MAN'S NEEDS
& ARCHITECTURE
BY
WAYNE COOPER

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Man's Needs & Architecture

by

Wayne Cooper

a thesis submitted in partial
fulfillment of the requirements
for the degree of
Bachelor of Architecture

Approved:

advisor

director

Montana State University
Bozeman
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INTRODUCTION 3

There are many different definitions of architecture & most of them are valid in their context. For this study architecture is defined as built structures that function to meet man's needs. The study tries to determine a means of defining man's needs & to determine in what ways they affect architecture.

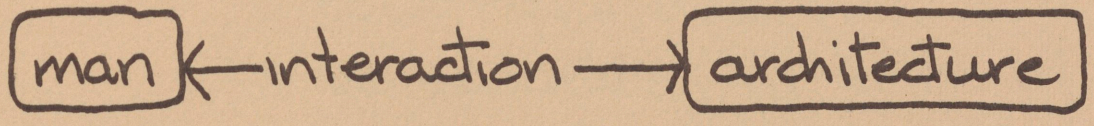
The thesis statement, then, is:

"Man & architecture interact. If man is to dominate this interaction, then architecture should always meet man's needs."

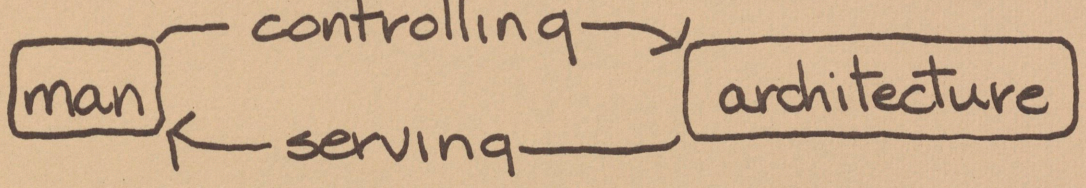
APPROACH 4

The thesis statement arises out of an approach to architecture that is developed as follows:

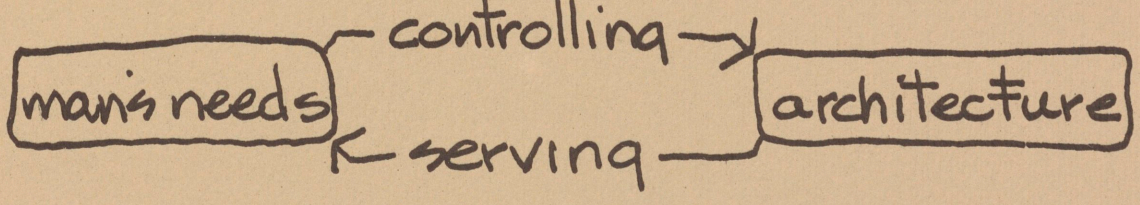
→ man interacts with his environment & architecture is part of that environment.



→ however, man should control architecture ⊕ which changes the relationship.



→ The term 'man' is too general, too nebulous & does not provide any real help as to how to deal with architecture. Substitute man's needs.

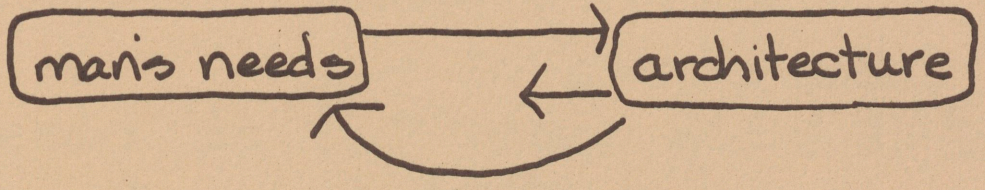


→ Finally, the approach can

be viewed as a process in that thru the interaction of man's needs & architecture, that architecture can:

- respond to needs.
- respond to changing needs.
- re-affirm needs.
- be evaluated in terms of needs.

The process chart is:

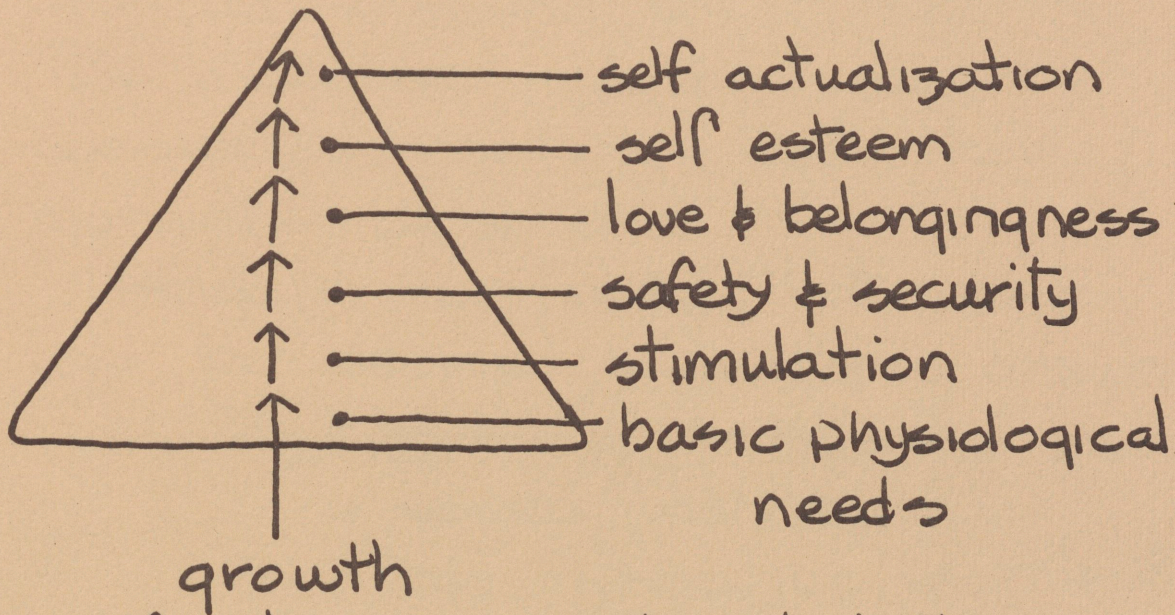


BACKGROUND 6

Needs is a construct developed in response to the question "Why do people act the way they do?" & stemming out of the belief that man's actions are purposeful. The construct has various labels such as needs, motives or motivation, drives, goals or goal directed behavior & even instincts. Whatever the label they all suggest some reason, some basis for man's behavior.

It is simple to define what needs do but much more difficult to define what the individual needs are. Many psychologists have developed a list of needs only to have it rejected as too general or as not specific enough or to have it superseded by another list. One prominent theorist has even presented two similiar but different lists of mans needs ②③ & both are currently in use!

The best known need theorist is A. H. Maslow & the set of needs developed by him takes the form of a pyramid.



Maslow suggests that these needs are hierarchial & that individuals can advance up a level only after fullfilling the needs of the previous level ☺

Birch & Viroff suggest that there are seven incentive systems:

- sensory
- curiosity
- affiliation
- aggression

- achievement
- power
- independence

These motivate a person to interact with the environment.[4]. The incentive systems may be considered needs in that they motivate behavior.

Hilgard suggested that needs can be devided into three groups:

- survival motives
- social motives
- ego-integrative motives[5]

but as categories they are too general.

A different viewpoint is presented by E. T. Hall in The Silent Language. Hall is an anthropologist who has tried to develop a system to analyze culture. He suggests that there are ten kinds of human activity that are common to all cultures.

They are:

- interaction
- association
- subsistence
- bisexuality
- territoriality
- temporality
- learning
- play
- defence
- exploitation ①

Hall further suggests that these activities function on three levels:

- formal
- informal
- technical ②

He suggests that these ten kinds of human activity are common to all cultures & that the differences between cultures is due to the way that individuals in each culture approach each activity. In other words, each individual will be

active in the ten areas listed & the differences in behavior in each area will be due, in part, to culture.

Hall's areas of human activity can be considered as needs, but needs that deal with the cultural variable.

A MATRIX 11

The investigation of mans needs suggests:

→ needs can be categorized.

→ needs cannot be totally listed, even in a category.

→ needs exist on various levels.

→ needs are affected by culture.

None of the systems studied were totally satisfactory so I have synthesized my own system. By reducing Hall's list & comparing it with other needs systems, I came up with four basic categories of mans needs:

- Subsistence
  - physiological needs
- Association
  - social needs
- Definition
  - learning & knowing needs
- Expression
  - actualizing needs

These four basic categories, called primary needs, can be expanded at a second level:

→ Subsistence
- food
- water
- shelter
- sex
- health

etc...

→ Association
- recognition
- esteem
- affection
- love
- respect
- security

etc...

→ Definition
- territorality
- temporality
- learning
- religion
- cognition

- superstitions

etc. ....

