could be gathered into three main groups of twelve total projects: self directed ecology, ecology through materiality and lastly ecology through energy conservation.

CASE STUDIES

Energy Consumption Metering



Fig. 38.1

This project installed meters in each of the unit that allows for the self monitoring of energy consumption as well as energy saving. This will help direct each living unit to see how they directly interact with the building and the consumption of energy. The goal in mind for this project was to cut down on the consumption of energy by at least 25%. The system as a whole can also be monitored through this system allowing for the success of the entire project to be measured.

Solar Energy



Fig. 38.2

Several of the units involved had new glazing placed on the interior courtyard that allowed for the collection of solar radiation. Additionally, more units were created that had solar panels on the outside façade of the private stair to collect more energy during the daytime. Also, the southern facing roofs had solar panels installed to collect more energy.

CASE STUDIES



Fig. 39.1



Fig. 39.2

Light

As this Unit was also a demonstration to the community as a whole a large stainless steel prism was mounted to the roof of the building and was used to reflect sunlight all the way down through the middle of the building. The unit was driven by a heliostat which would constantly reposition the prism throughout the day to reflect the largest amount of sunlight through the core of the building.

CASE STUDIES

Garbage and Community areas



Fig. 40.1

On the interior courtyard side of the building is a large space created for the benefit of all the users of the site. There are spaces designated for the recycling of most consumer waste and goods. There is also parking for bicycles and a children's playground. The communal area also helps to foster life by having a variety of plants for both birds and insects.



Fig. 40.2

Kitchens

All of the kitchens were installed using “green” natural materials that are healthy for the users. Many used vertical planters to also help collect solar energy. There was also space set aside for the apartment owner to plant their own herbs, thus reducing the need for the transportation of food sources from long distances. Also, all of the kitchens had an air cooled larder to help reduce the need for extra energy costs of the refrigerator.

CASE STUDIES

Plant life

One of the most natural attempts at creating an ecologic design was the installation of the plants that help clean the air and produce oxygen for the apartments. The need for the flat owner's participation is such a critical part of this installation. If they do not wish to participate, the plants will die and they will see no benefit. Through psychological benefits of this installation, the group claims a reduction of between 30 and 40% of the energy required to heat the space from the user's participation. Grey water collected from the showers is recycled collectively and then redistributed to provide water for the plants.



Fig. 41.1

Solar siding

The attempt here was for the creation of the spaces that helped the flat owner by giving them as much natural light as possible, while also helping them financially by reducing the need for extra heating. This was done through multiple outlets which included installing solar siding to trap and distribute heat; low energy window installations, passive solar heating as well as roof mounted solar panels.

CASE STUDIES

Case Study Significance

This is the most important case study for this project. It hits on all the important issues that pertain to this design thesis. It has shown how effective a project like this can be when you engage the apartment owners on multiple levels. This project shows the rehabilitation of an almost abandoned building that was converted from low income to average income housing. It was also important as it showed a variety of different ecological or passive techniques that can be used successfully in housing design. The area ranges from passive systems like light collection to active systems such as the energy metering system. It also shows how some parts of a design solution can be behind the scenes. The users see the plant life in their windows and realize that it is cleaning the air, but the solar panels on the roof cannot be seen from many vantages and work behind the scene adding extra energy to the site and heating water. It also engages the user as much as they wish to participate. The can take the self directed ecological methods as far as they wish.



Fig. 42.1

CASE STUDIES CONT.

CASE STUDY #2

Red River College in downtown Winnipeg, Manitoba

INFORMATION

A whole city block was turned into a new a community college in downtown Winnipeg utilizing not only the old building and structure, but managing to incorporate something new and fresh for the city. The main incorporating theme into this building is the alleyway. The old alley was converted into a roof covered walkway for the students and staff linking the entire block together. The main entrances to the college are on either end of the alley. The windows that once were outside still function, just to a large interior space.



Fig. 43.1

CASE STUDIES CONT.

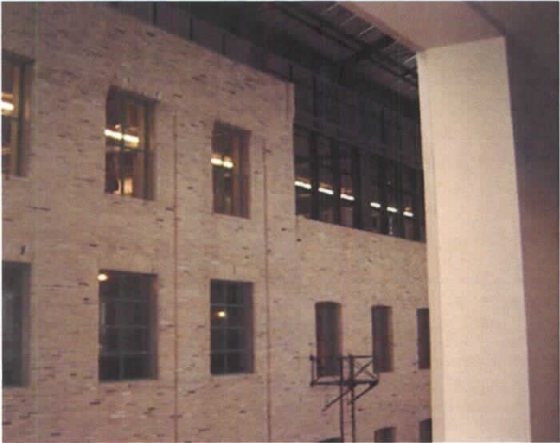


Fig. 44.1



Fig. 44.2



Fig. 44.3



Fig. 44.4



CASE STUDIES CONT.

Case Study Significance

This study is important to the thesis as it shows a Northern Great Plains example of site rehabilitation and adaptive reuse. Although there may be some argument on the façade treatment of some of the elevations, the idea of creating a whole community on the site incorporating existing elements was thought out very well. The covered alley way works well to bring light into an otherwise dark center of the building and provides a much needed break from the harsh winter winds for pedestrians.



Fig. 45.1

CASE STUDIES CONT.

CASE STUDY #3

Housing Project, Austria

INFORMATION

Dornbirn, Austria

Hermann Kaufmann



Fig. 46.1

This project represents a simplicity in sustainable apartment design. The project was located in an already dense fabric. The housing was constructed out of prefabricated high quality elements and had an onsite construction time of only four months. (Gauzin-Müller)

The Building utilizes a multiple stage air intake to help cool and heat the building. Air is brought in from the garden side and then is taken under the earth to travel through a tube which is able to lower and raise the temperature by about 45 degrees. The roof of the building has 350 square feet of solar panels that are able to provide a majority of the buildings hot water supply. At a cost of 5% over current housing costs, this building is expected to occur only 10% of the energy costs over it's lifetime. (Gauzin-Müller)

Case Study Significance

This case study is very important to the thesis as it shows ways to simply add sustainable techniques to average middle class housing projects. It is also important as it takes an important look at the savings properties of sustainable building techniques.

CASE STUDIES CONT.

CASE STUDY #4

Housing In Finland

INFORMATION

Viikki Helsinki, Finland

Arrak Architects



Fig. 47.1

This example of sustainable housing is built in a suburb of Helsinki, Finland. The building itself was designed to be responsive to the cold winters. It was designed to block the wind from both the north and south with the installation of the buildings which creates an open courtyard in between. The idea behind the creation of this courtyard was to create a public space for the interaction of the inhabitants to create a sense of place within the community. (Gauzin-Müller)

CASE STUDIES CONT.

The site plan showing the creation of the public space promoting a sense of community as well as the smart placement of the buildings to help naturally block the winds.

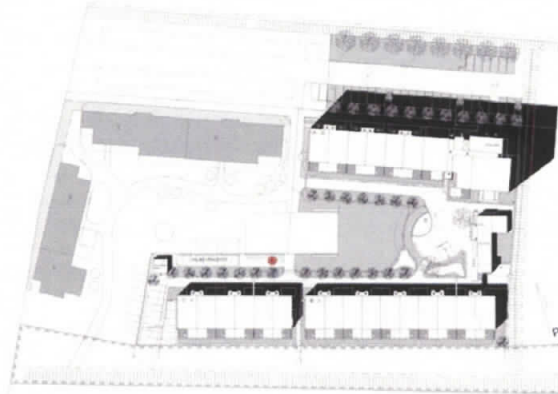


Fig. 48.1

A view of the building showing the exterior stair elements allowing for a more compact building with less spaces to spend heating and cooling. Also one can see the installation of solar energy collector panels mounted onto the roofing system provide a majority of the water heating needs. (Gauzin-Müller)



Fig. 48.2

CASE STUDIES CONT.

Case Significance

This case is very important for the design of the thesis project for a number of reasons. First the building is important considering its similar location in a cold climate. This has been addressed in multiple ways. In the image below the simple design of having a lower southern building to allow heat from the sun to still get into the courtyard while also raising the level of the rear building to provide as much blockage of the north winds as possible. (Gauzin-Müller)

Second, the application of sustainable techniques is also very important to this case study. The use of color choices, such as grey on the southern façade helps to retain some heat during the winter from the sun, but yet is light enough to not promote overheating during the summer months. The northern facades are painted white to help encourage more indirect lighting throughout the day. (Gauzin-Müller)

The warm water in the building is brought in from a neighboring power plant and is distributed throughout the buildings concrete floors and allows the natural thermal mass properties of the concrete to be utilized. Also very effective for climates that undergo a large amount of temperature change between seasons the mechanical heating system is designed to bring in air from the southern side during the winter months and from the cooler northern side in the winter to take advantage of the appropriate air temperatures. (Gauzin-Müller)

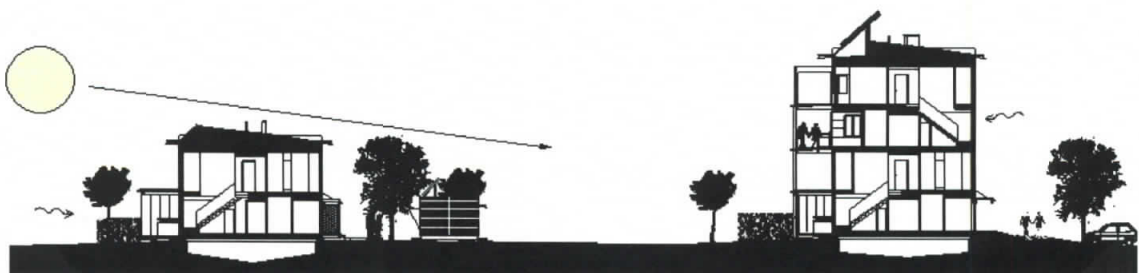


Fig. 49.1

CASE STUDIES CONT.

CASE STUDY #5

Koldinghus Castle Restoration

INFORMATION

Kolding, Denmark

Inger and Johannes Exner Architects

1975-1988



Fig. 50.1

This project represents an example of taking an almost demolished building and utilizing it to create a museum that not only shows the character of the castle but brings out new construction technologies that integrate themselves within the castle walls.

The castle suffered a fire and the roof and many floors were damaged by conquering foreigners many years ago. The building sat for a long time as ruins until enough money was raised to restore the castle and preserve it as both ruins and a modern interpretive museum also containing period rooms and a fine collection of silver.

CASE STUDIES CONT.

This image shows the height of the laminate wood columns supporting the new roof as well as gives an impression of the separation between old and new.



Fig. 51.1

A view of the original chapel modified with a new second story seating area.

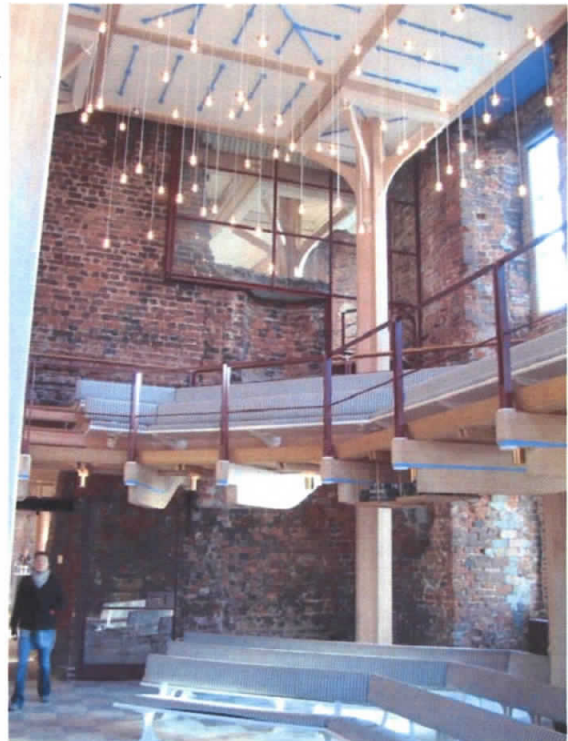


Fig. 51.2

CASE STUDIES CONT.

This picture illustrates the way in which the new circulation was hung in and around the load bearing masonry walls of the castle. It also shows the connection and detail of the laminate columns used to support the new roof removing the masonry walls from having to do any major structural support of the roof.

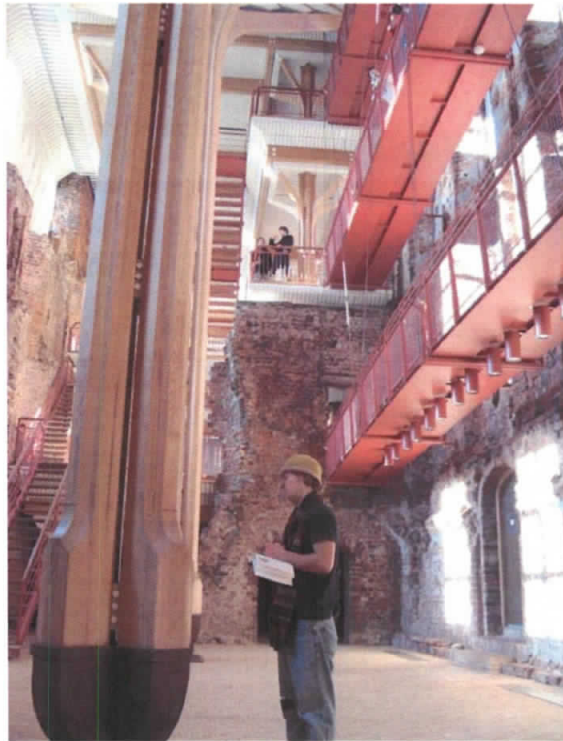


Fig. 52.1

One of the few external modifications with the exception of the roof is the stair tower in the courtyard which is only seen from the private side of the museum. One has to pay to get this far in the building.



Fig. 52.2

CASE STUDIES CONT.

The structural wood laminate columns that connect to the new roof structure in the castle.



Fig. 53.1

The hanging steel staircase that needs no connection or support to the original load bearing masonry walls at Koldinghus.



Fig. 53.1

An exterior shot showing the original silhouette of the castle unchanged after modifications.



Fig. 53.3

CASE STUDIES CONT.

Case Significance

This case is very important as it helps to show ways to take a building that was no more than ruins and thoughtfully think of a way to incorporate a new roof structure and place new floors within. It does this with new lightweight materials while taking nothing away from the exterior of the building. This is an important way at looking at keeping a form that has been in a community for an extended period of time and modifying it in a way to provide a new use for the community and maintain the existing building as much as possible.



Fig. 54.1



Fig. 54.2

PROGRAMMATIC REQUIREMENTS

PROGRAMMATIC REQUIREMENTS

Spatial Requirements

For this design, the spatial requirements of the project are meant to be an exploration of site context and the possible housing solutions that could best fit the site and city. Therefore, there will not be any detailed information given at this point in regards to how many apartment units or how many housing units may be installed on account that it will be a constantly evolving design throughout the design process.

However, this spatial requirements section will provide general information on general sizing guides for apartments and houses and the spaces that occupy themselves within or around each dwelling unit. This section also contains information relevant to the creation or the installation of the auxiliary units that surround the housing units. The programmatic requirements will also look at the creation of the new units that may be built on the paved portion of the site.

Although there is a further break down of the apartment spaces to show the actual sizes of each individual room, the spatial requirements are currently looking at the constraint of the larger unit.

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

EFFICIENCY APT

SPACE ANALYSIS

AREA:

400-600 S.F.

HOURS OF USE:

24 HOURS

DESCRIPTION:

The area consists of a large central space that has to take the place of a living room, dining room, kitchen and bedroom. There will also be a private bathroom. This space will also need some closets and pantries within for storage.

SERVICES AND SYSTEMS:

Water, Heating, Cooling, Electricity, Communications

FUNCTION:

To provide a place for living.

SPATIAL RELATIONSHIPS:

Entry/exit, laundry, refuse

LIGHTING:

Natural and artificial lighting

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

1 BEDROOM APT

SPACE ANALYSIS

AREA:

650-900 S.F.

HOURS OF USE:

24 HOURS

DESCRIPTION:

The area consists of a separate bedroom, kitchen, living room and bathroom. This space will also need some closets and pantries within for storage.

SERVICES AND SYSTEMS:

Water, Heating, Cooling, Electricity, Communications

FUNCTION:

To provide a place for living.

SPATIAL RELATIONSHIPS:

Entry/exit, laundry, refuse

LIGHTING:

Natural and artificial lighting

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

2 BEDROOM APT

SPACE ANALYSIS

AREA:

950 - 1250 S.F.

HOURS OF USE:

24 HOURS

DESCRIPTION:

The area consists of two separate bedrooms, a kitchen, living room and bathroom. This space will also need some closets and pantries within for storage.

SERVICES AND SYSTEMS:

Water, Heating, Cooling, Electricity, Communications

FUNCTION:

To provide a place for living.

SPATIAL RELATIONSHIPS:

Entry/exit, laundry, refuse

LIGHTING:

Natural and artificial lighting

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

3 BEDROOM APT

SPACE ANALYSIS

AREA:

1250-1600 S.F.

HOURS OF USE:

24 HOURS

DESCRIPTION:

The area consists of three separate bedrooms, a kitchen, living room and bathroom. This space will also need some closets and pantries within for storage.

SERVICES AND SYSTEMS:

Water, Heating, Cooling, Electricity, Communications

FUNCTION:

To provide a place for living.

SPATIAL RELATIONSHIPS:

Entry/exit, laundry, refuse

LIGHTING:

Natural and artificial lighting

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

LAUNDRY

SPACE ANALYSIS

AREA:

200-600 S.F.

HOURS OF USE:

8 A.M.—10 P.M.

DESCRIPTION:

The area consists of a place for washers and dryers, at least one large sink to wash articles in by hand and possibly a natural drying area.

SERVICES AND SYSTEMS:

Water, Heating, Cooling, Electricity

FUNCTION:

To provide a place for the cleaning and laundering of clothing

SPATIAL RELATIONSHIPS:

Entry/exit, housing units, refuse, circulation

LIGHTING:

Artificial lighting is the primary necessity, however natural lighting should be strived for.

USERS:

Owners/renters

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

STORAGE

SPACE ANALYSIS

AREA:

0 - 100 S.F / UNIT

HOURS OF USE:

24 HOURS.

DESCRIPTION:

This area consists of a dry, secure area to place extra valuables and possession not in immediate use by the owners or tenants on the site.

SERVICES AND SYSTEMS:

Heating, Cooling, Electricity

FUNCTION:

To provide a place to store extra goods.

SPATIAL RELATIONSHIPS:

Entry/exit, housing units, circulation

LIGHTING:

Artificial lighting

USERS:

Owners/renters

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

RECREATIONAL

SPACE ANALYSIS

AREA:

500-2000 S.F.

HOURS OF USE:

8 A.M. - 12 P.M.

DESCRIPTION:

This space would need to have the room and volume necessary to play different recreational games such as billiards, darts and table tennis. The space also could have room for a TV lounge

SERVICES AND SYSTEMS:

Heating, Cooling, Electricity, Communication

FUNCTION:

A place for owners/renters to come and find relaxation

SPATIAL RELATIONSHIPS:

Entry/exit, housing units, circulation

LIGHTING:

Natural and Artificial lighting

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

READING ROOM

SPACE ANALYSIS

AREA:

500-2000 S.F.

HOURS OF USE:

8 A.M. - 12 P.M.

DESCRIPTION:

This space would need to have space for the storage of books and periodicals as well as the possibility of housing a few computers

SERVICES AND SYSTEMS:

Heating, Cooling, Electricity, Communication

FUNCTION:

A place for owners/renters to come and find relaxation and a place to read or exchange books

SPATIAL RELATIONSHIPS:

Entry/exit, housing units, circulation

LIGHTING:

Natural and Artificial lighting. Natural lighting is a large benefit to this space during the day.

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

MEETING SPACE

SPACE ANALYSIS

AREA:

500-2000 S.F.

HOURS OF USE:

8 A.M. - 12 P.M.

DESCRIPTION:

This space would provide the need for those who are hosting more guests than their apartment allows them to receive.

SERVICES AND SYSTEMS:

Heating, Cooling, Electricity, Communication, Water, Refuse

FUNCTION:

A place that allows users to host small gathering and parties.

SPATIAL RELATIONSHIPS:

Entry/exit, housing units, circulation, refuse

LIGHTING:

Natural and Artificial lighting. Natural lighting is a large benefit to this space during the day.

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE:

DAYCARE

SPACE ANALYSIS

AREA:

35-50 S.F. / CHILD

HOURS OF USE:

6:30 A.M. - 6:30 P.M.

DESCRIPTION:

This space would provide for a place for people to watch over the children of the residents who were employed during the day. The space would provide for all the needs of the children ranging from food to education and entertainment

SERVICES AND SYSTEMS:

Heating, Cooling, Electricity, Communication, Water, Refuse

FUNCTION:

The short term temporary housing and education of children

SPATIAL RELATIONSHIPS:

Entry/exit, housing units, circulation, refuse, Outdoor play area

LIGHTING:

Natural and Artificial lighting. Natural lighting is a large benefit to this space during the day.

USERS:

Owners/renters and guests

PROGRAMMATIC REQUIREMENTS CONT.

SPACE ANALYSIS

SPACE:

OFFICE / SHOP
SPACE

AREA:

150 - 1000 S.F.

HOURS OF USE:

8 A.M. - 10 P.M.

DESCRIPTION:

This space could be used for a variety of different end users but primarily will consist of a hair stylist/barber, a small grocery kiosk, and a few other small offices such as a private dentist, physician, florist, or small scale bakery

SERVICES AND SYSTEMS:

Heating, Cooling, Electricity, Communication, Water, Refuse

FUNCTION:

To provide a place for the exchange of goods and services within the larger and smaller community

SPATIAL RELATIONSHIPS:

Entry/exit, automobile and pedestrian parking, circulation, refuse

LIGHTING:

Natural and Artificial lighting.

USERS:

Owners/renters, clients, customers, employees, shop owners

PLANS FOR PROCEEDING

RESEARCH DIRECTION

The first and most important thing is the need for quality literary research to proceed in this project. There will be a need to study previously designed adaptive reuse projects. Another area of importance of knowledge to be gained to proceed is the research of examples of taking previous designs and applying sustainable and green principles to them. Lastly it will be important to research new medium density housing projects that have a sense of community or intimacy from the surrounding areas yet still integrate themselves to function within the city as a larger whole.

DESIGN METHODOLOGY

Through the aforementioned research I will gain a deeper understanding of the application of this body of knowledge on the thesis itself. This will lend itself to the production of a more thorough design process. This process will have a system of checks and balances from my major points of focus. I will constantly use them to make sure that my designs and intentions are adhering to the standards being set.

DOCUMENTATION OF THE DESIGN PROCESS

In order to show the development of this project, several things will have to be recorded. This will include recording thoughts and knowledge to a physical sketchbook. Digitally, there will be a folder containing architectural and three dimensional drawings. Models will need to be built to represent the creation of space and form. Physically, all hand drawings will also be held as well in a drawing portfolio. It will be most important to make sure that not only outcomes of the design are realized, but the process of that outcome was documented and rewarding.

PLANS FOR PROCEEDING CONT.

PREVIOUS STUDIO EXPERIENCE

2ND YEAR

Fall – Vince Hatlen

Understanding Space and Form – Public Viewing Space – No Site

Nativity Elementary School Addition – Fargo, ND

Spring – Philippe D’Anjou

World Trade Center redesign – New York City

World Trade Center memorial – New York City

Place for self – No site

School for architecture - Copenhagen, Denmark

Pedestrian Bridge Competition at Lachine Canal - Montreal, Canada

3RD YEAR

Fall – Steve Martens

Abercrombie Interpretive Center Museum – Abercrombie, ND

Municipal Airport Design – Dickinson, ND

Spring – Carol Prafcke

Children’s Center for the Arts – Fargo, ND

A Place for Worship – Fargo, ND

Creating Something Old: Bringing new housing back within city limits

TY GREFF

NDSU ARCHITECTURE DEPARTMENT

PLANS FOR PROCEEDING CONT.

