RESEARCH REPORT

COST OF FLEXHOUSING

HOUSING TECHNOLOGY SERIES

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Cost of FlexHousing™

Final Report

Canada Mortgage and Housing Corporation

October 2002

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Sun Ridge Group

In association with

John Carroll of Carroll Homes Ltd. for costing the project

Rita Lalonde, for producing the report

Doug Schmidt of CADvantage Design Ltd. for the design work

Access 2000 for their elevator/stair lift information

Tartan Homes for their preliminary plans

Dave Fetsch, P. Eng and Sun Ridge Group for managing the project

CMHC for sponsoring this study

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Introduction

FlexHousing is an idea that is gaining popularity in North America. As housing and land prices continue to rise and land becomes less available—especially in large urban areas, buying a house that will allow you to have flexible options in the future is economical, sustainable and feasible.

FlexHousing is affordable, adaptable and accessible housing. It takes extra planning time, but the pay-off is a comfortable home that will satisfy special needs in the future. This project shows the breakdown of costs involved in building a home with many of the FlexHouse options, as well as the cost to renovate an existing house to make it accessible and adaptable.

This research project involved selecting a benchmark house that is a popular design and would be constructed in volume by larger builders. Design modifications were then made to the plan to incorporate features that make the house relatively easy to modify as the family's needs change. These features include changes to accommodate mobility and make the house easier to live in right from day one. Other features include planning for expansion of the house, such as a suite in the basement and a bonus room in the attic.

The results of this project show that for only a few per cent over the price of the benchmark house, many features can be incorporated from day one, and other features can be preplanned for easy future upgrades. For instance, an upgrade of only $2,631.00 can provide grade access, wider hallways, lever style door handles, wider doors and provision for a future elevator, a wet bathroom and an accessible kitchen. Future upgrade costs that include $25,000.00 for an elevator and incorporating all of the other upgrades would add only another $34,952.00 for a total of $37,583.00.

If the benchmark house would be upgraded to include all of these features, the total upgrade cost would be $63,600.00 or about 70 per cent more than when the features were planned for in advance. The up-front costs of about 2 per cent are quite minimal for substantial savings in the future and can be sold as an upgrade just like a whirlpool tub or upgraded flooring.

There are additional benefits to preplanning and incorporating some basic features at the construction stage. The home is much easier to live and work in right from the start, even if mobility or some other physical limitation is not currently an issue. The home is also much more inviting to friends and family who need or would appreciate the accessible features.

Similar scenarios apply to creating additional space in the house by planning for it at the construction stage. Attic expansion or a basement suite are much less expensive if services and the structure can accommodate easy future development. This holds potential for an expanding family, returning family members, or another revenue source.

FlexHousing is truly a concept that builders should consider incorporating into their sales package. A minimal amount of education at the beginning can provide a good opportunity at expanding markets. Training for both the sales force and for the construction personnel is a small investment that can be recovered in a short period of time.

Executive Summary

This project shows the breakdown of costs involved in building a new home with many of the FlexHouse options, as well as the cost to renovate an existing home to give it those qualities. Costs where determined in Saskatoon in 2002.

Our Benchmark House Plan is 173 m^2 (1,863 sq. ft.)

The main floor has a covered porch entryway with a hallway and archway into the living room that is spacious and can be renovated into an office/den or a bedroom if needed. The U-shaped kitchen provides ample cupboard space; the family room is large and has a fireplace. The dining room also offers a great space for entertaining.

The benchmark house is built with the following standard features:

- 813 mm (32 inch) doors,
- Standard light switches and wall plugs,
- No reinforced walls,
- Standard weight Berber carpet and linoleum,
- Locks and hardware are good quality, but standard knob style,
- Windows are casement style with mid-grade energy efficiency and have locks and operators that are easy to use,
- The furnace, hot water tank and thermostat controls are all mid-grade to high efficiency.

The Basic FlexHouse version of the benchmark house includes provision for those items that will make the house adaptable in the future to include a liveable attic space and/or a basement suite, (the roughed-in extra living space is 1,106 sq. ft.). Also, it provides features that make the house more comfortable and easier to live in for those with limited mobility. Some of the features, such as wider doorways and wider hallways, will be present from day one while other features will only be roughed-in.

Costs of Basic FlexHouse Features	$ 7,833.00
Cost of Benchmark	$143,072.00
Total Cost of Basic FlexHouse	$150,905.00

5.5% over the cost of the benchmark house
includes rough-in for basement and attic - additional 1106 sq. ft.

2.0% over cost of benchmark house
includes rough-in for basement - additional 748 sq. ft.

The Full FlexHouse is a very functional home and will accommodate even someone who requires wheelchair access. With the revenue potential to offset the cost of the renovation, this house plan is feasible. However, the attic conversion would only be useful to a family who truly needed the space. It will be a functioning bedroom, or office/play room, but it may be easier to renovate the family or living room on the main level than to expand into the attic. Again, because FlexHouse concepts are designed into the original plans, this renovation is uneventful and the homeowners will be pleased with the results.

Without Elevator

Cost to Renovate	$ 49,605.00
Original Cost of Basic FlexHouse	$150,905.00
New Cost of Full FlexHouse	$200,510.00

Includes finishing an extra 1,106 sq. ft. of living space

The Cost of FlexHousing™

FlexHousing is affordable, adaptable and accessible housing. It takes extra planning time, but the pay-off is a comfortable home that will satisfy the occupants' changing needs over their lifetime. This project shows the breakdown of costs involved in building with many of the FlexHouse options, as well as the cost to renovate an existing house to give it those qualities. Costs where determined in Saskatoon in 2002.

What Makes a FlexHouse Flexible?

FlexHousing is planning for your changing needs. Planning your front entry so that it is accessible and inviting to visitors, choosing cabinet hardware that is D-shaped, using lever-style door handles and selecting non-slip, low-maintenance flooring, are simple ideas that ensure your home is comfortable and useable, as you grow older. Good planning includes everyone, whether they are young and fit or older and may be developing mobility problems.

FlexHousing concepts address more than just mobility issues. Using extra space more efficiently may permit a future in-law or revenue suite, a wise idea that literally pays the homeowner back! Previous documents written by CMHC including *"FlexHousing, Homes that Adapt to Life's Changes"* and *"FlexHousing, The Professionals' Guide"* reveal that FlexHousing is achievable.

