

**FINAL REPORT - PHASE III  
TETRA SOCIETY OF NORTH AMERICA  
RAIL ASSISTED BATHROOM  
TRANSFER DEVICE**

***FINAL REPORT - PHASE III***

***TETRA SOCIETY OF NORTH AMERICA***

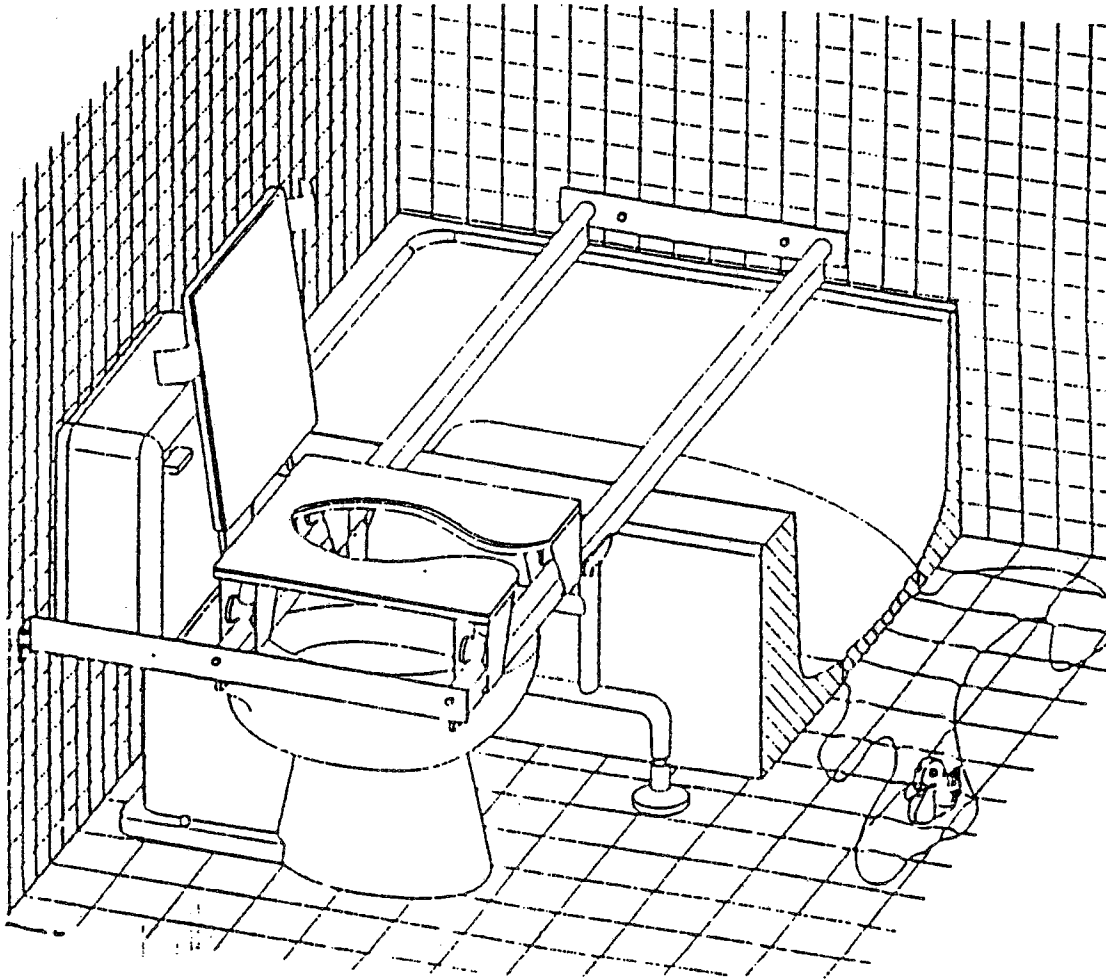
***RAIL ASSISTED BATHROOM TRANSFER DEVICE***

***CMHC File #6521 -24/93***

**PROJECT TITLE: RAIL ASSISTED BATHROOM  
TRANSFER DEVICE**

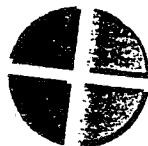
**AUTHOR: THOMAS BALESHTA**

**COMPLETION DATE: FEBRUARY 7, 1995**



**ACKNOWLEDGEMENT:**

*"This project was carried out with the assistance of a grant from Canada Mortgage & Housing Corporation under the terms of the Housing Technology Incentives Program. The views expressed are those of the author and do not represent the official views of the Corporation."*



**Tetra Society**  
*of North America*

## TABLE OF CONTENTS

<b>ABSTRACT</b> .....	<b>-1-</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>-2-</b>
<b>BACKGROUND STATEMENT</b> .....	<b>-4-</b>
<b>PROJECT OBJECTIVES</b> .....	<b>-5-</b>
<b>DESCRIPTION OF SYSTEM</b> .....	<b>-6-</b>
<b>DESCRIPTION OF TESTING</b> .....	<b>-7-</b>
<b>PERFORMANCE CHARACTERISTICS</b> .....	<b>-10-</b>
<b>COMMENTS ON TESTING</b> .....	<b>-11-</b>
<b>CONCLUSIONS</b> .....	<b>-12-</b>

## APPENDIX

<b>House Bathrooms</b> .....	<b>-A-</b>
<b>Configurations</b> .....	<b>-B-</b>
<b>Computer generated drawings of Original Prototype &amp; Bathroom Setting ...</b>	<b>-C-</b>
<b>Photos of the Device in use</b> .....	<b>-D-</b>
<b>Completed Ergonomic Evaluation Forms</b> .....	<b>-E-</b>
<b>Summary of G.F. Strong and In-House Tests</b> .....	<b>-F-</b>

## 1. ABSTRACT

The Rail Assisted Bathroom Transfer Device developed by the Society allows disabled users to move between the shower/bathtub and the toilet in a regular sized bathroom, without having to use their wheelchair.

The device consists of a seat equipped with rollers mounted on rails. The seat rolls back and forth between the toilet and the shower/tub. The design reduces the number of transfers necessary in standard-sized bathrooms. This project was undertaken to test the performance of the device and to make improvements based on the results.

The Rail Assisted Bathroom Transfer Device was tested and evaluated in the G.F. Strong Rehabilitation Centre and in several homes.

At G.F. Strong Rehabilitation Centre the device was tested with people of different disabilities, age and sizes.

The results of G.F. Strong testing were analyzed and modifications made to the second prototype used in home tests.

Based on the tests in people's homes we found the device best suited to all bathrooms where the bath or soaker tub could be connected via rail to the toilet seat. In conclusion, the modifications improved the device and made it marketable.

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## RÉSUMÉ

Le dispositif de transfert sur rails pour salle de bains mis au point par la *Tetra Society of North America* permet aux personnes handicapées de se déplacer entre la douche ou la baignoire et la toilette d'une salle de bains de dimensions courantes sans avoir à recourir à leur fauteuil roulant.

Le dispositif se compose d'un siège équipé de roulettes montées sur des rails. Grâce aux roulettes, le siège peut aller et venir entre la toilette et la douche ou la baignoire. Ce dispositif permet de réduire le nombre de transferts nécessaires dans une salle de bains standard. Le présent rapport fait état des essais de performance menés sur le dispositif en vue de l'améliorer.

Le dispositif de transfert sur rails pour salle de bains a été mis à l'essai et évalué aux installations du *G.F. Strong Rehabilitation Centre* ainsi que dans plusieurs maisons.

Au *G.F. Strong Rehabilitation Centre*, le dispositif a été essayé par des personnes d'âge et de taille variés ayant des déficiences diverses.

Après analyse des résultats des essais menés au *G.F. Strong Rehabilitation Centre*, un second prototype a été fabriqué en tenant compte des modifications suggérées et mis à l'essai dans des maisons.

Les essais menés chez les gens ont permis de constater que le dispositif convenait particulièrement bien à toutes les salles de bains où la baignoire pouvait facilement être raccordée au siège de toilette avec des rails. En conclusion, les modifications apportées ont amélioré le dispositif et l'ont rendu commercialisable.

## **2. EXECUTIVE SUMMARY**

### **The Rail Assisted Bathroom Transfer Device.**

The Tetra Society of North America is a non-profit organization that matches skilled volunteers with people with disabilities who need an assistive device developed or adapted that will increase their independence.

The rail transfer device developed by the Society allows disabled users to move between the shower/bathtub and the toilet in a regular-sized bathroom, without having to use a wheelchair. The device consists of a seat with rollers mounted on rails. The seat rolls back and forth between the toilet and the shower/tub. This design reduces the number of transfers needed in the bathroom and can be used in standard-sized bathrooms.

The device makes standard-sized bathrooms accessible to disabled users and does not require structural modifications to the bathroom.

Dwellings would no longer require oversize bathrooms for people with disabilities, virtually eliminating one of the main obstacles of accessible housing design.

This device has enormous potential to revolutionize the lives of people with severe disabilities, as the original prototype has done for its current user. At present, nothing similar exists on the market.

The original prototype was designed and built by Paul Cermak and Sam Sullivan. It has been used by Mr. Sullivan in three different bathrooms. Only small modifications have been made to the device to accommodate it in two different bathroom configurations.

As part of the project, two prototypes were designed and built for testing.

These units were tested by people with different levels of disability and in different bathrooms.

The units were designed to accommodate the various levels of motor ability.

### **Testing of the Prototypes.**

The first prototype was installed in the G.F. Strong Rehabilitation Centre.

Ian Dennison, Equipment Evaluator, and Diana Mah-Jones, Head of the Occupational Therapy of G.F. Strong Rehabilitation Centre, agreed to have the device tested in the Occupational Therapy Department at G.F. Strong.



The tests were carried out with the help of Occupational Therapy Staff.

Large groups of people observed the device in practical use and several people tested the device. Occupational Therapy Staff and people using the device made similar recommendations.

Improvements requested:

- a wider seat and improved cushioning
- arm rests for the seat
- a brake for the seat
- improved movement along the track

Based on the testing changes were introduced to the second device as follows:

- The seat was made 18" wide - to give users a better seating platform for transfers
- Cushioning was improved
- Arm rests were installed to both sides of the seat
- Brakes were installed to stop the seat at any point on the rail
- Crossbars were installed to make the pulling and pushing easier for the user

Although the official G.F. Strong test yielded a relatively small user group, the comments were valuable. A table with details of the G.F. Strong trials is in Appendix E. The second prototype which was modified according to the results of the tests was used in a house with a large accessible bathroom with a shower and no bathtub.

The device was tested with three users generating feedback. Additional tests were made in a home with a toilet positioned beside the tub and taps behind the seat and a home with the toilet beside the tub and taps in front of the seat.

The prototype was used in homes by able-bodied people as well, with minimum inconvenience. No other changes were necessary.

After introduction of the changes requested, the only changes required are those necessitated by conditions associated with manufacturing and shipping.

### 3. BACKGROUND STATEMENT

There is a need for a rail transfer system. The device makes standard sized bathrooms accessible to people with severe disabilities and does not require structural modifications to the bathroom. Disabled users generally prefer standard size bathrooms because there are more available handholds and fewer places to fall. The device also has the potential to solve an important problem encountered by architects and building designers. People with severe disabilities would have a greater choice of dwellings because the rail transfer device will enable them to live in units with standard small bathrooms.

#### 4. PROJECT OBJECTIVES

- To design and build two prototypes of the Rail Assisted Bathroom Transfer Device.
- To test these prototypes in a variety of settings including both institutional environments and private homes.
- To test these prototypes on a target group with as wide a range of disability and motor skills as possible.
- To produce a final design for a product which is easily assembled and readily adaptable to a number of different types of bathroom environments.

## 5. DESCRIPTION OF SYSTEM - Rail Assisted Bathroom Transfer Device

### Drawing Bathroom Scenario #1.

The Rail Assisted Bathroom Transfer Device enables disabled users to move themselves between the shower/bathtub and the toilet in a regular size bathroom without having to use a wheelchair.

Device consists of a seat (3) with rollers (5) that is mounted on rails (6). The seat can roll back and forth between the toilet and the shower and/or bathtub.

The seat (3) is 18" wide with cushioning on seat, back rest (7), arm rest (1) and hand or arm supports (8) and brake (2).

Arm rests (1) are installed to both sides of the seat. They can be flipped out of the way for transfers and/or completely removed each separately for persons who do not require them or who need support on one side only.

The brake (2) allows the seat to be secured in any position along the rails (6). This allows the user to transfer from any position and keeps the seat (3) steady at any point on the track. The seat is used both as a shower chair and a toilet chair.

Pull bars (4) are attached along the track. The bars assist with movement and can act as grab bars if the user loses balance.

Position and length of non-slip feet (11) on the rail are adjustable - and are equipped with the rubber suction cups (12).

Additional drawings in Appendix B.

There is a description of bathroom configurations suitable for the use of the device. The basic configurations are all bath or shower rooms where the bath or shower tub and/or shower area could be connected via rail (6) with the toilet seat.

The prototype used in homes included a spacer (9) which changes the position of the regular toilet seat (10) by 3" and makes it usable by able-bodied people as well. It is not necessary to use the seat (3) for disabled people. **(See drawing of bathroom scenario and additional bathroom configurations suitable for the use of the device in Appendix A attached).**

## DESCRIPTION OF TESTING

### PHASE ONE - Testing in G.F. Strong Rehabilitation Centre

Equipment Evaluator Ian Dennison and, Head of Occupational Therapy Diane Mah-Jones at G.F. Strong Rehabilitation Centre, agreed to test the device in the Occupational Therapy Department at G.F. Strong. The testing was carried out with the help of Occupational Therapy Department Staff and Occupational Therapy students.

Tom Baleshta from TETRA was present at all testing.

The purpose of the tests at G.F. Strong was to test the device with people of different disabilities, age groups, and different sizes. The ergonomic evaluations form, included in Appendix D, was used to collect the observations and experience of users. The tests were done with the first prototype in G.F. Strong. The configuration of the bathroom is designed for use of a shower chair.

The bathtub at G.F. Strong and the set-up as shown in Scenario #1 in Appendix A was used for testing. The device consisted of the rail, two sets of the support feet, a seat 16" wide, and a pin brake for the transfer position of the user. The device was observed by a large group of people working at G.F. Strong and used by several people as follows:

1. A paraplegic male, with one person assisting.
2. A male recovering from a stroke, with right hemiplegia, one person assisting.
3. A male with multiple sclerosis, without assistance.
4. A male recovering from a stroke, with left side paralysis, without assistance.
5. A quadriplegic male, with one person assisting.
6. A female with multiple sclerosis, one person assisting.

**Observations and Suggestions were as follows:**

- Improve the seat by making it 18" wide, having deeper cushioning, and an adjustable backrest.
- Equip the seat with a brake allowing the seat to be stopped in any position along the rails.
- Install arm rests on the seat.
- Install a foot rest.
- Improve movement along the track by using crossbars.
- Install a waist belt.