4TH YEAR

Fall – *Brian Dougan, Cindy Urness, Joshua Walters, and Mark Barnhouse*

Fargo Urban Design

Spring – *Study abroad in Copenhagen, Denmark. Bo Christensen*

Movie Theater Downtown Copenhagen

Floating Kunsthal (art hall) – At sea

5TH YEAR

Fall – *Jay Waronker*

Olympic Medal Traveling display area

Unites States Supreme Court Building – Washington D.C.

PLANS FOR PROCEEDING CONT.

SCHEDULE

FALL SEMESTER

Week #1 **October 3-9, 2004**

Oct. 7 **Thesis Proposal, Abstract and Cover Page due**

Week #2 **October 10-16, 2004**

Oct. 13 **Return Thesis Advisor Statement to Main office**

Week #3 **October 17-23, 2004**

Oct. 21 **Advisor list made available**

Week #4 **October 24-30, 2004**

Oct. 28 **Begin case study work
Last day of programming class**

Week #5 **October 31- November 6, 2004**

Week #6 **November 7-13, 2004**

Nov. 11 **Begin detailed site analysis work
Veterans Day holiday (Thursday)**

Week #7 **November 14-20, 2004**

Nov 15-19 **Final week of 571 Projects/Presentations**

PLANS FOR PROCEEDING CONT.

Week #8 November 21-27, 2004

Nov. 24 **Draft Thesis to primary critic**

Nov. 25-26 **Thanksgiving holiday**

Week #9 November 28- December 4, 2004

Week #10 December 5-11, 2004

Dec. 9 **Final Thesis Program due**

Dec. 10 **Final day of classes**

Week #11 December 12-18, 2004

Dec 13-17 **Final examinations**

Holiday break starts

Begin Research

Week #12 December 19-25, 2004

Maintain research. Site model work digitally

Week #13 December 26 - January 1, 2005

Maintain research. Site model work digitally

Week #14 January 2-8 2005

Maintain research. Site model work physically

Holiday break ends

PLANS FOR PROCEEDING CONT.

SPRING SEMESTER

Week #15 **January 9-15, 2005**

Begin project development. Sketches, etc.

Jan. 11 **Classes Start**

Meet w/primary

Week #15 **January 16-22, 2005**

Jan 17. ***Martin Luther King Holiday***

Meet w/primary and secondary

Week #17 **January 23-29, 2005**

Meet w/ primary

Week #18 **January 30 - February 5, 2005**

Wrap up beginning development and sketch work

Meet w/primary and secondary

Week #19 **February 6-12, 2005**

Design development phas

Meet w/primary

Week #20 **February 13-19, 2005**

Meet w/primary and secondary

Week #21 **February 20-26, 2005**

Feb. 21 ***President's Day holiday***

Meet w/primary

PLANS FOR PROCEEDING CONT.

Week #22	February 27- March 5, 2005
	Meet w/primary and secondary
Week #23	March 6-12, 2005
	Wrap up design development for final revision
Mar. 7-11	Mid-semester thesis reviews Meet w/primary
Week #24	March 13-19, 2005
Mar. 14-18	Spring Break
Week #25	March 20-26, 2005
	Finish Final revisions. Begin final presentations
Mar. 25	Start Easter Holiday
	Meet w/primary and secondary
Week #26	March 27- April 2, 2005
Mar. 28	Easter Monday Holiday
	Meet w/primary and secondary
Week #27	April 3-9, 2005
	Meet w/primary and secondary
Week #28	April 10-16, 2005
	Meet w/primary and secondary

PLANS FOR PROCEEDING CONT.

Week #29 April 17-23, 2005

Finish final presentation work
Meet w/primary and secondary

Week #30 April 24-30, 2005

Wrap up all loose ends

Apr. 25 **Thesis projects due at 4.30 pm in MU ballroom**
Apr. 26-27 **Annual Thesis Exhibit in the MU ballroom**
Apr. 28-05 **Final Thesis Reviews**
Apr. 29 **Draft of Thesis document due to primary critics**

Week #31 May 1-7, 2005

May. 6 **Last day of classes**

Week #32 May 8-14, 2005

May 9-13 **Final examinations**

Week #33 May 15-21, 2005

Enjoy!

DESIGN

RESEARCH RESULTS AND GOALS

RESULTS FROM THEORETICAL PREMISE RESEARCH

Through all the various research that I engaged in during the design process, I came to several conclusions about the housing situation in Bismarck, the site, and the general housing construction and development process in the region. I determined that the housing situation in Bismarck was in dire need of a suggested change.

After reading several books on new housing techniques across the United States and abroad, the research was leading me towards adopting a new focus on the thesis. The site took on a different kind of importance towards the thesis as well. Instead of being the main focus, with an intensity towards adaptive reuse, the site became more of a means within which this thesis could explore new potentials within the housing market. In fact, the attempt of design towards the existing site became such a hindrance towards the new focus of the thesis, that it was intended for the thesis project focus to be completely revamped. The existing buildings were now not in focus at all and actually intended to follow the premise that they were demolished and that the site itself sat empty.

The last part of research that was focused on was the current situation of the housing process within the region. After looking at current options of housing (ranging from rental to ownership) it was determined that choice or options were left very slim. The research into this focused a lot of attention on the possibilities of introducing a new idea or process to the housing situation.

DESIGN CONT.

RESULTS FROM TYPOLOGY RESEARCH

Searching through the various typologies of this project resulted in some very focused results. In researching housing abroad, Denmark specifically, it was found that the creation of new housing made strong efforts to include as much creation of community as possible. Each new housing development was inclined to adapt or include itself into the current city plan as much as possible. New housing developments were keen into placing bike trails and bike parking that would allow users to get directly to bus or train lines. New neighborhoods would always have some place that would allow people to get basic grocery items as well as sometimes basic goods that people may wish to purchase. This is not to say, however, that these places attempted to reduce the need for a city center with a higher density and assortment of goods and services that people might need or want. The development simply provided for basic needs, without having the user left traveling long distances in order to find groceries, basic clothing, etc.

In the typology of the individual unit, it was found often that the unit itself attempted to permit the largest amount of freedom to the user in terms of customization. Instead of focusing on creating as many built in elements as possible, many developments created the barest of spaces, only providing walls and openings, therefore allowing the user of the space to configure it in the way they found to be best or most suitable.

With the analysis of three adaptive reuses, it was found to be very important in the way that the existing structures were handled. Removing the new structure from any contact with the existing structure was one option that was often taken. Another option was to integrate the new structure within the existing structure where ever possible. Lastly, there seemed to be a type of hybrid of the two, doing both options where it seemed a best fit within a project.

DESIGN CONT.

HISTORICAL CONTEXT OF THE THESIS

Projects of this type have been undertaken throughout history. Books on this subject are constantly being published. Humankind seems determined to ascertain their past while constantly updating and predetermining their future in housing techniques and styles.

LeCorbusier had attempted to create a new system of housing along the coast in Algiers. His very theoretical drawings established the creation of a large belt of housing overlooking the ocean. Each user or separate dwelling unit was allowed to create what he or she desired as their "individual" unit. With the addition of the computer to design, architects are constantly pushing the idea and theories of housing.

Currently the desire of customization and diversification within society is very high. Everything from cars to entertainment devices offer various levels of customization. You are allowed to purchase different makes and models of cars. You can customize trim levels as you wish. It would seem that more and more importance is being given on each user's or unit's ability choose what they want in anything, be it a house, or a pen.

This project, then, places itself at a very interesting crossroads in Bismarck. People are still limited in the choices they have for housing. The fact that they have merely the option to rent an apartment from someone, with no customization to the unit, except for what they bring into the interior is quite limited. If this option does not work, a user must then buy a condominium which still affords them the same level of customization. If the user has the ability to purchase a house, they are then limited to purchasing a used house with all exterior facades existing and determinant upon the structural system. If the user is allowed the luxury of building a new house, it mostly is pushed to the exterior of the city where little or no infrastructure or urban fabric exists.

DESIGN CONT.

GOALS

With all the research analyzed and ready to be used for design, a series of goals have been established to address the complexities of creating a housing system within the city of Bismarck. They are as follows.

- **Numerous options for individuality**
- **Customization**
- **Power to the users, not the owners**
- **Reuse of building materials, not the existing structure**
- **Native building techniques**
- **Durability**
- **Creation of Community**
- **Freedom and Flexibility**
- **Determinant by those in need, not those with power**
- **Sustainability**

DESIGN CONT.

PROCESS DOCUMENTATION

BEGINNINGS

In order to begin the designs of this project, I first started some basic sketching to let me creativity develop and to ascertain the direction I might wish to take on this project. I also started out with over a 100 photographs, both black and white and color, that I used to help me find some relationships with the site and its surroundings. From there I continued sketching and playing with clay to see if there was some basic forms or ideas that I could use to develop me main ideas.

MAIN GUIDING IDEA (SCALE THEORY)

The whole main idea of this project was an underlying principle of ideas comprising three levels of interaction. The three levels of interaction are sustainability, personal, and society.

Human

- Personal
- Family
- Block (housing)
- Neighborhood
- City
- Regional
- State

Structural

- Building Block (unit)
- Unit
- Block (housing)
- Neighborhood (infrastructure)
- City (infrastructure)
- Regional (infrastructure)
- State (infrastructure)

Sustainability

- Personal
- Family
- Block (housing)
- Neighborhood
- City
- Regional
- State

DESIGN CONT.

CURRENT HOUSING METHODS FOR BISMARCK

Currently there is a set method with which housing is generally developed in the Bismarck area.

- **Open Farmland Acquisition**
- **Site Development**
- **Gain potential clients interest**
- **Develop site**
- **Make city build “infrastructure”**
- **Designed by Builder/Architect/ other**

Problems with this are

- **Continued push from the city center**
- **Waste of farm land**
- **Client has interest/users have no rights**
- **Methods of Construction**
- **Lack of community**

PROPOSED NEW METHOD OF HOUSING FOR BISMARCK

This is a proposal for what might be a new method of housing within the Bismarck area.

- **Establish Location for housing**
- **Create “Program” Database for individual site**
- **Advertise to Potential new users**
- **Direct users to website**
- **Have individuals create home profile**
- **Wait for Critical Mass**
- **Construction Begins**

DESIGN CONT.

Advantages

- **Individuality**
- **Choice**
- **Target Market**
- **Site Responsiveness**
- **Capital is expanded when appropriate**
- **Scalability**
- **Responsive Community**

DEVELOPMENT OF COMPUTER PROGRAM

A program was designed and detailed to accomplish the new proposal for housing in Bismarck. It would include the following things.

- **Location**
- **Room Layout**
- **Interior and Exterior Façade Choice**
- **Building Orientation**
- **Floor Choices**
- **Gardens/Balcony**

PROGRAM TESTING

As the program was developed, it became ready for first round or beta testing. It was decided that it would be a good idea to attempt to test the program on someone who would be currently interested in the housing market. I was able to find someone who fit the scheme and was willing to also participate.

DESIGN CONT.

TESTING CONTINUED.

Gary Franz was selected to be the test subject for this program pilot. Gary is a single male living currently with roommates and is the caretaker of a large dog. He is currently interested in the housing market and has been in discussion with some bankers on the feasibility of purchasing a home. After running the computer program he received the following output of what his housing needs might be.

- **Flat**
- **1 bedroom**
- **1 bathroom**
- **Shared living dining**
- **South bedroom**
- **North kitchen/living**
- **North west south exposure**
- **Private roof garden**
- **6th Floor (or at least top)**
- **Weightless series (curtain wall with operable windows) exterior facade all around)**
- **Balcony (southwest)**

Gary was very pleased with his results and what ended up being his design for the housing option he chose. He had this to say.

“Viewing my apartment in 2D and 3D motion renderings greatly enhanced the overall project. I was clearly able to identify any major and minor issues that needed addressing before construction would begin. Being able to answer a few simple questions about housing and then being able to actually see my house made it much simpler for me in the overall design process.”

DESIGN CONT.

PROGRAM TESTING

As the program was developed, it became ready for first round or beta testing. It was decided that it would be a good idea to attempt to test the program on someone who would be currently interested in the housing market. I was able to find someone who fit the scheme and was willing to also participate.

RULES FOR PROCEEDING

Now that a computer program was developed and the ideas for the design were in place, a set of rules were developed that would help to determine the entire outcome of the project from construction to rules of operation for units and blocks of units within the housing community.

RULES FOR CONSTRUCTION

Local Labor

- **Construction of exterior façade panels should be done close to site in a factory condition if possible. This allows the workers to avoid being out in the elements that shorten the construction season and increase the risk of accident**

Local Materials

- **All materials that go into the site should attempt to be found as close as possible to help alleviate the dependency on transportation. This will help promote a much more natural economy, instead of a free market money driven economy.**

DESIGN CONT.

Use of Sustainable materials

- All choices regarding materials should be held to the highest sustainable choice.
- If a carpet is available locally, but it is composed of chemicals known to off gas carcinogens, then it should be avoided and a sacrifice made in local materiality in favor of a choice that is more ethical in the long term.

Recycling of Current Materials

- All materials on the site should be recycled as best as possible.
- All Glass can be used to frame borders of bicycle racks as to help deter the wind, but not subdivide the outdoors space.
- Brick should be used for new facades
- Brick should be used to help make porous pavers for walking paths
- Concrete should be recycled as best is possible for reuse and rebar separated for recycling.
- All finish materials should be reused where applicable and sold locally if possible. If not, recycling should occur for all the materials

RULES FOR MASTER SITE PLAN

Once the units are chosen, there are rules that the site layout must follow.

Creation of small, medium and large outdoor spaces.

Instead of following site boundaries with buildings, the layout will consist of a mainly north/south approach to maximize day lighting to all users. This will leave irregular spaces that are created. They will fall into three sizes mentioned earlier. The size dimensions are not critical to define the space, but merely a concise look at all the exterior spaces created and then a dividing up logically between distance, averages and need.

Small Spaces

These spaces will be irregular spaces, often not square (but not necessarily so) and have some direct south light. Possible detailing for these is:

- Private Sitting Areas (benches and chairs)
- Flower Beds
- Small canopies and Enclosures

DESIGN CONT.

Medlum Spaces

These spaces will have some decent size to them, and will be able to occupy about 10-15 people comfortably. Possible detailing for these spaces is:

- Bicycle Racks
- Composting Sites
- Recycling Sites
- Small Play Areas (one or two swings, one see-saw, etc)

Large Spaces

These Spaces will be able to get large amounts of sunlight and will function for at least 15 people with no problem. Possible detailing for these spaces is:

- Large Green Spaces
- Playgrounds
- Barbeque Areas
- Sheltered Canopies
- Swimming Pool
- Bus Pickup
- Guest Parking Loops

RULES FOR UNITS

There are basic ideas that are governing the rules for the individual units.

Freedom of Layout

- All buildings are made of Slab Concrete construction that allows for wide open floor plans. The only exception to this would be the designated bathroom area as well as the area for the main or shared stairs (in apartments and studios)

Freedom of Choice

- Each owner should have the right to choose the layout and facade (exterior) that they think will best match their wants and needs. Instead of providing the user with built in spaces for cabinetry and closets, the user is allowed to keep that money and spend it on the specific items they want to arrange and organize their possessions.

Freedom for Re-occupancy

DESIGN CONT.

- **When a unit become vacant, the next occupant should have the right to customize the unit to the same degree the previous had the right too. This would mean an installation choice that permits for ease in demolition or removal of facades, and interior finishes.**

All units must touch at least one other unit

- **In order to promote a sense of community and help cut back on the detachment that is plaguing the current housing markets. The design idea here is to bring units together. This idea also works well in making efficient site construction. The units all share the same frame**

RULES FOR BLOCKS OF UNITS

There are basic ideas that are governing the rules for the blocks of units.

All units are to be stacked against each other on a mainly east-west basis

- **The idea behind this is that no single unit will be forced to occupy a space that is without direct south lighting. All human beings should be allowed to inhabit a space that sees the sun.**

Flow through ventilation

- **All units must have at least two sides that allow for some type of ventilation to occur. These are going to be north/south, north/east/south and north/west/south. It will be possible on the northern side of the site to have simply east/south and west/south permitting the interior adjacent unit spaces are provided with occupancy for commercial or office.**

Height Restrictions

- **Row Housing is limited to a maximum of three full floors with an option of a roof garden with partially enclosed space. Apartment and Flat units are meant to be at height limit of 6 stories. They are also limited to the Northern edge of the site. Anything about 4 stories will include a warning about children and their desire to possibly be on a lower story to allow them to play and interact on the ground level with other children.**

All units must touch at least one other unit

- **In order to promote a sense of community and help cut back on the**

DESIGN CONT.

detachment that is plaguing the current housing markets. The design idea here is to bring units together. This idea also works well in making efficient site construction. The units all share the same frame

Lots of Stairs

- This rule states that no more than one abutment of units is allowed to share a common stair. The idea of this is to have more stair units and less unnecessary hallways. Vertical space takes up much less footprint than vertical space and hallways.

Common Underground Parking

- Each block unit will have underground parking directly underneath the site. This will help to minimize the on ground space consumption of building area and green space by parking lots.

RULES FOR CONTINUED/OPERATION SUSTAINABILITY

There are basic ideas that are governing the rules continued operation/sustainability

Re-occupancy

- As stated before, the units will need to be able to be taken back to their pure form to allow the next user to customize the unit. (at least some attempt should be made through database tracking to allow for potential new users to have the right to pick a unit if they know it matches their needs) . If however no user can be found to match the unit, all pieces must be removed and dismantled to be used again later when the time comes for another unit or sold back onto the construction market if possible.

Sustainable Common Areas

- All common areas (mainly stairs) will be made in such a way to provide little or no need for mechanical heating and cooling.
- All stairs should have a mostly south facing trombe wall (with operable windows) to collect heat for the stair units as well as operable windows on the north side to allow summertime ventilation.
- All trombe walls are to have a planter base that allows for the growing of hot weather plants and gives the opportunity to help filter grey water back into the

DESIGN CONT.

sites external green spaces for on site watering.

- **All stair Roofs are to collect water for grey water recycling as well as Solar Heat Panels to help heat the hot water for the site.**

DESIGN SERIES FOR FAÇADE OPTIONS

The intentions of this are to show you the two and three dimensional drawings that would accompany the two specific test subjects as well as various site conditions

Façade Series

This section includes information and pictures referencing all the different façade series that are available to the user.

- **Sustainable series**
- **Metal series**
- **Brick series**
- **Wood series**
- **Weightless series (partially operable window curtain wall)**
- **Tinted weightless series (fully tinted and partially opaque curtain wall with operable windows)**
- **Balcony series (a balcony at the edge matching the rest of the façade choice for that specific floor)**
- **Plaster series**

Interior Series

- **Match exterior series**
- **Translucent series**
- **Textured series**
- **Eco series**
- **Movable partition series**

DESIGN CONT.

DLAP (DESIGN LAYOUT AND ASSIST PROGRAM)

Dlap is the culmination of all the previous theories, rules and ideas that makes this thesis a reality. It is the computer program that brings together all the information.

DLAP is meant to:

- Engage the community in choosing their living spaces
- Enrich the body of knowledge shared between designers and clients/users
- Enhance the ability of an architect to design beautiful and functional spaces
- Promote the use of smart, sustainable materials
- Provide users with not only choices, but choices that might actually be an honest fit
- Track trends in desires
- Provide a database that allows for research into the wants/desires of those that are interested in housing

This page contains all the information that culminates everything you have looked at before into the main idea of this thesis. This page will take you to what I have coined the Design Layout and Assist Program. You can call it DLAP (da-lap) for short.

DLAP takes into account basic user inputs and helps determine what I hope to be the best possible layout and configuration for each user in the housing development. It goes as far to help the user start to customize exterior and interior finishes, as well as their choice of rooftop gardens, balconies and ground level yards or gardens.

DLAP does not remove the need of the architect. The architect is still responsible for the creation of the facades the user decides on choosing. The architect is still responsible for collaborating with landscape architects and engineers to help develop a suitable master site plan (although this stage is somewhat enhanced by the fact that the users get some input on the possible location of their groups unit)

DESIGN CONT.

TYPES OF HOUSING SUPPORTED THROUGH THE PROGRAM

Single Floor Studios

- One unit apartments that are designed for one bedroom or one very large open space

Apartment Flats

- These units are just like modern apartments and condos. They are allowed to occupy more than one floor and more than one unit in width if desired.

Row Houses

- These units are designed to occupy at least 3 floors and have the only possibility of neighboring on either side.

HOW THE ORIGINAL MAIN IDEA/THEORY IS HELD UP

Example #1 (First level integration)

- The individual person wishes to be a part of this project
- The person also desires to participate in sustainable ethics
- The architect designs operable windows that also have a high R- value and save on energy while also maximizing the owner's happiness and well-being

Example#2 (Second level integration)

- The individual person wishes to be a part of this project
- The person also desires to participate in sustainable ethics
- The architects chooses to include recycling stations into the design of the site for the use of the inhabitants and it is improved by the client who too also shares the individual desire to produce less waste

Example #3 (Third level integration)

- A family wishes to live on the site
- They move into a row-housing block with 5 other families
- They all wish to participate in sustainable designs and decisions
- The architect and client design a system that allows for co-owned cars that run off of restaurant grease from the 3 restaurants on site. (this prevents a need for

DESIGN CONT.

the restaurant to dump the grease and allows for the users to carpool and prevent single occupancy traffic in the mornings. If for some reason the restaurant doesn't produce enough grease one day, the users aren't in a bind, because the cars run just as well off of pure diesel)

SUSTAINABILITY

Ethical Choices

Every Choice is a sustainable one

Examples

- **Flow through ventilation in every apartment**
- **Trombe walls on stair towers**
- **Green Roof Garden**
- **Rain water collection on stair tower**
- **Hot water solar panels on stair tower**
- **Bus pickup zones**
- **Shared car theory**
- **Recycled materials from previous building**
- **Pervious walking paths**
- **Sustainable façade series**
- **Sheltered bicycle racks**
- **Sheltered recycling stations**
- **Composting Zones**
- **Grey Water Planter Filtration**
- **Local Materials**
- **Local Construction**
- **Connections to Bike Paths**
- **Reuse as office or commercial units**
- **Adaptation with growth**

DESIGN CONT.

SKETCHES THROUGH THE DESIGN PROCESS

This part of the process documentation just shows a series of sketches that show a good idea of the process that happened in order for the thesis project to become what it is.