Our FlexHousing costing reflects a "move-up" home. We have concentrated on features that would make this home more accessible and adaptable over time. Our costing detail reveals that most of these features are inexpensive and easily incorporated. This makes FlexHousing an efficient approach to home construction.

We think that the basic FlexHousing principles can be introduced to a greater or lesser extent depending on the perceived need; for example, provision for an attic expansion may be worth considering in some markets but not in others.

Living in Our FlexHouse

Imagine an established family who purchases our FlexHouse after living in a smaller starter home or condo. The three-bedroom house has three bathrooms: two three-piece baths upstairs plus a two-piece bathroom on the main floor. The laundry room is located on the second floor for convenience. The use of special trusses provides the opportunity for a livable attic. The basement is also unfinished but is roughed-in for plumbing and electrical with private access at the side of the house.

The established family invites their parents to live with them. The grandparents graciously decline for now and the family uses the living room as a home office. Later, the family completes the bonus room with a two-piece bathroom to allow for a bedroom, home office or games room. The basement is finished as a two-bedroom apartment complete with a full three-piece bath, kitchen and laundry for their teenager or as an income-producing unit. This allows the family full use of the house.

The children eventually move out and our couple rents out the basement suite as a revenue property. The remaining grandparent becomes more dependant and decides to move in. The elevator is installed. As the couple age, they hire a live-in home care worker to help with the care of the grandparent. The home care worker has the private suite in the basement and can be near when required.

This scenario demonstrates the full use of the FlexHouse concepts throughout the lifespan of one family. We trust that our study will show that FlexHousing is accessible, adaptable and affordable.

Benchmark House

We based our benchmark house on a popular 162 m^2 (1,743 sq. ft.) plan. Tartan Homes of Ottawa provided us with a preliminary drawing and we have ensured that our specification list includes the same standard finishes. This plan was chosen because it has a floor plan that builders, particularly in Ontario, consider a "good seller."

Thanks to CADvantage of Saskatoon, the plans were modified slightly to allow for a covered deck off the back door. The back wall of the house was extended to allow extra room in the kitchen and family room. It provides space for the side entry into the basement but the main bathroom is between floors.

Our Benchmark Plan is now 173 m^2 (1,863 sq. ft.)

The main floor has a covered porch entryway with a hallway and archway into the living room that is spacious and can be renovated into an office/den or a bedroom if needed. The U-shaped kitchen provides ample cupboard space, and the family room is large and contains a fireplace. The dining room also offers a great space for entertaining.

The benchmark house is built with the following standard features:

- 813 mm (32 inch) doors
- Standard light switches and wall plugs
- No reinforced walls
- Standard weight Berber carpet and linoleum
- Locks and hardware are good quality, but standard knob style,
- Windows are casement style with mid-grade energy efficiency and have locks and operators that are easy to use.
- The furnace, hot water tank and thermostat controls are all mid-grade to high efficiency.

The disadvantages to this plan for FlexHousing purposes are primarily the stairs and the location of the main floor bathroom and the laundry. A future stair lift is a possibility but not ideal because of the curve of the staircase. The stairway cannot be made wide enough to accommodate the lift plus an able-bodied person. However, a future stair lift would meet the needs of many who are mobile but cannot climb stairs.

We thought it is better to deal with these disadvantages instead of trying to find a "perfect" plan. We want to show that with advanced planning before construction begins, this house plan and other popular plans can incorporate FlexHousing features without a large increase in cost.

The cost of the benchmark house is $143,072.00. This is our base price that is used to compare costs within this project. This price does not include taxes since provincial tax varies from province to province and GST may vary from a renovation to new construction.

Basic FlexHouse

This FlexHouse version of the benchmark house includes provision for those items that will make the house adaptable in the future to include a liveable attic space and/or a basement suite. Also it provides features that make the house more comfortable and easier to live in for those with limited mobility. Some of the features, such as wider doorways and wider hallways, will be present from day one while other features will only be roughed-in.

Entranceway

The front yard is graded to provide proper drainage away from the house and is landscaped to provide a pleasant, meandering path from the driveway sidewalk to the front door. By using berms, we have gradually raised the level of the path, so that there is no need for any steps, thereby making it comfortable for those who cannot manage stairs. The covered entrance protects the flush threshold from the elements and shelters those arriving.

Doors and Thresholds

All doors are a minimum 865 mm (34 inch) wide and have lever-style door handles. The front door has a side window panel. This allows anyone to check who is at the door before it is opened and does not require a peephole. The locks and bolts are easy to secure. A closet at the entrance is convenient. The exterior thresholds are under 19 mm (3/4 inch) in height to provide easy, unencumbered access to both the front and back porches. Because our plan has open archways, the main floor feels spacious and provides lots of room for maneuvering.

Electrical

All light switches are placed 840 mm (33 inch) from the floor and electrical outlets are installed 450 mm (18 inches) from the floor throughout the house. There is no additional cost to provide wiring in these convenient locations.

Bathrooms

The main bathroom is raised so that it is level with the main floor. A storage shelf is installed along the wall of the bathroom to provide added open storage for household supplies. Single-levered faucets are used although some people find two-lever faucets less confusing. Pedestal style and wall-mounted bathroom sinks are chosen and installed at construction, as they are easy to use from a seated position.

The second floor bathrooms are constructed so that the main bathroom has a 910 mm (36 inch) door and is easily accessible. The two bathrooms have been reconfigured from the benchmark plan so that the master bathroom can be renovated in the future to accommodate a walk-in shower with wet floor and drain. By planning ahead, this floor plan ensures that future renovations are economical.

Reinforcements

Walls in all the bathrooms are reinforced with 19 mm (3/4 inch) plywood. This will allow easy installation of grab bars to meet the needs of all occupants in the future.

Handrails

Walls in the stairway are reinforced to permit easier installation of extra handrails or a future stair lift. We believe that since most houses do not have reinforced walls (this adds minimal cost at the time of construction) it was an important safety issue. The handrails are placed between 813 mm (32 inches) and 920 mm (36 inches) above the nosing. The railing is oval in shape and 30 mm (1-1/4 inches) in diameter.

Bedrooms

All bedrooms have closet space. The master bedroom has an ample walk-in closet, and a storage closet that could be used as an elevator shaft if needed in the future.

Laundry Room

The laundry room is relocated from the stairwell to its own closet on the second floor. The plan includes the cost of plumbing and electrical to this area. This location is more convenient for everyone.