Although the G.F. Strong trials yielded a relatively small user group, the observations were, in general, consistent. Diana Mah-Jones, Head of Occupational Therapy of G.F. Strong Rehabilitation Centre, was disappointed that more people were not involved in the trials. However, she was pleased at the outcome.

The changes requested based on the testing in G.F. Strong Rehabilitation Centre were applied to the second prototype as follows:

- The rail from the first prototype was used with minimum changes.
- Additional cross bars were installed to the rail to make the pulling and or/pushing easy.
- The seat was changed to a seat 18" wide (first prototype seat was 16" wide), to give a better platform for transfers.
- Cushioning of the seat was improved by increasing the foam thickness on the seat and the back rest.
- Arm rests were installed on both sides of the seat.
- The arm rests can be removed or flipped out of the way for transfers by people who do not require them and/or who need one side support only.
- A new brake was installed to stop the seat at any point on the rail.
- To make cleaning simple all material used is stainless steel, aluminum, plastic and hardwood.

## PHASE TWO - Testing in the Home Environment

Anne Parsons, a physiotherapist from the Vancouver West Main Health Unit, Barb Parsons from the Central Office of the Vancouver Health Department, and Moira Jaques, Occupational Therapist from the Vancouver Resources Society all expressed interest in the device and had candidates and locations for further evaluation in homes ready.

The second prototype was tested in three homes and with three different configurations of bathrooms.

One house has a large size accessible bathroom with a shower and no bathtub. The device was tested by three users and generating feedback.

The second house had the toilet positioned beside the bathtub, with the taps behind the seat and one user.

The third house had the toilet beside the bathtub with the taps in front of the seat, and one user.

The prototype used in homes is equipped with a spacer which makes it usable by able bodied people as well, with minimum inconvenience. No other additional changes were necessary. Data from house testing are in Appendix E. Considering feedback from Phase Two testing, including Sam Sullivan's 2-year long use of the original device in three different bathroom configurations, no additional changes were required.

In each bathroom where the device was tested it was clear some additional grab bars should be added for the users convenience.

Drawings: Bathroom Scenario #1 and #2. )  
          Brake mechanism                    ) APPENDIX A  
  )

## 7. PERFORMANCE CHARACTERISTICS

The Rail Assisted Bathroom Transfer Device is difficult to compare with other supporting devices in bathrooms. This is a completely different aid for disabled people to be used in bathrooms where several transfers are necessary.

This system will not solve bathroom problems for all disabled people in all bathrooms. But installation is fast (approx. one half hour), and easy and it can be left in place with minimum inconvenience for able bodied people.

In general, the device is limited to certain bathrooms depending on simple requirements as to the configuration of the bathroom as shown in the drawings in Appendix A.

The main advantage of this device is that it reduces the assistance required to move from the toilet to the shower or bathtub as well as giving the user a choice of the proper transfer position that is not dictated by the position of the toilet or bathtub/shower area in the bathroom.



## 8. COMMENTS ON TESTING

After the completion of testing in the G.F. Strong Rehabilitation Centre, Diana Mah-Jones, head of Occupational Therapy Department at G. F. Strong, expressed her disappointment that more people were not involved in the trials as users. However, overall she was pleased at the outcome. This sort of evaluation was new to the Centre. The positive outcome based on the tests should encourage future trials.

From our point of view we see the testing as very important since it generated useful observations and suggestions.

Testing in the homes was useful to evaluate the usefulness of the device for different configurations of bathrooms.

In general, based on the results, the testing was considered to be successful. For future testing, more time should be allotted for testing in institutional settings as well as in the home.

## 9. CONCLUSIONS

The advantage of the rail assisted bathroom transfer device is that it reduces the assistance required to move from the toilet to the shower /tub, giving the user greater independence. This is achieved in a very simple manner. The design of the device reduces the number of transfers in the bathroom and can be used in standard-sized bathrooms as shown in Appendix A .

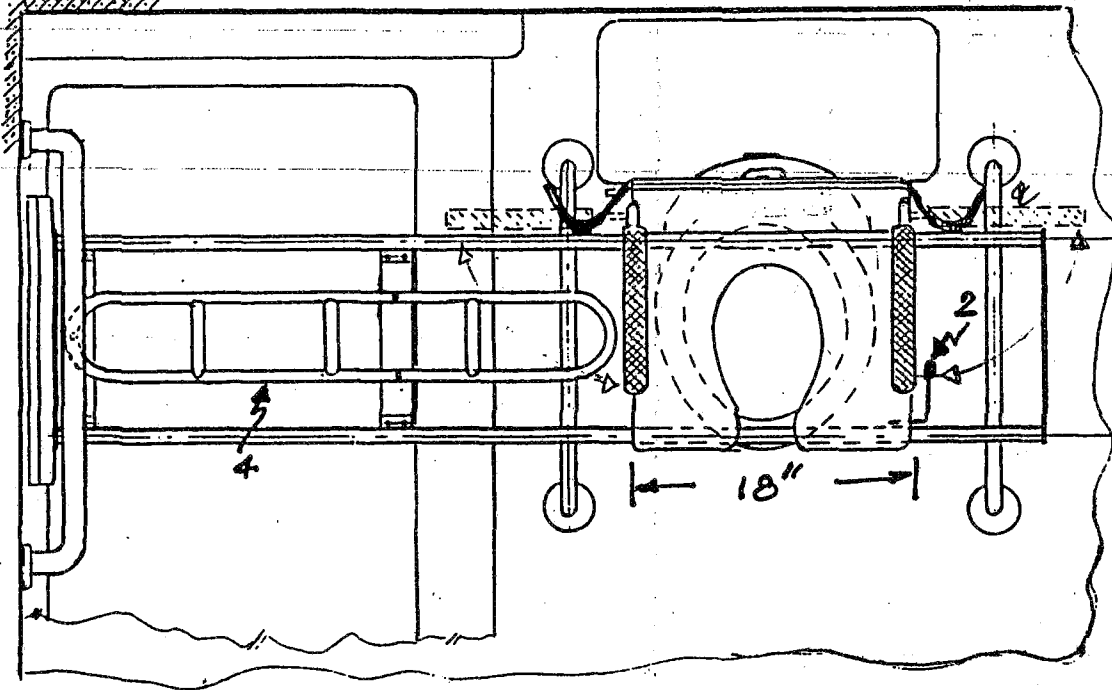
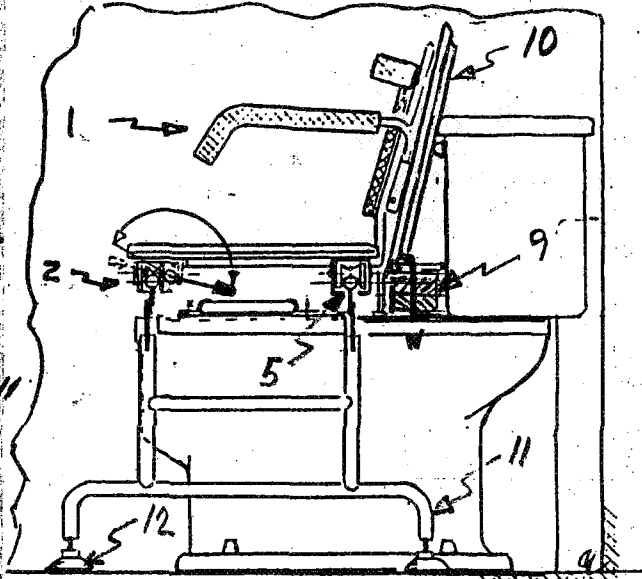
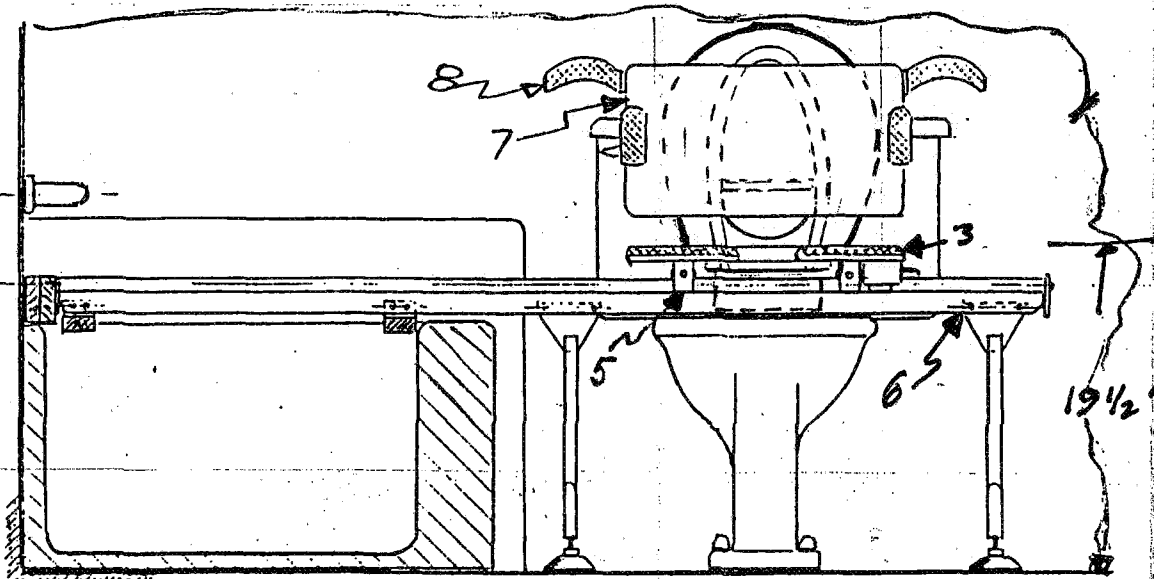
The device makes most standard-sized bathrooms accessible to disabled users and does not require structural modifications to the bathrooms.

The Society feels this device has enormous potential to revolutionize the lives of people with severe disabilities, as the original prototype has done for its first user.

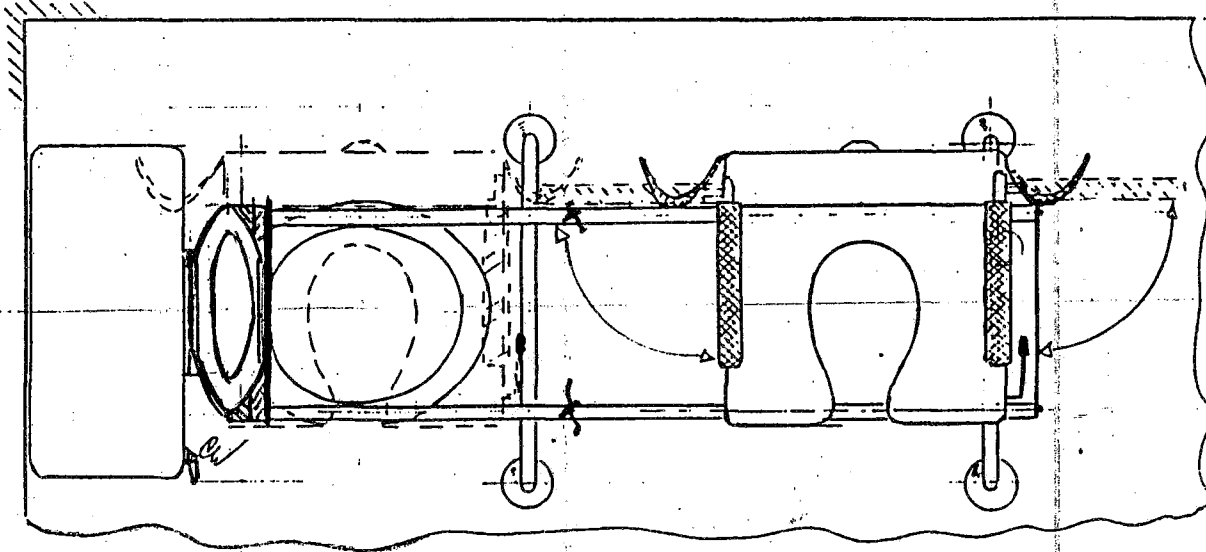
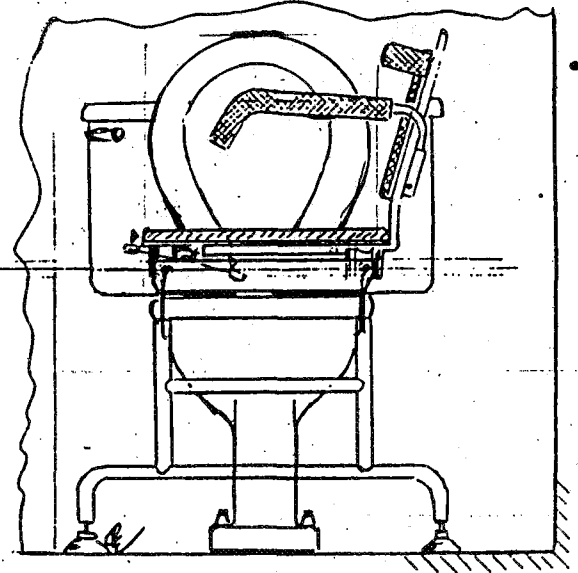
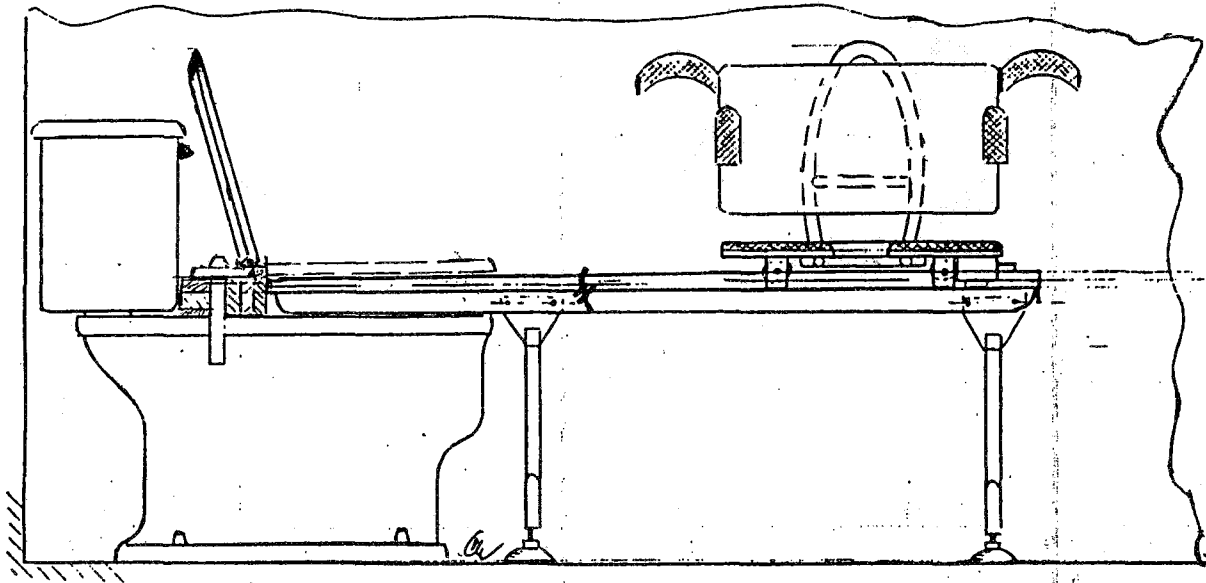
The device does not restrict the bathroom for use by disabled people only. The bathroom is usable by able-bodied people as well, with minimum inconvenience.