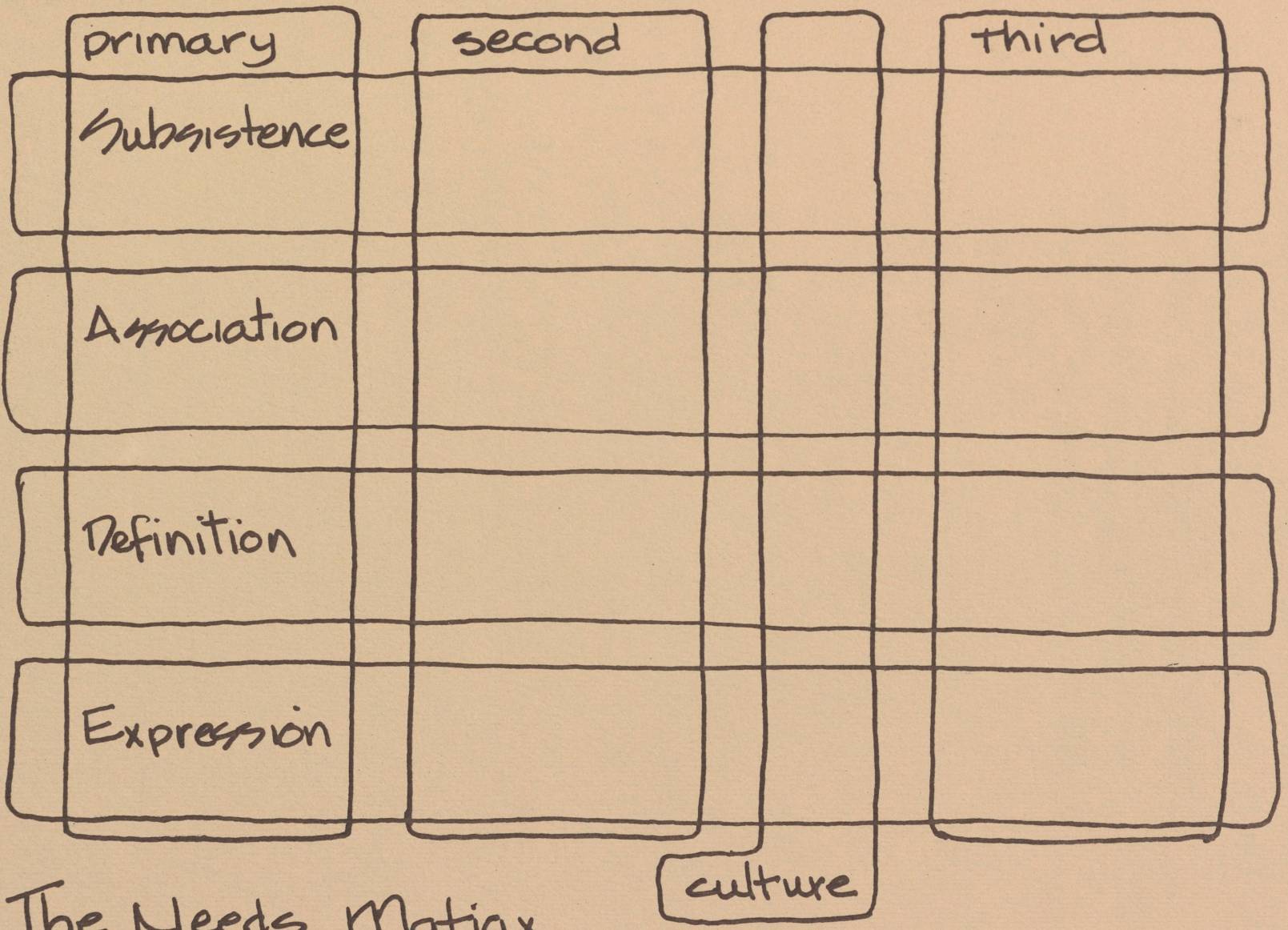
→ Expression

- work
- relaxation
- play
- recreation
- aesthetic expression

etc. ....

These second level needs are universal however, as mentioned, culture affects which needs are dominant for each culture. Therefore, to continue this listing there should be third level needs & these should be understood to be the second level needs adapted for a particular culture

These needs can now be fitted into a matrix:



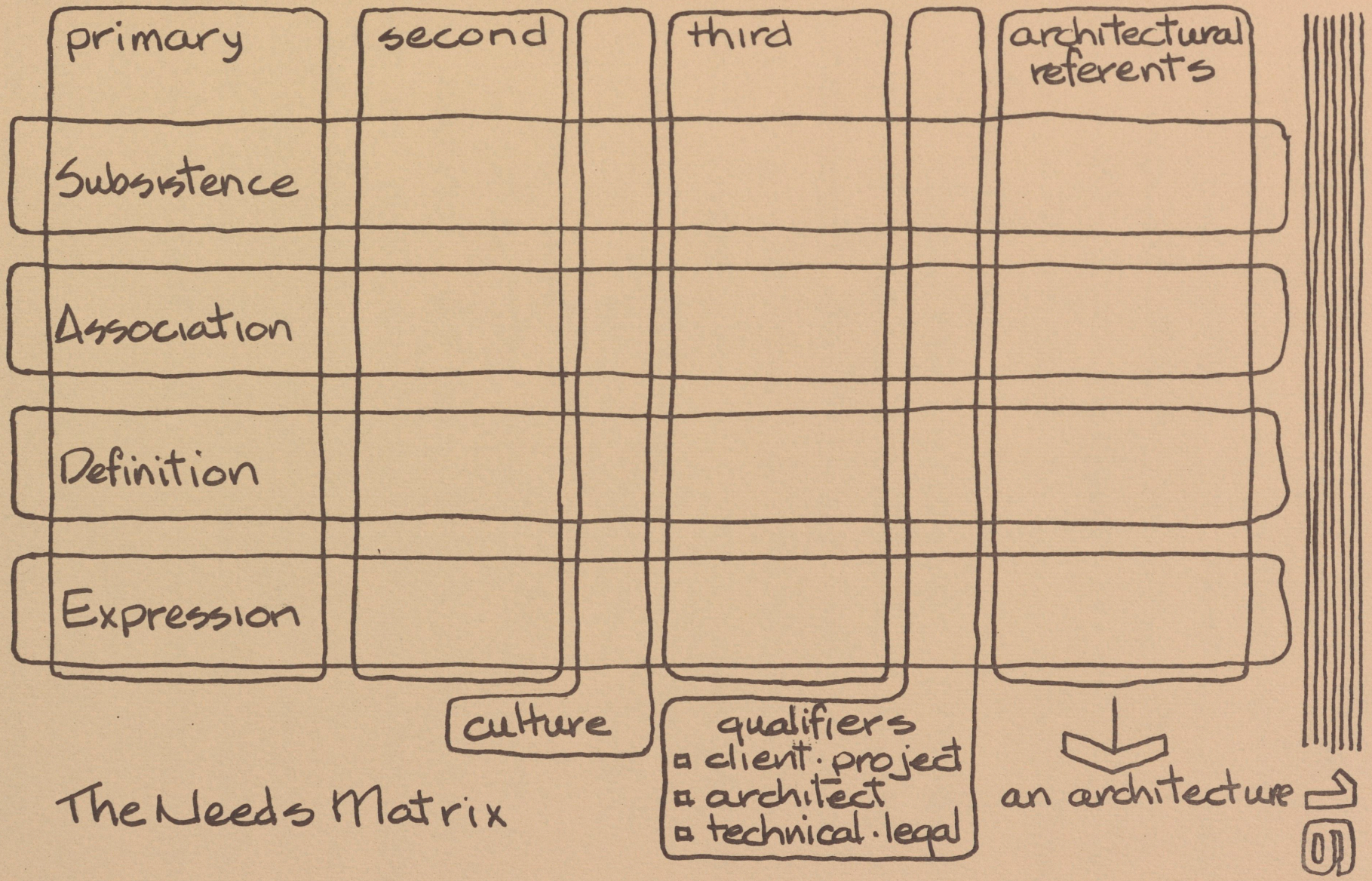
The Needs Matrix

The approach requires that man's needs affect architecture or that man's needs can be translated into architectural referents. This translation takes place thru three qualifiers:

- client &/or project
- architect
- technical &/or legal

Mr. A van Teylingen said that architecture is the process of translating people's dreams into reality ⊙. It follows that the success of the reality (the architecture) depends on the dreams (the client &/or project qualifiers), how well they are understood & sympathized with (the architects qualifiers), & how feasible they are (the technical &/or legal qualifiers)

These three qualifiers provide the last step that completes the matrix.



The Needs Matrix

The matrix now presents four basic categories of needs, a way to expand them, a way to account for culture & a way to translate needs into architectural referents.

It does not, however, provide a list of man's needs. Certainly, one could do this by listing needs in the second or third levels, but there is a real danger of such a process going on forever. This is not the intent of the matrix!

Rather the matrix is a tool & cannot do any thing by itself. It is part of the design process. The design process starts with a project & the project is also the way to activate the matrix.

A project starts to define what needs have to be dealt with, which ones are important & which are unimportant. For example,

if a project were a residence then possibly the need for work could be eliminated but the needs in the subsistence category would be very important.

Conversely, in a factory, the work need would be very important & many subsistence needs could be eliminated.

Given a project, the matrix is intended to do the following:

→ to go from the general to the specific. For example, one can start in the expression category &, by working accross the matrix, end up with a set of details for an office that are responsive to most of the needs in that category.©

→ to elaborate on specific needs. By locating a specific need in the matrix one can see what category (or categories) it fits into & what associated needs

are also involved.

→ to discover further needs. As noted above, associated needs may not have been known or thought of before using the matrix.

→ to discover alternates. By working back & forth thru the matrix, alternate needs or architectural referents may be found which better suit the solution.

→ to evaluate architecture. By locating architectural referents opposite their corrisponding needs, architecture may be evaluated in terms of response to needs.

→ to assist in programming. If an architect has the needs matrix in mind when he does his programming then he should be better able to find out what the needs of the client are.

All too often needs are either taken for granted or not talked about, both to the detriment of the resulting architecture.

In summary, most architects will readily admit that they want to be sensitive to man's needs in their designs but very few can tell how.

The matrix is presented as one way to exercise this sensitivity.

PROJECT 21

As stated, the matrix requires a project to make it work. For this study the project chosen was a clinic/medtel.

The clinic is for 20 doctors & has the standard office - exam room facilities as well as nurses facilities, waiting rooms, etc. Also in the clinic are a medical laboratory & X-Ray facilities.