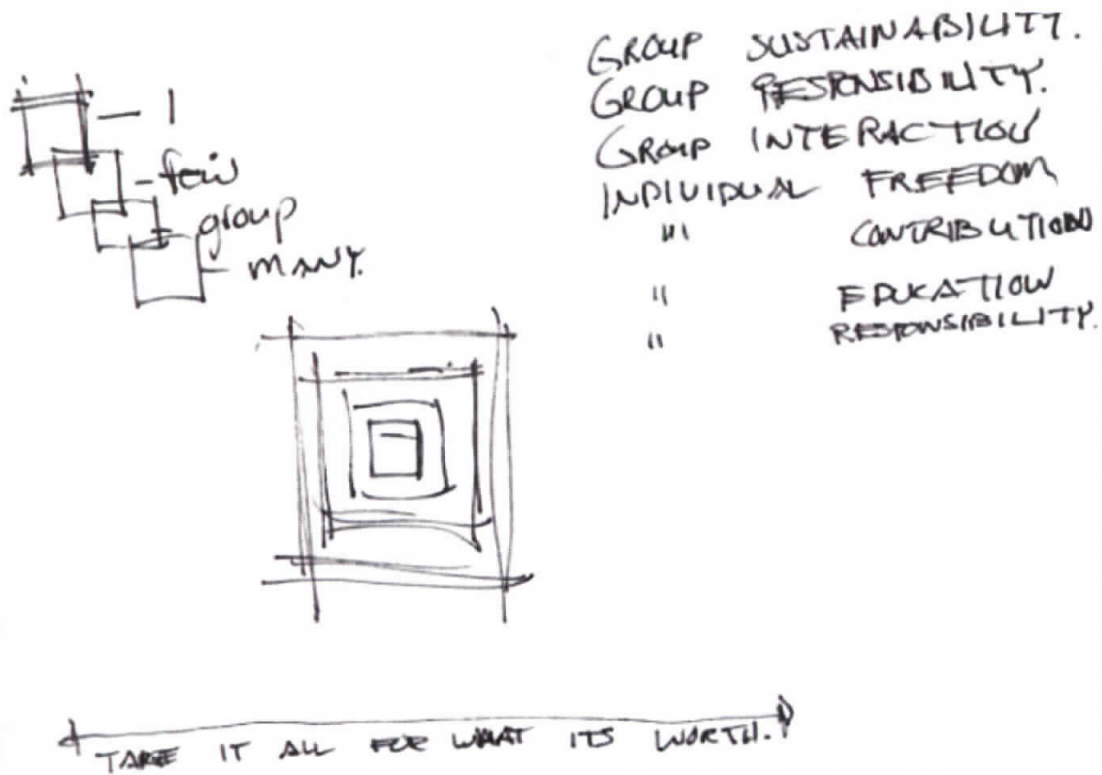


Fig. 92.1

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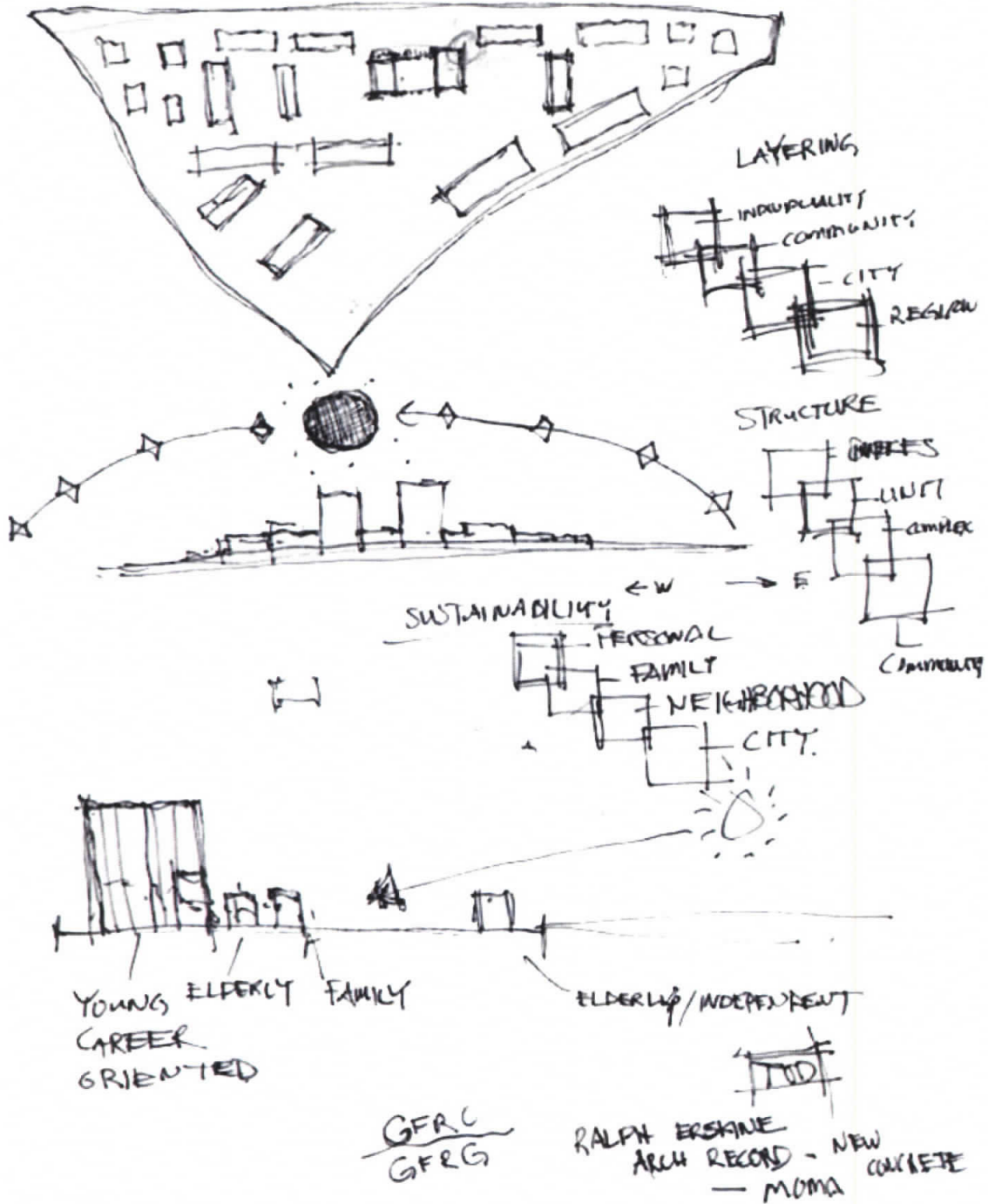


Fig. 93.1

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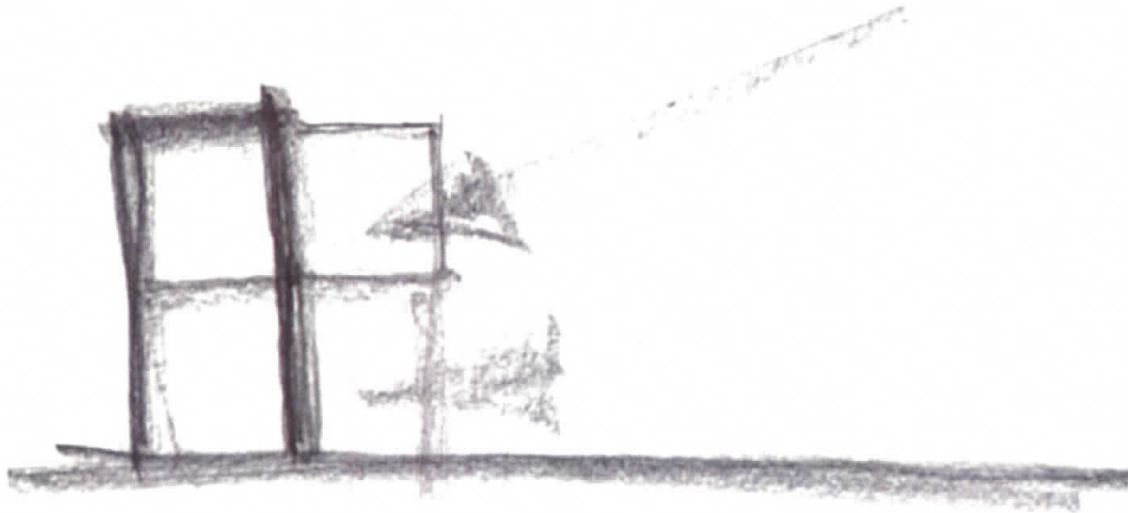


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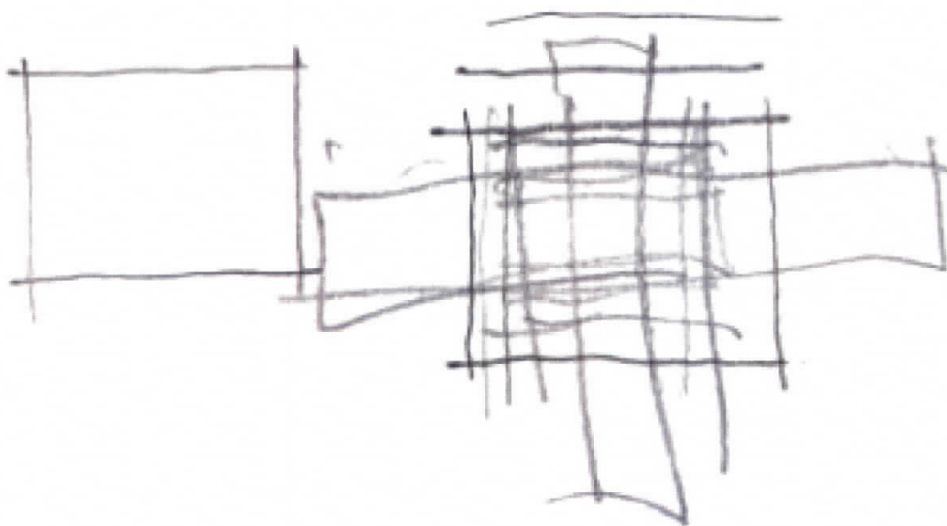


Fig. 94.2

DESIGN CONT.



Fig. 95.1

DESIGN CONT.

MODULARITY & PRE-FABRICATION:

~~THE VERNACULAR OPTION OF TODAY'S TECHNOLOGY~~
~~TODAY'S HIGH-TECHNOLOGY VERNACULAR~~
TOMORROW'S VERNACULAR. TODAY.

← OPTIONS BY LEVEL →

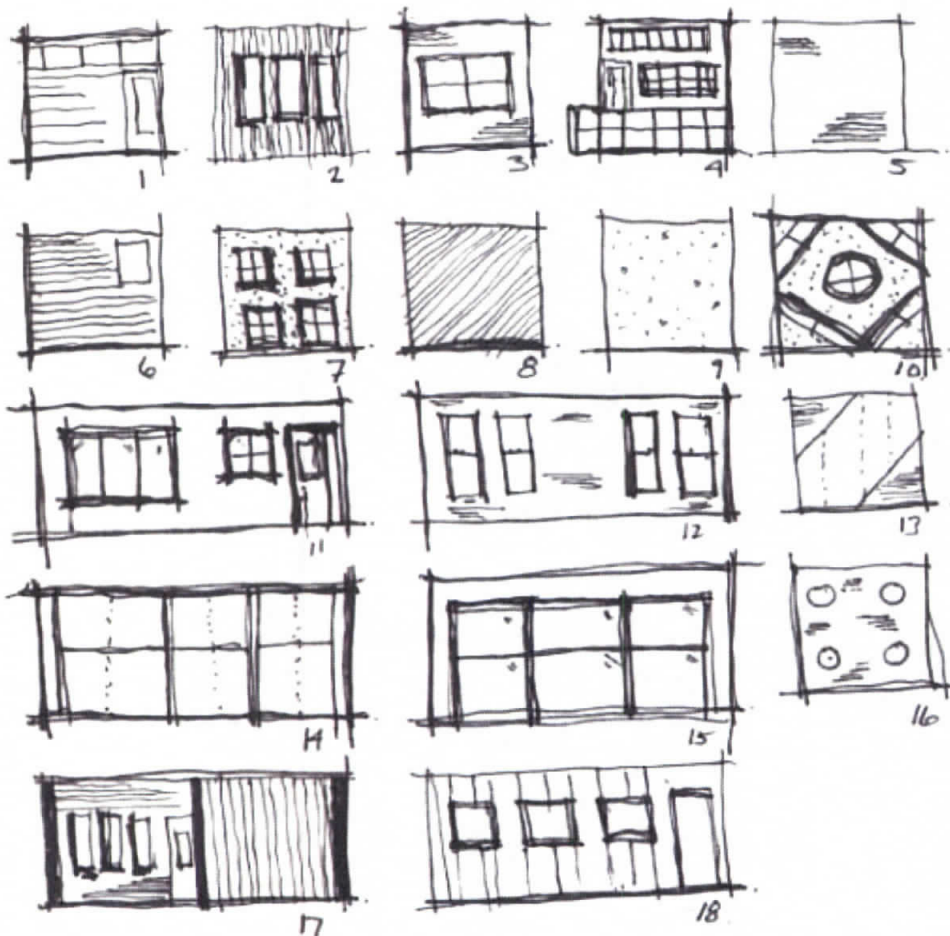


Fig. 96.1

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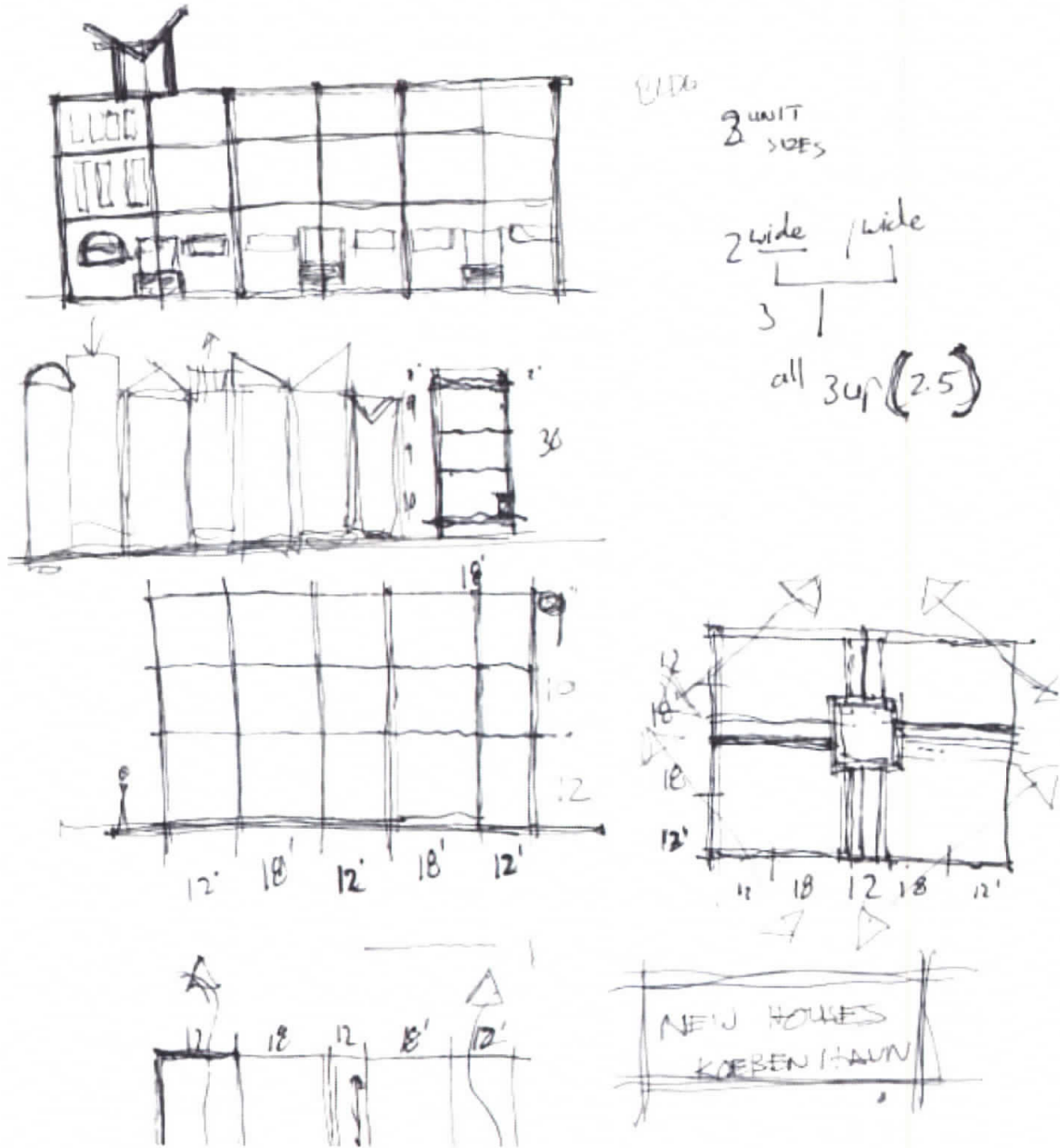


Fig. 97.1

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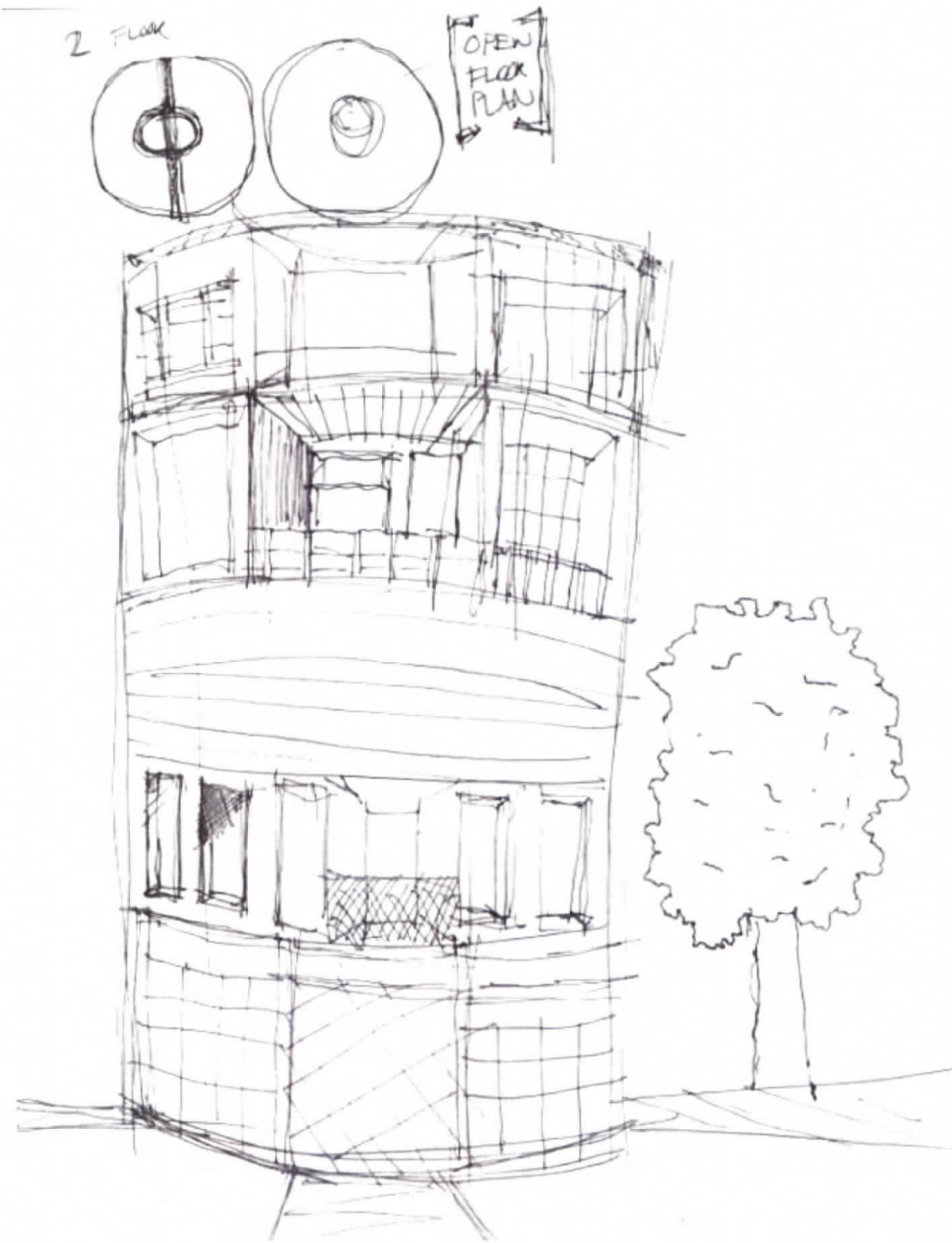


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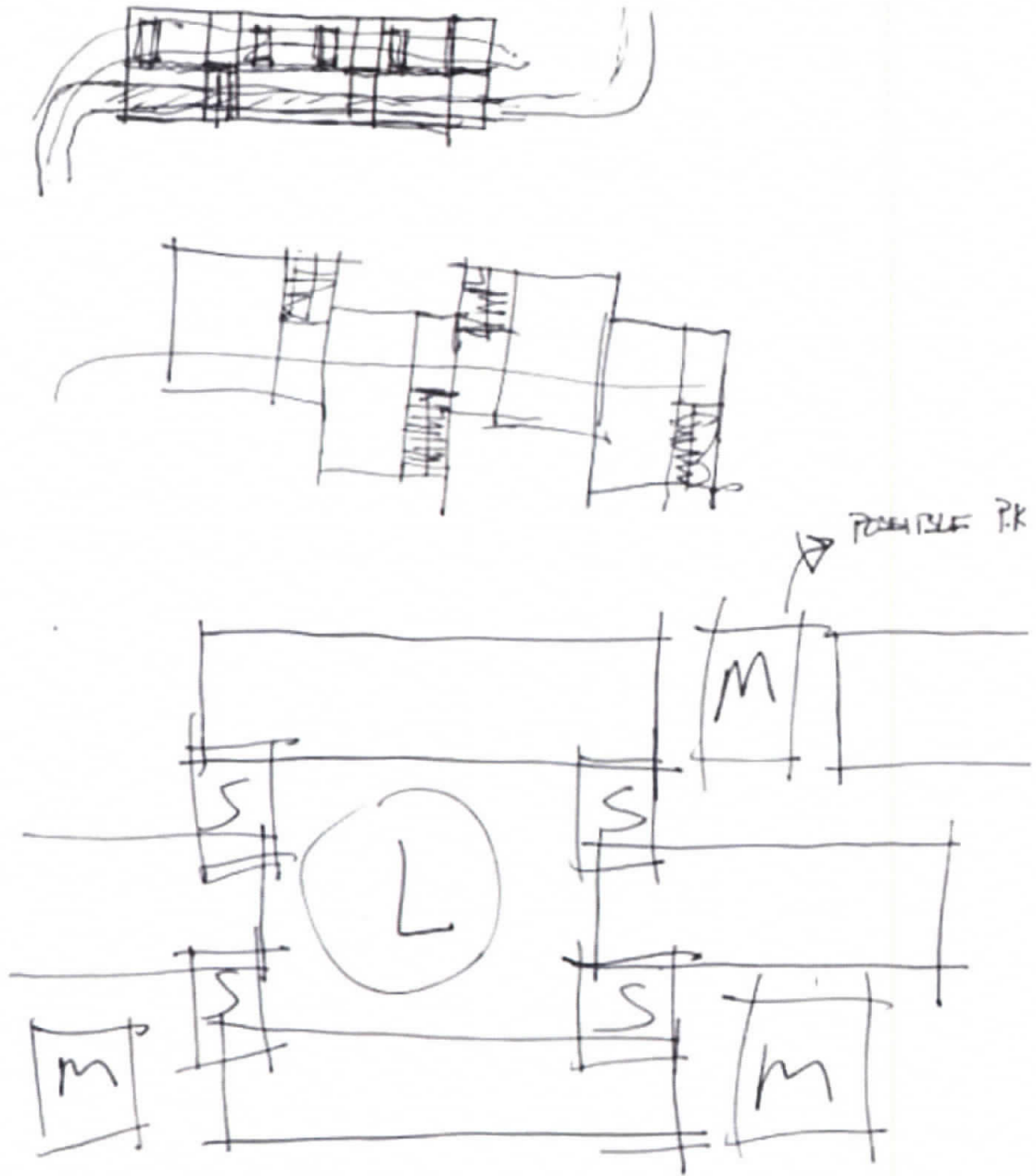