Private Entrance to Basement

By planning and constructing the main floor bathroom and the laundry room in their new locations, we now have an area for the private entrance to the basement suite, if the basement suite option is taken in the future. We have built a clothes closet at this entrance for extra storage.

Kitchen

The U-shaped kitchen is a maneuverable area thanks to our benchmark house design. Electrical outlets are installed on the front of cabinets. The sink drain is lower at installation to allow the kitchen sink height to be easily changed in the future. Walls are reinforced with 19 mm (3/4 inches) plywood to allow for the lowering of the sink and cook-top. Cabinets have D-shaped handles for convenience. A wall oven is installed beside the pantry or refrigerator.

Rough-in for Elevator

Providing the possibility for safe access to all levels for those who cannot easily and safely manage stairs is an important issue for the future. Consequently, the plan provides space for the installation of a home elevator, wall reinforcement, as well as the extra electrical wiring that may be required. The pit is located in the concrete of the basement floor allowing access to all main floors and the basement, and helping contain the sound of the hydraulics, making the lift very quiet. This may be an important issue for an occupant in the basement suite.

Rough-in for Basement Suite

Everything a self-contained in-law suite needs is roughed-in at this time including electrical, cable, Internet and telephone lines. The kitchen plumbing and venting are roughed-in. Future needs for a three-piece bathroom, as well as heating and ventilation are roughed-in. Larger windows are installed to make this suite bright and inviting, and to meet the bedroom escape requirements of the National Building Code. If this suite were to be occupied by someone unrelated to the family, the code would require a separate heating and air supply, sound separation, increased fire ratings etc. (would provide additional 748 sq. ft. of living space)

Attic: Truss System and Bonus Room

To construct this home with provision for an attic bonus room, the entire roof design is changed from the benchmark plan. This is relatively easy to do at time of construction, but is expensive to complete as a renovation. A vapour barrier and insulation is installed.

The stairs leading to the bonus room as well as all electrical, cable, Internet and telephone lines are roughed-in. The two-piece bathroom with exhaust fan vented out, heating and ventilation are planned and a window is roughed-in. (This would provide an additional 348 sq. ft. of living space.)

The cost increase from the benchmark plan is due to constructing the home with all the basic FlexHouse concepts. These improvements will dramatically affect the usefulness of this house in the future. The small increase in cost provides the owners with features that are more convenient from day one, and will save money and reduce stress in the future when renovations are needed so the occupants can continue living in the home in their senior years.

Costs of Basic FlexHouse Features	$ 7,833.00
Cost of Benchmark	$143,072.00
Total Cost of Basic FlexHouse	$150,905.00
5.5% over the cost of the benchmark house includes rough-in for basement and attic - additional 1,106 sq. ft.	
2.0% over cost of benchmark house	$2,910.00
Total cost of basic without attic	$145,653.00
includes rough-in for basement - additional 748 sq. ft.	

Renovating a Basic FlexHouse to a Full FlexHouse

Pricing renovations is a risky business for a builder. The unforeseen problems can seem endless and can easily run a project over budget. If the builder knows the house, or perhaps has built the house originally, it helps tremendously.

Our costs do not include a mark-up for contingency problems that happen during a renovation. We have charged a mark-up that is higher than our new housing construction, which is normal procedure.

This renovation puts into action all the FlexHouse elements of accessibility and expandability.

Elevator

The elevator is installed. The garage storage room and the master bedroom storage closet are replaced to hold the working elevator. New doors are installed in the garage, the master bedroom and basement as part of the elevator installation.

Bathrooms

The toilet in the main floor bathroom is moved to make this bathroom more accessible. We take space from the side entry closet to expand this room. The master bathroom on the second floor has the tub removed so that a wet-floor with drain can be used as a walk-in shower in its place. The pedestal sink is moved to allow for more maneuverability. The second floor main bathroom remains untouched as it was constructed accessible at the Basic FlexHouse stage. The pre-planning of this room saves a tremendous amount of time and money in bathroom renovations.

Kitchen

The kitchen sink is lowered easily as the drain line was installed lower at the time the Basic FlexHouse was constructed. The cook-top is lowered; cupboard doors are removed from underneath the sink and cook-top to accommodate a seated person.

Because the Basic FlexHouse is well planned at construction, the renovation to Full FlexHouse is relatively painless in terms of renovation time, waste and disarray. The main cost of the renovation is in the elevator. The reinforcing of bathroom and kitchen walls allow for the re-hanging of sinks and cupboards without a lot of work or untidiness. The homeowners will find that this renovation is relatively trouble-free and is an attainable reformation.

Attic

The attic is converted into the finished bonus room. Because our Basic FlexHouse planned for this potential expansion, the open trusses make this job achievable. Installing the stairwell from the second floor to the attic will be very challenging and is considered a difficult job. The walls and ceilings are insulated, dry-walled and painted. The two-piece bathroom is finished. The flooring and lighting are installed. The window will be larger in order to accommodate the sheets of four-foot drywall that will be delivered through this window. The completed bonus room provides 32.3 m^2 (348 sq. ft.) of additional living space.

Basement Suite

The basement is finished as a two-bedroom unit with kitchen, bathroom, laundry and living room areas. The side entrance closet is

reconfigured to provide a half-closet where boots and shoes are placed. It is an effective way of using what would have been wasted space. Plumbing and venting are completed. The unit is dry-walled, painted; light fixtures and flooring complete the job.
(If this suite were to be occupied by someone unrelated to the family, it would require the code features mentioned earlier).

The Full FlexHouse is a very functional home and will accommodate even someone who requires wheelchair access. With the revenue potential to offset the cost of the renovation, this house plan is feasible. However, the attic conversion would only be useful to a family who truly needed the space. It will be a functioning bedroom, or office/play room, but it may be easier to renovate the family or living room on the main level than to expand into the attic. Again, because FlexHouse concepts are designed into the original plans, this renovation is uneventful and the homeowners will be pleased with the results.

Cost to Renovate Basic FlexHouse to full FlexHouse

With Elevator Installed

Cost to Renovate	$ 74,605.00
Original Cost of Basic FlexHouse	$150,905.00
New Cost of Full FlexHouse	$225,510.00

49% over the cost of Basic FlexHouse
includes finishing basement and attic - additional 1,106 sq. ft.

Without Elevator Installed and Without Attic Bonus Room

Cost to Renovate	$ 28,662.88
Original Cost of Basic FlexHouse	$145,653.00
New Cost of Full FlexHouse	$174,316.00

19% over the cost of Basic FlexHouse
includes finishing basement - additional 748 sq. ft.