Further development should focus on finalizing and refining the design and market planning.

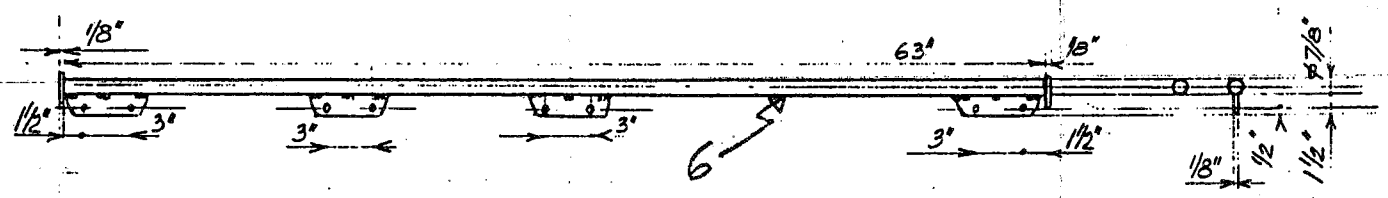
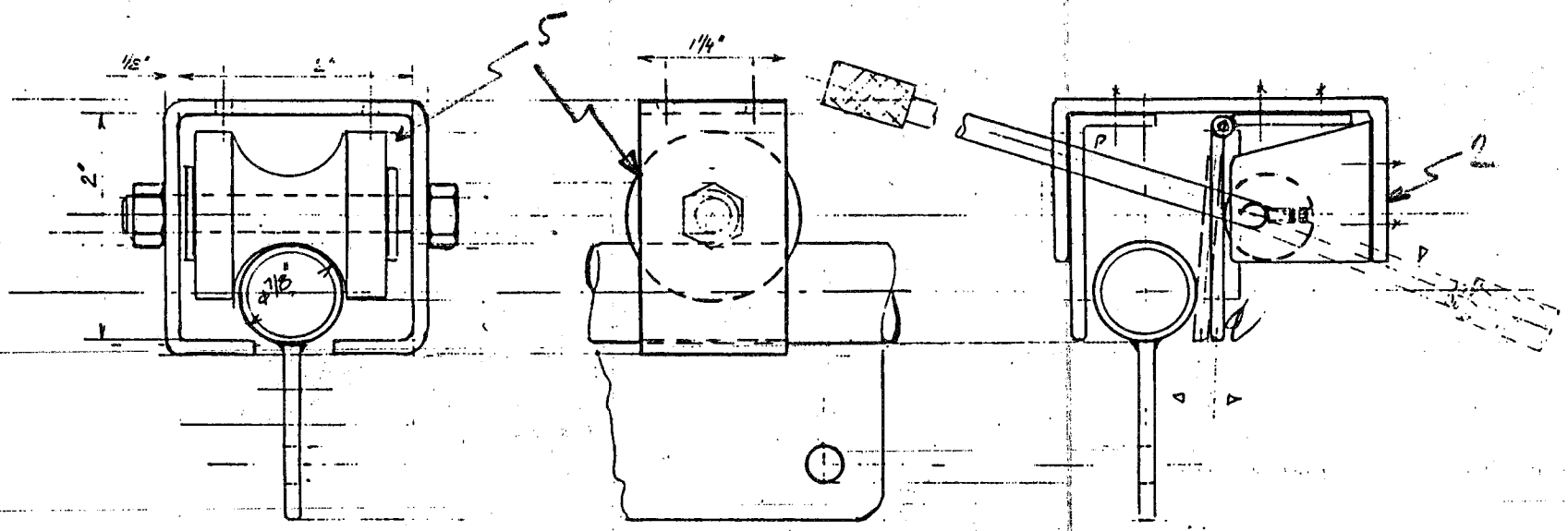
APPENDIX A  
HOUSE BATHROOMS



BATH/Room  
 Scenario 1.



BATH ROOM  
SCENARIO 2.



BRAKE  
MECHANISM.

APPENDIX B  
CONFIGURATIONS

Garden

Kitchen

Living Room

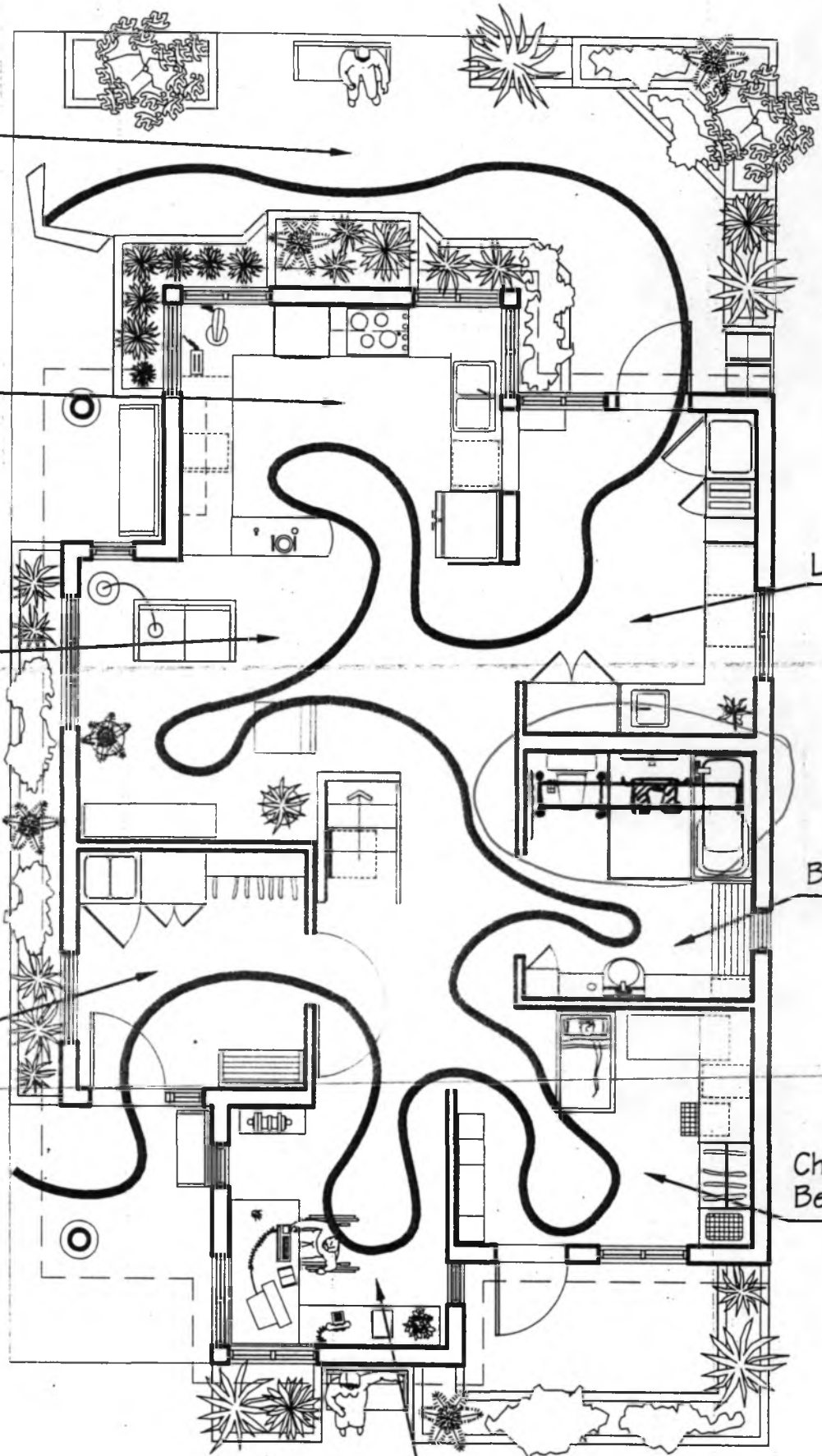
Entry

Laundry

Bathroom

Child's Bedroom

Office

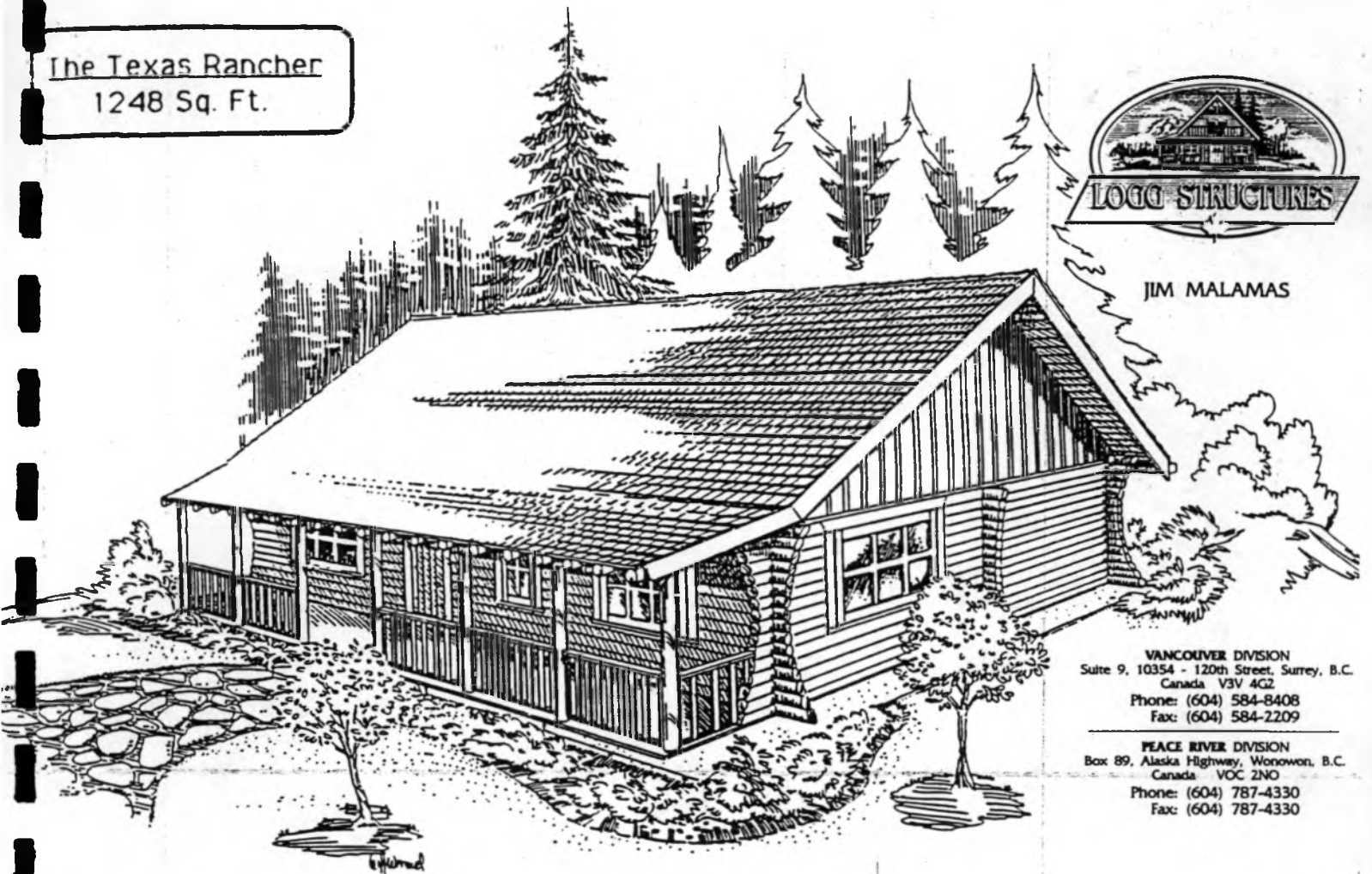




The Texas Rancher  
1248 Sq. Ft.