Fig. 99.1

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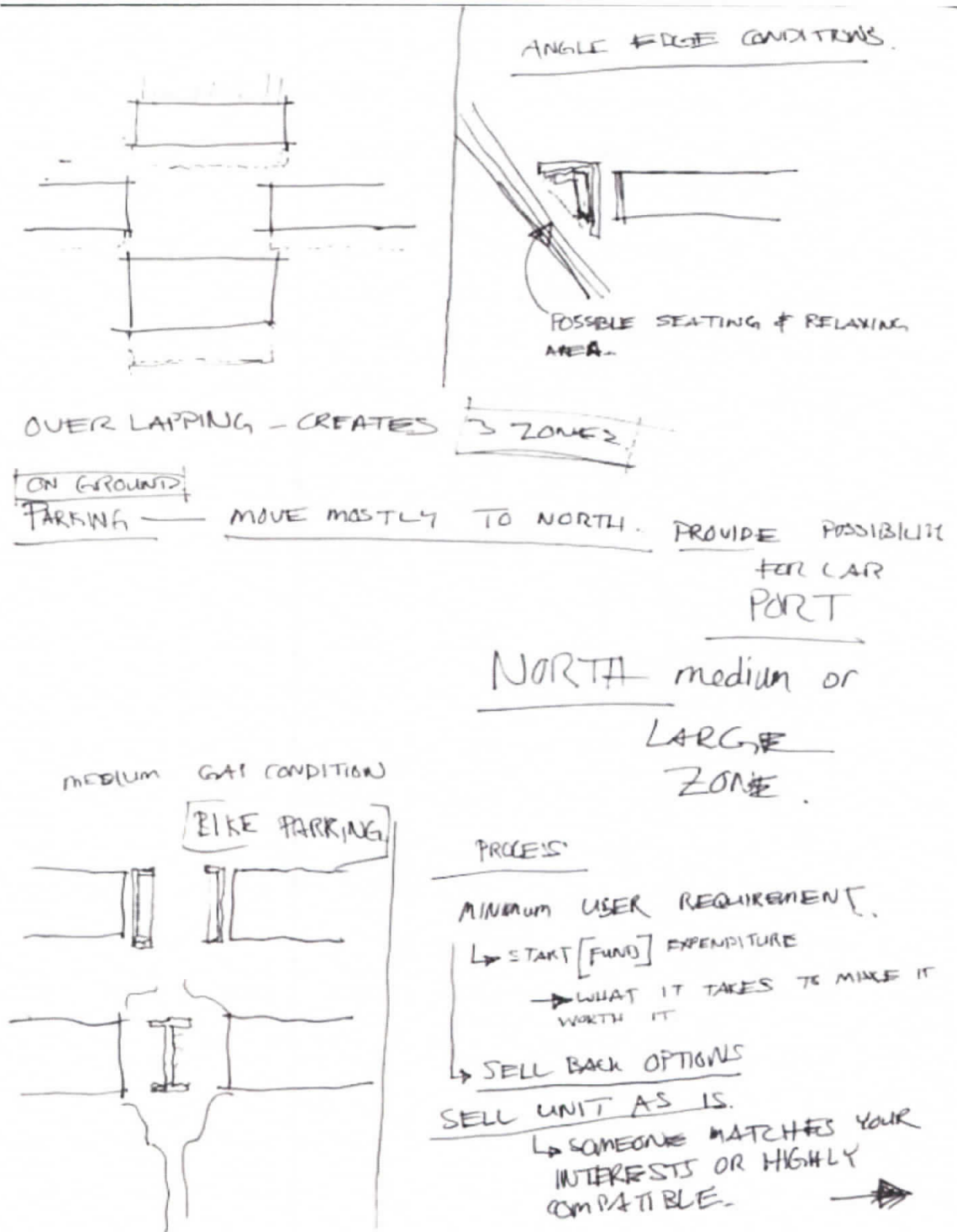


Fig. 100.1

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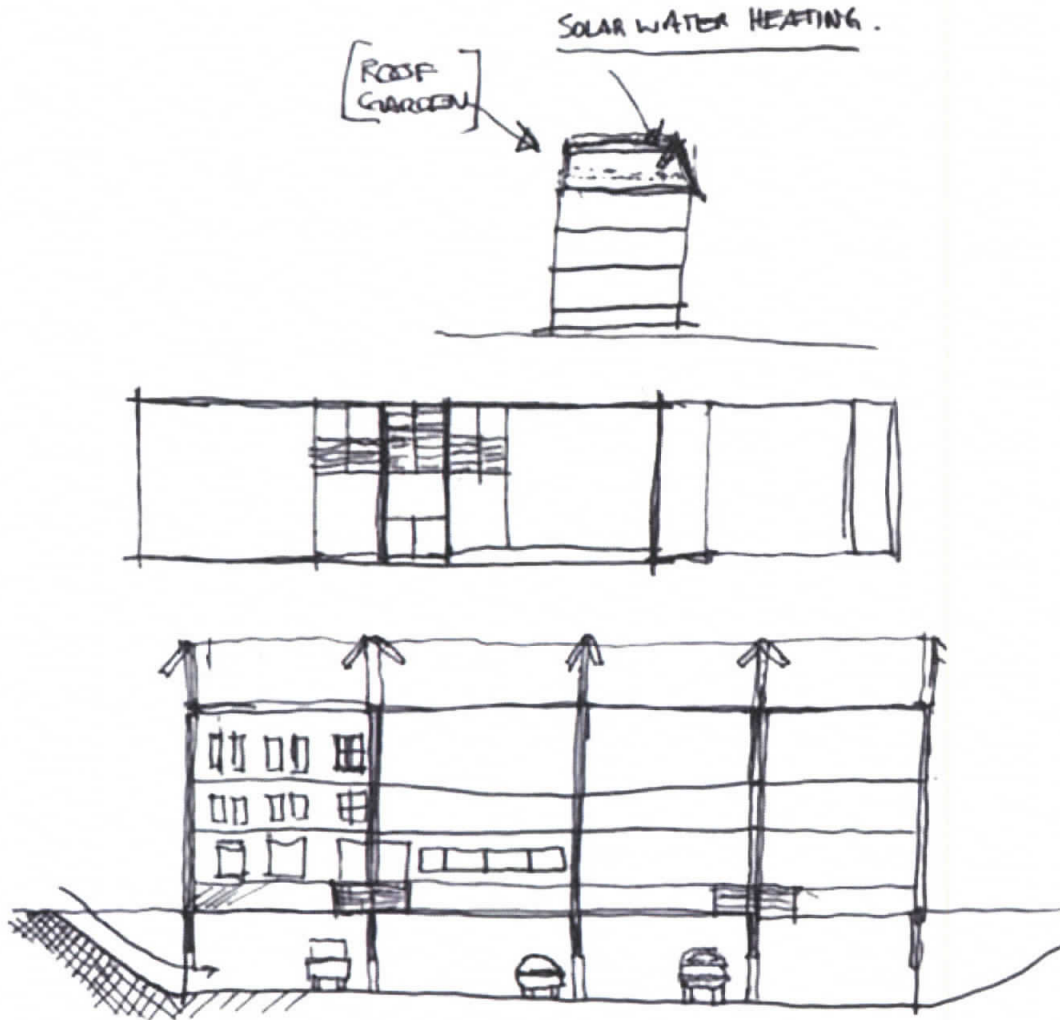


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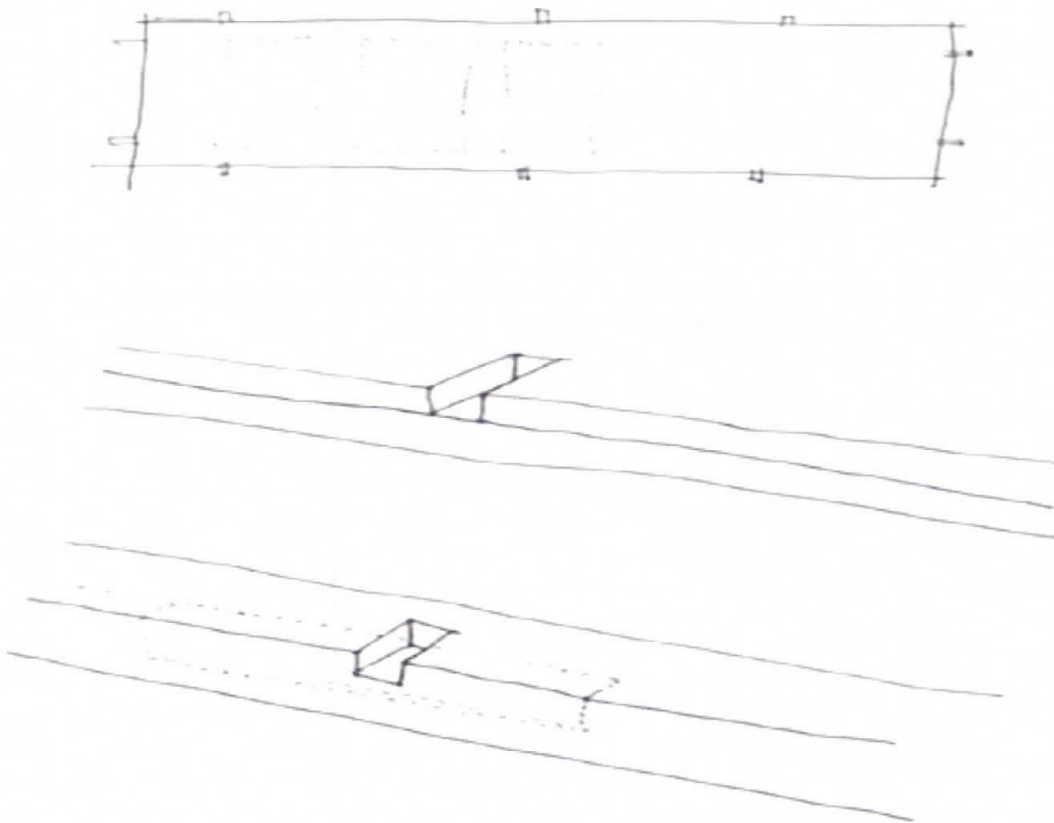


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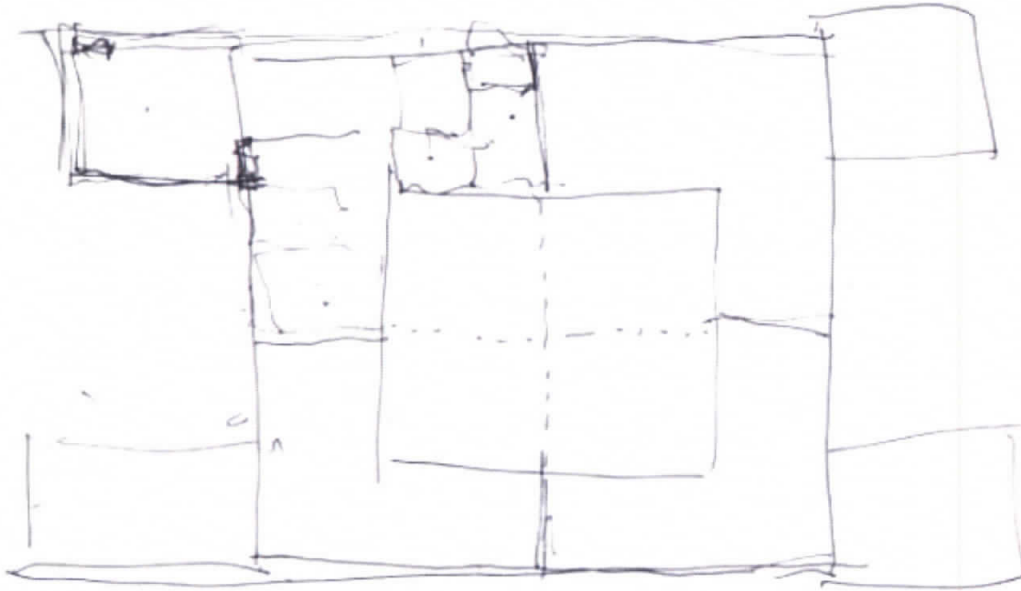


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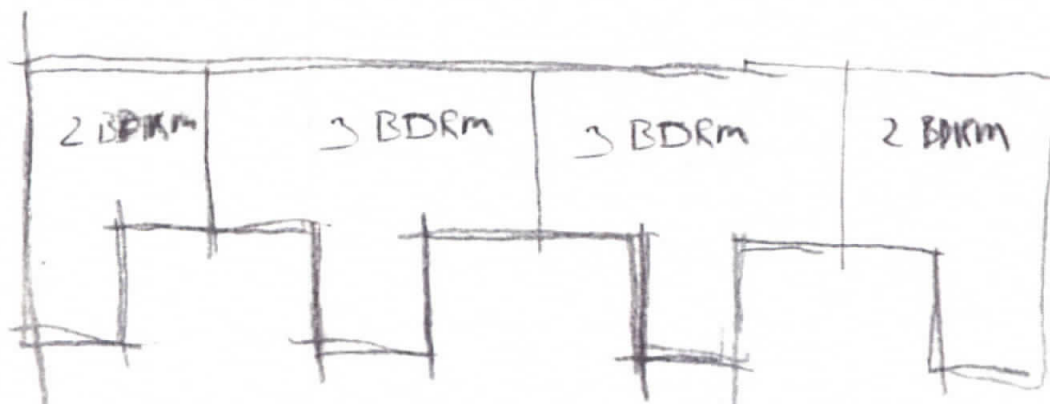


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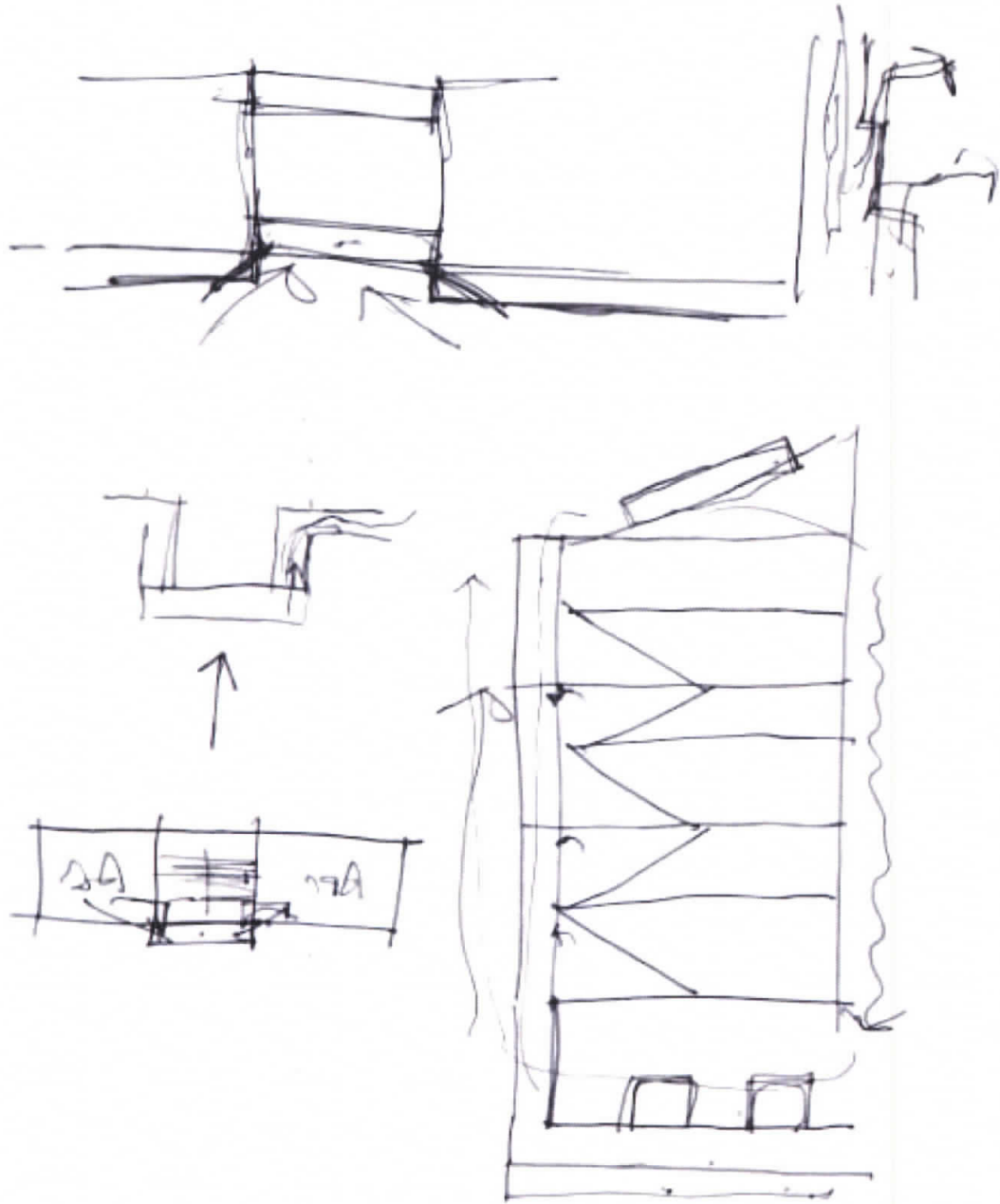


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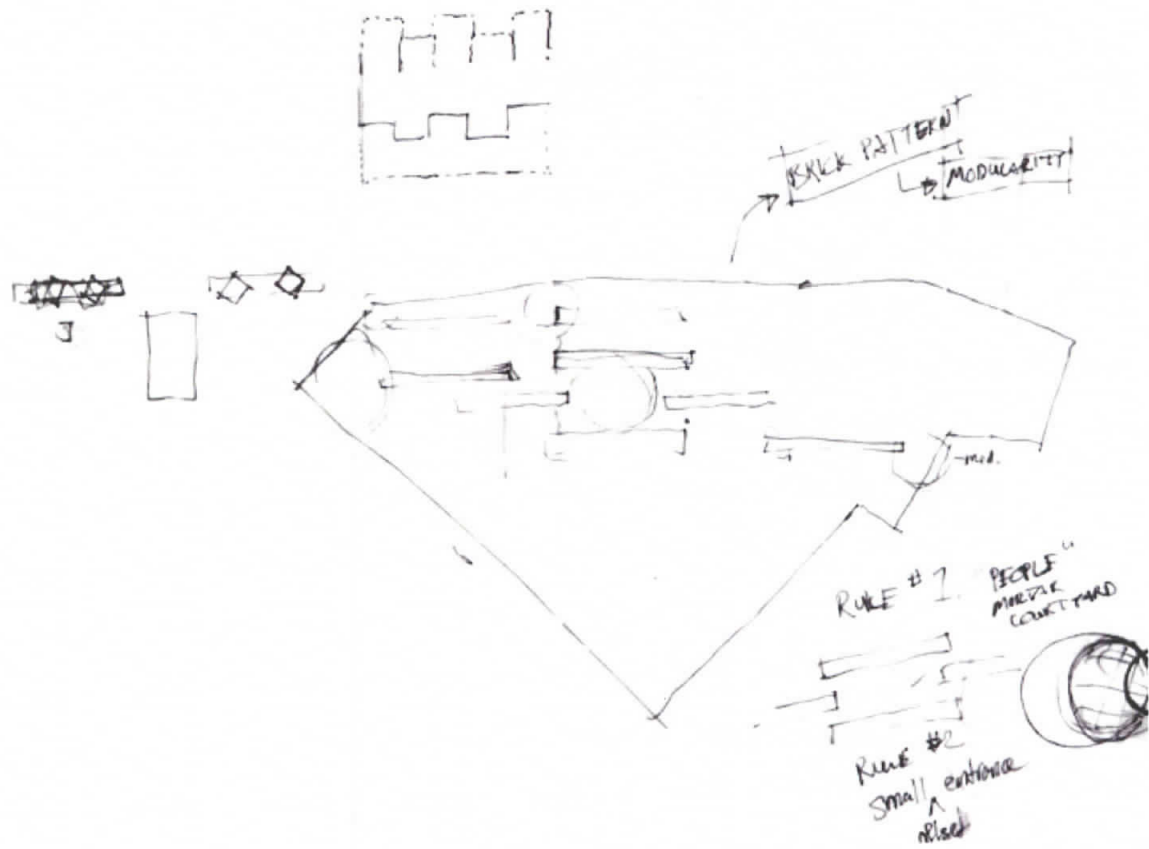


Fig. 106.1

DESIGN CONT.



Fig. 107.1

DESIGN CONT.

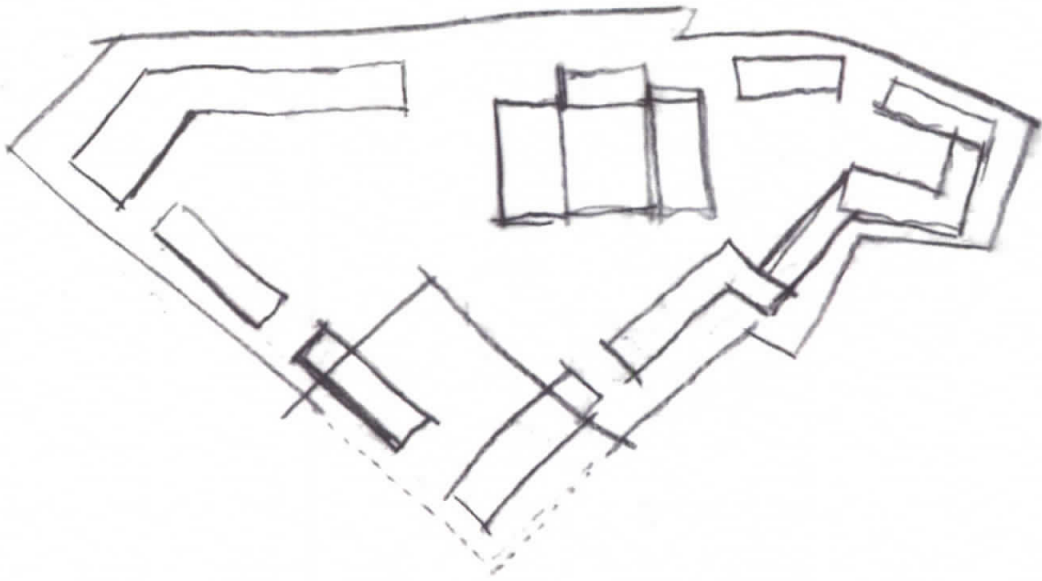


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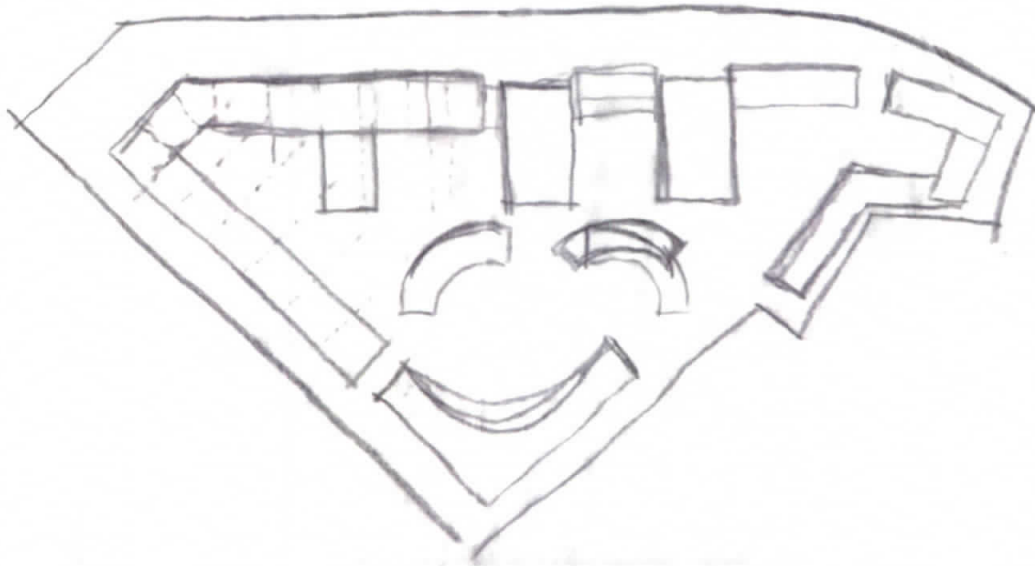