FlexHouse Costing Summary

New Construction Costs

	Increases	Total Cost
Benchmark		
Total Cost		$143,072.00
Basic FlexHouse (adaptable and accessible)		
Cost of Upgrades	$7,833.00	
Cost of Basic FlexHouse		$150,905.00

Renovation Costs

	Increases	Total Cost
Basic FlexHouse to Full FlexHouse		
Cost to Renovate	$74,605.00	
Original Cost of Basic FlexHouse	$150,905.00	
Total Cost after Renovation		$225,510.00
Benchmark House to Full FlexHouse		
Estimated Cost to Renovate	$150,000.00	
Original Cost of the Benchmark	$143,072.00	
Total Cost after Renovation		$293,072.00

It doesn't take much time to realize that a little planning before construction begins can save homeowners a lot of money. Comparing the cost of the benchmark house to the FlexHouse options shows that the Basic FlexHouse increases the cost of the house by about five per cent initially. That is an extremely reasonable cost increase when you consider the benefits of having FlexHouse concepts in place.

The Full FlexHouse is 57 per cent higher than a standard benchmark house but that gives you full access to all floors and garage with an elevator. If the need for an elevator does not exist, the costs increase is only about 40 per cent.

Having the private suite is also appealing if you plan to accommodate aging parents, or have a home care worker live-in. As nursing home costs increase and subsidized care

decreases, there will be a greater demand for homes built, not only accessible, but also adaptable. The extra space in the house allows you the option of having a home office/business where you can deduct part of your house as a business expense. FlexHousing is able to address these requirements.

Unit Costing

The advantage of volume building 20 Basic FlexHouses would be 20 happy families, spreading the word about a great housing concept called FlexHousing. In terms of benefits to the builder—anything that the builder would order in volume for a large project would be subject to a volume discount rate. Items like 865 mm (34 inch) doors and levered door handles would be more readily available and kept in stock if volume buyers demanded them.

Builders who build in large volume will save the same amount in FlexHouse feature items as they traditionally save in other construction costs. In theory, the volume contractor will save the most; whereas the smaller builder may not be able to enjoy the same quantity discounts rates. FlexHousing concepts will not change that advantage.

Recommendations

FlexHousing is a practical plan for the future. Selling the idea to homeowners and builders may be a challenge. Why? There are so many things to consider when you think about FlexHousing that even the team producing this report struggled with the number of features to consider.

The challenge to promote the FlexHouse concept is to break it down into achievable steps. A family can live content for years when FlexHouse concepts like planning for grade level entryways, choosing better hardware and door sizes, and reinforcing kitchen and bathroom walls are utilized. Perhaps that is what should be promoted. The more complicated or expensive items like the stair lifts and elevators may never be required. Promoting the wisdom of planning first, then building, is important.

Builders need to sell what they build. They are quite cautious and conservative when it comes to change. Planning for grade level entryways or installing wider doors is not something they feel compelled to do. Training and education may be the most efficient method to promote FlexHousing to the building industry. Builders need to know that being knowledgeable about FlexHousing will get them ahead of their competitor (and it is a competitive business). If you can show builders that it will increase sales then applying FlexHousing concepts will increase dramatically.

Feedback from builders will be helpful as well. What is it about FlexHousing that is hard for them to implement? It may just be that it is new and they do not have the time to get their company up to speed. The concept doesn't make money up front and it may be a hard sell to some homeowners who don't feel accessibility and adaptability are issues for them. Without actually discussing it with builders and getting their input it is hard to guess why they would not implement FlexHousing concepts.

From the information we have gathered from builders and engineers, there really is no technical training required other than becoming more aware of accessibility issues and the requirements for those with mobility and health problems. As we have shown in this project, once you are aware of the issues and are familiar with the requirements, making changes in designs and materials is not difficult at all and they are very inexpensive.

Conclusions

Nothing brings more anxiety to a homeowner than having to renovate a perfectly good bathroom to install a grab bar. The waste and the fact that you have to pay for that waste are hard to accept. For a minimal cost, houses can be built more efficiently—making renovations in the future easier and affordable.

Homeowners, although they don't always like to admit it, depend on government agencies, building codes and the advice of their building contractor to provide them with good, helpful information to construct their home. They depend on contractors to build a home that will suit their needs now and into the future. Something as simple as reinforcing bathroom walls to allow for grab bars is not something a homeowner thinks about, until they are trying to install a grab bar and it can't be done properly. At that moment good construction becomes very important and makes sense.

FlexHousing features are just “Good Construction.” A mother carrying in groceries and a screaming two-year old at the same time can appreciate the larger doorways. The furniture mover can also appreciate those extra inches when that perfect sectional couch needs to be moved in. The cost is not excessive and everyone appreciates a well-built home.

Our project shows that building a home with FlexHousing principles can be inexpensive. It takes some extra planning and good choices of materials and finishing hardware, but FlexHousing is the technique by which “Good Construction” will be measured, now and in the near future.

Appendix A

Costing Spreadsheets

New Construction Upgrade Costs		
Benchmark to Basic Flex		
		1st
Items (marked with* changed for priority column)	Upgrade Cost	Priority
Lever door knobs	$580.00	$580.00
Doors - 865 mm (34 in)	$203.00	$203.00
Blocking bathroom, ceiling, handrails framing	$50.00	$50.00
Blocking bathroom, ceiling, handrails lumber	$106.00	$106.00
Stairs	$75.00	$75.00
Light switches 840 mm (33 inches from floor)	$0.00	$0.00
Plugs 450 mm (18 in) from the floor	$0.00	$0.00
Plugs on cabinet face	$0.00	$0.00
Laundry on 2nd floor	$0.00	$0.00
Lower door thresholds	$178.00	$178.00
New private entrance door	$259.00	$259.00
New closet at side door	$296.00	$296.00
More closet space upstairs	$91.00	$91.00
Framing labour	$90.00	$90.00
	$1,928.00	
Rough-in for elevator		
Wall and pit, 2 extra corners in basement and lowering elevator pit 3'x5' - 12"	$265.00	$265.00
Framing elevator shaft	$75.00	$75.00
Electrical for elevator	$75.00	$75.00
Basement (install 3 larger windows in basement)		
Windows - larger for basement occupancy	$103.00	$103.00
Window wells	$135.00	$135.00
	$653.00	
Third floor attic/Bonus (extra 348 sq.ft.)		
Plumbing rough-in 2-pc bath *	$230.00	
Electrical, phone, TV, cable and heat rough-in*	$80.00	
Install 48”x48” window*	$414.00	
Insulate and poly ceiling, remove ceiling R40, install R20 batts*	$1,327.00	
Rough-in stair access*	$75.00	
Attic trusses*	$1,834.00	
Framing*	$406.00	
Subtotal	$6,947.00	$2,581.00
Markup	$886.00	$329.08
Total upgrade cost	$7,833.00	$2,910.08
Add the cost of the benchmark house	$143,072.00	$143,072.00
Total cost	$150,905.00	$145,982.08
Percentage increment for Flex features	5.5%	2.0%