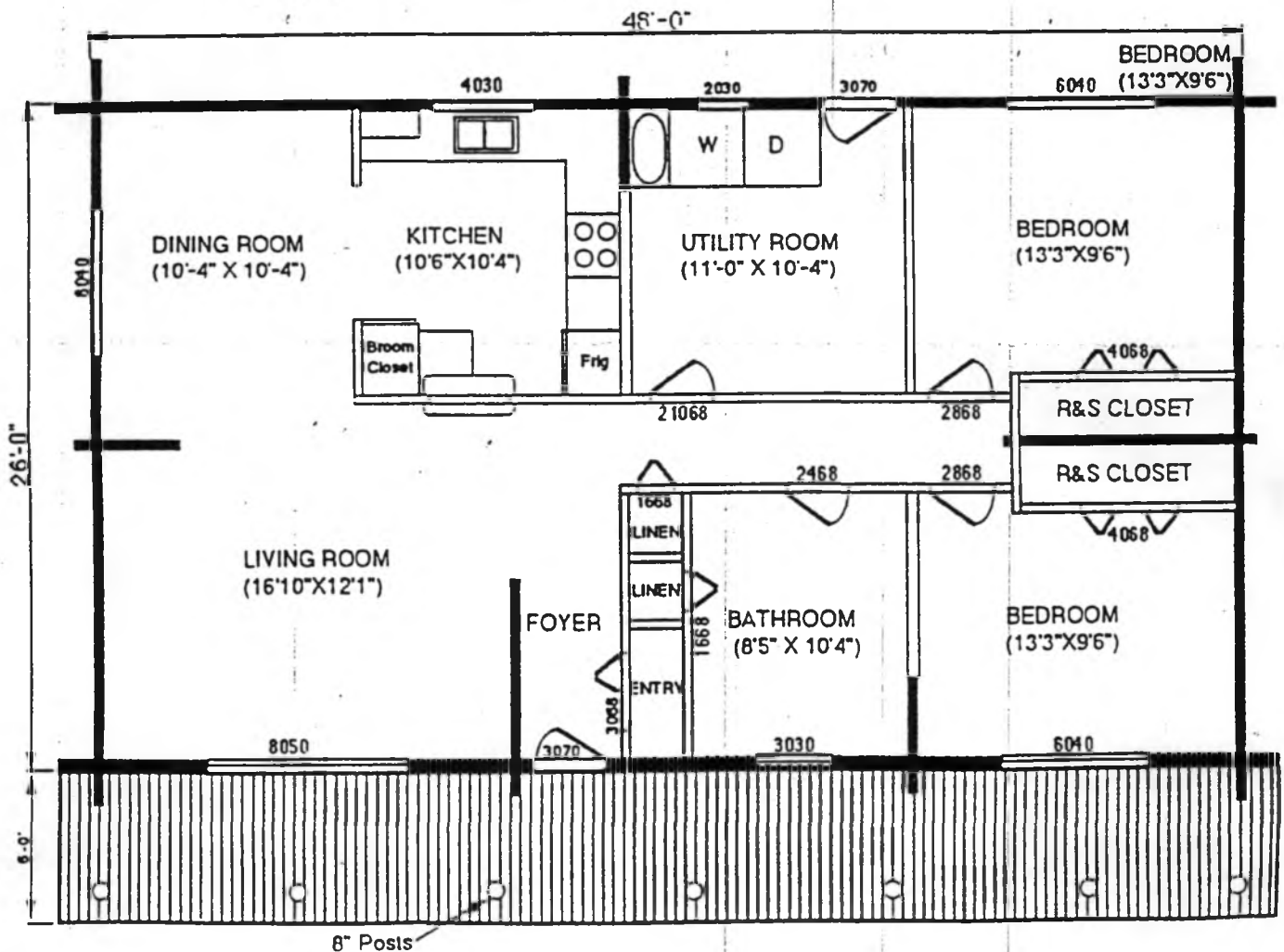


JIM MALAMAS

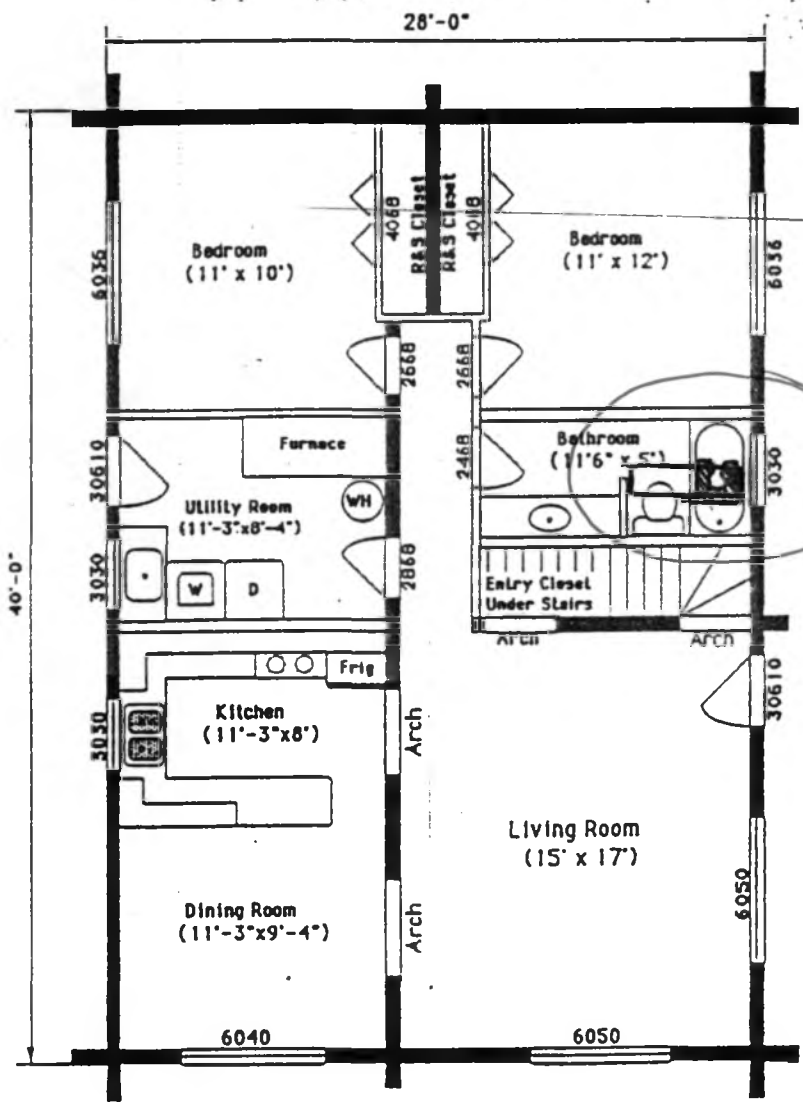


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**The Kootenay**  
1496 Sq Ft.



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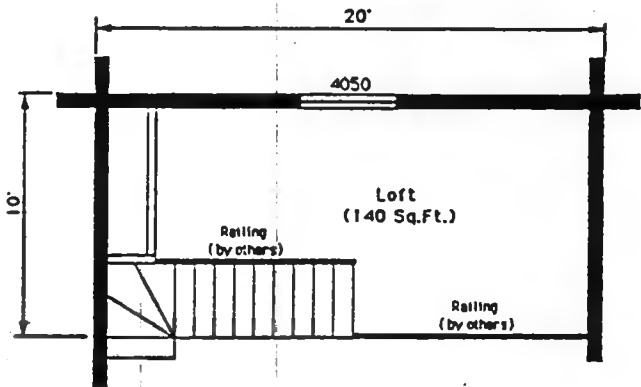
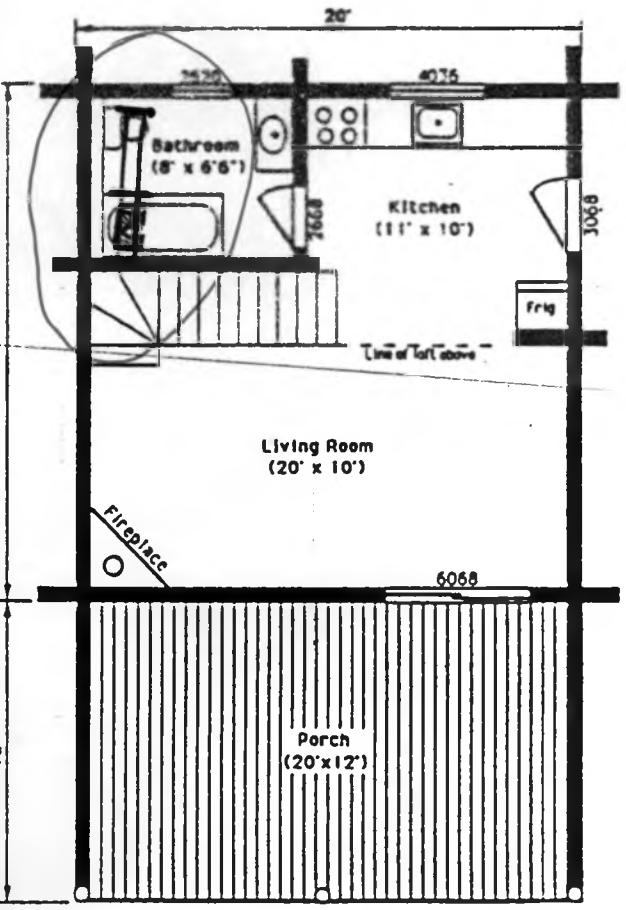
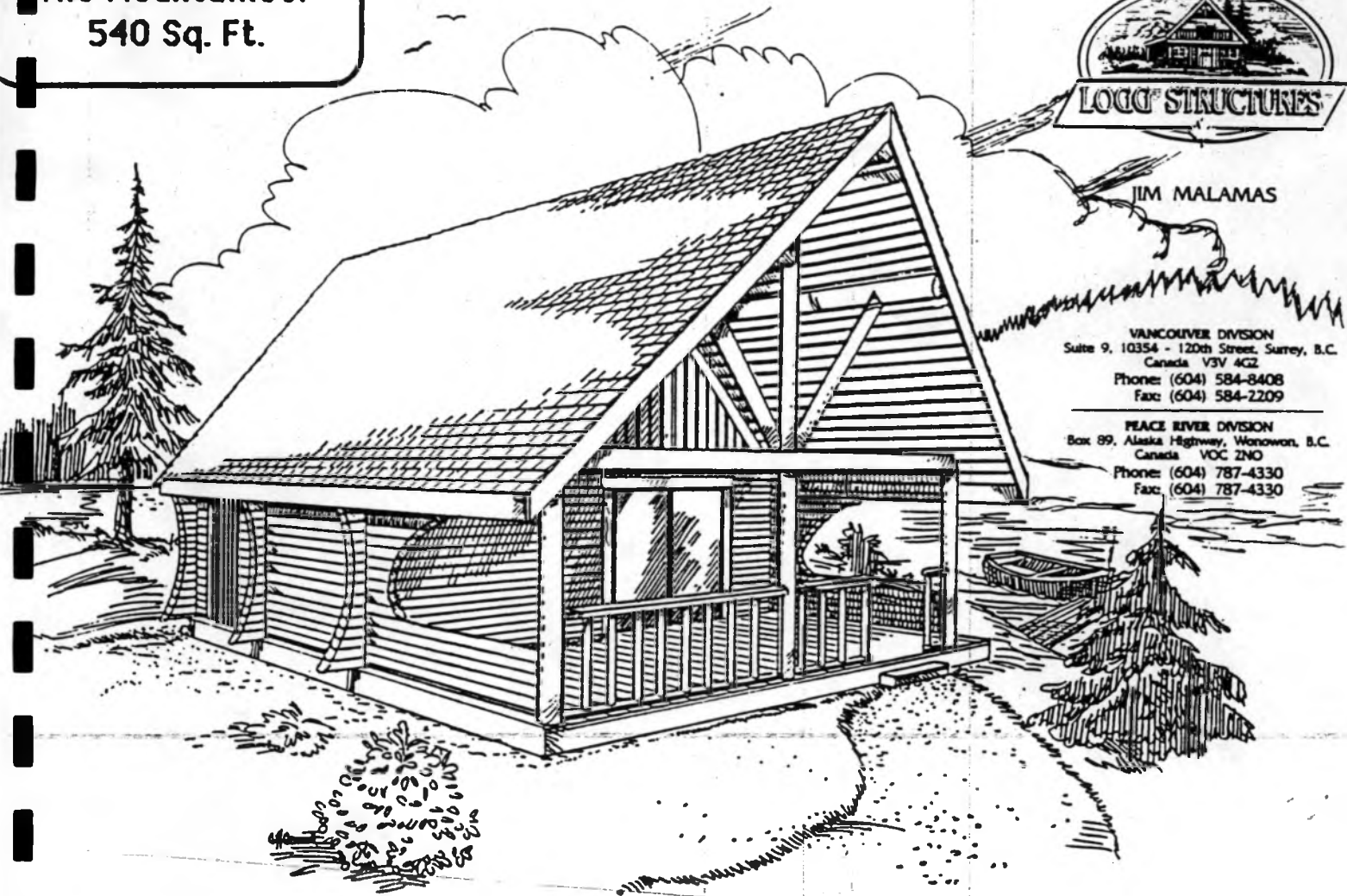
**The Mountaineer**  
**540 Sq. Ft.**



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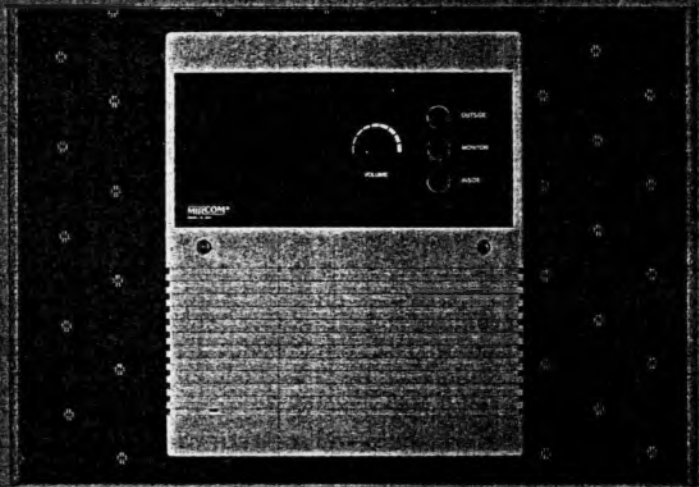




# CA-Series

## Intercom Only System

The CA-Series is ideal for home or office. The CA-Series is similar to the EP 4-wire series without the AM/FM radio. All 4-wire remote components are fully compatible to the CA-Series. If communication is not limited between a room and the entryway but where every storey or certain rooms are to be served as well, then the CA-Series is the solution. The CA-800 amplifier provides a harmonic call signal or an optional tone chime. The dual tone chime enables a second outdoor station to be used with its own unique call. Up to 20 remote room stations can be used with the CA-800.



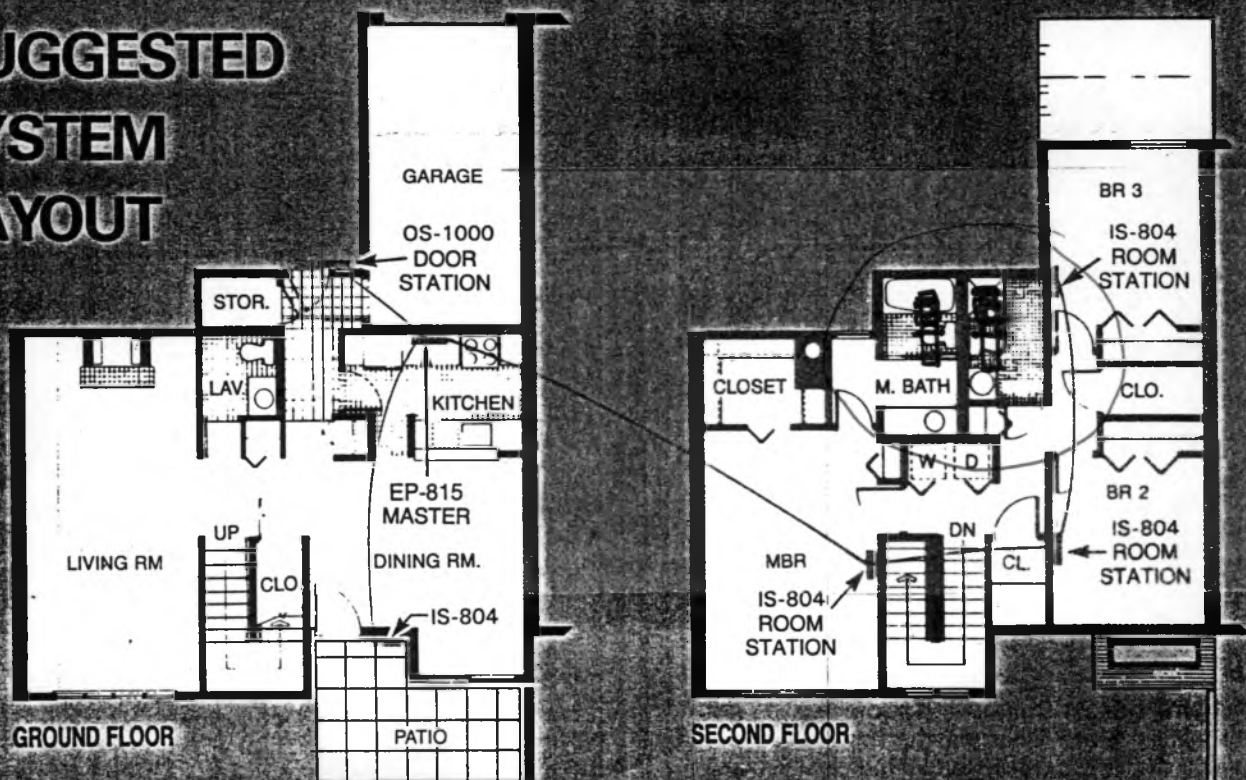
## Door Stations

The OS-1000 or OS-1001 Door Stations can be used with the CA-800. The OS-1001 is a solid metal, gold lacquered station. For a lesser profile station, the OS-1000 door station can be provided. The OS-1001 is made from durable plastic. Using only low cost station to station, four conductor wiring makes installation economical and easy. Three conductor wiring is used to the door stations.