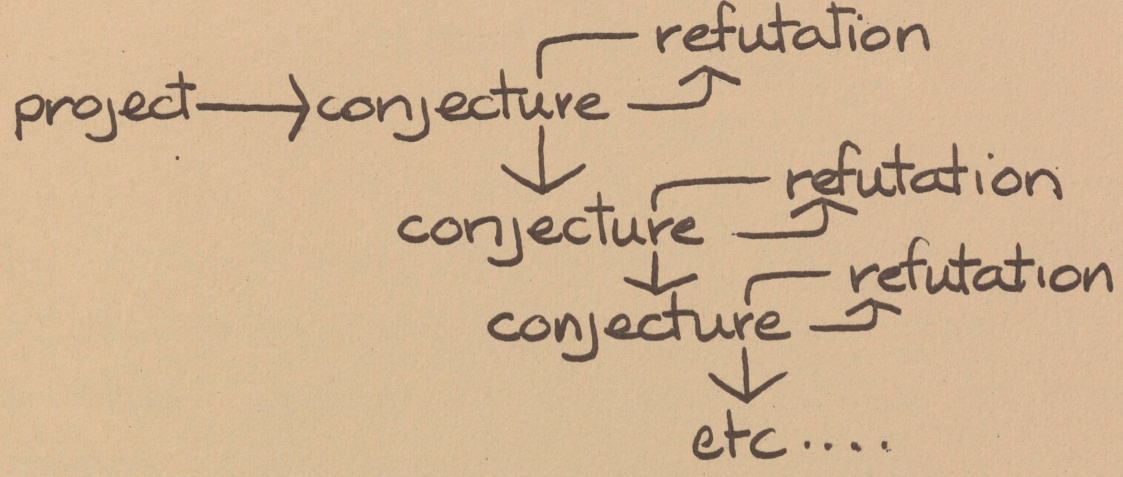
The medtel is a hotel for people with medical problems that do not require hospitalization More & more medical diagnostic & treatment procedures require specialized equipment, controlled conditions &/or extended time. The result is that people have been hospitalized so as to avail themselves of these D&T procedures, in many cases even when they are not ill enough to require hospilalization. The ever rising cost of hospitalization

is making this prohibitive. One alternative is the medtel-hotel accommodation attached to or nearby a hospital for patients that must be at the hospital but do not require hospitalization.

The clinic/medtel is located in Edmonton, Alberta & is sited accross the street from a major teaching hospital. Altho' the project is assumed to be a private venture it would have a close working relationship with the hospital.

PROCESS 23

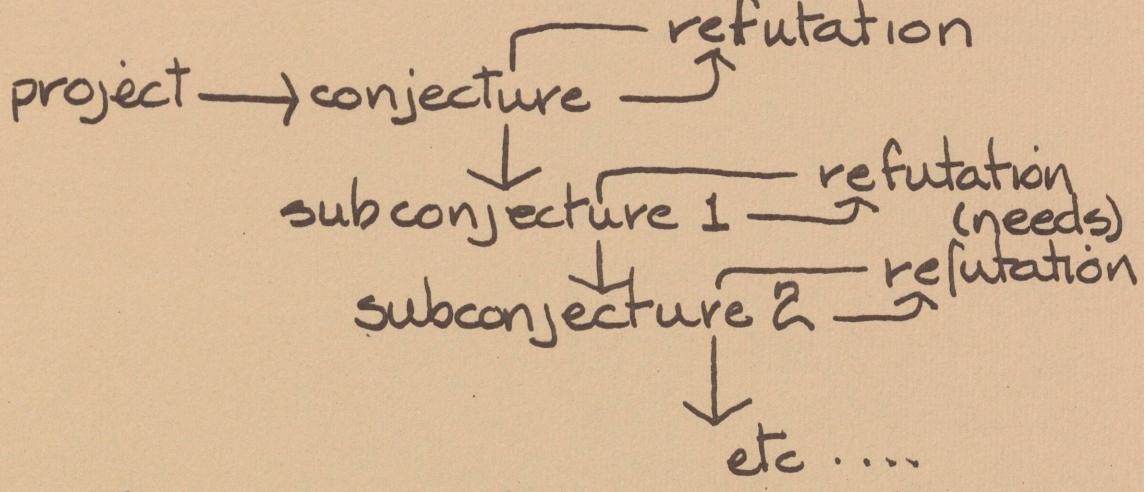
The fundamental design process does not seem to be clearly understood & many theories have been presented. The best [11] model I have seen is the conjecture-refutation process presented by Mr. M. Gelertner.[12] He suggests that a conjecture arises in response to the project & the designer proceeds to refute that conjecture & develop a new one. This second conjecture is now refuted & so on...



The process continues as long as time allows.

I would modify the model somewhat by suggesting that

each conjecture beyond the first one is not new but rather a modification of the previous one. The refutation stage becomes a matter of evaluating the conjecture against some criteria & adjusting it to better meet that criteria. One set of criteria would be man's needs.



The same refutation may be used repeatedly as the design evolves & the process would stop at the point of diminishing returns.

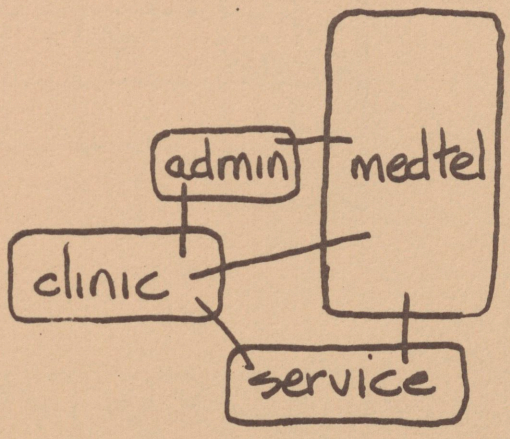
This is the process that was utilized to get the project to the final design. This statement is qualified in that the process is

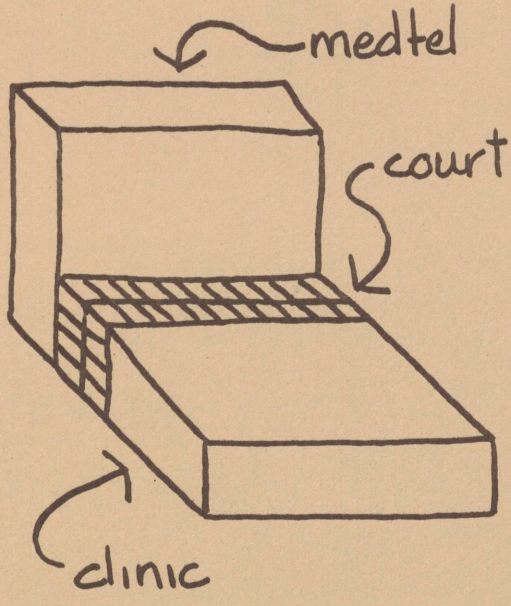
not formalized. Rather it is unconscious & almost intuitive. Sometimes a conjecture would arise & be rejected immediately because it just wouldn't work or wasn't liked. Other conjectures required extensive evaluation before they were refuted

Of course, the refutation that involved man's needs played a major role in this design process

DEVELOPMENT 26

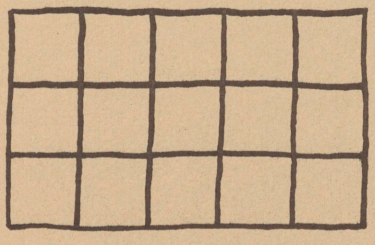
→ Overall Complex - the initial schematics suggested that the clinic was smaller than the medtel & that the medtel would be multi-story. This resulted in the general shape & massing of the complex.



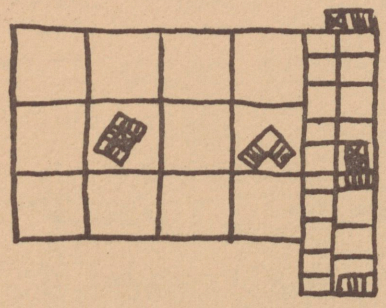


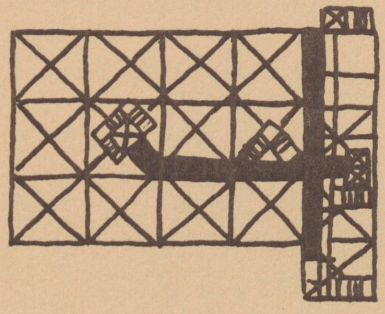
Present in the initial concept was the idea of a court to both separate & join the two functions

Further development suggested a grid pattern & a 50' x 50' module was chosen as the basic unit.

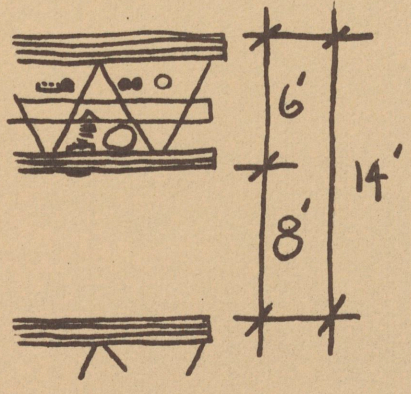


Inclusion of vertical circulation elements & development of the medtel plan caused changes to this grid. Finally circulation & pattern were imposed on the grid to give it it's final configuration. This provided the basic plan for the first two floors.





→ Structure - past experience at the University of Calgary & the University of Alberta Hospital suggested that services in a laboratory type building can be a major problem & that interstitial space can provide a solution. With this in mind I



provided 6' between the ceiling & the floor above. This resulted in a floor to floor height of 14'.

With this space, installation, repair, modification & replacement of services can be carried out with minimal disruption to the occupants. Also services can be located anywhere & fed from the interstitial space which gives greater freedom of layout.