Renovation Costs		
Basic Flex to Full Flex		
Items (marked with* changed for priority column)	Upgrade Costs	1st Priority
Accessible Features		
Change tub to shower master bathroom, Relocate toilet on main floor	$495.00	$495.00
Electrical - minor bathrooms + elevator	$332.00	$332.00
Drywall bathroom and shower	$695.00	$695.00
Painting bathroom	$425.00	$425.00
Finishing - add 3 more doors for elevator, redo trim in bathrooms	$875.00	$875.00
New flooring in master bath	$375.00	$375.00
Elevator*	$25,000.00	
Clean-up	$250.00	$250.00
House labour	$675.00	$675.00
Basement suite 748 sq. ft.		
Attic bonus room 348 sq. ft. (* items reduced by .465=attic cost)		
Plans	$275.00	$275.00
Building permit	$375.00	$375.00
Lumber-framing walls in basement and bonus room*	$2,280.00	$1,219.80
Insulation and poly-basement outside walls	$1,168.00	$1,168.00
Stairs to bonus room*	$300.00	
Handrail in bonus room*	$630.00	
Framing labour *	$1,875.00	$496.88
Plumbing - install bathrooms in basement and bonus rooms*	$1,475.00	$789.13
Ventilation and heating*	$800.00	$428.00
Electrical plugs, switches and lights*	$1,023.00	$547.31
Drywall and taping*	$5,468.00	$2,925.38
Lights*	$600.00	$321.00
Painting*	$2,750.00	$1,471.25
Finishing doors and trim*	$3,562.00	$1,905.67
Mirrors in bathrooms*	$190.00	$101.65
Cabinets	$3,175.00	$3,175.00
Flooring*	$5,448.00	$2,914.68
Clean-up	$375.00	$375.00
House labour - removing old bathrooms etc	$1,275.00	$1,275.00
Subtotal	$62,166.00	$23,885.74
Markup (higher on renovations)	$12,439.00	$4,777.15
Cost to renovate Basic Flex to Full Flex	$74,605.00	$28,662.88
Plus - Cost of Basic Flex	$150,905.00	$145,982.00
Total cost	$225,510.00	$174,644.88
Percentage increment for Flex features	**49.4%**	**19.6%**

Renovation Costs		
Benchmark to Full Flex		
(not including basement suite or attic expansion)		
Items (marked with* changed for priority column)	Upgrade Cost	1st Priority
Lumber for raising bathroom floor and redoing second floor	$651.00	$651.00
Framing labour in bathrooms and walls as needed	$1,875.00	$1,875.00
Plumbing: moving bathroom and laundry	$2,350.00	$2,350.00
Electrical for laundry, bathroom, elevator	$1,275.00	$1,275.00
Drywall repair - Bathrooms, kitchen, dining, laundry, bedrooms	$4,850.00	$4,850.00
Repainting the above rooms	$2,475.00	$2,475.00
Finishing 2 new doors for elevator, replacing old doors, baseboards*	$1,300.00	
Kitchen cabinets, redoing counter, sink, cook-top,	$3,200.00	$3,200.00
Flooring	$4,675.00	$4,675.00
Elevator*	$23,750.00	
Labour to remove old materials	$4,275.00	$4,275.00
House clean-up and landfill fees	$675.00	$675.00
Ramp for front of house	$1,600.00	$1,600.00
Subtotal	$52,951.00	$27,901.00
Markup (higher on renovations than new)	$10,649.00	$5,580.20
Total of renovation from benchmark	$63,600.00	$33,481.20
Cost of Benchmark House	$143,072.00	$143,072.00
Total cost	$206,672.00	$176,553.20
Percentage increment for Flex features	44.5%	23.4%