Fig. 108.2

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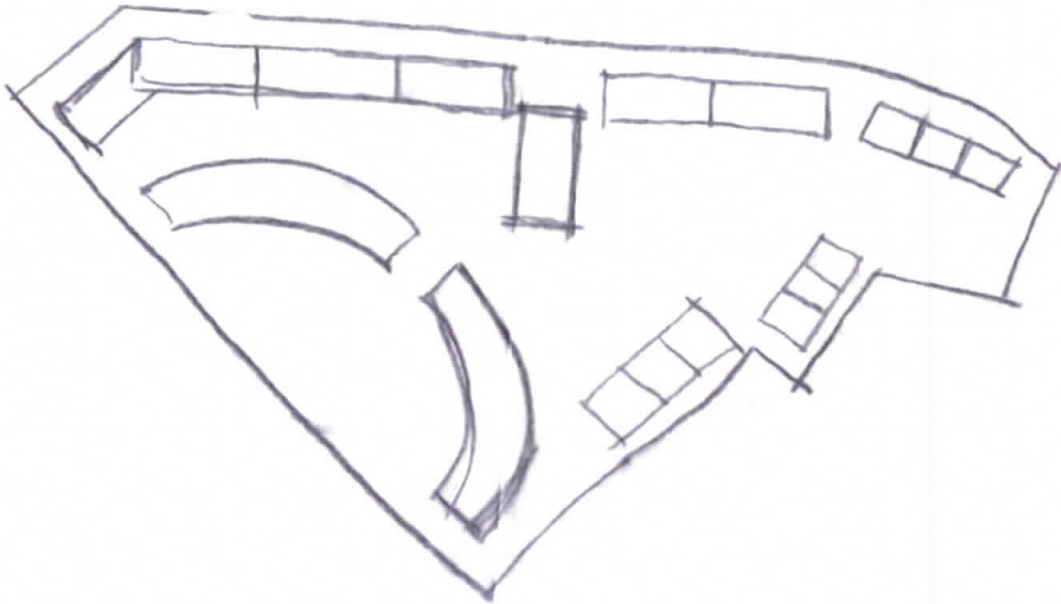


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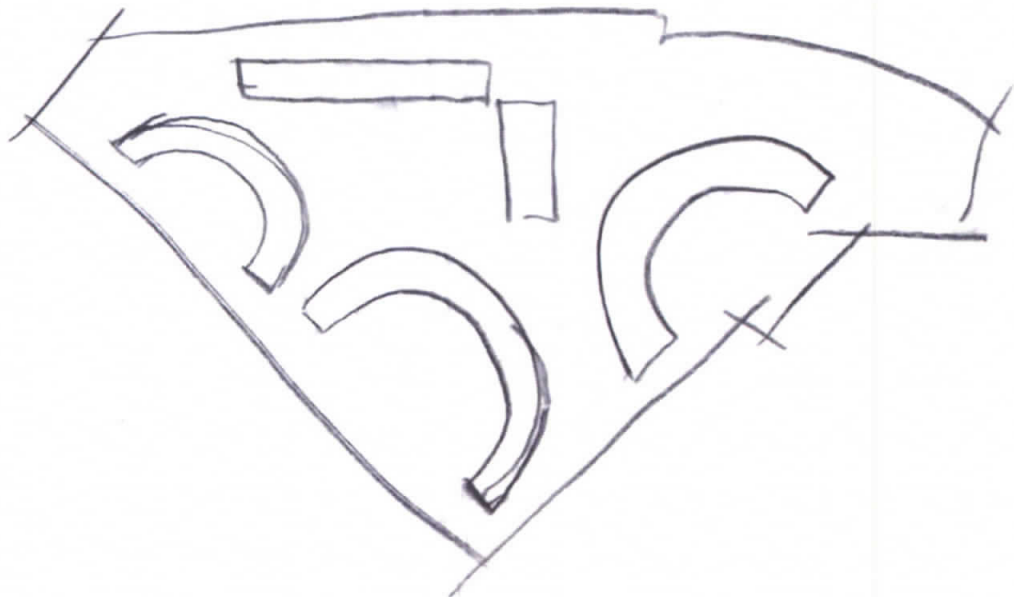


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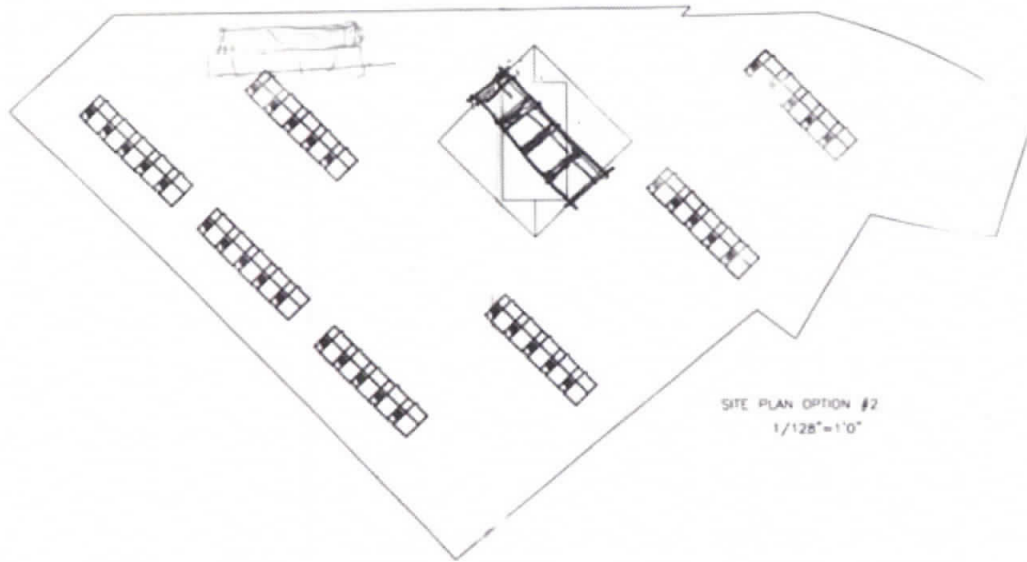


Fig. 110.1

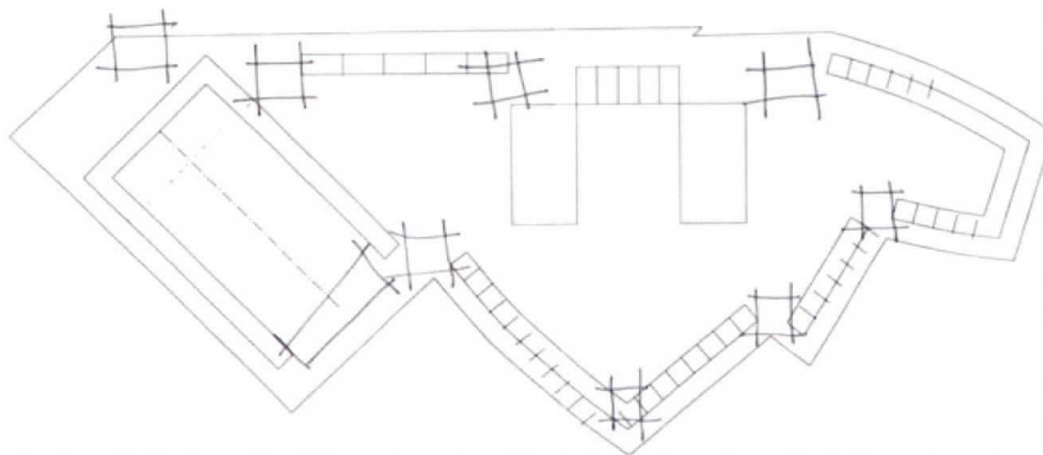


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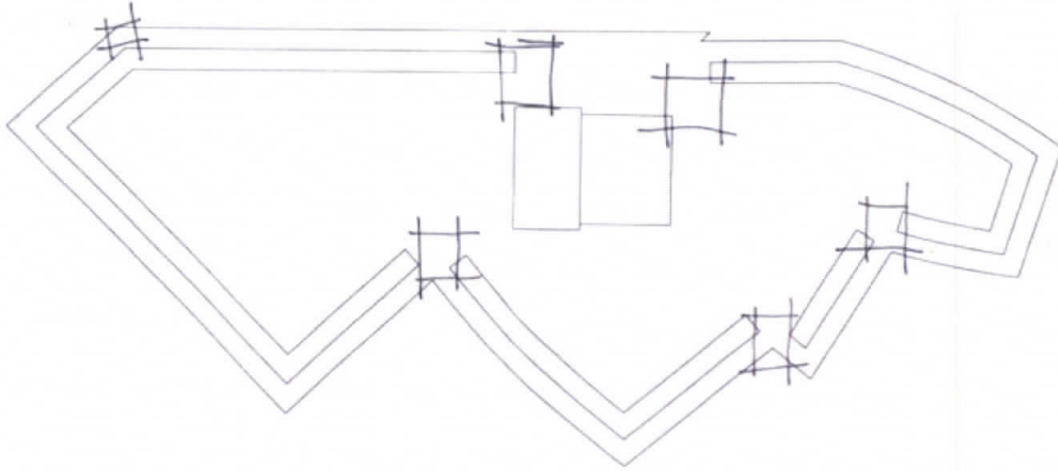


Fig. 111.1

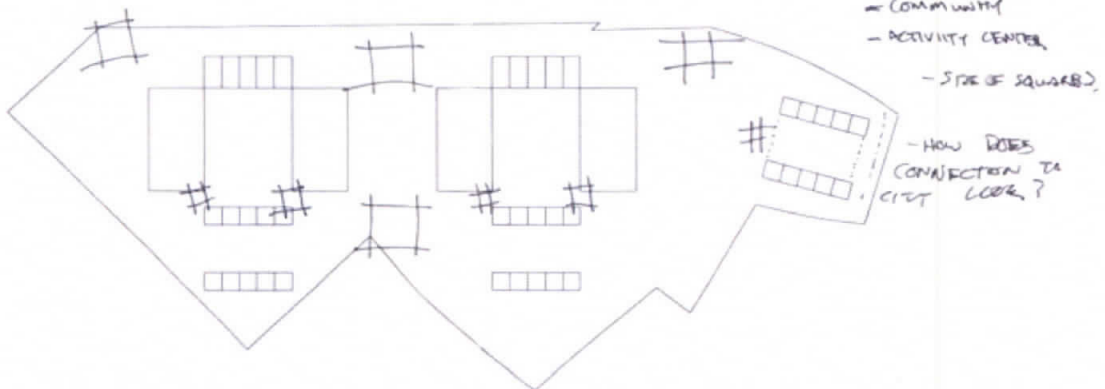


Fig. 111.2

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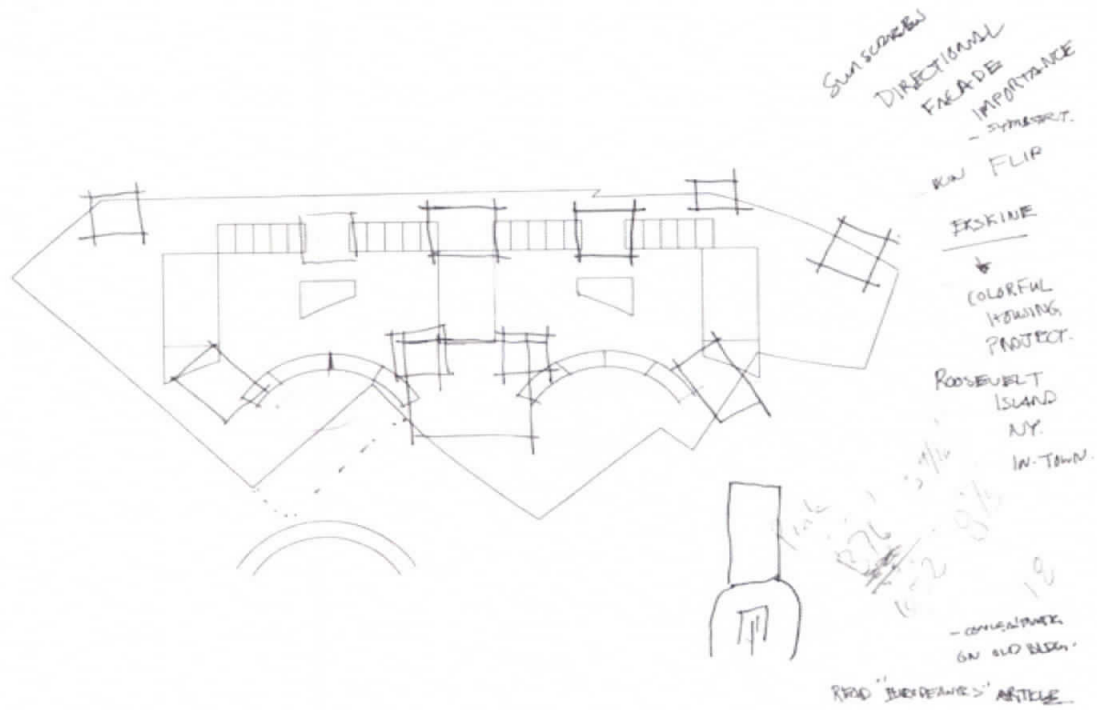


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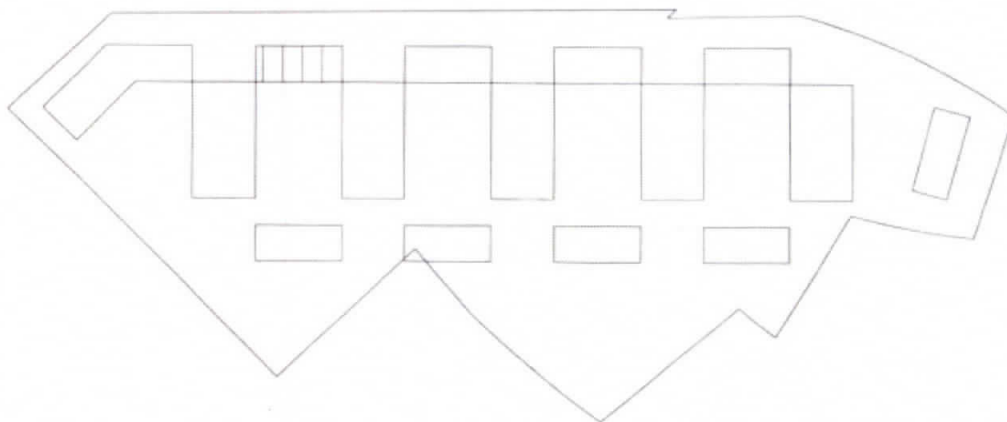


Fig. 112.2

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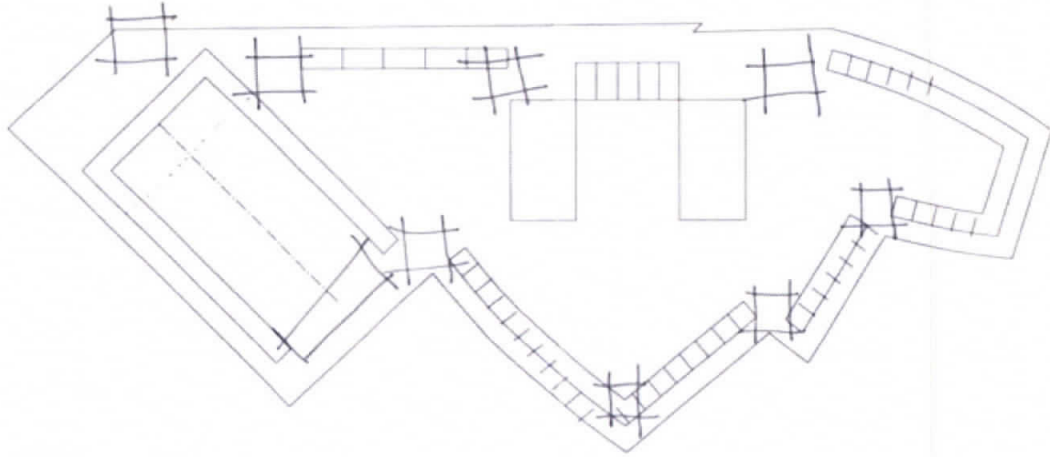


Fig. 113.1

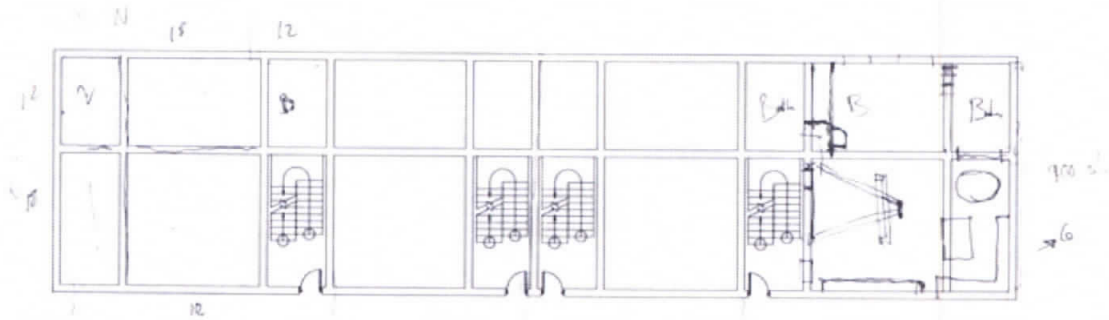


Fig. 113.2

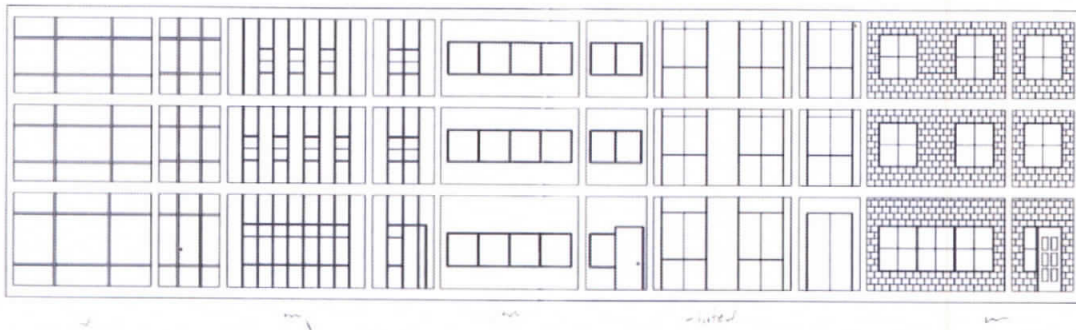


Fig. 113.3

DESIGN CONT.



Fig. 114.1

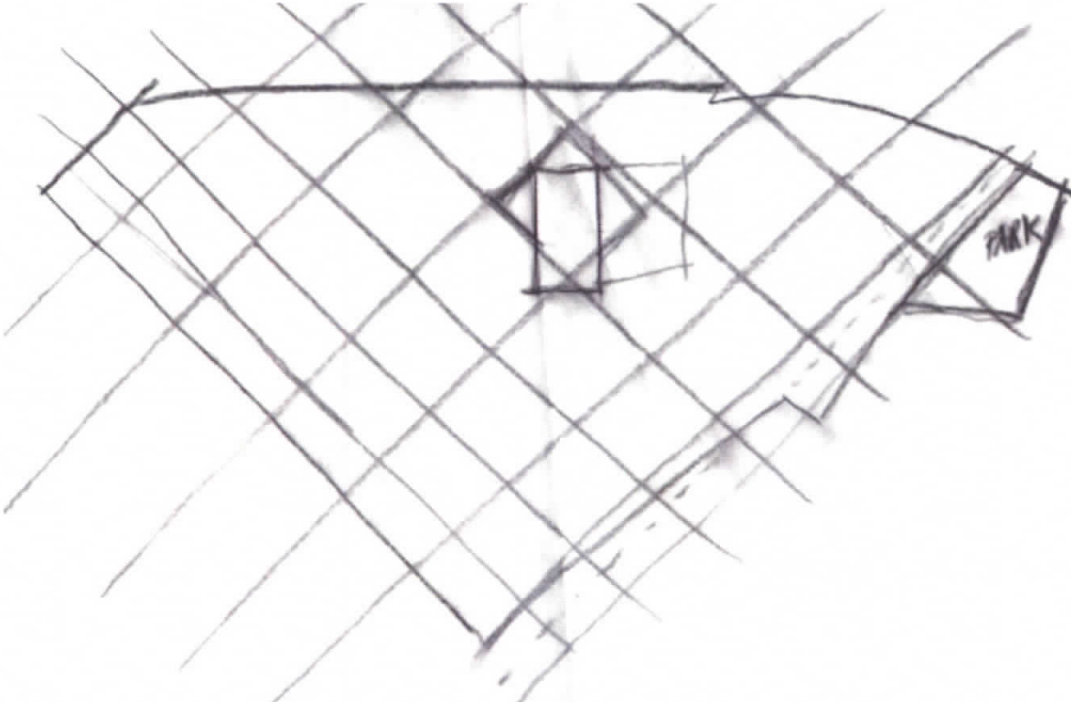


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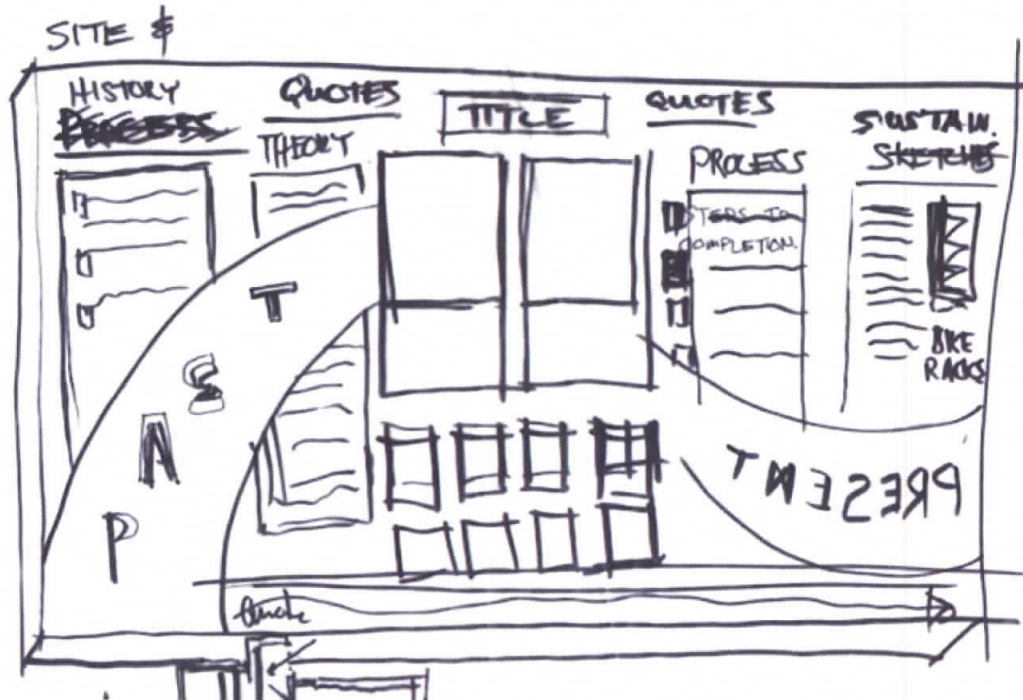


Fig. 115.1

DESIGN CONT.

PROJECT SOLUTION DOCUMENTATION

FINAL BOARDS

This section contains small thumbnail images of the final boards as well as larger images of the individual drawings and renderings of the project.

However to get the full affect of this project, it would be best if the viewer of this program loaded the CD and actually manipulate the different web sites and programs as they were intended to be used.

The web site DLAP program was designed by Ty Greff and written in code and developed by Christopher Forseth and then revised again by Ty Greff. A special thanks goes out to Chris for all his hard work and effort in helping make this thesis program a reality.



Fig. 116.1

DESIGN CONT.

Creating something old:
Bringing new housing back within City Limits
Bismarck, ND
Ty Greff
Creating Something
Creating Something

An Introduction

*This project is intended to be experienced **digitally***

There should be no reason that you have to look at my boards, as a model is understood my thesis and its ideas. I merely have knock up so that of a machine is currently busy, you are able to at least get a general overview about my project.

The site itself is located in Bismarck North Dakota. It is on Main Ave at the very western edge of Bismarck near the Memorial Highway Bridge. The main borders are Memorial Highway and Main Ave. The site itself comprises nearly 10 acres of land in a large, nearly triangular form.

The significance of this site is of great importance to the city of Bismarck. Currently the city is working on the development of a new city bridge to connect Bismarck to Mandan. This will replace the memorial highway bridge that has been in operation about 100 years and was the final link connecting the Pacific and Atlantic Coast on Highway Trip. The site is seven and a half acres currently sits without use. It is within a couple of minutes of downtown Bismarck and the Missouri River.

Regional Building History (sustainability)

The area is rich in cultural history. The area was first settled by the Native Americans. The housing they generally employed in the area was either temporary structure or earth lodges. Both had a series of properties that made them advantageous to the area.