⟶ Clinic - the original idea was to have a large central waiting room with doctor's offices & exam rooms off it. Thought about man's needs led me to believe that patients waiting to see a doctor would experience anxiety & that the design should work to relieve this as much as possible.

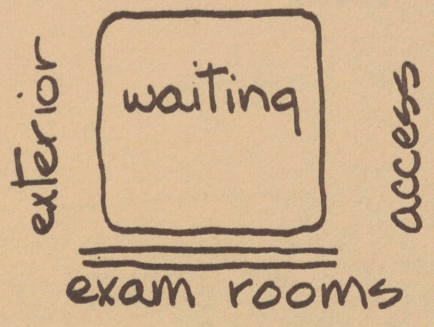
The design goals I settled on were:

- that the space be small

& intimate so that the patient could relate to it & feel reassured.

- that it be easily accessed so that the patient could get to it.
- that there be exterior exposure (reference light)
- that it be separate from the exam rooms.

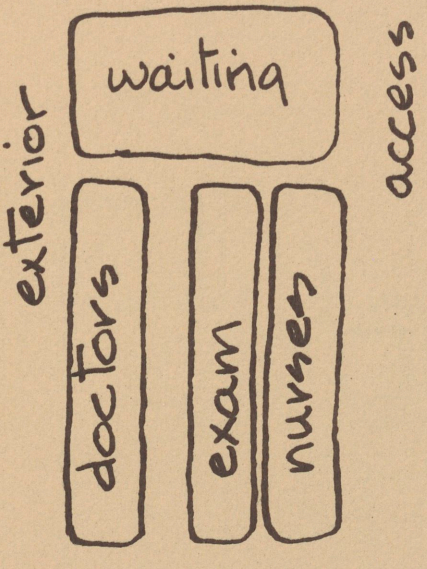
The pattern that resulted tended to control one end of the clinic. Doctors offices, I felt, were proper offices rather than work spaces.



They would be offices where the doctor would do paperwork, reading & interviews with patients & other people. As such, they were given exterior exposure & arranged as closely as possible to the exam rooms

Initially I felt there should be as many exam rooms as possible but research indicated that two per doctor would be adequate. This would allow three patients to be handled by each doctor at any time. (13)

The exam rooms ended up in a linear configuration on the inside of the clinic & a nursing station was difficult to fit unfill a linear nursing station was developed.

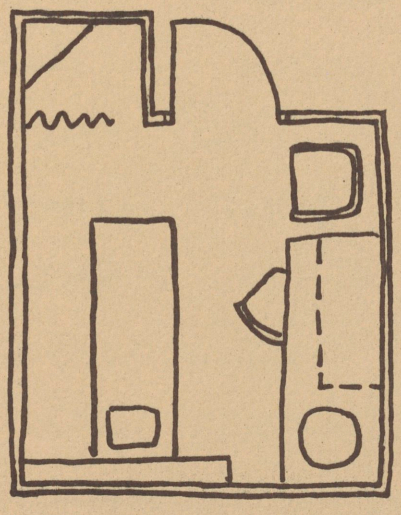


This, then, was the basic clinic. It was designed for five doctors & sized to fit two modules. All that remained was to fit it onto the grid.

→ Exam Room - the activities that take place & the equipment used in an exam room determined its basic size but needs determined the arrangement. The examination procedure & the attendant needs are:

enter
disrobe ..... privacy
wait ..... stimulation
interview ..... reassurance
examination ..... privacy, reassurance
interview ..... reassurance
dress ..... privacy, self image
exit

Privacy is the prominent need & this is met by creating a changing cubical, by opening the door towards the nurses area & locating the patients chair behind the door.

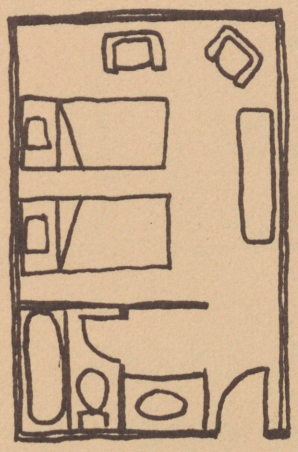


The location of the patients chair in relation to the desk puts the doctor & patient in a close informal situation so as to help relieve the patients anxiety & so the doctor can provide reassurance.

The exam table is located in the centre of the room so that the doctor can get at the patient from either side rather than requiring the patient to move. The headboard would contain exam equipment.

→ Laboratory & X-Ray - the upper floor of the clinic was to be laboratory & X-Ray however when the areas were worked out it was found that there was too much space. As a result one clinic was moved upstairs & two modules were eliminated. It is assumed that these would be filled in with expansion.

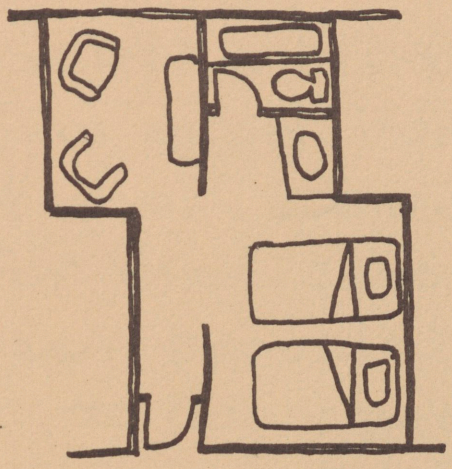
→ Medtel Rooms- research on hotels suggested that rooms are usually rectangular & contain a bathroom on the corridor side.



I started working with this as a guide but found that most of the room became bedroom. There was no living space.

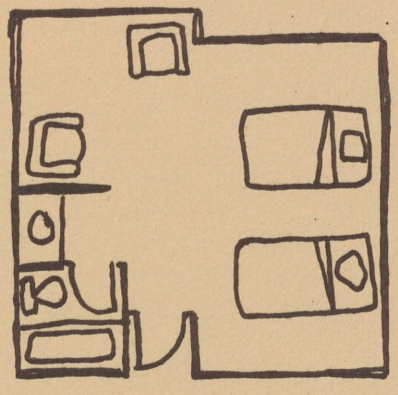
I felt that for this problem, living space was important. This is not a typical hotel & guest activities would be different. The medtel guests would be there for a specific purpose & would be spending time in their rooms. Living space had to be provided.

The next step was to create two separate rooms & arrange them into a hotel suite that



could be repeated. This gave a distinction of space but too much exterior was used for the bathroom & the bed room was too removed from natural light.

Further re-arrangement put the living area & bathroom on one side of the hotel suite & the beds on the other. This became the final arrangement The living area was extended out to create more space, break up the rectangularity of the room & create a corner where the guest could go if he wanted to be alone. The medical reasons for staying in the medtel can be very



emotional.

⟶ Medtel Floors - guests at the medtel will probably interact more than most hotel guests because of their common medical problems. For this reason, a small lobby has been provided on each floor.

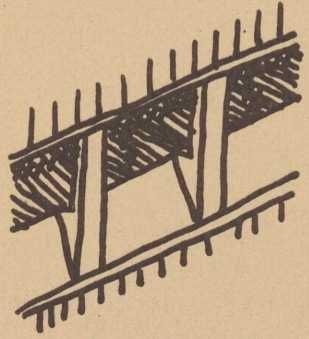
⟶ Courtyard - the two facilities are connected by a glassed over courtyard which houses the medtel checkin desk, a variety drugstore, a restaurant & a bar. As well as both connecting & separating the two buildings & housing the above functions the courtyard acts as a mall for the medtel guests, the patients & staff in the clinic & people from the surrounding area. It is a place where one can sit & relax, meet other people or just watch other people. It is a place where one can drink & dine or just

bring a "brown bag".

Edmonton experiences a harsh winter so the courtyard has been designed as an indoor park with plants & water to create that image. It's function is as a park.

→ Facade - it was diffioult to co-ordinate the facade with the interior arrangement. Certainly windows could have been provided where required & the rest could have been solid. However the resulting pattern would not have worked. Further, flexability in the sense of atlerations, would be limited by a fixed window pattern.

What I did was develop a facade where concrete mullions were located in a band accross the exterior of



the facade, & the windows (or panels where there were not windows) were set back from these mullions & separated from them. This setback became a transition zone whereby the mullions eslablished an exterior facade but the windows related to the interior.

CONCLUSION 38

The purpose of the study was to determine in what ways man's needs affect architecture. Three things became apparent:

→ that needs are very difficult to define. The matrix helps somewhat but it does not yet provide specific architectural referents.