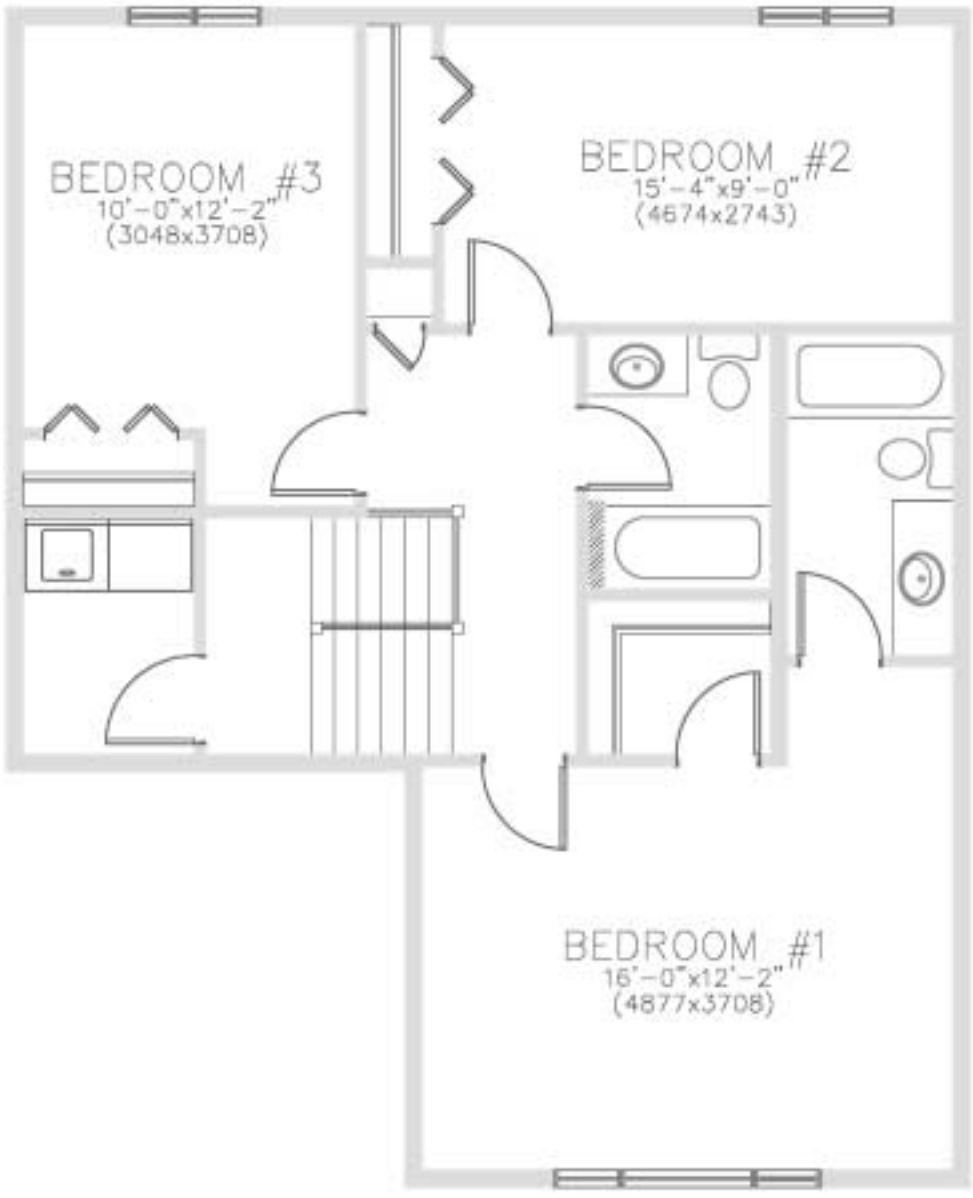
Appendix B

House Plans

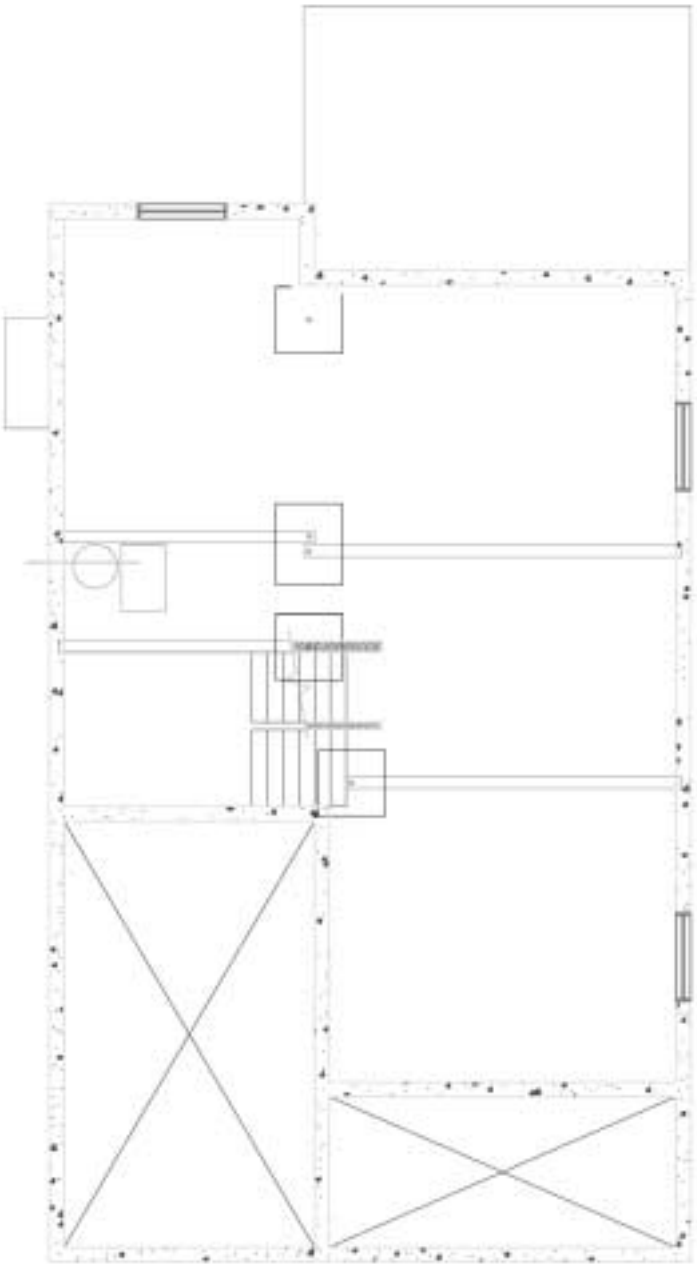
Front Elevation - Bench mark House

Main Floor Plan - Bench mark House - 983 sq. ft. (91.3 m^2)

Second Floor Plan - Bench mark House - 880 sq. ft. (81.75 m^2)