## Music Paging

The CA-Series can be used exclusively as a music amplifier when an external music source is connected (e.g. turntable, tape deck or radio). The system can provide background music for offices or a showroom and be muted during intercom calls.

# SUGGESTED SYSTEM LAYOUT

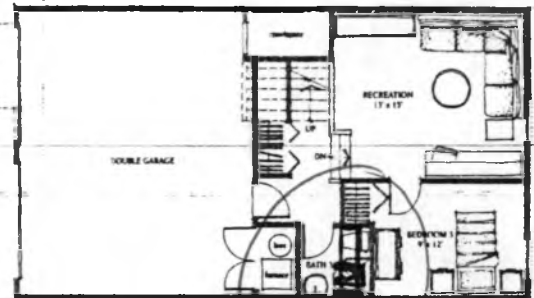
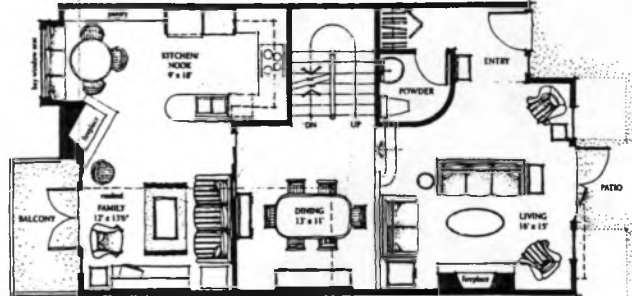
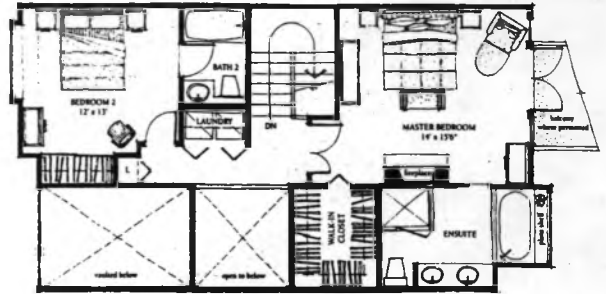


*West*  
HAMPSTEAD



**CANTERBURY**  
TOWN HOMES

3 BEDROOM PLUS FAMILY TOTAL AREA 2,120 SQ. FT.

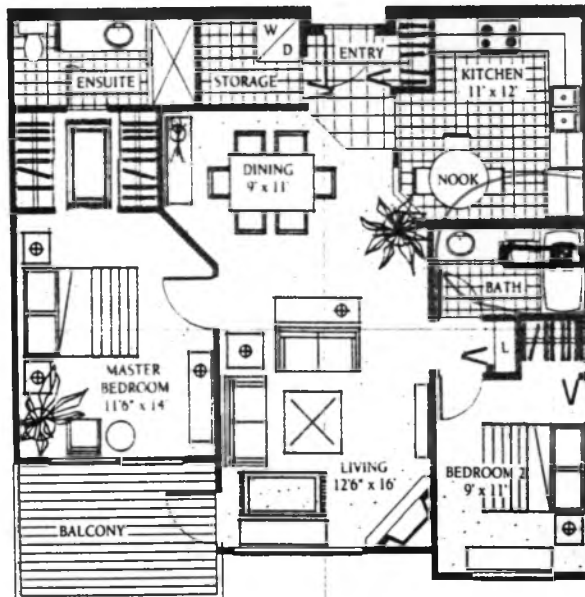


The developer reserves the right to make modifications and changes. Sizes and dimensions are approximate and may vary with actual strata plan, survey and model.

*Plan A*

*The Embassy*

*2 Bedroom  
1,036 sq. ft.*

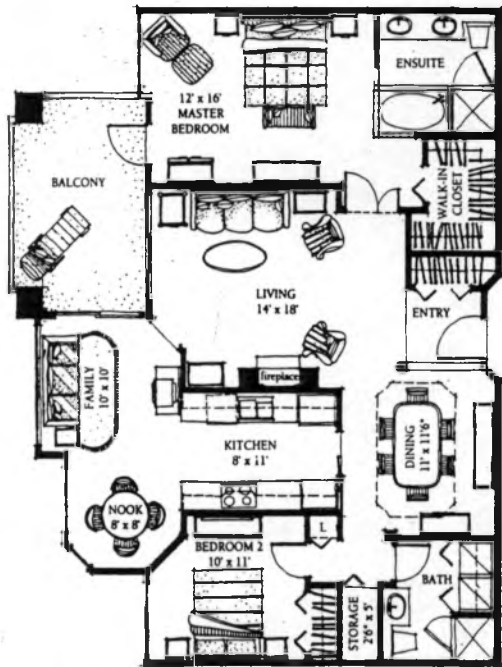


*West*  
HAMPSTEAD



**FARNSWORTH**  
APARTMENT HOMES

2 Bedroom plus Family  
1,275 sq.ft. (approx. area)



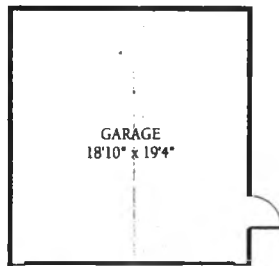
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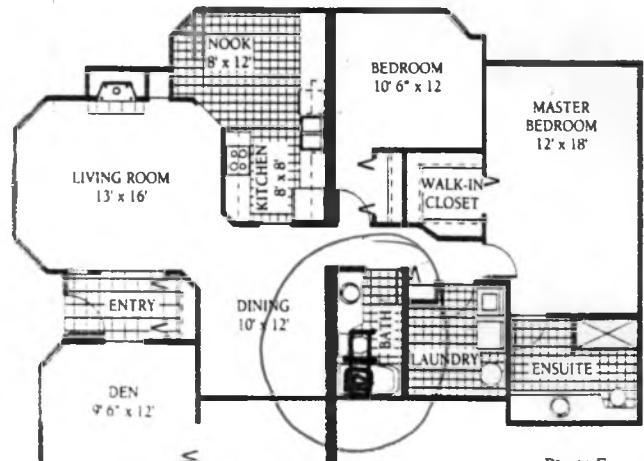
TOWN HOMES

*TREETOPS* PLAN E

2 BEDROOM PLUS DEN  
Total Area 1,508 sq. ft.



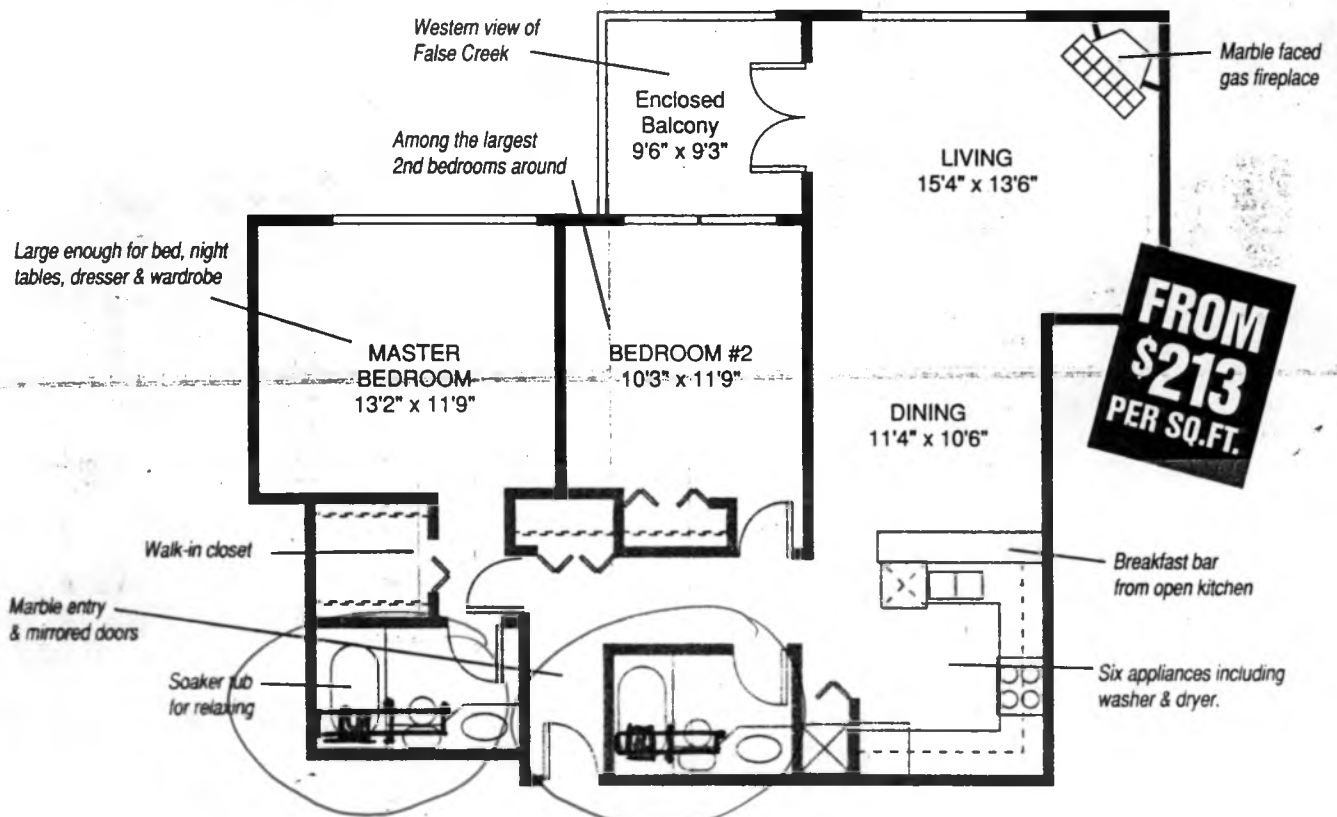
PLAN E  
DETACHED  
DOUBLE GARAGE



PLAN E  
MAIN FLOOR  
1,508 sq. ft.

# THINK BIG

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# SHOWCASE HOME 02

To be located at Westwood Plateau.

## Deck

- Firemagic Gas BBQ
- Fully Insulated Hot Tub
- Interlocking Brick for Patio

## Family Room

- Built-in Entertainment Shelving
- Direct Vent Gas Fireplace

## Kitchen

- Karadon Counter Tops
- Granite Eating Bar
- Water Purification System

## Dining Room

- High Tech Stretched Vinyl Ceiling
- Faux Finish Walls

## Hallway

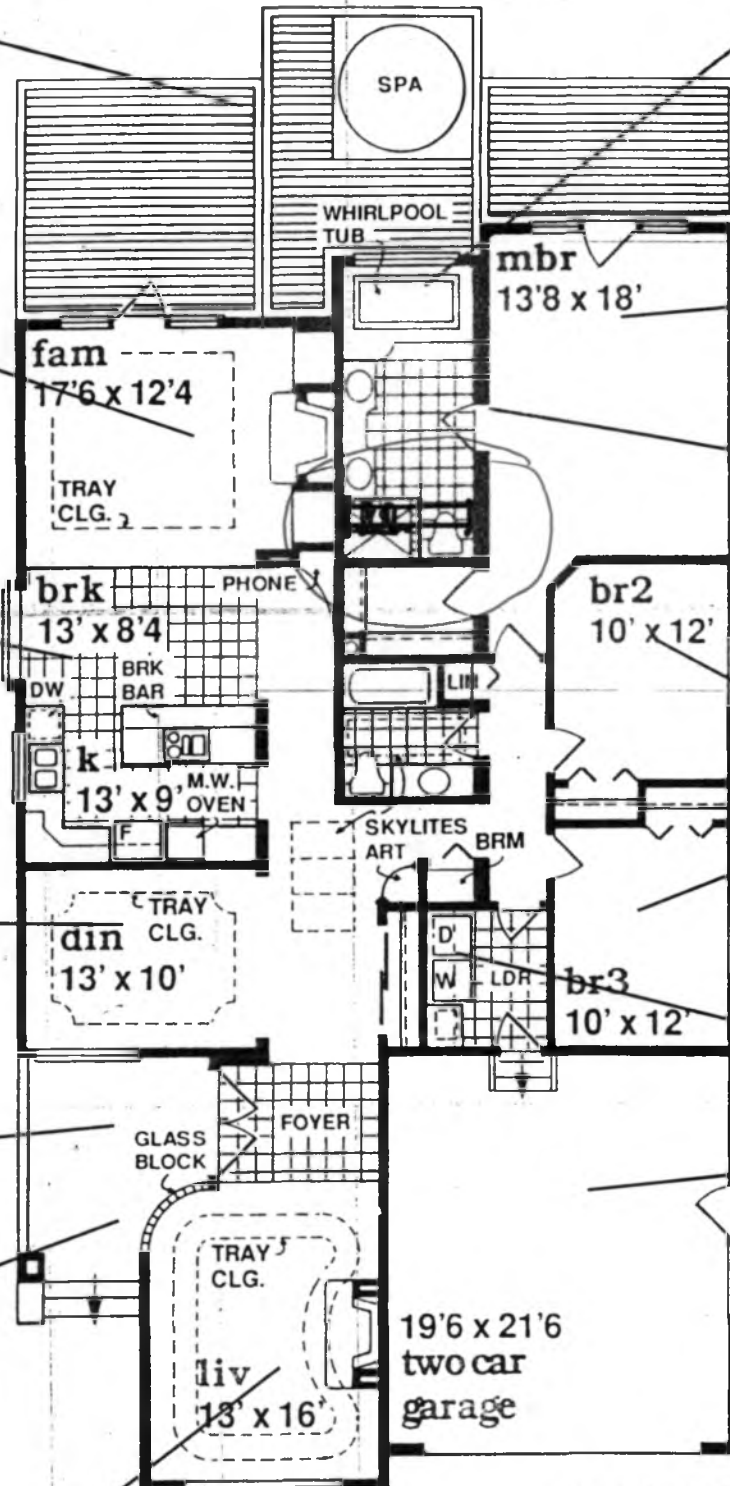
- Nutone Automated Switch Control Center
- Automated Velux Skylights

## Entry

- Inif Security System
- Home Alone Sentinel
- Vidioman Door Monitor
- Reinforced Glass Block Wall
- Columned Entry with Faux Finish

## Living Room

- Karadon Fireplace Mantle
- Tray Ceiling



## Main Bath

- Eneready Whisper POWER Grill
- Superboard Waterproof Tile Backing
- High Tech Stretched Vinyl
- Skylight Well
- Skylight

## Master Bedroom

- Faux Finish Walls
- Walk In Closet

## Master Ensuite

- Hydro Massage Tub
- Brass Fixtures
- Extensive Tile
- Etched Glass Window

## Bedroom 2

- Faux Finish Wall Mural

## Bedroom 3

- Library Conversion
- High Tech Stretched Vinyl Ceiling

## Laundry

- Washer and Gas Dryer

## Garage

- Eneready Van EE Zoned Ventilation System
- Micro Heat High Tech Heating/Hot Water System

## General Home Features

- Radiant Floor Heating
- 10 ft Ceilings Throughout
- "The Silent Floor"
- "All Gas" Home
- 30 Year Warranty Siding
- 30 Year Treated Cedar Shake Roof
- Kiln Dried 2"x6" Wall

2087 sq.ft.