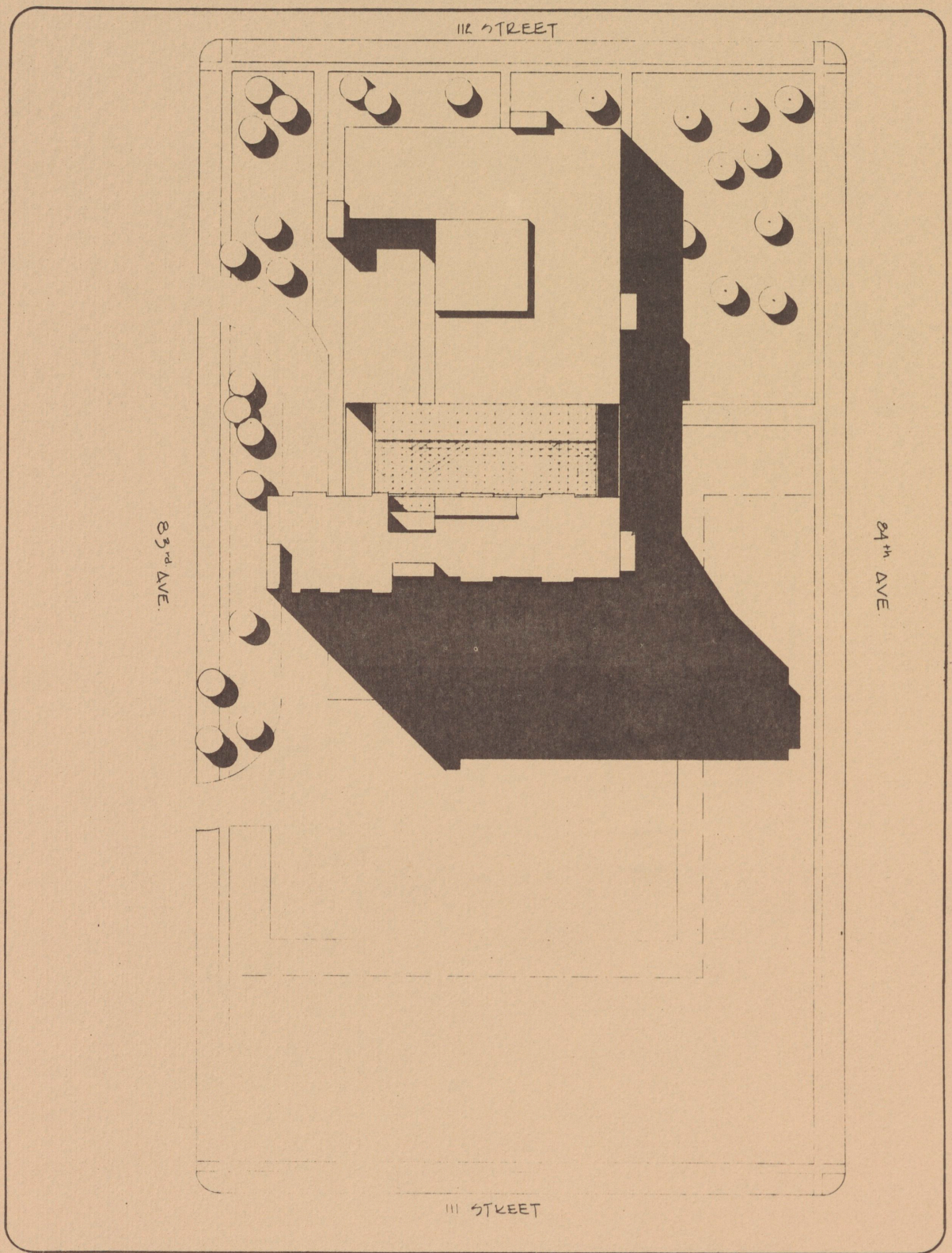
→ to deal with man's needs appears to result in a design that starts on the inside & works out. I found that the exterior was one of the last things I worked on, to it's detrement.

→ needs seem to affect small areas (ie rooms & details) more than large areas

In conclusion, I think needs are important & they should control architecture. They did not affect this project as much as I wanted to see but I

think they are something To pursue in the future.

DRAWINGS 40

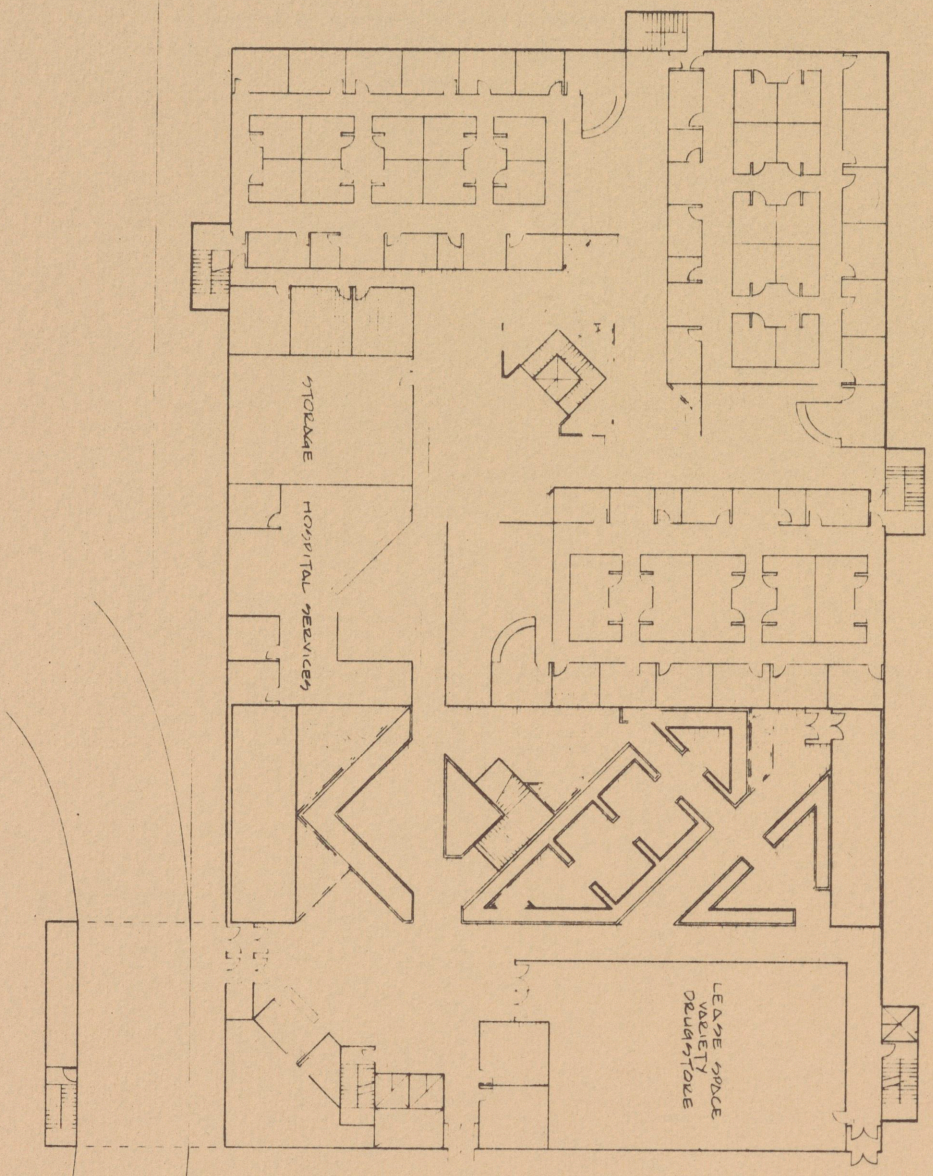


ARCH 556 THESIS 2

A CLINIC/MEDTEL

SITE PLAN

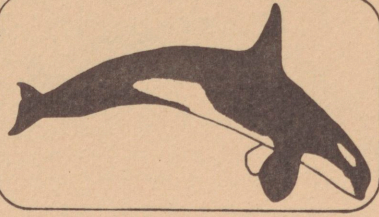
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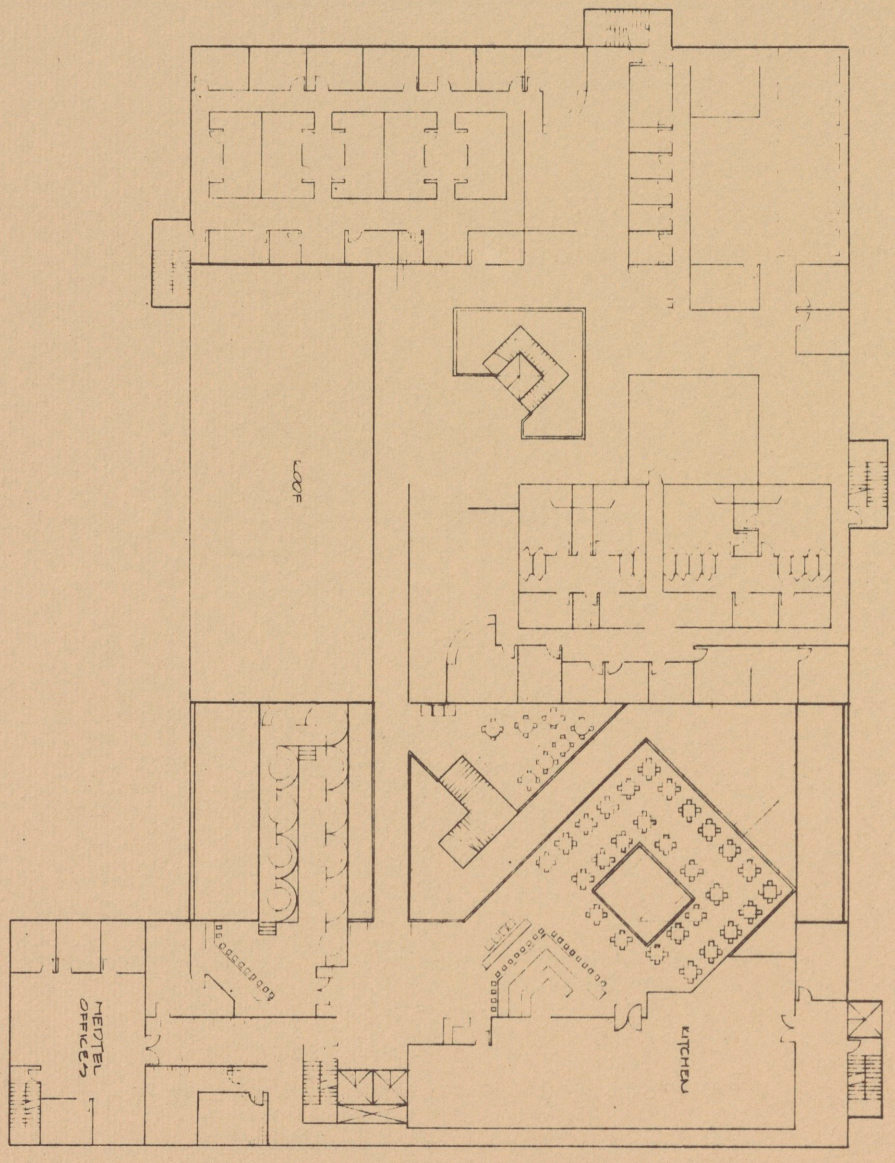
ARCH 556 THESIS 2