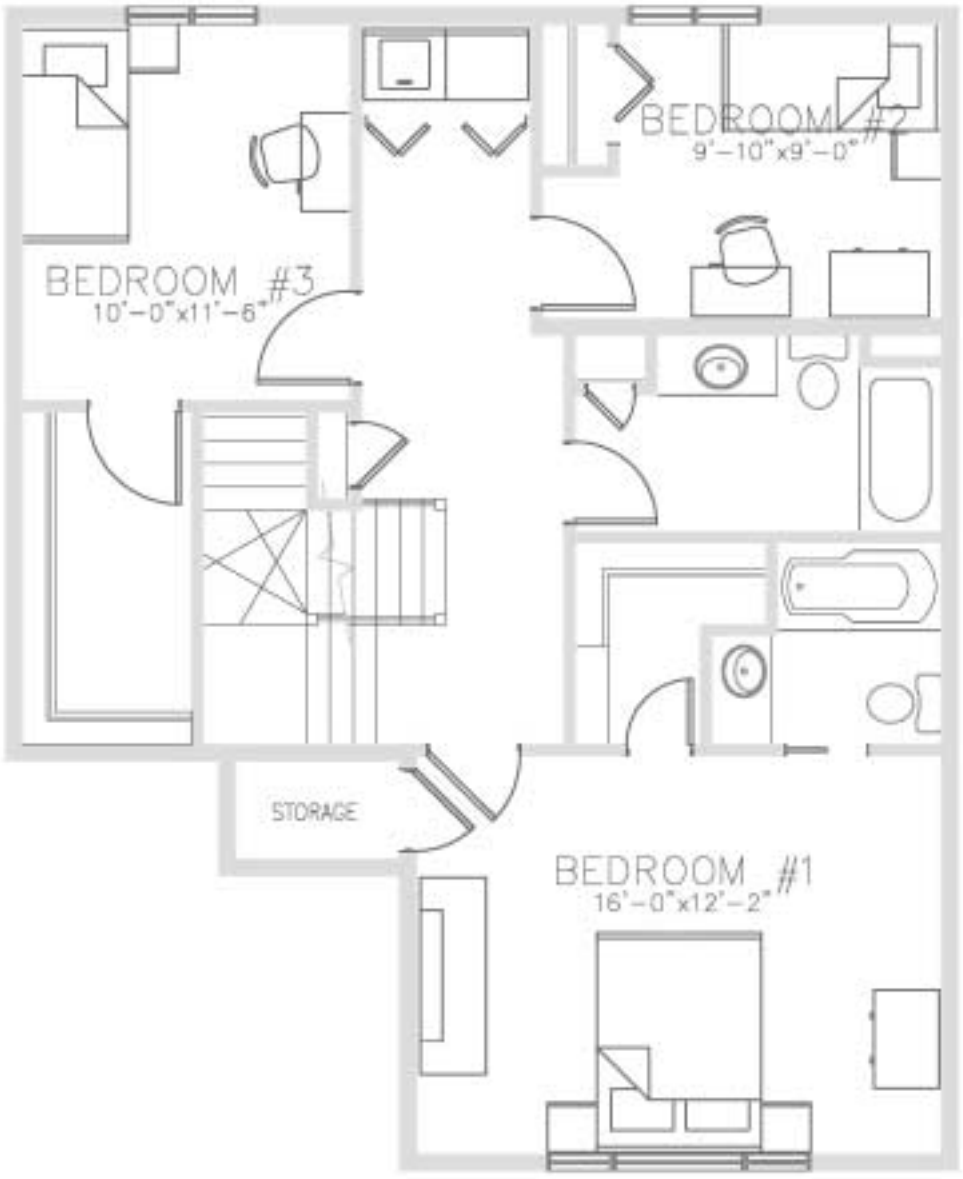
Foundation - Bench mark House



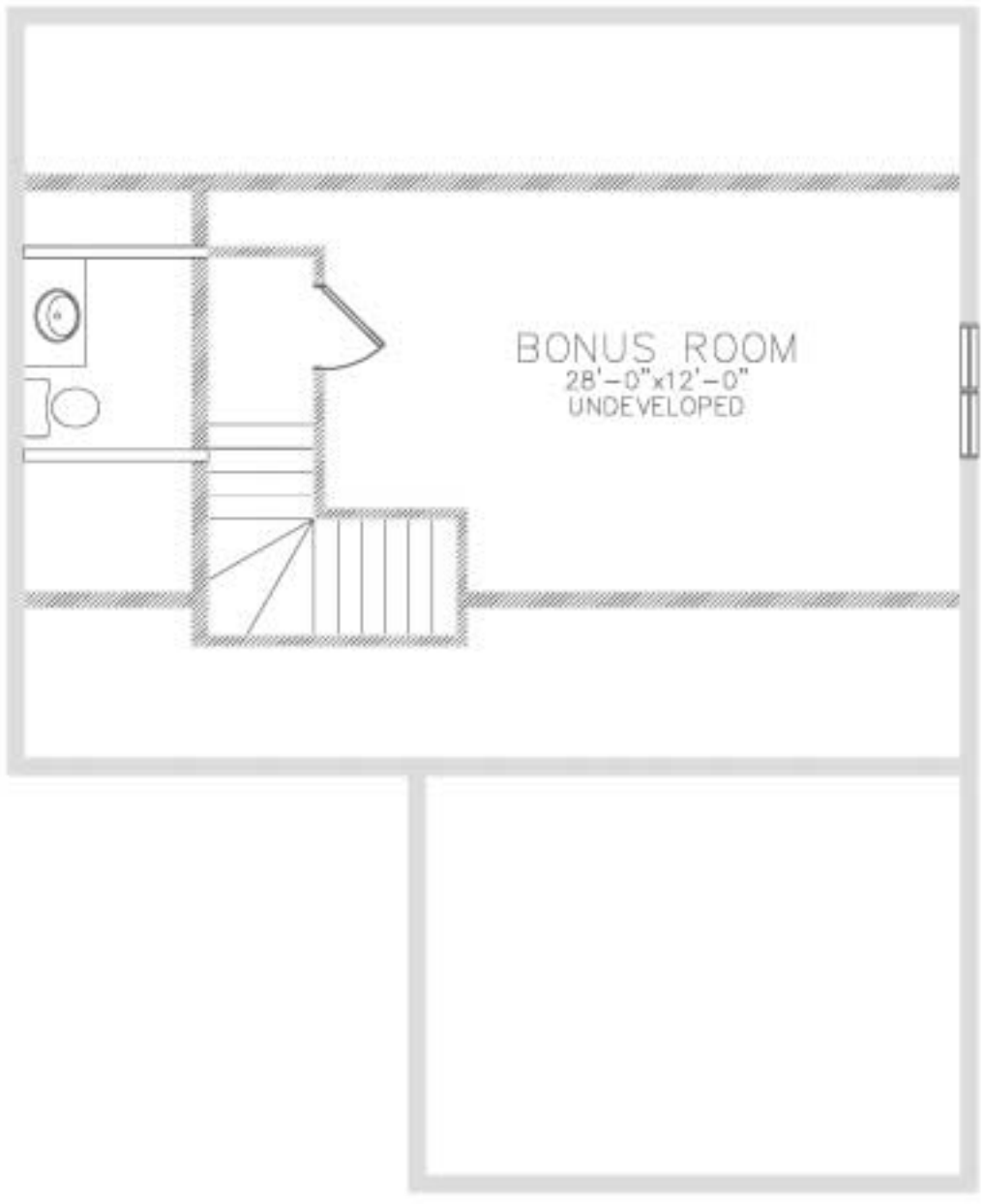
Front Elevation - Partial Flex House

Main Floor Plan - Partial Flex House - 1,004 sq. ft. (93.3 m²)

Second Floor Plan - Partial Flex House - 898 sq. ft. (83.4 m²)