ST. PAUL'S HOSPITAL FOUNDATION

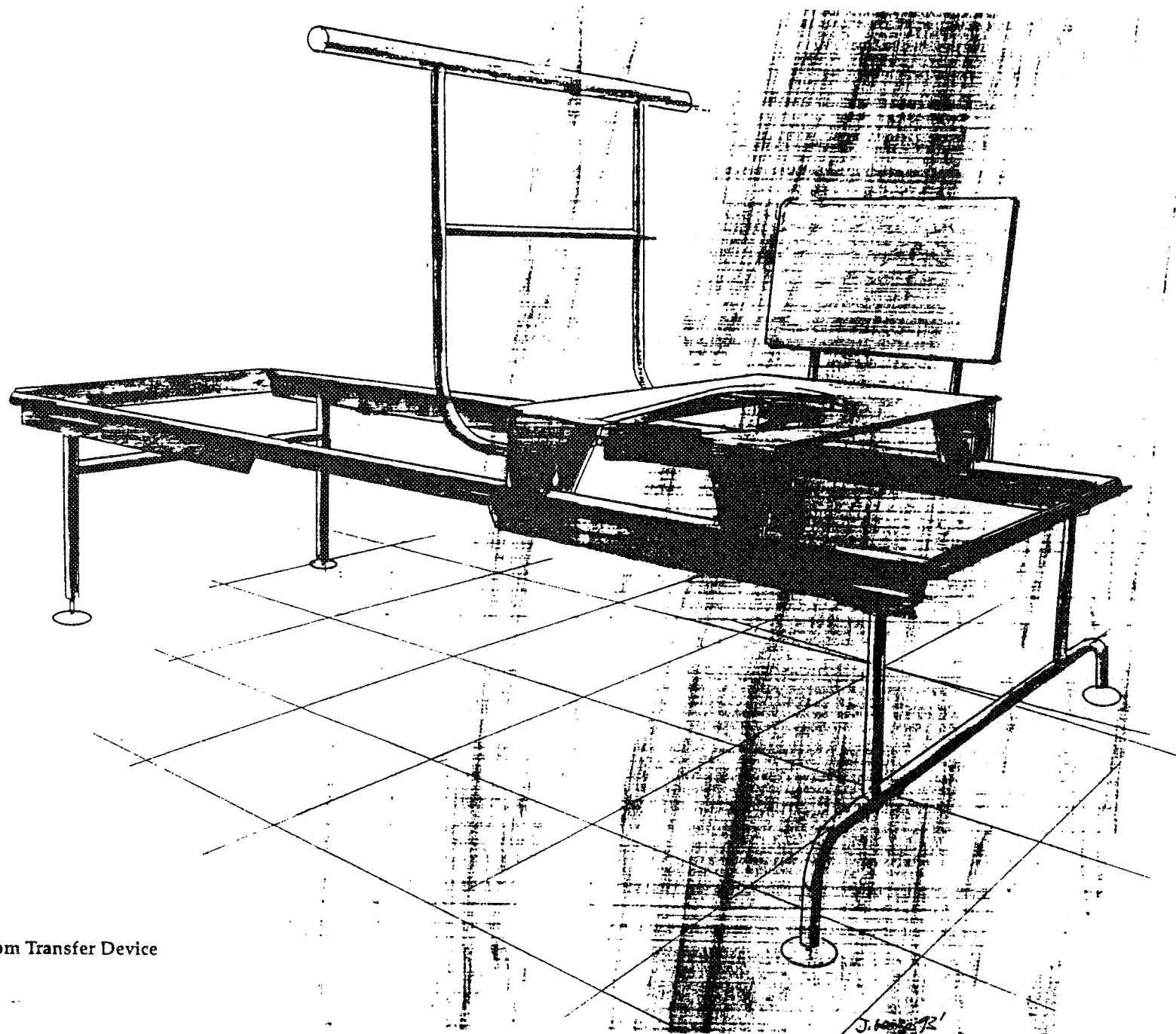
SHOWCASE

HOME 02



APPENDIX C

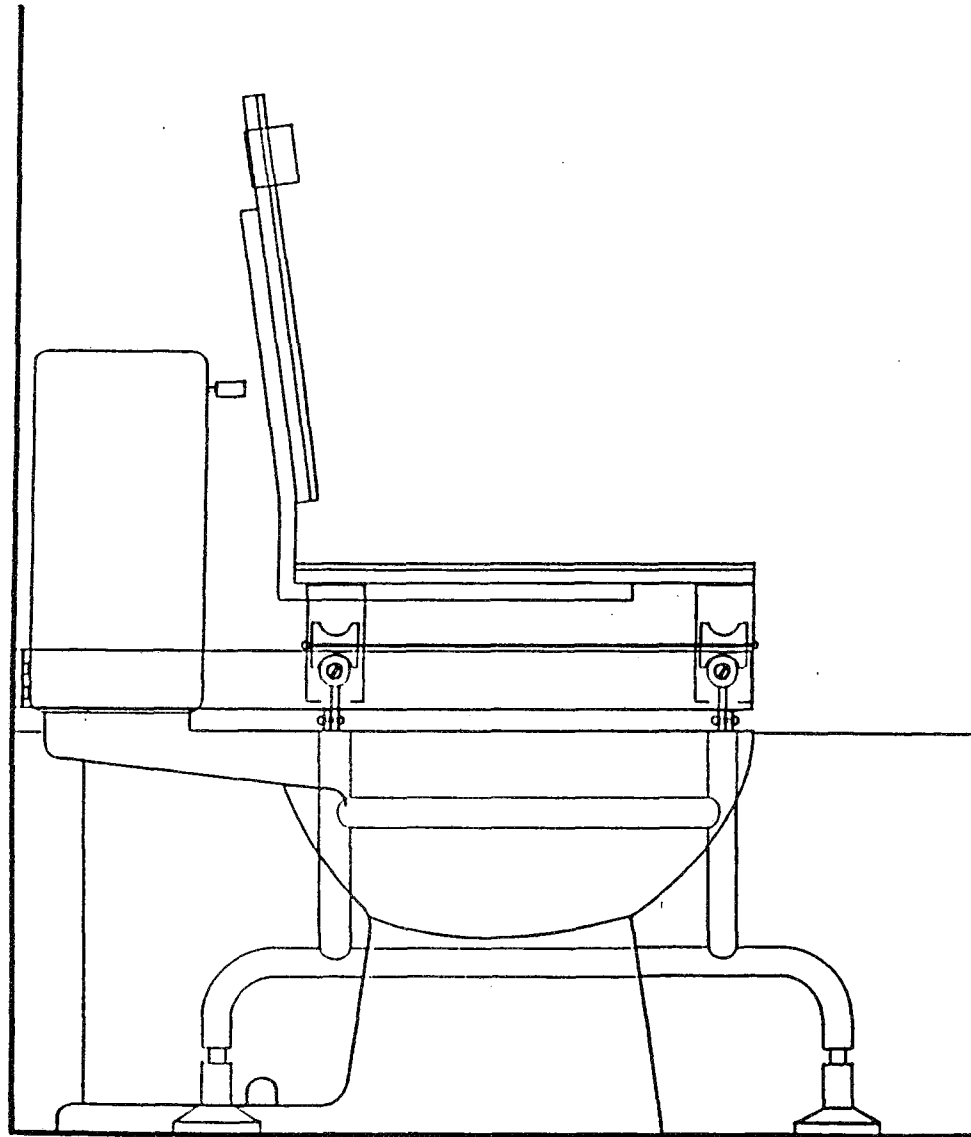
COMPUTER GENERATED DRAWINGS OF ORIGINAL PROTOTYPE  
AND BATHROOM SETTING



Rail Assisted Bathroom Transfer Device  
Existing Prototype

J. King '92

TITLE:	File No:	
	Page:	
KEYWORDS:	Date:	
	Project:	
DESIGNED BY:	Cost:	



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 THE TETRA DEVELOPMENT SOCIETY 1300 Discovery St., Vancouver, B.C. V6R 4L9 tel: 222-2600 fax: 222-3004

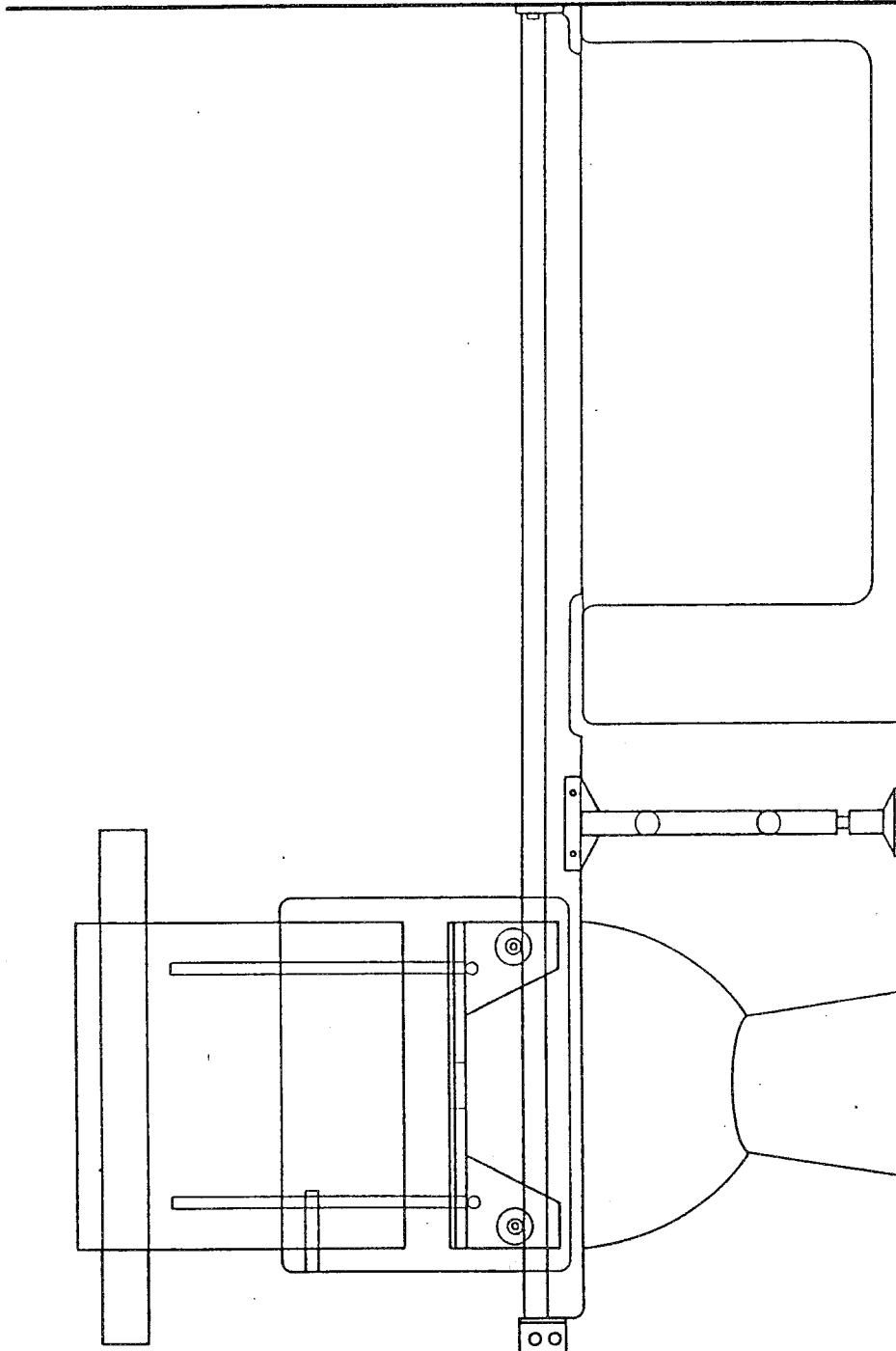
TETRA  
 DEVELOPMENT  
 SOCIETY



TITLE:

File No:

Page:



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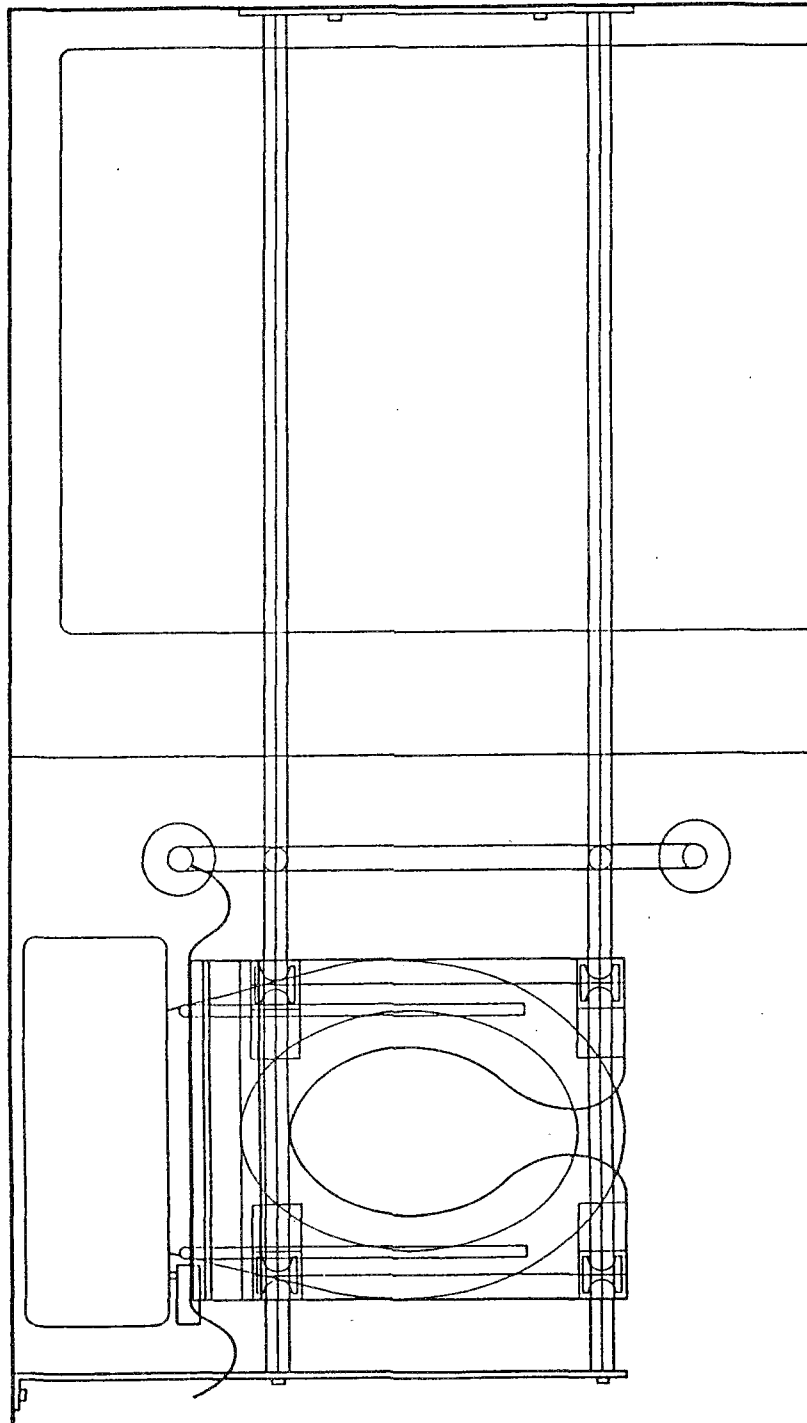
TETRA  
DEVELOPMENT  
SOCIETY