A CLINIC/MEDTEL

MAIN FLOOR PLAN
SCALE 1/16" = 1'0"



2

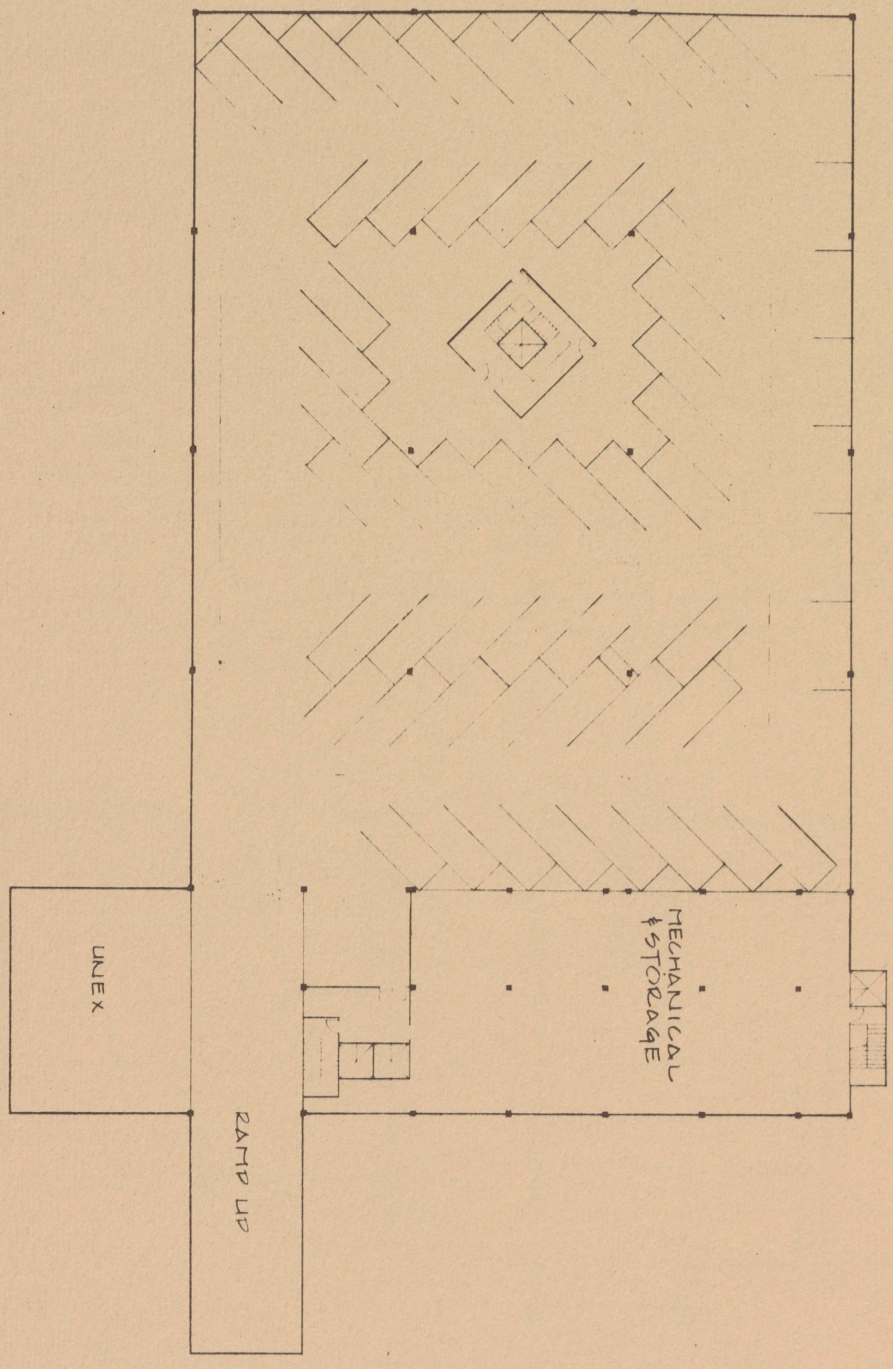


ARCH 556 THESIS 2

A CLINIC/MEDTEL

SECOND FLOOR PLAN

SCALE: 1/16" = 1'0"



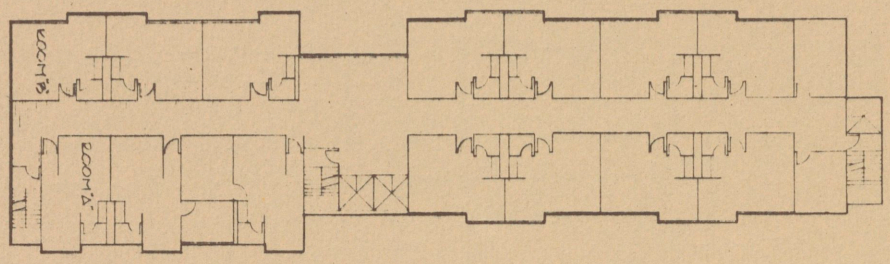
ARCH 556 THESIS 2

A CLINIC/MEDTEL

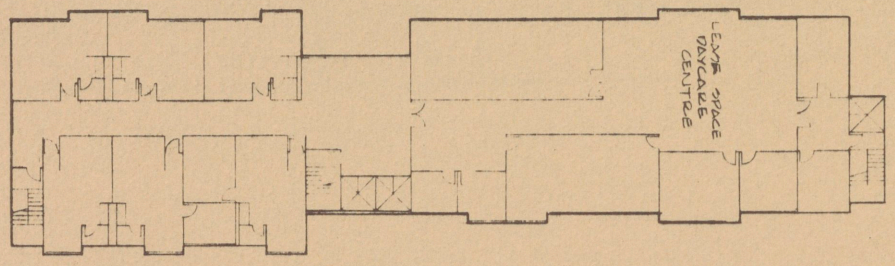
PARKING LEVEL

SCALE: 1/16" = 1'0"

TYPICAL FLOOR

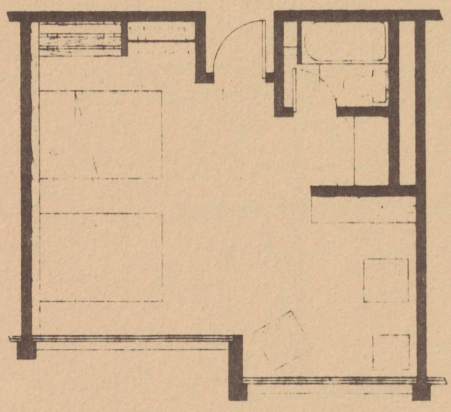


TOP FLOOR

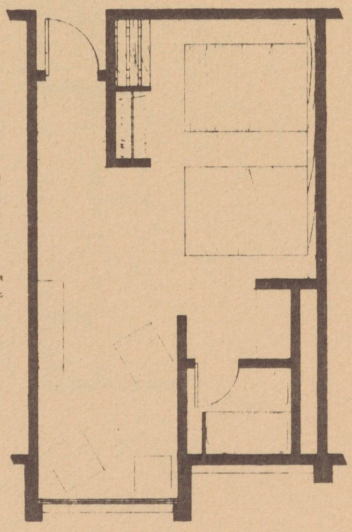


CORRIDOR SIDE

ROOM 'B'



ROOM 'A'



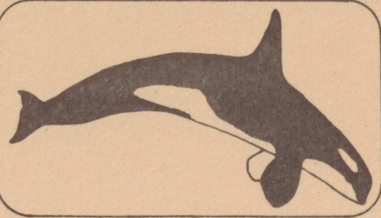
EXTERIOR

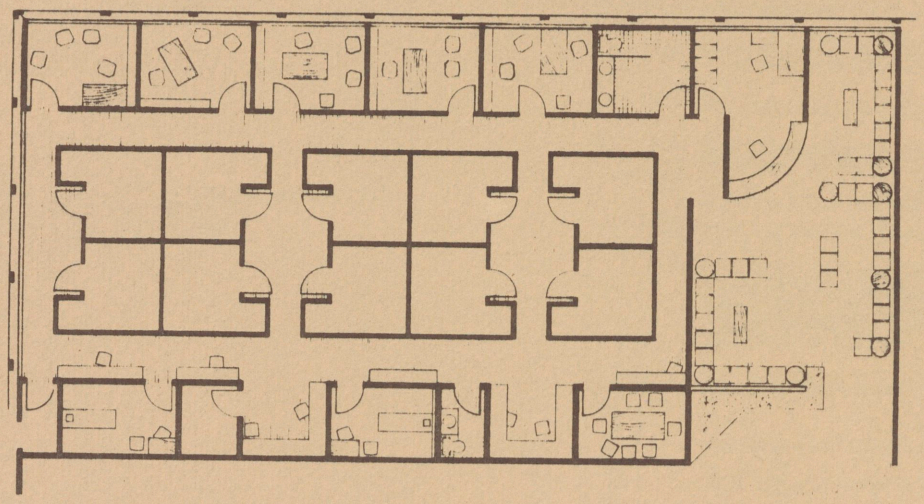
ARCH 556 THESIS 2

A CLINIC/MEDTEL

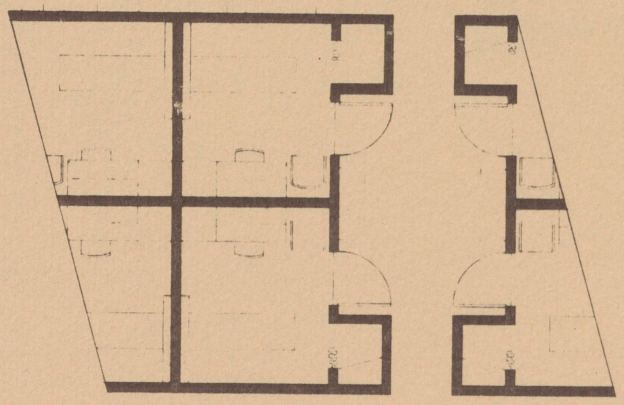
MEDTEL FLOOR & ROOM

SCALE: 1/16" = 1'0" - 1/4" = 1'0"