- Local Materials (buffalo skins, river and creek valley timber, soil, stone, earth)
- Passive R/R techniques (natural airflow currents, thermal mass heating)
- Walkable sites

The next group of people that settled the area were the Germans from Russia. They helped to settle the United States under the Homestead Act. These people had preferred small towns in the homestead, but were unable to bring their design elements due to the rules of the Homestead Act itself. They brought the soil from the Steyer in Russia. This was intended to be a temporary structure until enough wealth could be built to afford the family a more "modern" house. The soil houses however, had many advantages over the new stick frame houses that replaced them. The Germans from Russia brought the following sustainable contributions to the area.

- Close East Housing (although not introduced in North Dakota, it was brought into cities in Kansas.)
- Southern Sun Oriented Neighborhoods
- Solar Mass Walls on and houses
- Local Materials

Main Idea

The main idea of this project is to take a digital look at post-housing housing within the current system. Furthermore, this project offers a different approach to housing than what is currently being offered. The key points are:

- Community involvement
- User input in design (now and next)
- Customization through options
- User driven site development
- Interactivity within the community
- A return to integrated, meaningful community living
- Local materials
- Local labor
- Sustainable design strategies
- Database system of gathering and storing information
- A time by which to provide the fulfillment of the three interacting levels: sustainability, human, and structural


















Fig. 117.1

DESIGN CONT.

ng Old: Bringing New housing bac
ing Old: Bringing New housing ba



Name: Gary Franz

Occupation: Computer Audio/Visual Specialist

Needs: Gary is a single man who owns a dog. He is currently looking to find a house that will fit the various needs that he has. He has spent some time with the banks and is interested in finding something that is within his budget.

What he chose: Flat

- 1 bedroom
- 1 bathroom
- Shared living/dining
- South bedroom
- North kitchen/living
- North west south exposure
- Private roof garden
- 6th Floor (or at least top)
- Weightless service balcony
- Balcony (southwest)

What he had to say:

"Viewing my apartment in 3D and 3D motion renderings greatly enhanced the overall project. I was clearly able to identify any major and minor issues that needed addressing before construction would begin. Being able to answer a few simple questions about housing and then being able to actually see my house made it much simpler for me in the overall design process."

Image List

1. Site Map
2. Le Corbusier
3. View to River
4. Eugene
5. Steel House
6. Bedroom View
7. Living Room
8. Entrance View
9. Gary Franz
10. Floor Plan
11. Bedroom
12. Bathroom
13. Roof Garden
14. Roof Section



Fig. 118.1

DESIGN CONT.

Living within City Limits
Creating something old:
Bringing new housing back within City Limits
Bismarck, ND
Ty Greff






Rules of Development

Rules for Construction

- Local Labor
- Local Materials
- Use of Sustainable Materials
- Recycling of Current Materials

Rules for Master Site Plan

Creation of small, medium and large outdoor spaces.

Rules for Housing Units

- Freedom of Layout
- Freedom of Choice
- Flexibility for Re-occupancy
- All units must be adjacent

Rules for Blocks of Units

- All units must be for one-level apartment units with a centrally located kitchen
- Eliminate through circulation
- Height Restrictions
- All units must touch on least one other unit
- Lots of Storage
- Common Underground Parking

Rules for Operation/Continued Sustainability

- Re-occupancy
- Sustainable Outdoor Areas

Levels of Interaction

Society

- Individual
- Family or Kin Group
- Cluster of Families and Individuals
- Neighborhood
- City
- Region

Sustainability

- Use of Choice
- Local Approval/Urban Choice
- Cluster Choice
- Neighborhood Policy or Agreements
- City Ordinances
- County or State Law or Programs

Structural

- Individual Building Block
- Assembly or Cluster Choice
- Cluster of Housing Units
- Master Plan Site
- City Infrastructure
- County or State Infrastructure

Example of Integration (First level integration)

- The individual pieces within to be a part of this project
- The pieces also become to participate in sustainable within
- The architect designs operable windows that also have a high R-value and some on storage while also maximizing the owner's experience and well-being

Types of Units

Single Floor Studios

- One unit apartments that are designed for one bathroom or one very large open space

Apartment Flats

- These units are just like modern apartments and condos. They are allowed to occupy more than one floor and some allow occupancy in width if desired

Row Houses

- These units are designed to occupy at least 3 floors and have the only possibility of neighboring on either side

Fig. 119.1



Fig. 120.1



Fig. 121.1



Fig. 122.1

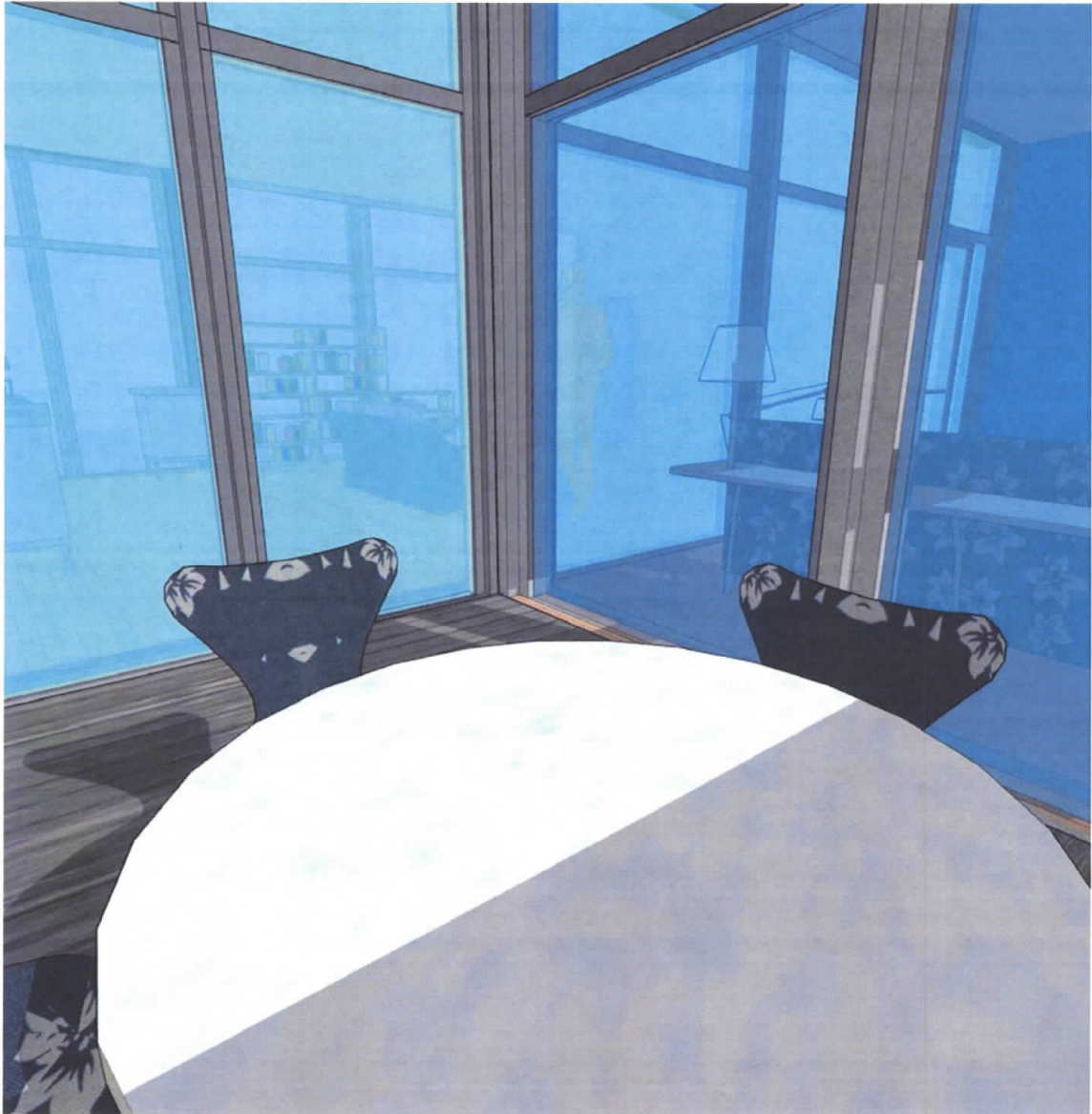


Fig. 123.1



Fig. 124.1

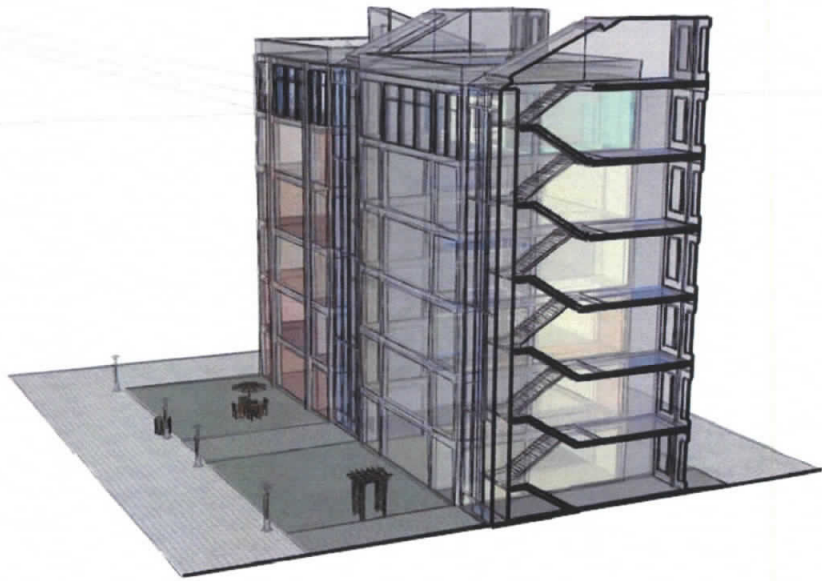


Fig. 125.1



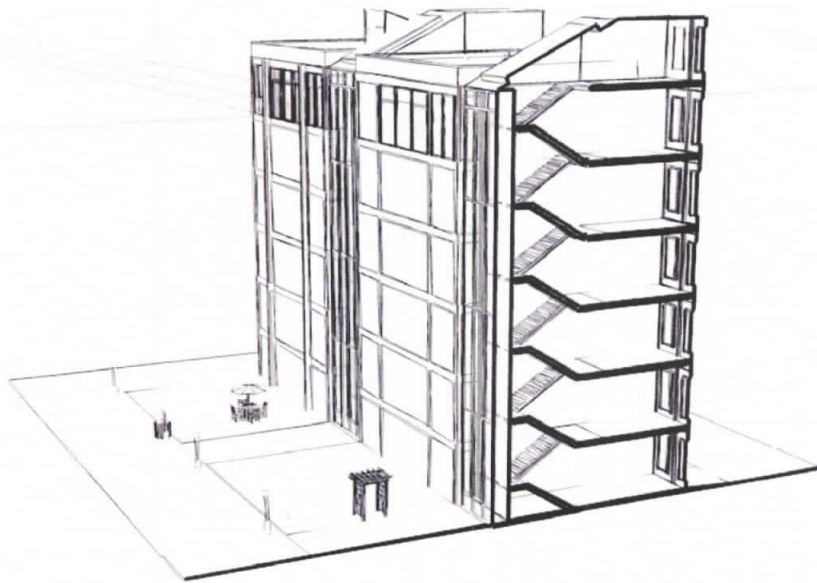


Fig. 126.1

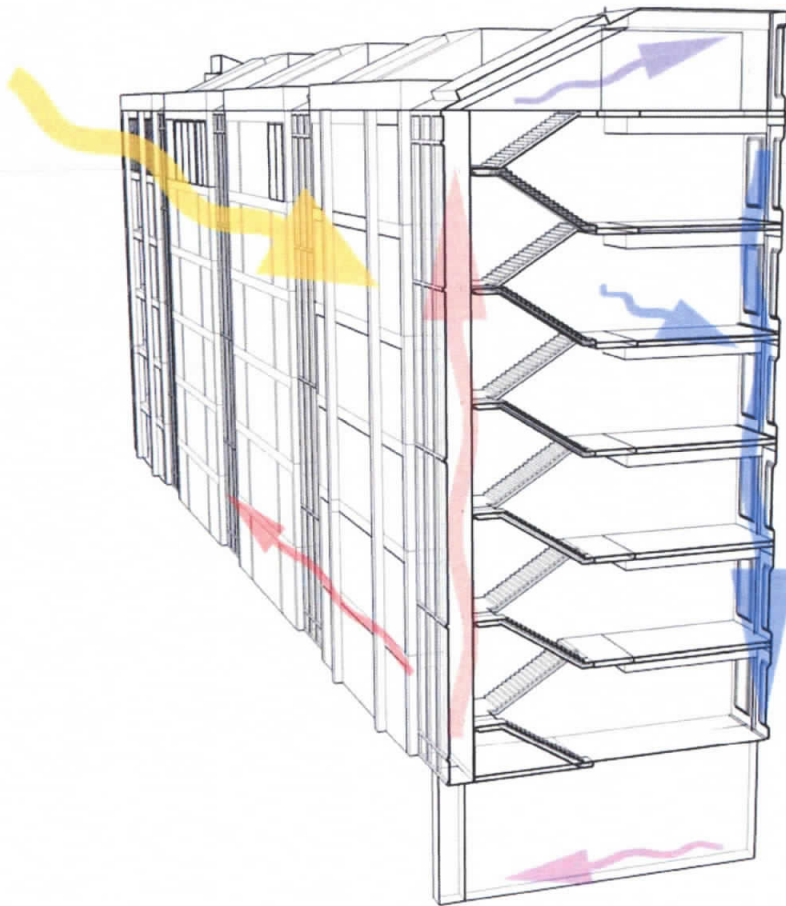


Fig. 127.1



Fig. 128.1

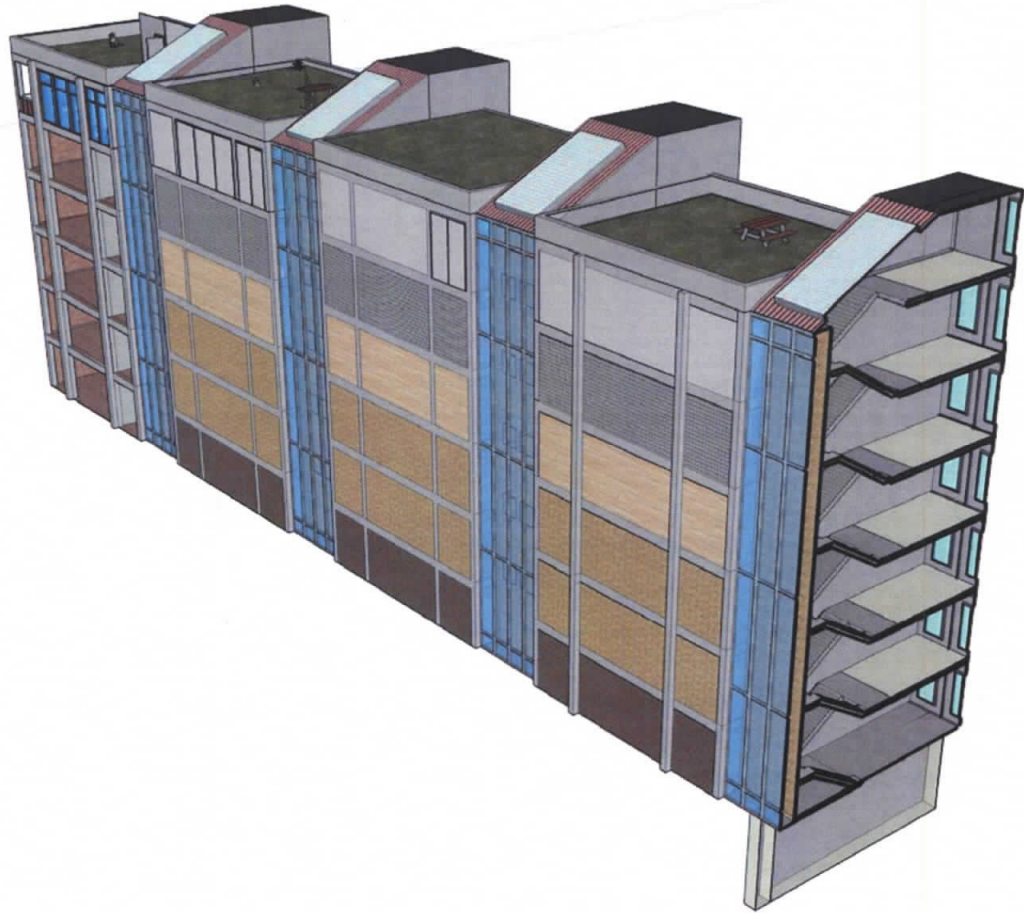


Fig. 129.1



Fig. 130.1

WEB PAGE

This section contains all the screen shots of the web page and Design Layout and Assist Program.

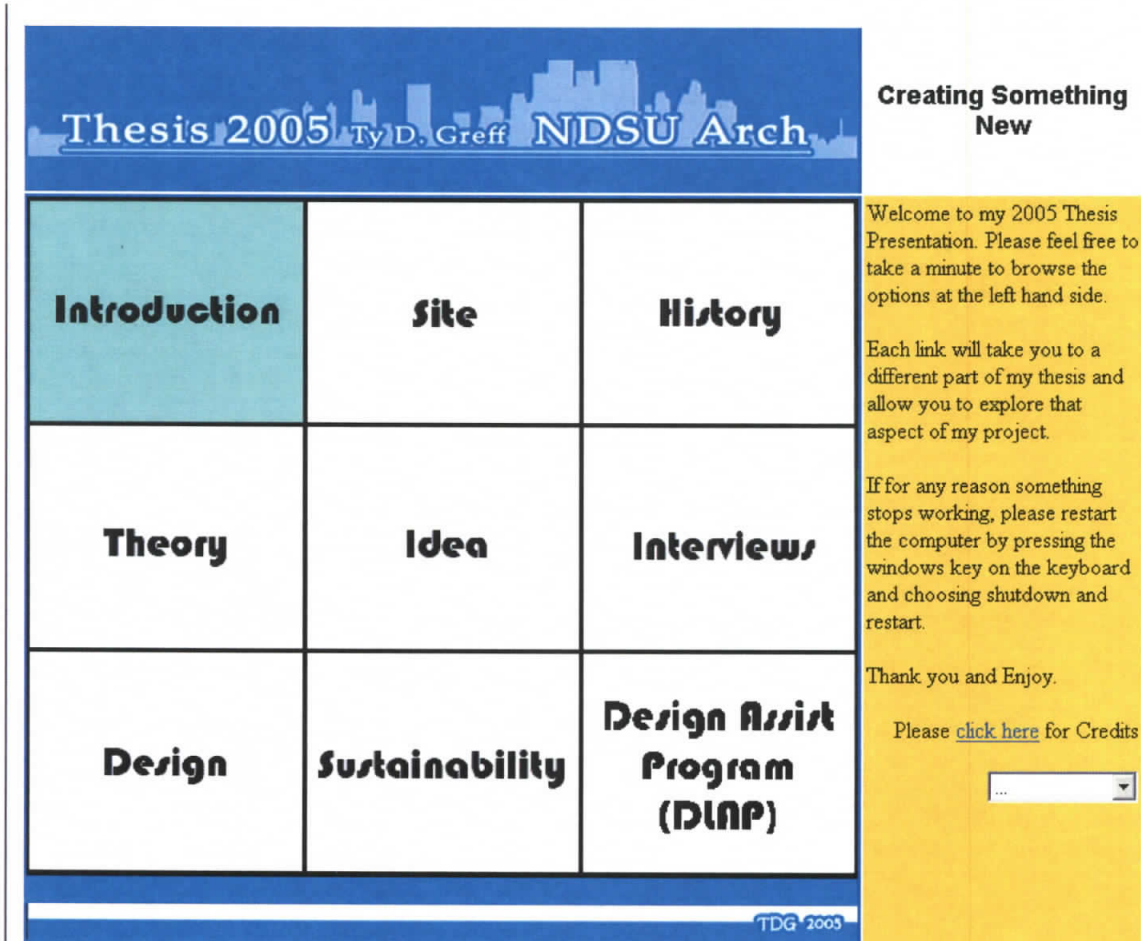


Fig. 131.1



Site

Site

The site itself is in the city of Bismarck , North Dakota . Currently North Dakota has an estimated population of almost 634,000people. Bismarck sits on the southwest central portion of the state. Bismarck , the capitol of North Dakota has a population of 55,500 people. The city itself contains 24,000 housing units. Bismarck 's neighboring city Mandan has a current population of 16,700 people. With outer lying developments this gives Bismarck a metropolitan size of approximately 91,000 people including both Burleigh and Morton counties.

The significance of this site is of great importance to the city of Bismarck . Currently the city is working on the development of a new city bridge to connect Bismarck to Mandan . This will replace the memorial highway bridge that has been in operation since 1922 and was the final link connecting the Pacific and Atlantic Coast on Highway Ten. The site is seven and a half acres currently sits without use. It is within a couple of minutes of downtown Bismarck and the Missouri River .

The site itself is located in Bismarck North Dakota. It is on Main Ave at the very western edge of Bismarck near the Memorial Highway Bridge . Its main borders are Memorial Highway and Main Ave. The Site itself comprises nearly 10 acres of land in a large, nearly triangular form.

Site Topography

The site itself is relatively flat as it has been previously developed. The area itself slopes towards the direction of the river and the embankment across memorial highway on the southern side. The highest point is the northeast corner.

Vegetation

Currently there is almost no vegetation on the site. There are several trees that surround the building and some areas that have been planted with domesticated grasses. The river valley has some native long grasses left.

Views

The site in question has some spectacular views of both the city of Bismarck as well as the Missouri River and towards the bluffs and hills south of Mandan . Most of the good views come from the tower. However, from the ground on the north side, one can see the dynamic exchange of traffic on and off of the bridge.

[Click Here](#) to view various pictures from the site and its surroundings.



Fig. 132.1



Theory

I feel there must be some set of rules a person follows when designing. Not necessarily rules that govern the design itself, but merely a framework of positive ideas that can help to benefit a design project. There are rules for construction, rule for the master site plan, rules for units, rules for blocks of units, and rules for operation/continued sustainability

Rules for Construction

There are basic rules for construction

Local Labor

- Construction of exterior façade panels should be done close to site in a factory condition if possible. This allows the workers to avoid being out in the elements that shorten the construction season and increase the risk of accident

Local Materials

- All materials that go into the site should attempt to be found as close as possible
- to help alleviate the dependency on transportation. This will help promote a much more natural economy, instead of a free market money driven economy.

Use of Sustainable materials

- All choices regarding materials should be held to the highest sustainable choice.
- If a carpet is available locally, but it is composed of chemicals known to off gas carcinogens, then it should be avoided and a sacrifice made in local materiality in favor of a choice that is more ethical in the long term.

Recycling of Current Materials

- All materials on the site should be recycled as best as possible.
 - All Glass can be used to frame borders of bicycle racks as to help deter the wind, but not subdivide the outdoors space.
 - Brick should be used for new facades
 - Brick should be used to help make porous pavers for walking paths
 - Concrete should be recycled as best is possible for reuse and rebar separated for recycling.
 - All finish materials should be reused where applicable and sold locally if possible. If not, recycling should occur for all the materials

Now we will look at rules for the master site plan

Fig. 133.1



Interviews

Gary Franz

Gary Franz is a single adult male who works at NDSU and has a degree in computer science. He currently lives with roommates and his dog. He desires to get away from roommates and to live on his own. He is planning on trying to purchase a home for himself within five years if possible.

He is:

- Single
- Has animals

Gary the following needs:

- Place for his dog to be outside
- A space he can watch movies in comfortably
- A good kitchen space
- Views

[This is what he choose....](#)

[Back](#)

Click the picture to listen to the clip of Gary's Interview. (or Right Click on it and save it to desktop)



[Home](#)

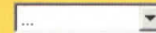


Fig. 134.1



Sustainability

Ethical Choices

I personally believe that every choice a person makes is a sustainable one, whether it really is or not. This makes it necessary for me to try as hard as possible to include sustainable design solutions into every aspect of my site. This page will give a brief overview of the sustainable techniques incorporated into the design.