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DEVELOPMENT  
SOCIETY



APPENDIX D

PHOTOS OF THE DEVICE IN USE

## PHOTOS

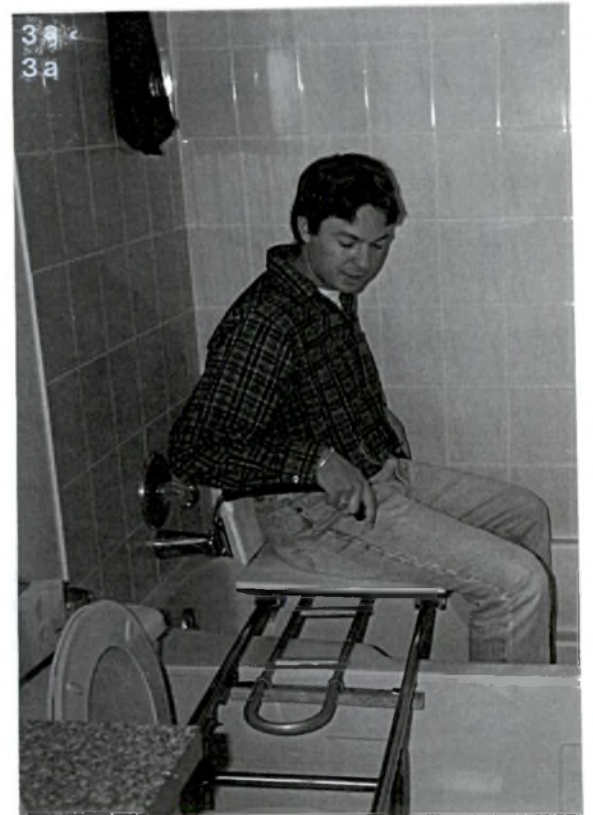
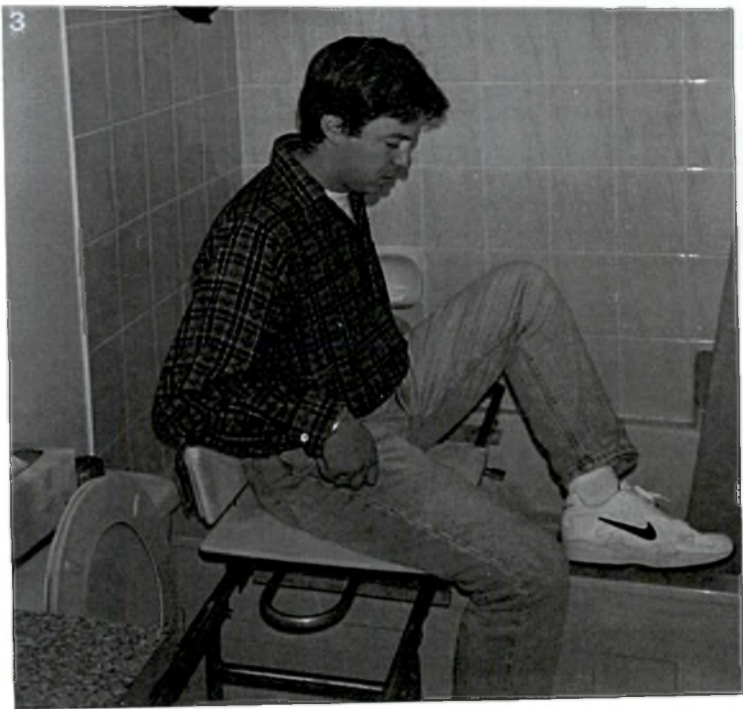
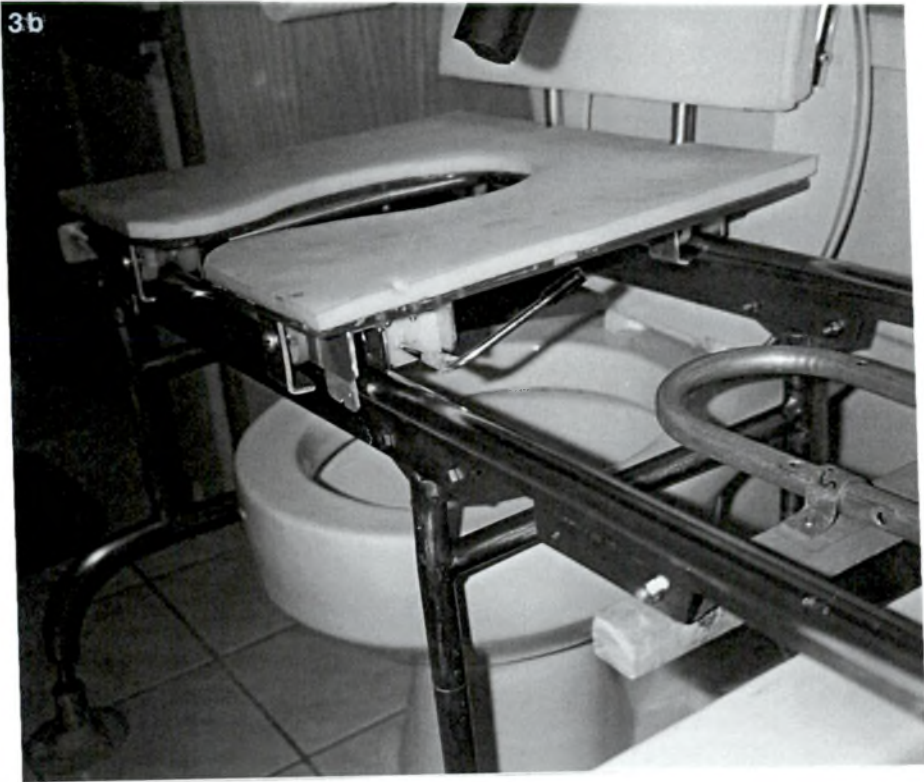
1. **G.F. Strong Rehab Centre**
  - 1 a) **transition into tub**
  
2. **tub position**
  - 2 a) **toilet position**
  - 2 b) **swivel armrest**
  
3. **transition into tub**
  - 3 a) **tub position**
  - 3 b) **brake mechanism**
  
4. **shower scenario**
  - 4 a) **perpendicular to toilet**



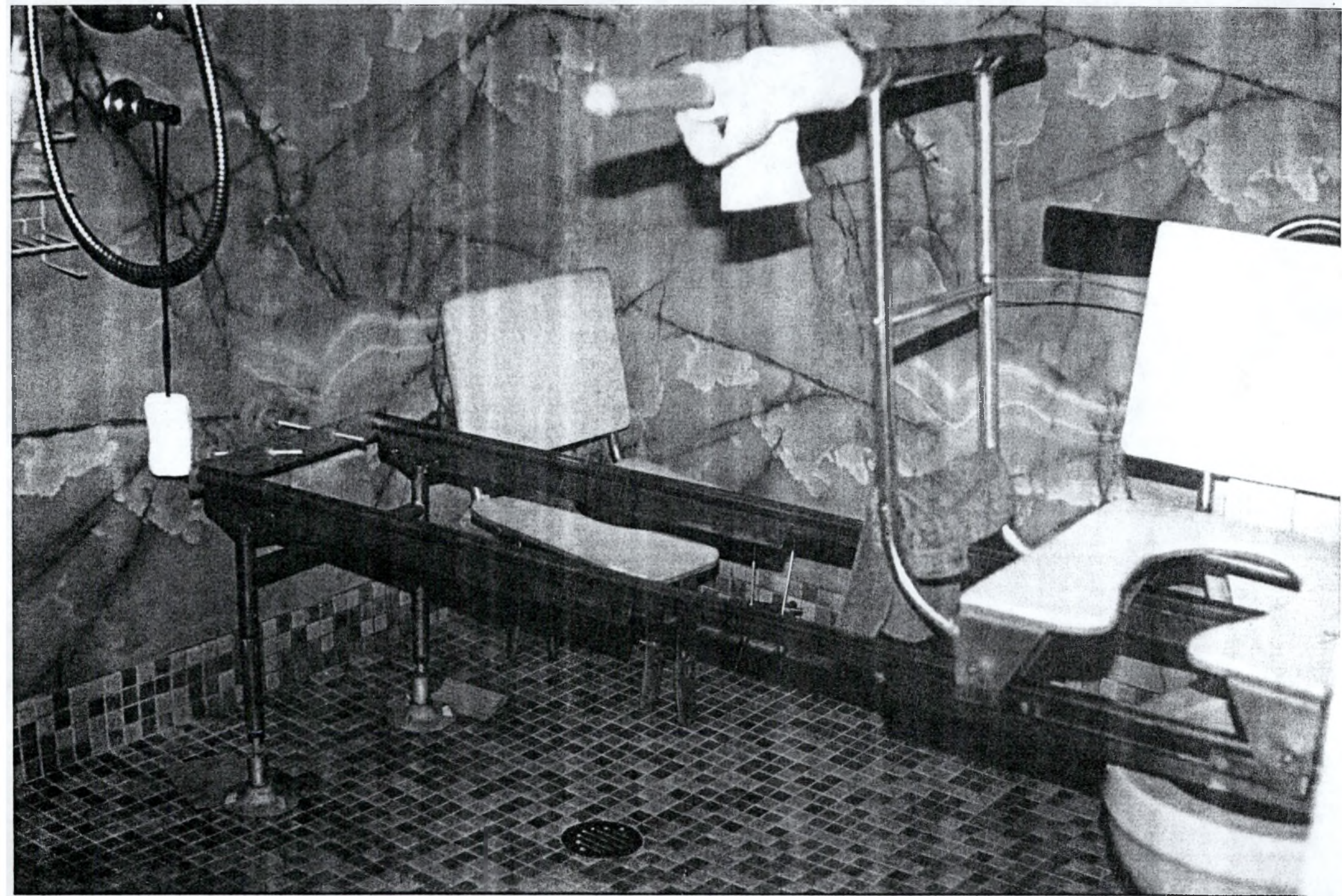












APPENDIX E

COMPLETED ERGONOMIC EVALUATION FORMS





# Ergonomic Evaluation

Location G.F. Strong Rehab. Centre

Date 10 June 1994

## Description of Device to be Tested

### Rail Transfer Device

The device consists of a seat which moves on a rail from the toilet to the bath or shower. This allows the user to transfer only once and eliminates the need for moving a wheelchair around in an inaccessible washroom.

User's Name

Address (if you wish further info. sent to you)

Age

Nature of Disability

Stroke - HEMIPLEGIC - RIGHT SIDE

Height

Weight

Present Assistance Required for Transfers

one person transfer

## Consent

I RON BOSTAIN agree to participate in the evaluation of the Rail Transfer Device by using the device.

Signature \_\_\_\_\_

Date 10 June 1994

Witness \_\_\_\_\_

## User Trails

A test model has been constructed which will be used to collect feedback with regards to the function of the device. Feedback from potential users will be used to further develop this device into a marketable product.

Please give your comments on the function of this device and how it could be improved.

## Transfers

Height and position of sliding toilet seat - No problem

Stability throughout transfer - No problems

Level of independence - 1 person transfer usually

### General comments

Would feel "considerably safe" if there was a locking system on seat.

### Movement along the track

Operating the brake - No problem.

Size and comfort and stability of toilet seat - Uncomfortable because "so thin"

Balance while moving and ease of movement - feels less balanced while transferring into bath. Arm holder helped balance.

Level of independence -

General comments Suggested locks on wheel to stabilise while transferring over into bath. Felt "insecure" during bath transfer (eg. lifting legs).

### Using the bath or shower

Operating the taps (simulation) - No problem.

Level of independence -

General comments - as long as rails are there.

### Further Comments / Suggestions Concerning the Device's Function and the level independence

- seat is ++ uncomfortable
- brake on seat would be great so can stop seat @ any point along rail

**Further Comments and Suggestions**

**Evaluator's Comments**

**Initials**

**Product Viability**

Before developing this device any further, the extent of its need and usefulness must be known.

Please answer and comment on the following questions.

**What was your first impression of the device?**

Looked "practical". First thing noticed was arm holders, thought good idea for balance.

**How do you presently cope with inaccessible washrooms?**

N/A.

**Could this device give you more independence?**

comments:

Yes

No

- be able to use bathroom by himself.

**Would you use this device if it was installed in an otherwise inaccessible hotel washroom?**

Yes

No

comments:

found that hotels he has been in have good washrooms.

**Do you feel that a rail transfer device could take the place of a large, accessible, code washroom?**

Comments:

Yes, but would still have to make adjustments in most washrooms.

**How do you think this device could be designed to minimize interference with able-bodied users?**

"Hinges on far side" suggested. In own bathroom, no space to put up against the wall. Would have to put in another room.

**Comments and Suggestions from Family, Attendants, Health Professionals Etc.**

Thank you very much for your assistance with this Project.



# Ergonomic Evaluation

Location

G.F. Strong Rehab. Centre

Date

MAY 20/94

## Description of Device to be Tested

### Rail Transfer Device

The device consists of a seat which moves on a rail from the toilet to the bath or shower. This allows the user to transfer only once and eliminates the need for moving a wheelchair around in an inaccessible washroom.

### User's Name

James Nemett

### Address (if you wish further info. sent to you)

Age 38

### Nature of Disability

Stroke ; L sided paralysis

Height

5.7

Weight

175

### Present Assistance Required for Transfers

None uses wooden bench at home

## Consent

I James Nemett agree to participate in the evaluation of the Rail Transfer Device by using the device.

Signature

Witness

James Nemett  
Mary Jones

Date

May 20/94

## User Trails

A test model has been constructed which will be used to collect feedback with regards to the function of the device. Feedback from potential users will be used to further develop this device into a marketable product.