DOCTORS + PATIENTS

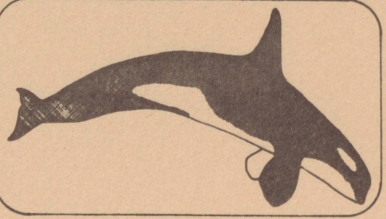


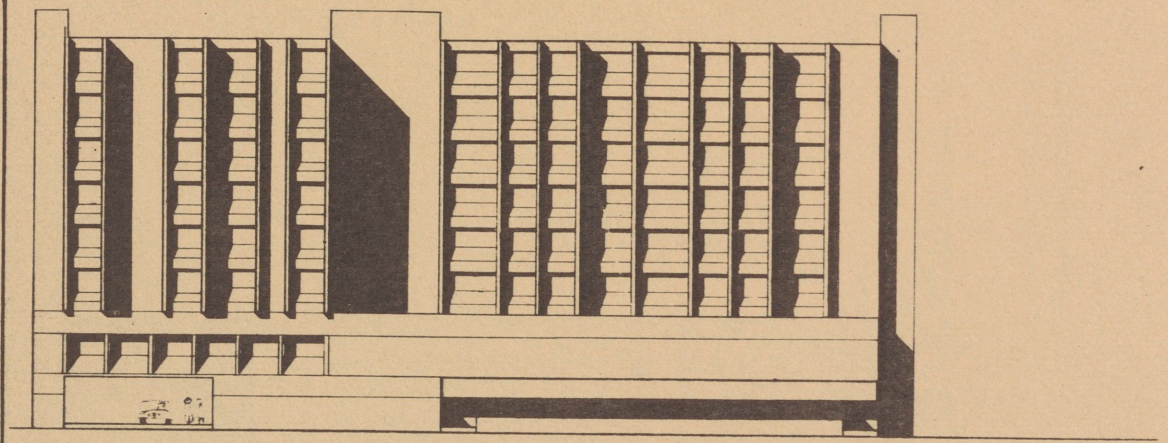
ARCH 556 THESIS 2

A CLINIC/MEDTEL

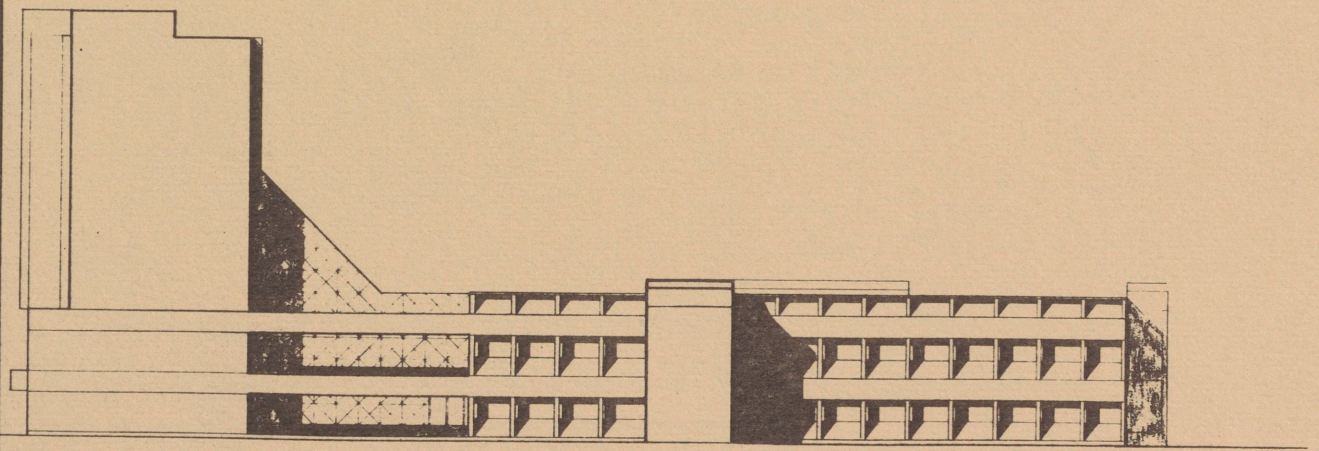
TYPICAL CLINIC MODULE

PLAN LOOM





EAST ELEVATION

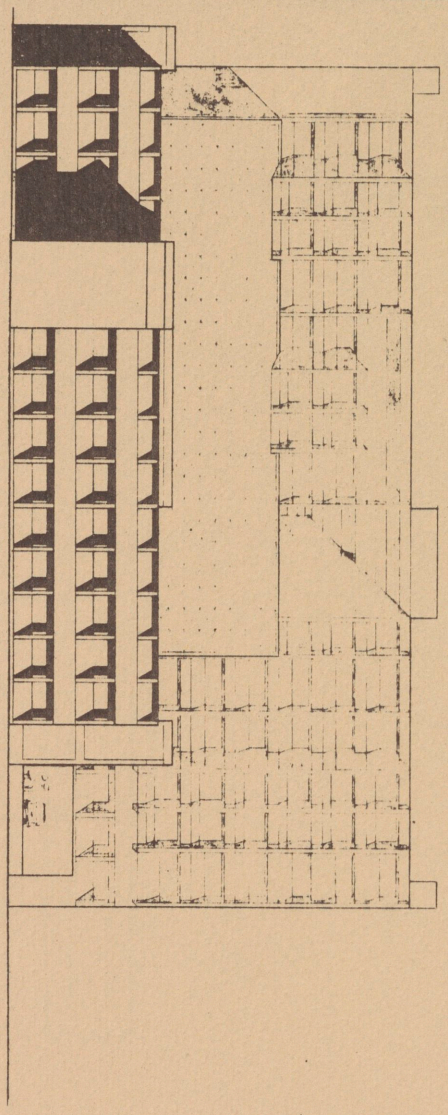


NORTH ELEVATION

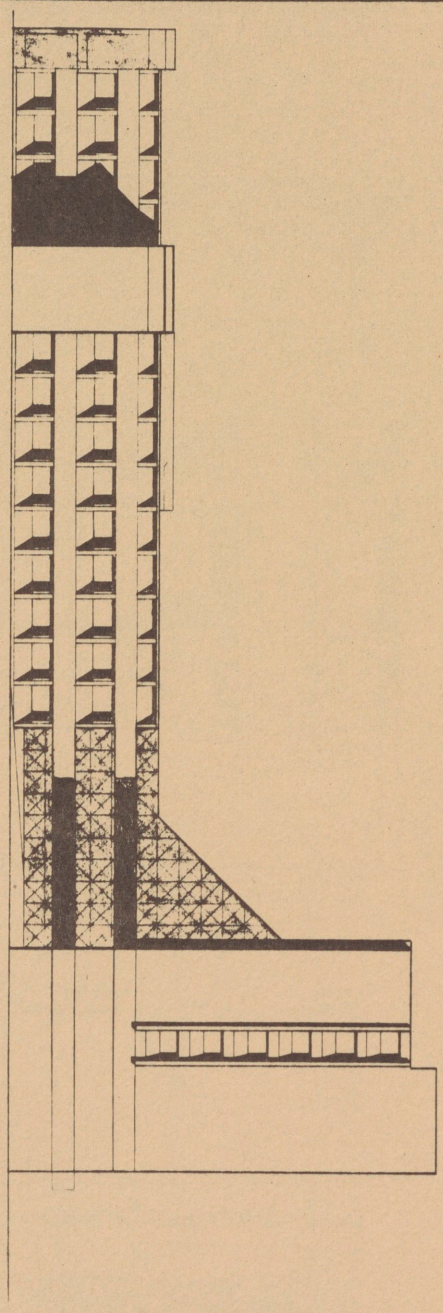
7

ARCH 556 THESIS 2
A CLINIC/MEDTEL

ELEVATIONS
SCALE: 1/16"=1'-0"