- Flow through ventilation in every apartment
- Trombe walls on stair towers
- Green Roof Garden
- Rain water collection on stair tower
- Hot water solar panels on stair tower
- Bus pickup zones
- Shared car theory
- Recycled materials from previous building
- Pervious walking paths
- Sustainable façade series
 - South Side (Solar Louvers, High R-Value Walls, Trombe Walls, operable windows)
 - West Side (High R-Value Walls and Windows, Solar Louvers, operable windows)
 - East Side (High R-Value Walls and Windows, operable windows)
 - North Side (High R-Value Walls and Windows, Large Windows to take advantage of northern daylighting, operable windows)
- Sheltered bicycle racks
- Sheltered recycling stations
- Reuse of Bridge Materials
- Composting Piles
- Grey Water Planter Filtration
- Local Materials
- Local Construction
- Connections to Bike Paths

[Home](#)

Fig. 135.1



Design Assist
Program (DLAP)

DLAP is meant to:

- Engage the community in choosing their living spaces
- Enrich the body of knowledge shared between designers and clients/users
- Enhance the ability of an architect to design beautiful and functional spaces
- Promote the use of smart, sustainable materials
- Provide users with not only choices, but choices that might actually be an honest fit
- Track trends in desires
- Provide a database that allows for research into the wants/desires of those that are interested in housing

This page contains all the information that culminates everything you have looked at before into the main idea of this thesis. This page will take you to what I have coined the Design Layout and Assist Program. You can call it DLAP (da-lap) for short.

DLAP takes into account basic user inputs and helps determine what I hope to be the best possible layout and configuration for each user in the housing development. It goes as far to help the user start to customize exterior and interior finishes, as well as their choice of rooftop gardens, balconies and ground level yards or gardens.

DLAP does not remove the need of the architect. The architect is still responsible for the creation of the facades the user decides on choosing. The architect is still responsible for collaborating with landscape architects and engineers to help develop a suitable master site plan (although this stage is somewhat enhanced by the fact that the users get some input on the possible location of their groups unit)

Click the icon to launch the DLAP program and try your own hand and possibly finding a solution to your housing needs/desires.

**Launch
Design
Layout &
Assist
Program**

Please [Click here](#) to get instructions if you are willing to have this information logged so that I can research the outcome of all those willing to participate in this program

[Home](#)


Fig. 136.1

Design Layout and Assist Program

<HOME> Chooser | Helper


Helper


The helper is a wonderful program designed to walk you step by step in order to find the home that may best fit you.



Chooser

The chooser was designed for those who have a better idea of what they want, and dont need step by step assistance in choosing it.



 Click Me!

TDG 2005

Fig. 137.1


Design Layout and Assist Program

[<<HOME>>](#) [Helper](#) >> [Introduction](#) | [Floors](#) | [Exposure](#) | [Extras](#) | [Exterior](#) | [Review](#)


Helper : Introduction

The helper will walk you step by step throughout the process of identifying which house style, location and layout might be right for you.


The first choice you have is to go ahead and pick the type of housing unit you wish to have. If you dont know, click on the I under the appropriate box you are questioning and you will get a little more information to help you make a choice.



Row Housing



Flat



Studio

TDG 2003


Fig. 138.1

Design Layout and Assist Program

[<<HOME>>](#)
[Helper >>](#)
[Introduction](#) |
 [Floors](#) |
 [Exposure](#) |
 [Extras](#) |
 [Exterior](#) |
 [Review](#)

Preferred Floors...

Floor	Allows for...	
6: <input type="checkbox"/>	Rooftop Garden Balcony	Go ahead and choose the floors you would like to live on. Keep in mind that your floors need to be adjacent for this to work. If you prefer to be on the top floors, go ahead and choose the top floors. Also if its important for you to have a balcony, choose anything above the first floor to secure a balcony option.
5: <input type="checkbox"/>	Rooftop Garden Balcony	
4: <input type="checkbox"/>	Rooftop Garden Balcony	
3: <input type="checkbox"/>	Rooftop Garden Balcony	
2: <input type="checkbox"/>	Balcony	
1: <input type="checkbox"/>	Ground Garden	



You must select at least one before you can move on.

TDG 2003

Fig. 139.1

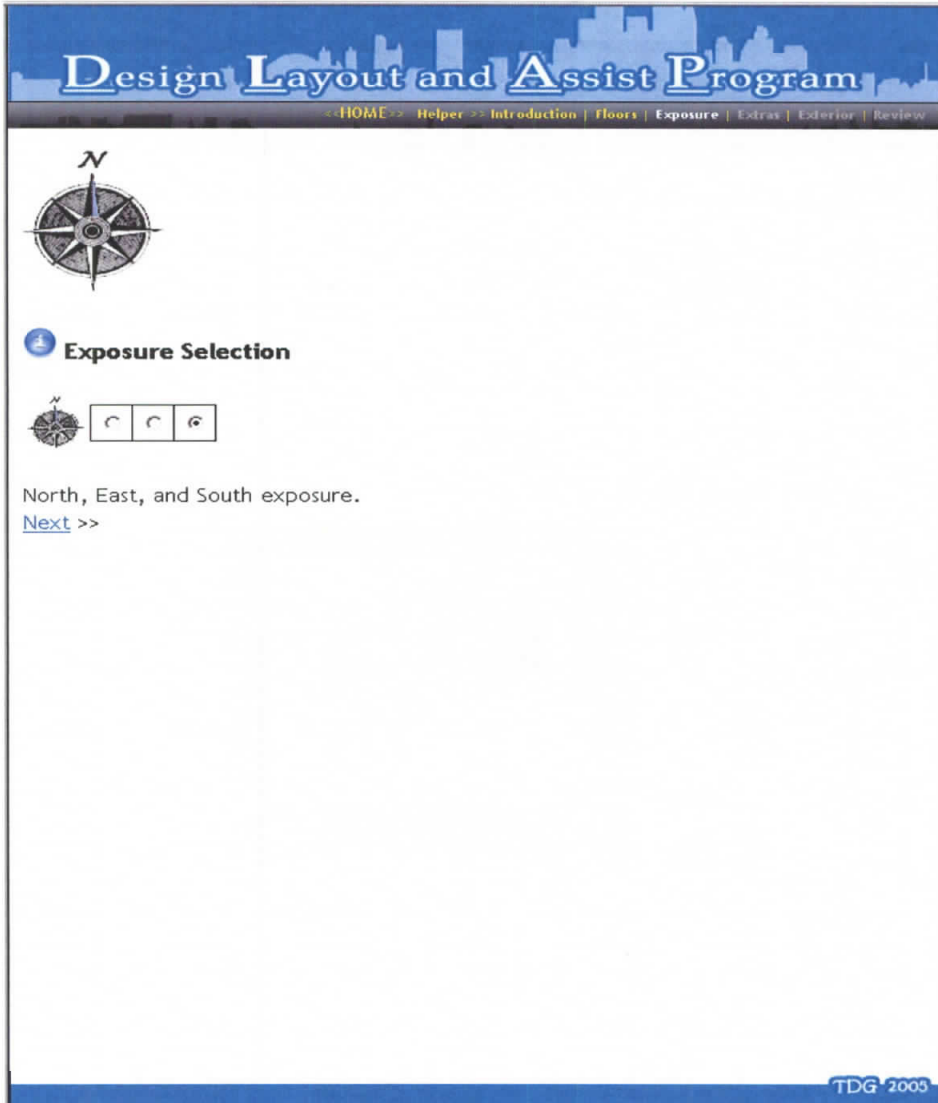


Fig. 140.1

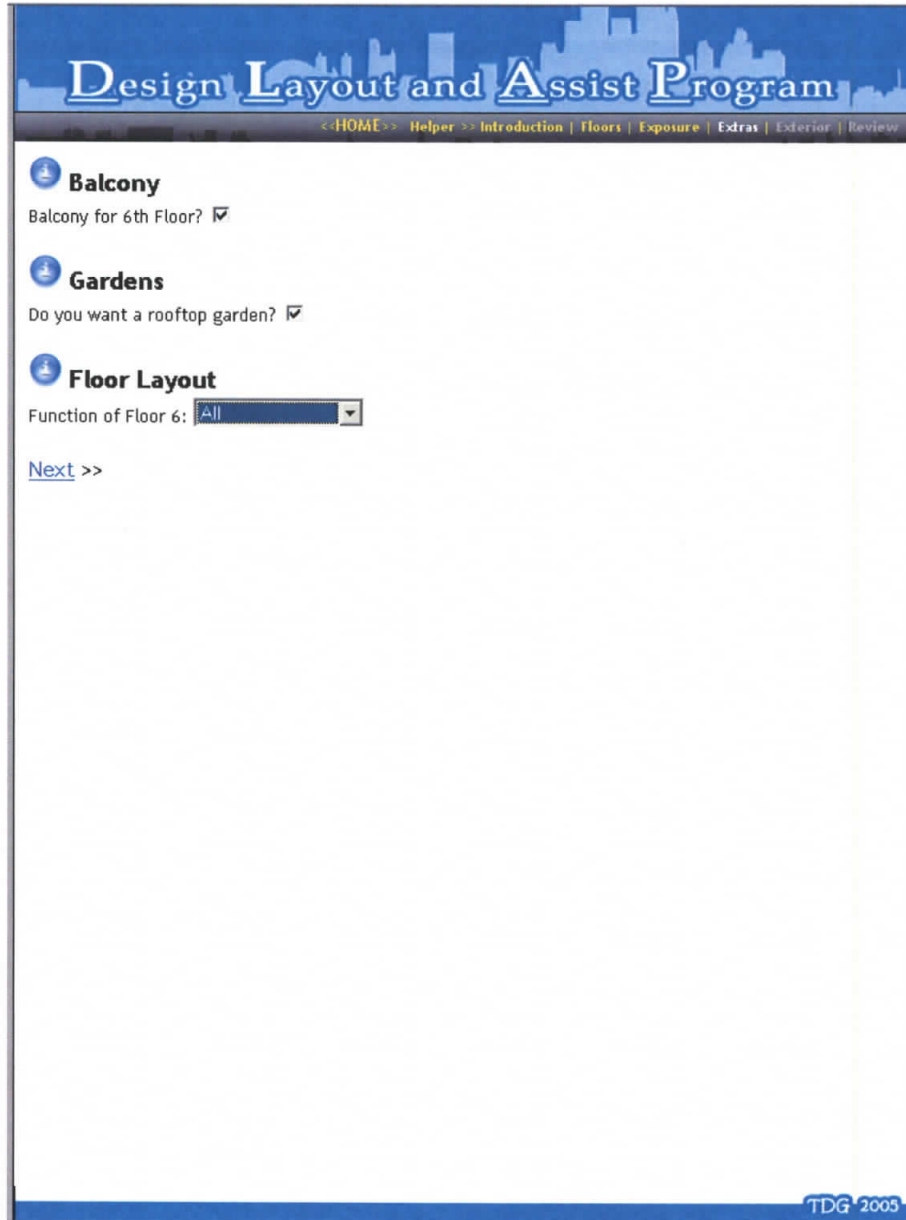


Fig. 141.1



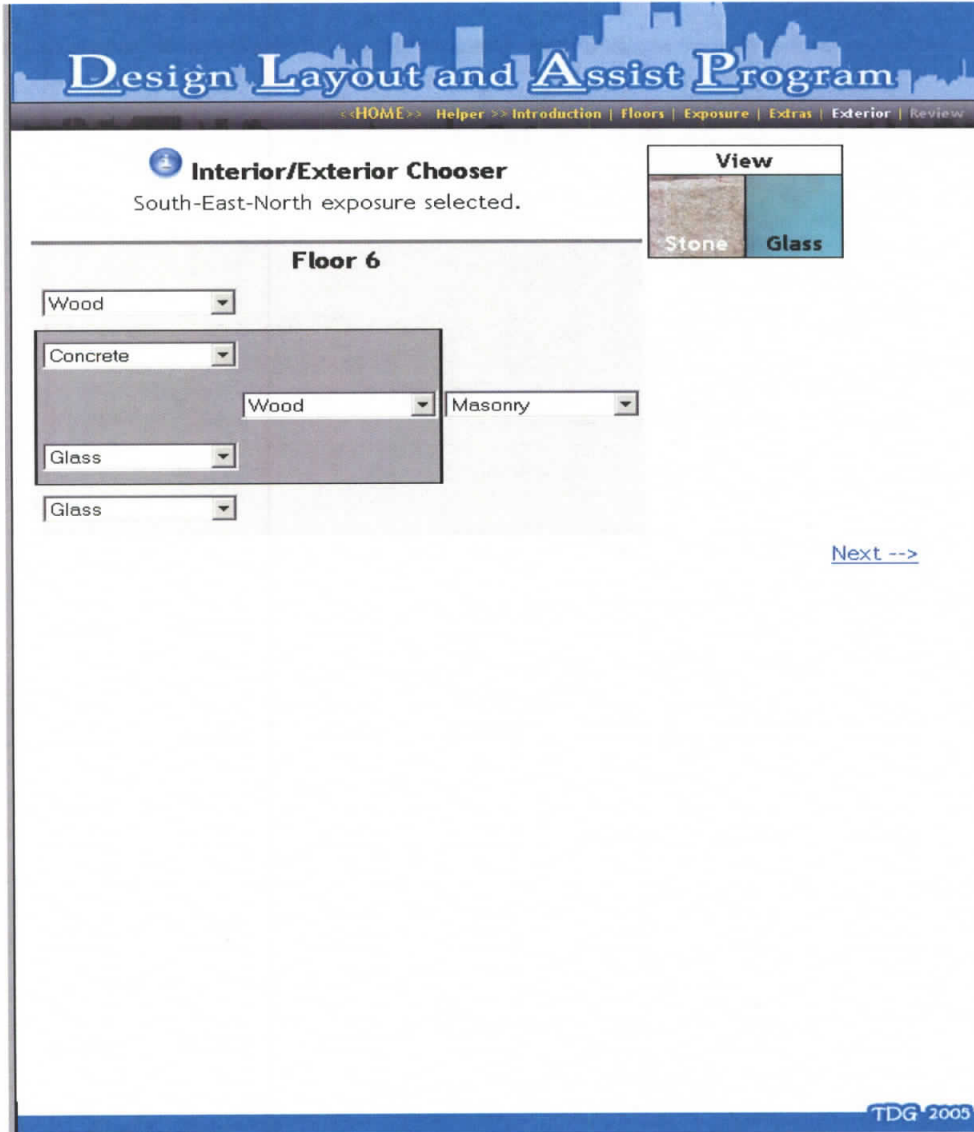


Fig. 142.1

The screenshot shows a web application interface for the 'Design Layout and Assist Program'. At the top, there is a blue header with the program name and a navigation menu: '< HOME >> Helper >> Introduction | Floors | Exposure | Extras | Exterior | Review'. Below the header is a table with a yellow header row containing 'Floor 6', 'All', and 'Balcony'. The table has five rows, each with the text 'Not selected.' in the second and third columns. To the right of the table, there are sections for 'Review', 'Exterior/Interior', 'Floor 1 Interior/Exterior;', and 'Gardens'. The 'Review' section states 'You have requested floor 6.'. The 'Exterior/Interior' section states 'North-East-South Exposure Selected.'. The 'Floor 1 Interior/Exterior;' section lists 'Concrete/Wood - Wood/masonry - Glass/Glass'. The 'Gardens' section states 'A rooftop garden has been requested.'. At the bottom of the page, there is a blue footer with 'TDG 2005'. Below the screenshot, there is a large instruction: 'Please click file and save as and name the html document as your first and last name for databasing of the project'.

Design Layout and Assist Program

< HOME >> Helper >> Introduction | Floors | Exposure | Extras | Exterior | Review

Floor 6	All	Balcony
	Not selected.	
	Not selected.	
	Not selected.	
	Not selected.	
	Not selected.	

Review
You have requested floor 6.

Exterior/Interior
North-East-South Exposure Selected.

Floor 1 Interior/Exterior;
Concrete/Wood - Wood/masonry - Glass/Glass

Gardens
A rooftop garden has been requested.

TDG 2005

Please click file and save as and name the html document as your first and last name for databasing of the project

Fig. 143.1

PERSONAL INFO

The name is Ty D. Greff

I grew up in Baldwin and Bismarck, North Dakota.

"The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity."

-Albert Einstein

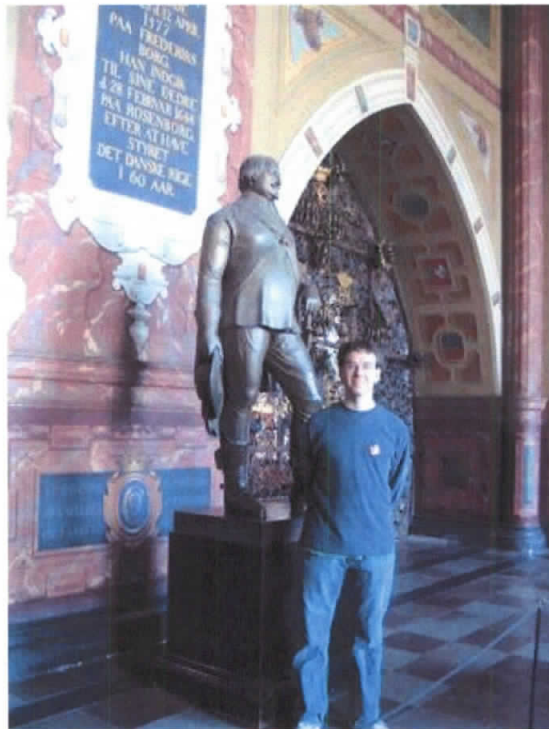


Fig. 144.1

APPENDIX

REFERENCES

Arrak. (1998-2001). ATT Viikki Sunh - Arrak. naakka new media Oy. http://www.arrak.com/pages/att_viikki_sunh/att_viikki_sunh_e_.htm

Chiara, J.D., & Crosbie, M.J. (Eds.). (2001). Time Saver Standards for Building Types. New York: McGraw-Hill

City of Bismarck. (2004). *Official City Web Site*.
<http://www.bismarck.org/>

Gauzin-Müller, Dominique. (2002). Sustainable Architecture and Urbanism. Basel, Switzerland: Birkhäuser.

North Dakota Department of Transportation. (2003). *Liberty Memorial Bridge*.
<http://www.memorialbridge.info/>

Northern Plains Wildlife Research Center. (2004). *Climate of North Dakota*.
<http://www.npwrc.usgs.gov/resource/othrdata/climate/climate.htm>

Red River College. (2004, November 12). RRC Princess Campus Photo Gallery.
<http://www.rrc.mb.ca/gallery/princess.htm>

SBS Byfornylse. (2001). Twelve Urban Ecology Projects in Hedebygade.
Copenhagen, Denmark: Orboe Tryk.

U.S. Census Bureau. (2000). *Census 2000 Housing Units*.
<http://quickfacts.census.gov/hunits/states/38pl.html>

APPENDIX

U.S. Census Bureau. (2004). *American Factfinder*.

[http://factfinder.census.gov/servlet/SAFFFacts?
_event=Search&geo_id=01000US&geoContext=&_street=&_county=&ci
tyTown=Bismarck&_state=04000US38&_zip=&_lang=en&_sse=on](http://factfinder.census.gov/servlet/SAFFFacts?_event=Search&geo_id=01000US&geoContext=&_street=&_county=&cityTown=Bismarck&_state=04000US38&_zip=&_lang=en&_sse=on)

U.S. Census Bureau. (2004). *State and County Quickfacts*.

<http://quickfacts.census.gov/qfd/states/38000.html>

U.S. Dept. of Agriculture Soil Conservation Service. (1974). Soil Survey of Burleigh County, North Dakota. Washington, DC: U.S. Government Printing Office.

**Wohnanlage Ölzbundt. (2004). Dornbirn, Vorarlberg. [http://www.proholz.at/
zuschnitt/06/pro_oelzbuendt.htm](http://www.proholz.at/zuschnitt/06/pro_oelzbuendt.htm)**

**Weather Underground. (2004). Average High Low Temperature for KBIS. [http://
www.wunderground.com/NORMS Dis
playNORMS.aspAirportCode=KBIS&SafeCityName=Bismarck&StateCode=N
D&Units=none&IATA=BIS](http://www.wunderground.com/NORMS DisplayNORMS.aspAirportCode=KBIS&SafeCityName=Bismarck&StateCode=ND&Units=none&IATA=BIS)**

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FIGURES

Fig. 1.1..... Used from <http://teraserver.microsoft.com/>

Fig. 11.1..... Taken by Ty Greff in September 2004

Fig. 12.1..... Taken by Ty Greff in September 2004

Fig. 12.2..... Taken by Ty Greff in September 2004

Fig. 12.3..... Taken by Ty Greff in September 2004

Fig. 13.1..... Taken by Ty Greff in September 2004

Fig. 13.2..... Taken by Ty Greff in September 2004

Fig. 13.3..... Taken by Ty Greff in September 2004

Fig. 14.1..... Taken by Ty Greff in September 2004

Fig. 14.2..... Taken by Ty Greff in September 2004

Fig. 14.3..... Taken by Ty Greff in September 2004

Fig. 15.1..... Taken by Ty Greff in September 2004

Fig. 15.2..... Taken by Ty Greff in September 2004

Fig. 15.3..... Taken by Ty Greff in September 2004

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Fig. 16.3..... Taken by Ty Greff in September 2004

Fig. 17.1..... Taken by Ty Greff in September 2004

Fig. 17.2..... Taken by Ty Greff in September 2004

Fig. 17.3..... Taken by Ty Greff in September 2004

Fig. 18.1..... Taken by Ty Greff in September 2004

Fig. 18.2..... Taken by Ty Greff in September 2004

Fig. 18.3..... Taken by Ty Greff in September 2004

Fig. 19.1..... Taken by Ty Greff in September 2004

Fig. 19.2..... Taken by Ty Greff in September 2004

Fig. 19.3..... Taken by Ty Greff in September 2004

Fig. 23.1..... Used from
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Fig. 24.2..... Used from
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Fig. 24.3..... Used from
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Fig. 25.1..... Used from
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Fig. 25.2..... Used from
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- Fig. 26.1..... Used from
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- Fig. 26.2..... Used from
.... <http://www.npwrc.usgs.gov/resource/othrdata/climate/climate.htm>
- Fig. 26.3..... Used from
.... <http://www.npwrc.usgs.gov/resource/othrdata/climate/climate.htm>
- Fig. 27.1..... Used from <http://terraserver.microsoft.com/>
- Fig. 28.1..... Used from <http://terraserver.microsoft.com/>
- Fig. 29.1..... Used from <http://terraserver.microsoft.com/>
- Fig. 30.1..... Used from <http://terraserver.microsoft.com/>
- Fig. 31.1..... Used from <http://terraserver.microsoft.com/>
- Fig. 32.1..... Used from <http://terraserver.microsoft.com/>
- Fig. 33.1..... Used from <http://maps.yahoo.com/>
- Fig. 36.1..... Taken by Ty Greff in April 2004
- Fig. 37.1..... Taken by Ty Greff in April 2004

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Fig. 37.2..... Taken by Ty Greff in April 2004

Fig. 38.1..... Taken by Ty Greff in April 2004

Fig. 38.2..... Taken by Ty Greff in April 2004

Fig. 39.1..... Taken by Ty Greff in April 2004

Fig. 39.2..... Taken by Ty Greff in April 2004

Fig. 40.1..... Taken by Ty Greff in April 2004

Fig. 41.1..... Taken by Ty Greff in April 2004

Fig. 42.1..... Taken by Ty Greff in April 2004

Fig. 43.1..... Used from <http://www.rrc.mb.ca/gallery/princess.htm>

Fig. 43.2..... Used from <http://www.rrc.mb.ca/gallery/princess.htm>

Fig. 43.3..... Used from <http://www.rrc.mb.ca/gallery/princess.htm>

Fig. 43.4..... Used from <http://www.rrc.mb.ca/gallery/princess.htm>

Fig. 44.1..... Taken by Ty Greff in April 2004

Fig. 45.1..... Used from
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Fig. 46.1..... Used from
.. http://www.arrak.com/pages/att_viikki_sunh/att_viikki_sunh_e_.htm

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Fig. 47.1.....	Used from .. http://www.arrak.com/pages/att_viikki_sunh/att_viikki_sunh_e_.htm
Fig. 47.2.....	Used from .. http://www.arrak.com/pages/att_viikki_sunh/att_viikki_sunh_e_.htm
Fig. 48.1.....	Taken by Ty Greff in April 2004
Fig. 49.1.....	Taken by Ty Greff in April 2004
Fig. 50.1.....	Taken by Ty Greff in April 2004
Fig. 50.2.....	Taken by Ty Greff in April 2004
Fig. 51.1.....	Taken by Ty Greff in April 2004
Fig. 51.2.....	Taken by Ty Greff in April 2004
Fig. 52.1.....	Taken by Ty Greff in April 2004
Fig. 52.2.....	Taken by Ty Greff in April 2004
Fig. 52.3.....	Taken by Ty Greff in April 2004
Fig. 53.1.....	Taken by Ty Greff in April 2004
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Fig. 93.1.....	Sketch by Ty D Greff 2005

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Fig. 97.1Sketch by Ty D Greff 2005

Fig. 98.1Sketch by Ty D Greff 2005

Fig. 99.1Sketch by Ty D Greff 2005

Fig. 100.1Sketch by Ty D Greff 2005

Fig. 101.1Sketch by Ty D Greff 2005

Fig. 102.1Sketch by Ty D Greff 2005

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Fig. 108.1.....Sketch by Ty D Greff 2005

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Fig. 109.1.....Sketch by Ty D Greff 2005

Fig. 109.2.....Sketch by Ty D Greff 2005

Fig. 110.1.....Sketch by Ty D Greff 2005

Fig. 110.2.....Sketch by Ty D Greff 2005

Fig. 111.1.....Sketch by Ty D Greff 2005

Fig. 111.2.....Sketch by Ty D Greff 2005

Fig. 112.1.....Sketch by Ty D Greff 2005

Fig. 112.2.....Sketch by Ty D Greff 2005

Fig. 113.1.....Sketch by Ty D Greff 2005

Fig. 113.2.....Sketch by Ty D Greff 2005

Fig. 113.3.....Sketch by Ty D Greff 2005

Fig. 114.1.....Sketch by Ty D Greff 2005

Fig. 114.2.....Sketch by Ty D Greff 2005

Fig. 115.1.....Sketch by Ty D Greff 2005

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Fig. 116.1..... Renderings by Ty Greff 2005

Fig. 117.1..... Renderings by Ty Greff 2005

Fig. 118.1..... Renderings by Ty Greff 2005

Fig. 119.1..... Renderings by Ty Greff 2005

Fig. 120.1..... Renderings by Ty Greff 2005

Fig. 121.1..... Renderings by Ty Greff 2005

Fig. 122.1..... Renderings by Ty Greff 2005

Fig. 123.1..... Renderings by Ty Greff 2005

Fig. 124.1..... Renderings by Ty Greff 2005

Fig. 125.1..... Renderings by Ty Greff 2005

Fig. 126.1..... Renderings by Ty Greff 2005

Fig. 127.1..... Renderings by Ty Greff 2005

Fig. 128.1..... Renderings by Ty Greff 2005

APPENDIX CONT.