Please give your comments on the function of this device and how it could be improved.

## Transfers

Height and position of sliding toilet seat

width fine  
LONGER FORWARD - MORE STABILITY

Stability throughout transfer

STRONGER ARM REST

Level of independence

General comments

**Movement along the track**

Operating the brake

- GOOD IDEA

Size and comfort and stability of toilet seat

- 2" OUT

- CUT OUT IS GOOD.

Balance while moving and ease of movement

- BAR IS GOOD - GIVES SECURITY.

Level of independence

General comments

**Using the bath or shower**

Operating the taps (simulation)

FINE

Level of independence

General comments

- SHOULDER CURTAIN

- CUT TWO SEATS

- SOAP BASKET

**Further Comments / Suggestions Concerning the Device's Function and the level independence**

**Product Viability**

Before developing this device any further, the extent of its need and usefulness must be known.

Please answer and comment on the following questions.

What was your first impression of the device?

= LOOKS SAFE  
= GOOD IDEA

How do you presently cope with inaccessible washrooms?

USES TOILET WITHOUT ASSISTANCE  
BATH/ BEDCH/

Could this device give you more independence?

comments:

Yes

No

EASIER IN HIS DISABILITY. NOT KNOW  
RE. OTHER ONE TRAYS. SAFE. - TRANSFER AWAY FROM TUB.

Would you use this device if it was installed in an otherwise inaccessible hotel washroom?

comments:

Yes

No

WOULD COME IN HAND - & WOULD NEED  
- HOW HE WOULD TAKE BATH BOARD - FLEX. SHOWER HEAD.

Do you feel that a rail transfer device could take the place of a large, accessible, code washroom?

Comments:

YES

GOOD FOR  
APARTMENTS

How do you think this device could be designed to minimize interference with able-bodied users? Room in PART. OF TUBS

Comments and Suggestions from Family, Attendants, Health Professionals Etc.

. ALL CHANGES

Thank you very much for your assistance with this Project.

Further Comments and Suggestions

COULD OF USED THIS POLICE @ HOME  
EARLIER IN PHASE 1.

BATTAL BOARDS REPT INTO TUB.  
" " MOBILITY

RT IS GOOD : ONE TRAILS  
TIGER SENT  
of BATTAL BOARD

Evaluator's Comments

Initials

CHECK VALIDITY OF WOODEN  
BATTAL BEACHES





# Ergonomic Evaluation

Location G.F. Strong Rehab. Centre

Date MAY 27/94

## Description of Device to be Tested

### Rail Transfer Device

The device consists of a seat which moves on a rail from the toilet to the bath or shower. This allows the user to transfer only once and eliminates the need for moving a wheelchair around in an inaccessible washroom.

User's Name

Address (if you wish further info. sent to you)

Age 53

Nature of Disability

PARAPLEGIA

Height 6'11"

Weight 215

Present Assistance Required for Transfers

one person assist

## Consent

Bill Minto agree to participate in the evaluation of the Rail Transfer Device by using the device.

Signature

Witness

Bill Minto  
M.J. Bergman (OT student)

Date

May 27/94

+/m. 255-4061 - Aug 1

## User Trails

A test model has been constructed which will be used to collect feedback with regards to the function of the device. Feedback from potential users will be used to further develop this device into a marketable product.

Please give your comments on the function of this device and how it could be improved.

## Transfers

Height and position of sliding toilet seat - too high

Stability throughout transfer - no problem

Level of independence - independent

General comments - seat is tiny, need space on either side  
- need handle on (L) side

**Product Viability**

Before developing this device any further, the extent of its need and usefulness must be known.

Please answer and comment on the following questions.

What was your first impression of the device?

"kind of primitive" Noticed foam on seat - didn't appeal to me

How do you presently cope with inaccessible washrooms?

Used to use a regular chair & transfer self & pull self around with arms

Could this device give you more independence?

comments:

Yes, in my apartment. Bachelor with very small bathroom

Yes

No

Would you use this device if it was installed in an otherwise inaccessible hotel washroom?

comments:

"If I was able to get something like this"

Yes

No

Do you feel that a rail transfer device could take the place of a large, accessible, code washroom?

Comments:

Yes.

How do you think this device could be designed to minimize interference with able-bodied users ?

Just as it is, would be fine

Comments and Suggestions from Family, Attendants, Health Professionals Etc.

Thank you very much for your assistance with this Project.

### Movement along the track

Operating the brake is awkward - except the placement of the handle

Size and comfort and stability of toilet seat - too small

Balance while moving and ease of movement - on side of hips (new foot rest)

Level of independence -

General comments - have a couple of things to be pulled out to be able to

### Using the bath or shower

Operating the taps (simulation)

Level of independence independent

General comments

### Further Comments / Suggestions Concerning the Device's Function and the level independence

Softer seat.

A non-slip foot board would be very helpful

Bars needed on both sides strong enough for transfers.

### Further Comments and Suggestions

Difficulty moving device, but recognizes that there would be improvement with practice

### Evaluator's Comments

### Initials

Bill is quite a big man. He felt the seat was too narrow, and uncomfortable for him. For stability, he really needed his hips and knees to be at a 90° angle. A foot rest of some kind would have helped him move along.

He had difficulty moving the device along the rail. He didn't want to use body movements, and couldn't really find anything to hold on to.



# Ergonomic Evaluation

Location G.F. Strong Rehab. Centre

Date 10/06/94

## Description of Device to be Tested

### Rail Transfer Device

The device consists of a seat which moves on a rail from the toilet to the bath or shower. This allows the user to transfer only once and eliminates the need for moving a wheelchair around in an inaccessible washroom.

User's Name

Address (if you wish further info. sent to you)

Age

Nature of Disability

multiple sclerosis

Height

Weight

Present Assistance Required for Transfers

none.

## Consent

I David Sweet agree to participate in the evaluation of the Rail Transfer Device by using the device.

DAVID SWEET.

Signature

Witness

David Sweet  
Paul Lane

Date 10/06/94

## User Trails

A test model has been constructed which will be used to collect feedback with regards to the function of the device. Feedback from potential users will be used to further develop this device into a marketable product.

Please give your comments on the function of this device and how it could be improved.

## Transfers

Height and position of sliding toilet seat

Stability throughout transfer

very stable

Level of independence

independent.

General comments

**Product Viability**

Before developing this device any further, the extent of its need and usefulness must be known.

Please answer and comment on the following questions.

**What was your first impression of the device?**

*really good idea - saves a lot of steps.*

**How do you presently cope with inaccessible washrooms?**

*- "launch self" onto this  
- normal toilet.*

**Could this device give you more independence?**

comments:

Yes

No

**Would you use this device if it was installed in an otherwise inaccessible hotel washroom?**

comments:

Yes

No

*definitely  
thinks it would be quite useful for many situations*

**Do you feel that a rail transfer device could take the place of a large, accessible, code washroom?**

Comments:

**How do you think this device could be designed to minimize interference with able-bodied users ?**

*- fold it up against the wall.*

**Comments and Suggestions from Family, Attendants, Health Professionals Etc.**

Thank you very much for your assistance with this Project.

### Movement along the track

Operating the brake diff. no prob - would prefer "latch break"

### Size and comfort and stability of toilet seat

- back is back to far

### Balance while moving and ease of movement

fine balance

### Level of independence

independent

### General comments

- slide easily.

would prefer something to grab on  
like grab bar on wall of tub.

### Using the bath or shower

#### Operating the taps (simulation)

no problem.

#### Level of independence

indep.

#### General comments

- would like lock for seat when in tub.

### Further Comments / Suggestions Concerning the Device's Function and the level independence

- grab bar

- flat, hard, uncomfortable seat - would like contour + padding

- lateral support on seat

**Further Comments and Suggestions**

- looks good for a prototype.

**Evaluator's Comments**

**Initials**

# Ergonomic Evaluation

Location

G.F. Strong Rehab. Centre

Date

## Description of Device to be Tested

### Rail Transfer Device

The device consists of a seat which moves on a rail from the toilet to the bath or shower. This allows the user to transfer only once and eliminates the need for moving a wheelchair around in an inaccessible washroom.

User's Name

Address (if you wish further info. sent to you)

Age

Nature of Disability

Present Assistance Required for Transfers

ALISON CLARK.

BRAIN STEM LESION

ONLY IN THE MORNING.

35

Height

5'2"

Weight

108 lbs

## Consent

I \_\_\_\_\_ agree to participate in the evaluation of the Rail Transfer Device by using the device.

Signature \_\_\_\_\_

Date \_\_\_\_\_

Witness \_\_\_\_\_

## User Trails

A test model has been constructed which will be used to collect feedback with regards to the function of the device. Feedback from potential users will be used to further develop this device into a marketable product.

Please give your comments on the function of this device and how it could be improved.

## Transfers

Height and position of sliding toilet seat

Stability throughout transfer

Level of independence

General comments

**Product Viability**

Before developing this device any further, the extent of its need and usefulness must be known.

Please answer and comment on the following questions.

What was your first impression of the device?

Doesn't look like it would help  
look like.

How do you presently cope with inaccessible washrooms?

Avoid them (like the place)

Could this device give you more independence?

comments:

Yes

No

NEED MORE HELP. - LEGS OVER TOP  
like to weight down (standing up)

Would you use this device if it was installed in an otherwise inaccessible hotel washroom?

Yes No

comments:

Person would need to know how to use it

Do you feel that a rail transfer device could take the place of a large, accessible, code washroom?

Comments:

ACCESSIBLE  
WOULD FEEL SAFER.

How do you think this device could be designed to minimize interference with able-bodied users?

MOVE IT OUT OF THE WAY!

Comments and Suggestions from Family, Attendants, Health Professionals Etc.

Thank you very much for your assistance with this Project.

**Movement along the track**

Operating the brake

Size and comfort and stability of toilet seat

Balance while moving and ease of movement

Level of independence

General comments

**Using the bath or shower**

Operating the taps (simulation)

Level of independence

General comments

**Further Comments / Suggestions Concerning the Device's Function and the level independence**

*of RETRACTABLE ARM RESTS ON BOTH SIDES*  
*- LIFT ~~OFF~~ SIDE TO WITHHELD LOW*  
*W/ WAIT TO TRAVEL, TO INCREASE REACH*  
*- HOLD OUT ON OTHER SIDE*  
*More Cushion on SEAT.*

**Further Comments and Suggestions**

**Evaluator's Comments**

**Initials**



APPENDIX F

SUMMARY OF G.F. STRONG AND IN-HOUSE TESTS

## APPENDIX F - SUMMARY OF IN-HOME TESTING

**Home #1** (Photo set 2)

**User:** Female stroke victim

**Environment:** The device was installed in a large sized shower, in a chair accessible washroom without a bathtub. The device reduced the number of transfers necessary. However, the regular method of transferring from bed to a shower chair and then to a regular chair after showering with the help of an attendant was considered acceptable, even with the extra transfer onto the toilet. Two women with disabilities who live upstairs also tried the device in this setting and reacted positively.

**Home #2** (Photo set 3)

**User:** 28 year old male paraplegic

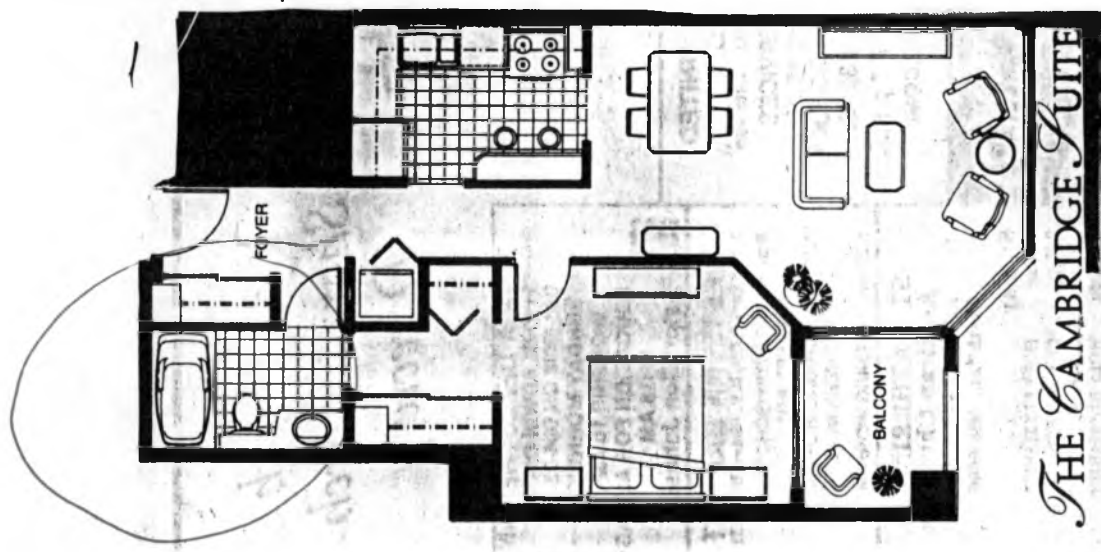
**Environment:** The toilet is located beside the bathtub. The taps of the bathtub are located behind the seat of the device in position. Normally a bath bench was used. The device was used and was considered to be helpful.

**Home #3** (Photo set 4)

**User:** 38 year old male C7 quadriplegic

**Environment:** The toilet is located beside the bathtub. The taps of the bathtub are located in front of the seat. A bath bench was normally used. The device was used and response was favorable.

All home tests generated a positive response. However a regular method of transfer was retained for the present . . .



Bathroom configuration similar to home #2 and #3.

## APPENDIX F. - SUMMARY OF G.F. STRONG TESTING

<u>Disability</u>	<u>Age</u>	<u>Height</u>	<u>Weight</u>	<u>Transfer Assistance</u>
Paraplegia, male	53	6'1"	215 lbs.	One person assistance
Stroke, right hemiplegia				One person assistance
Multiple sclerosis, male				None needed
Stroke, left side	38	5'7"	175 lbs.	None needed
Paralysis, male				
Quadriplegic, male	25	6'	140 lbs.	One person assistance
Multiple sclerosis, female	32	5'3"	115 lbs.	One person assistance

### **Observations**

#### Seat

Seat was too narrow(16") for comfortable transfers so it was widened to 18". To further aid the comfort of the user deeper cushioning was used and the back rest was made adjustable to different angles.

#### Brake

Pin brake did not allow user to stop anywhere on the track. The brake was modified to allow this.

#### Arm Rests

Arm rests were installed on both sides of the chair for comfort and safety.

#### Crossbars

Crossbars were installed so that the user could pull and push on them to help them move along the track and to stop themselves from falling should they lose their balance.

## General

The front of the chair should remain unobstructed for ease of transfer and so that provisions can be made for waist straps.

## **APPENDIX F (Continued)**

### Conclusion

Although the G.F. Strong trials yielded a relatively small user group, the documents and suggestions were consistent. The feedback has indicated how the device can be improved. Before the next stage of testing, i.e. in home evaluations, the results of the G.F. Strong tests were used to modify the prototype.