WEST ELEVATION



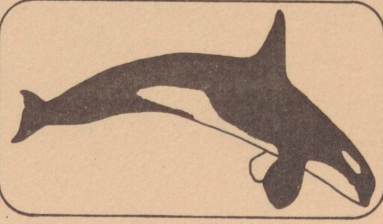
SOUTH ELEVATION

ARCH 556 THESIS 2

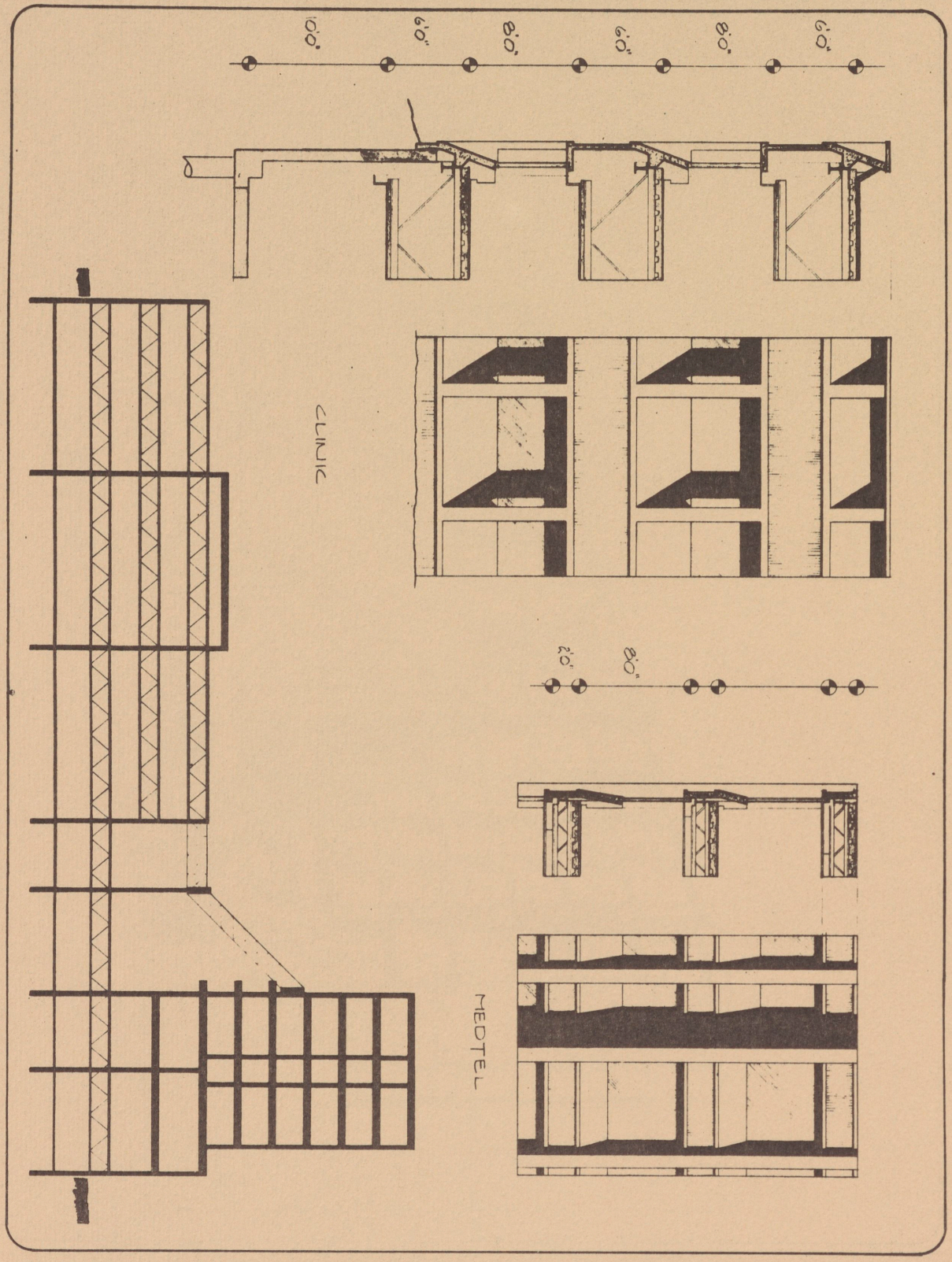
A CLINIC/MEDTEL

ELEVATIONS

SCALE 1/16" = 1'



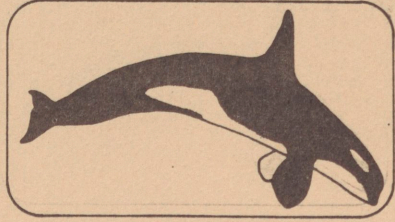
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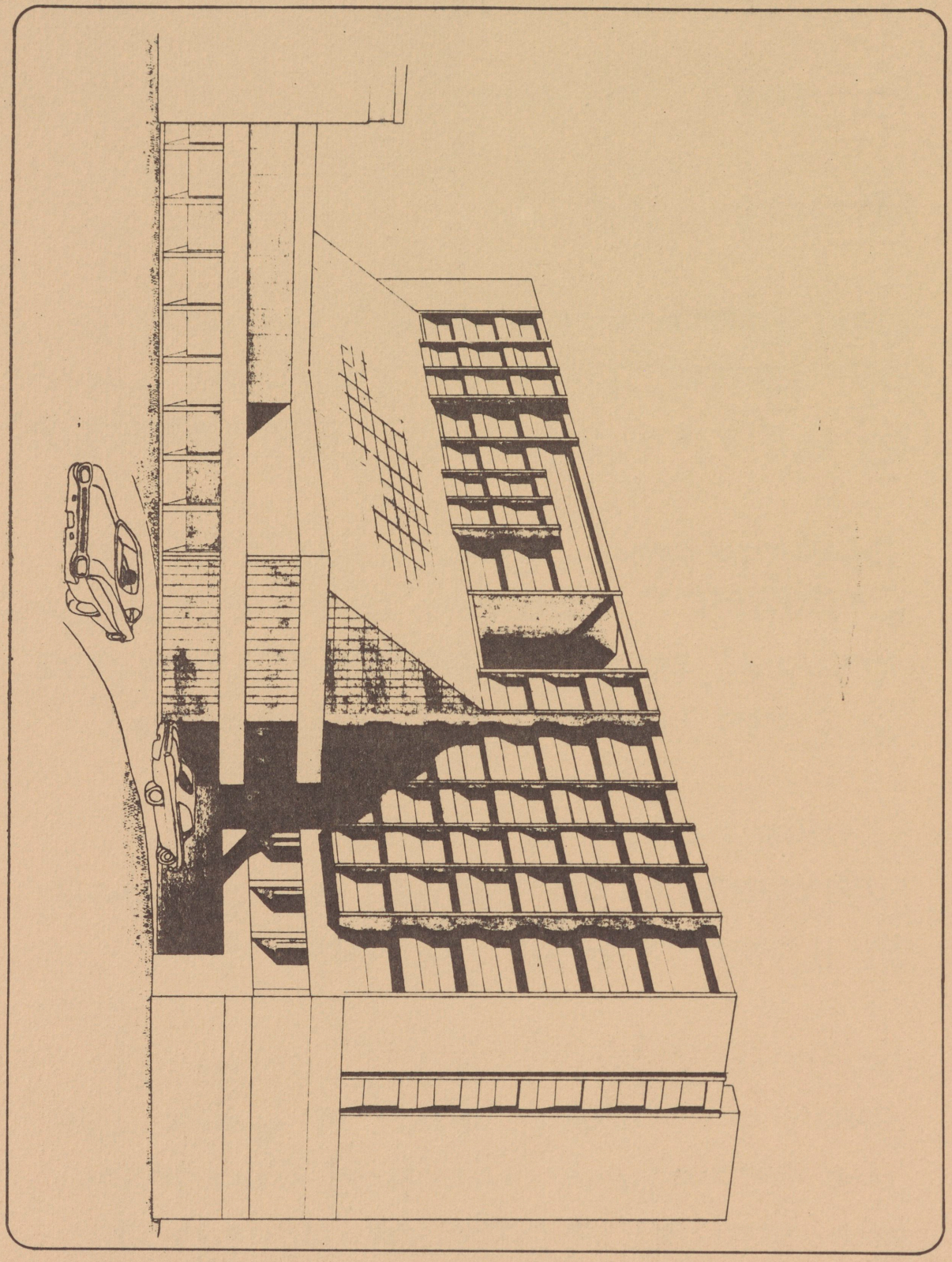


ARCH 556 THESIS 2

A CLINIC/MEDTEL

CLINIC & MEDTEL FACADES
STRUCTURAL SECTION
SCALE: 1/8" = 1'0 - 1/16" = 1'0"

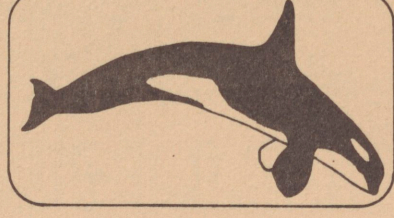




ARCH 556 THESIS 2

A CLINIC/MEDTEL

PERSPECTIVE



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FOOTNOTES 51

① the underlying assumption is that man should control the world. This can & should be questioned. The corolary is that architecture should serve man & that's the point.

② Maslow, A.H., Towards a Psychology of Being, Van Nostrand, Princeton, N.J., 1968, pg. 3.

③ Lang, Burnette, Moleski & Vachon, eds., Designing for Human Behavior, Dowden, Huchinson & Ross, Stroudsburg, Penn., 1974, pg. 84.

④ McNeil, Elton B., The Psychology of Being Human, Canfield Press, San Francisco, 1974, pg. 194.

⑤ ibid, pg. 194.

⑥ ibid, pg. 196

⑦ Hall, Edward T., The Silent Language, Fawcett, Greenwich, Conn., 1959, pg. 45-46

⑧ ibid., pg. 66.

⑨ from a lecture given in Arch. 462, Intern Seminar, Montana State University, Bozeman, Montana, Winter, 1976.

⑩ a good example of rethinking work space in terms of mans needs is found in Probst, Robert, The Office: a Facility Based on Change, Business Press, Elmhurst, Ill., 1968.

⑪ best is used in the sense of most consistant with my process.

⑫ from a design studio, Arch 455, Montana State University, Bozeman, Montana, Winter, 1976.

(13) Reuter, Louis F., "Programming Ambulatory Care Facilities + Manpower.", Medical Care, vol XII #2, Feb. 1974.

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→ Reuter, L.F., "Planning Ambulatory Care Facilities & Manpower." Medical Care, Vol XII #2, Feb., 1974.

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→ ———, University of Alberta Health Sciences Centre: A Proposal for Implementation, December, 1975.

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