Fig. 129.1 Renderings by Ty Greff 2005

Fig. 130.1 Renderings by Ty Greff 2005

Fig. 131.1 Renderings by Ty Greff 2005

Fig. 132.1 Renderings by Ty Greff 2005

Fig. 133.1 Renderings by Ty Greff 2005

Fig. 134.1 Renderings by Ty Greff 2005

Fig. 135.1 Renderings by Ty Greff 2005

Fig. 136.1 Renderings by Ty Greff 2005

Fig. 137.1 Renderings by Ty Greff 2005

Fig. 138.1 Renderings by Ty Greff 2005

Fig. 139.1 Renderings by Ty Greff 2005

Fig. 140.1 Renderings by Ty Greff 2005

Fig. 141.1 Renderings by Ty Greff 2005

APPENDIX CONT.

Fig. 142.1 Renderings by Ty Greff 2005

Fig. 143.1 Renderings by Ty Greff 2005

Fig. 144.1 Photo by Hanne Molgaard 2004

APPENDIX CONT.

STATEMENT OF INTENT

Ty Greff

Statement of intent

8/28/2004

Creating Something Old: Bringing new housing back within city limits

Bismarck, North Dakota

What happens when something has outlived its purpose? Do you throw it away, use the pieces for something else, or come up with another idea? When this thing is a building the situation becomes more complicated. Bismarck is home to a currently abandoned hotel which was originally the Holiday Inn. For many years it was considered one of the nicest hotels in the city. I propose to take this site and building and to design a new use for it.

Currently there is a new bridge crossing the Missouri River being planned adjacent to this site. The site itself sat unused for a period of years. The city of Bismarck, like most growing cities, is pushing its boundaries outward, instead of looking at ways it can expand from within the city. Instead of creating a new housing development on the fringe of the city, this project will turn the site into a housing community within the existing framework of Bismarck-Mandan. I will be simulating using a private developer who is well educated and is interested in providing housing for multiple income classes and is able to recognize all the possible uses for the site.

The focus of this project will be in three main areas. The first and most important focus is transforming the existing building into housing. The second is the addition of auxiliary needs of a small community sitting within Bismarck. In this area will be the addition of new structures on the site. The last focus will be on the redevelopment of the land surrounding the building, which is currently parking. The foundation of this design is the necessity of any city to rebuild or redesign itself through adaptive reuse.

NDSU ARCHITECTURE
DEPARTMENT

DESIGN THESIS PROPOSAL
TY D. GREFF

OCTOBER 07, 2004

CREATING SOMETHING OLD

**Bringing new housing back within city
limits.**

Bismarck, North Dakota



ABSTRACT

Creating Something Old: Bringing new housing back within city limits

How long should a building last; twenty years, thirty years? What if a building is still standing? There is a better answer than demolition and forgetting. Buildings can be rebuilt, reused and recycled back into the community. A building becomes a living presence. It breathes, grows changes and evolves. It affects things around it. Its functions might change; its form might be modified. Buildings can become smarter as there users become more aware. Green and sustainable methods can be added to and found within existing structures and forms. Potential is meant to be found and nurtured.

How about cities then? Should they have a long life span? Or should a city keep growing outward neglecting its interior, its core? Cities also change; they affect life and their surroundings. Smart design places emphasis on constantly evolving the city within before looking for quick expanding fixes. Cities can also become more responsible by becoming more sustainable. They can adapt to the needs of their populace.

There is a need for adaptive reuse design. Buildings are huge investments and are not meant to be replaced within a set period of time. This will be a research into the theory of design and redesign. This will be the redesign. An old hotel that has been abandoned and will now be turned into a housing community. It will take upon something and build. Build upon physical constraints and build upon a body of knowledge. There is a need to harmoniously blend building and city. This is that synthesis; to take a building that has no current use and to find a suitable new use. It will be reshaping the site and building both in form and function. This will be a sensitive response to macro and micro site conditions. This will be an ethically responsive design necessary for an intercity solution. It is creating something old. It will be forming and reforming an old hotel into something that can give back to the city, the synthesis of people and place to form community within.

USER / CLIENT DESCRIPTIONS

CLIENT

For this project the client will consist of a sole “invented” developer. The developer will be interested in creating a unique opportunity for housing in the community. The developer will also be interested in making sure that there is no focus on a certain social or income classes in this housing development and is interested in developing housing for all who are interested. In simple terms the developer is most interested in creating a living community within a city that adds to the value of Bismarck without taking away.

USER GROUPS

The users of this project will mainly represent those who choose to take residence within the housing community. Also this will include those who will use the auxiliary spaces on the site.

PROJECT ELEMENTS

PRINCIPAL ELEMENTS

In considering this project, the major elements will include the current hotel tower, the large horizontal hotel element and lastly the site surrounding the project, which is currently only asphalt parking. Another element of this site is the proposed bridge that will be built with its entrance directly adjacent to the site and the historic bridge that will be taken down.

MAJOR SPACES AND FUNCTIONS

The major spaces that will be taken into consideration on this site will be.

- Individual housing units
- Supporting spaces such as
 - Laundry
 - Parking

PROJECT ELEMENTS CONT.

- **Storage**
- **Relaxation**
- **Group or Public meeting space**
- **Exercise facilities**
- **Treatment of the bike trail that will run on the site connecting Bismarck's recreational trail system with Mandan's trail.**
- **Spaces for leasing of small businesses possibly including**
 - **Hair stylist**
 - **Barber**
 - **Flower shop**
- **Restaurant**
- **Kiosk**
- **Onsite daycare**

SITE INFORMATION

SITE OVERVIEW

The site itself is in the city of Bismarck, North Dakota. Currently North Dakota has an estimated population of almost 634,000 people. Bismarck sits on the southwest central portion of the state. Bismarck, the capitol of North Dakota has a population of 55,500 people. The city itself contains 24,000 housing units. Bismarck's neighboring city Mandan has a current population of 16,700 people. With outer lying developments this gives Bismarck a metropolitan size of approximately 91,000 people including both Burleigh and Morton counties.

SITE IMPORTANCE

The significance of this site is of great importance to the city of Bismarck. Currently the city is working on the development of a new city bridge to connect Bismarck to Mandan. This will replace the memorial highway

SITE INFORMATION CONT.

bridge that has been in operation since 1922 and was the final link connecting the Pacific and Atlantic Coast on Highway Ten. . The site is seven and a half acres currently sits without use. It is within a couple of minutes of downtown Bismarck and the beautiful Missouri River

SITE INVENTORY

ECONOMIC BASE

Currently Bismarck has about 31,000 employees in the work force. The current median household income is 39,000 dollars. The median family income is 51,000 dollars and the income per capita is 20,000 dollars. Approximately 8.5% of the population is currently below the poverty level.

DEMOGRAPHICS

The population of the Bismarck is approximately 94% White with the second largest population being Native American at 3.4%. Black or African-American and Asian populations constitute less than 1% to the total population. The rest of the population is a breakdown of other races including Pacific Islander and Latino

LOCATION

The site itself is located where Main Ave and Memorial Highway in Bismarck meet and diverge. Across Main Ave are small two and three storey office buildings as well as several car sale lots. To the South of the site is Memorial Highway and a row of small business ranging from a butchers shop to an ambulance service. To the east and southeast is all residential housing ranging from single family detached units to medium size apartment buildings three stories in height.

MAJOR LANDMARKS

Again, one of the most important landmarks is the current bridge set for removal after the completion of the new four lane bridge almost adjacent to the existing bridge. Also important to the Bismarck area is the State

SITE INFORMATION CONT.

Capital, which includes the Governor's Mansion, Heritage Center and state library. Directly south of Mandan is the Mandan Indian Village and Fort Lincoln State Park.

SITE TOPOGRAPHY

The site itself is relatively flat as it has been previously developed. The area itself slopes towards the direction of the river and the embankment across memorial highway on the southern side. The highest point is the northeast corner.

VEGETATION

Currently there is almost no vegetation on the site. There are several trees that surround the building and some areas that have been planted with domesticated grasses. The river valley has some native long grasses left.

UTILITIES

The site itself is within the bounds of the city of Bismarck, so it currently has connections to water, sewer, electricity, and communications. The site itself has already been previously setup for handling water drainage.

TRANSPORTATION

Bismarck itself has a connection with a regional bus line that can deliver people either to Amtrak or to the closest Greyhound hub. Bismarck has a regional airport providing service to Denver and Minneapolis. The city itself currently has two taxi companies for service. The city also recently open its own public transportation, which consists of multiple buses. The site is close by a city recreational bike line, which can also double as a means of transportation to and from the site during the warmer months. Highway 83 which runs from Canada to Mexico and I-94 which runs from New York to The Pacific also intersect in Bismarck, making it a very accessible place via automobile transportation.

SITE INFORMATION CONT.

VIEWS

The site in question has some spectacular views of both the city of Bismarck as well as the Missouri River and towards the bluffs and hills south of Mandan. Most of the good views come from the tower, however, from the ground on the north side, one can see the dynamic exchange of traffic on and off of the bridge.

SOLAR ORIENTATION

The southern side of the site has great opportunities to capture both light and heat. With such a large site, there is a great chance to utilize passive solar design strategies. Bismarck currently gets on average 272 sunny or partly sunny days each year.

WIND ANALYSIS

Bismarck has a low average wind speed of 9.8 mph in July and a high of 12.5 mph in May. The primary wind direction is west northwest which blows from September to April. The summer months vary with winds coming from the south southeast in May to west northwest in June and east in August.

EXISTING STRUCTURES

Currently there are two main structures existing on the site. The first is the large hotel tower and conference center. The next is the main hotel with atrium, restaurant and pool area. These two spaces are connected by a glass walkway.

SITE INFORMATION CONT.

ACOUSTIC ENVIRONMENT

The site does receive a large amount of noise from the Main Ave traffic which is loudest during both rush hours. The south and southeast sides of the site are well sheltered from noise by the residential area and existing buildings. The South side directly adjacent to memorial highway has some noise from traffic, but not at the level of a commercial street. There is also a train within a few city blocks that may need to be accounted for on the northern portion of the building.

PROJECT EMPHASIS

EMPHASIS

First and foremost, the emphasis of this project is to take and analyze a currently abandoned structure and site and develop a design that would give the space a new use and function of housing within the city of Bismarck

MAJOR POINTS OF FOCUS

In addressing a project of this nature and scale, there will be some main points that are necessary to consider and touch upon throughout the project. They are as follows.

- **Adaptive Reuse**
 - *This will include making design and programmatic decisions to the buildings and structures currently on the site and to their future relationship to the thesis design. This could include leaving some structures as they are, modifying them to a new use, or removing parts of them entirely for a different purpose. Also included in this is the possibility for the addition of new structures.*
- **Completion of Site design**
 - *The site itself is currently asphalt paving with some street*

PROJECT EMPHASIS CONT.

lights and electric car plugs for the winter month. The site will be redesigned to fit better within the context of sharing boundaries to residential and commercial zoning as well as the river and bridge.

- **Adherence to Sustainable building techniques**
 - ***It is important both ethically and personally that I choose to establish design techniques that not only serve the users and client of this thesis, but also serve the community. I will do this by being responsible in the selection of materials. Also I will be responsible for the utilization of current building features to more properly utilize the further consumption natural resources.***
- **Relationship to both old and new bridges**
 - ***The site itself has a great relationship to the old highway that ran across the northern great plains. The bridge that lies currently across the Missouri River was the last link to connect the coasts together. The design itself must take into consideration the needs of the bridges themselves and their importance not only to the site, but also to the connection of Bismarck to Mandan and the psychological connections a bridge has by definition.***
- **In new design and modification of current structure, a recognition of design principles used by both the Regional Native Americans as well as the original homesteaders in the area, taking into consideration the Germans from Russia.**
 - ***Currently there are no design principles governing design in the Bismarck area, especially in the area of housing. However previously both early settlers and Native Americans used principles that worked to their advantage such as constructability and day lighting. Such ideas have a direct place in the adaptive reuse of this project.***
- **Creation of a community**
 - ***In some ways this idea embraces all the others. It is a main focus to make sure at all times this design becomes something that can function on its own. But at the same time it needs to also embrace the fact that it is part of the larger Bismarck Mandan community.***

PLANS FOR PROCEEDING

RESEARCH DIRECTION

The first and most important thing is the need for quality literary research to proceed in this project. There will be a need to study previously designed adaptive reuse projects. Another area of importance of knowledge to be gained to proceed is the research of examples of taking previous designs and applying sustainable and green principles to them. Lastly it will be important to research new medium housing projects that have a sense of community or intimacy from the surrounding areas yet still integrate themselves to function within the city as a larger whole.

DESIGN METHODOLOGY

Through the aforementioned research I will gain a deeper understanding of the application of this body of knowledge on the thesis itself. This will lend itself to the production of a more thorough design process. This process will have a system of checks and balances from my major points of focus. I will constantly use them to make sure that my designs and intentions are adhering to the standards being set.

DOCUMENTATION OF THE DESIGN PROCESS

In order to show the development of this project, several things will have to be recorded. This will include recording thoughts and knowledge to a physical sketchbook. Digitally, there will be a folder containing architectural and three dimensional drawings. Models will need to be built to represent the creation of space and form. Physically, all hand drawings will also be held as well in a drawing portfolio. It will be most important to make sure that not only outcomes of the design are realized, but the process of that outcome was attained.

PLANS FOR PROCEEDING CONT.

PREVIOUS STUDIO EXPERIENCE

2ND YEAR

Fall – Vince Hatlen

Understanding Space and Form – Public Viewing Space – No Site

Nativity Elementary School Addition – Fargo, ND

Spring – Phillippe D’Anjou

World Trade Center redesign – New York City

World Trade Center memorial – New York City

Place for self – No site

School for architecture - Copenhagen, Denmark

Pedestrian Bridge Competition at Lachine Canal - Montreal, Canada

3RD YEAR

Fall – Steve Martens

Abercrombie Interpretive Center Museum – Abercrombie, ND

Municipal Airport Design – Dickinson, ND

Spring – Carol Prafcke

Children’s Center for the Arts – Fargo, ND

PLANS FOR PROCEEDING CONT.

4TH YEAR

Fall – *Bring Dougan, Cindy Urness, Joshua Walters, and Mark Barnhouse*

Fargo Urban Design

Spring – *Study abroad in Copenhagen, Denmark. Bo Christensen*

Movie Theater Downtown Copenhagen

Floating Kunsthal (art hall) – At sea

5TH YEAR

Fall – *Jay Waronker*

Olympic Medal Traveling display area

Unites States Supreme Court Building – Washington D.C.

PLANS FOR PROCEEDING CONT.

SCHEDULE

FALL SEMESTER

Week #1 October 3-9, 2004

Oct. 7 Thesis Proposal, Abstract and Cover Page due

Week #2 October 10-16, 2004

Oct. 13 Return Thesis Advisor Statement to Main office

Week #3 October 17-23, 2004

Oct. 21 Advisor list made available

Week #4 October 24-30, 2004

**Oct. 28 Begin case study work
Last day of programming class**

Week #5 October 31- November 6, 2004

Week #6 November 7-13, 2004

**Nov. 11 Begin detailed site analysis work
Veterans Day holiday (Thursday)**

Week #7 November 14-20, 2004

Nov 15-19 Final week of 571 Projects/Presentations

Week #8 November 21-27, 2004

Nov. 24 Draft Thesis to primary critic

PLANS FOR PROCEEDING CONT.

Nov. 25-26 **Thanksgiving holiday**

Week #9 **November 28- December 4, 2004**

Week #10 **December 5-11, 2004**

Dec. 9 **Final Thesis Program due**

Dec. 10 **Final day of classes**

Week #11 **December 12-18, 2004**

Dec 13-17 **Final examinations**

Holiday break starts

Begin Research

Week #12 **December 19-25, 2004**

Maintain research. Site model work digitally

Week #13 **December 26 - January 1, 2005**

Maintain research. Site model work digitally

Week #14 **January 2-8 2005**

Maintain research. Site model work physically

Holiday break ends

SPRING SEMESTER

Week #15 **January 9-15, 2005**

PLANS FOR PROCEEDING CONT.

- Begin project development. Sketches, etc.**
- Jan. 11** **Classes Start**
Meet w/primary
- Week #15** **January 16-22, 2005**
- Jan 17.** ***Martin Luther King Holiday***
Meet w/primary and secondary
- Week #17** **January 23-29, 2005**
- Meet w/ primary**
- Week #18** **January 30 - February 5,2005**
- Wrap up beginning development and sketch work**
Meet w/primary and secondary
- Week #19** **February 6-12, 2005**
- Design development phas**
Meet w/primary
- Week #20** **February 13-19, 2005**
- Meet w/primary and secondary**
- Week #21** **February 20-26, 2005**
- Feb. 21** ***President's Day holiday***
Meet w/primary
- Week #22** **February 27- March 5, 2005**
- Meet w/primary and secondary**
- Week #23** **March 6-12, 2005**

PLANS FOR PROCEEDING CONT.

Mar. 7-11 **Wrap up design development for final revision**
Mid-semester thesis reviews Meet w/primary

Week #24 **March 13-19, 2005**

Mar. 14-18 ***Spring Break***

Week #25 **March 20-26, 2005**

Mar. 25 **Finish Final revisions. Begin final presentations**
Start Easter Holiday
Meet w/primary and secondary

Week #26 **March 27- April 2, 2005**

Mar. 28 ***Easter Monday Holiday***
Meet w/primary and secondary

Week #27 **April 3-9, 2005**

Meet w/primary and secondary

Week #28 **April 10-16, 2005**

Meet w/primary and secondary

PLANS FOR PROCEEDING CONT.

Week #29 April 17-23, 2005

**Finish final presentation work
Meet w/primary and secondary**

Week #30 April 24-30, 2005

Wrap up all loose ends

Apr. 25 Thesis projects due at 4.30 pm in MU ballroom

Apr. 26-27 Annual Thesis Exhibit in the MU ballroom

Apr. 28-05 Final Thesis Reviews

Apr. 29 Draft of Thesis document due to primary critics

Week #31 May 1-7, 2005

May. 6 Last day of classes

Week #32 May 8-14, 2005

May 9-13 Final examinations

Week #33 May 15-21, 2005

Enjoy!

REFERENCES

City of Bismarck. (2004). *Official City Web Site.*

<http://www.bismarck.org/>

North Dakota Department of Transportation. (2003). *Liberty Memorial Bridge.*

<http://www.memorialbridge.info/>

Sunshine information

Northern Plains Wildlife Research Center. (2004). *Climate of North Dakota.*

<http://www.npwrc.usgs.gov/resource/othrdata/climate/sunshine.htm>

Sunshine information

Northern Plains Wildlife Research Center. (2004). *Climate of North Dakota.*

<http://www.npwrc.usgs.gov/resource/othrdata/climate/wind.htm>

U.S. Census Bureau. (2000). *Census 2000 Housing Units.*

<http://quickfacts.census.gov/hunits/states/38pl.html>

U.S. Census Bureau. (2004). *American Factfinder.*

[http://factfinder.census.gov/servlet/SAFFacts?
_event=Search&geo_id=01000US&_geoContext=&_street=&_county=&_ci
tyTown=Bismarck&_state=04000US38&_zip=&_lang=en&_sse=on](http://factfinder.census.gov/servlet/SAFFacts?_event=Search&geo_id=01000US&_geoContext=&_street=&_county=&_cityTown=Bismarck&_state=04000US38&_zip=&_lang=en&_sse=on)

U.S. Census Bureau. (2004). *State and County Quickfacts.*

<http://quickfacts.census.gov/qfd/states/38000.html>

PLANS FOR PROCEEDING CONT.

REFERENCES

http://www.rhbpc.com/histpres_main.htm -<http://www.adaptivereuse.org/pages/home.html>

<http://www.crh.noaa.gov>

<http://www.wunderground.com> – seasonal averages

<http://www.npwrc.usgs.gov/resource/othrdata/climate/relative.htm>

<http://www.npwrc.usgs.gov/resource/othrdata/climate/blizzard.htm>

<http://www.npwrc.usgs.gov/resource/othrdata/climate/wind.htm>

<http://www.npwrc.usgs.gov/resource/othrdata/climate/obstruct.htm>

<http://www.npwrc.usgs.gov/resource/othrdata/climate/sunshine.htm>

<http://www.npwrc.usgs.gov/resource/othrdata/climate/precip.htm>

<http://www.npwrc.usgs.gov/resource/othrdata/climate/temp.htm>

<http://www.rrc.mb.ca/gallery/princess.htm>

<http://www.sacredplaces.org/PSP-InfoClearingHouse/articles/Adaptive%20Reuse%20Profiles%20Residential%20Facilities.htm>

<http://www.njfuture.org/>

<http://www.pennrose.com/awards.html>

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Creating something old: Bringing New Housing Back within City Limits.

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