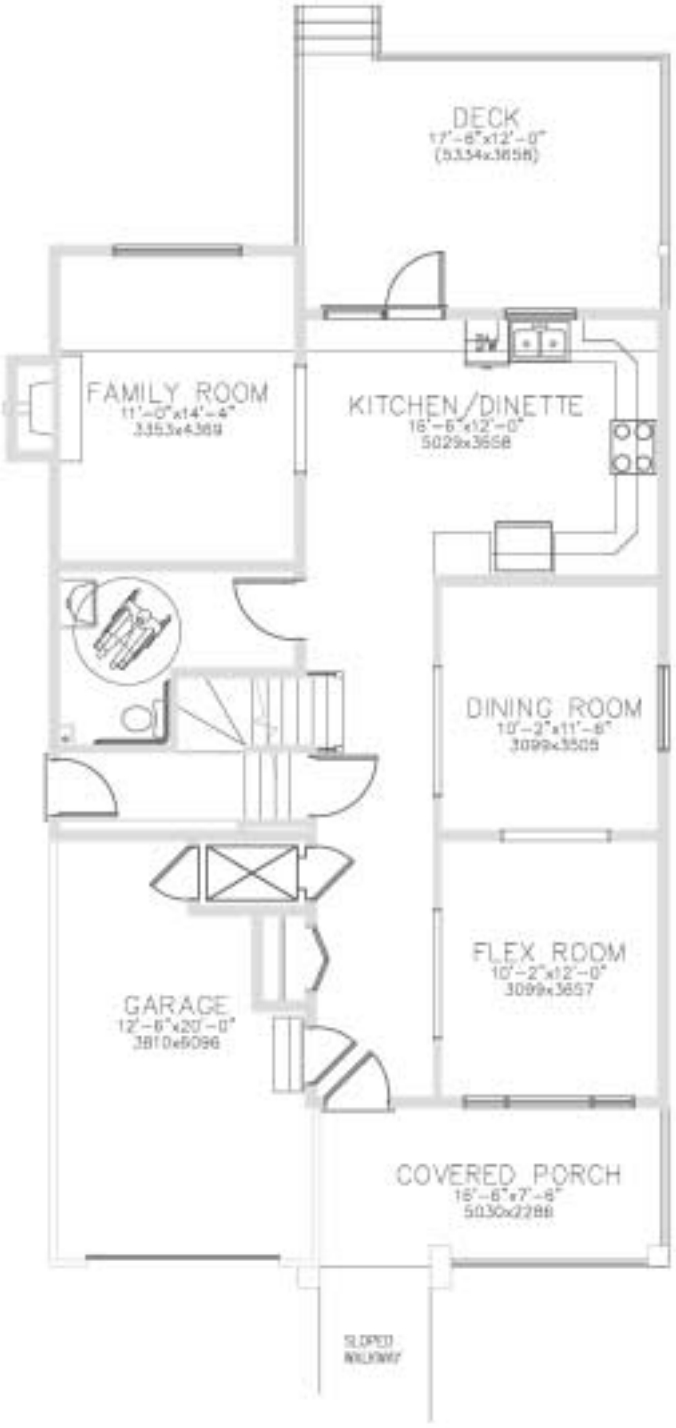


Attic Floor Plan - Partial Flex House - 348 sq. ft. (32.3 m^2)

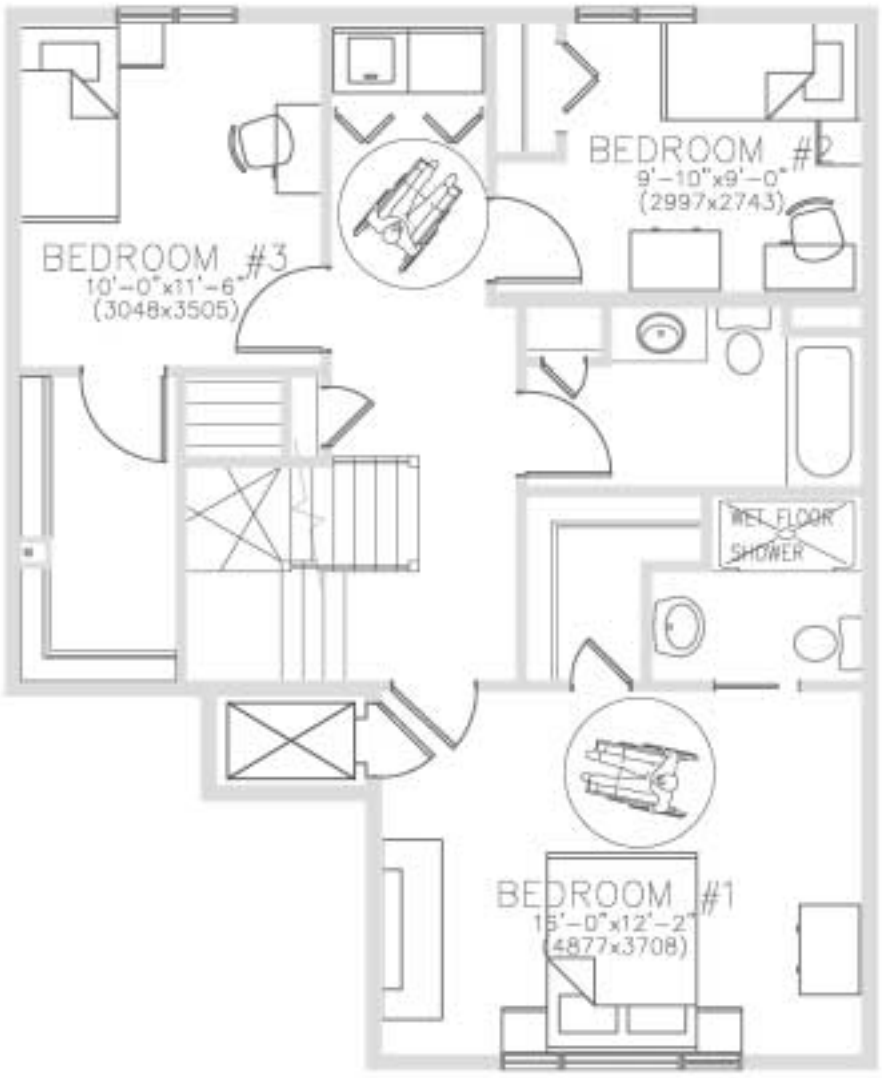


Front Elevation - Full Flex House

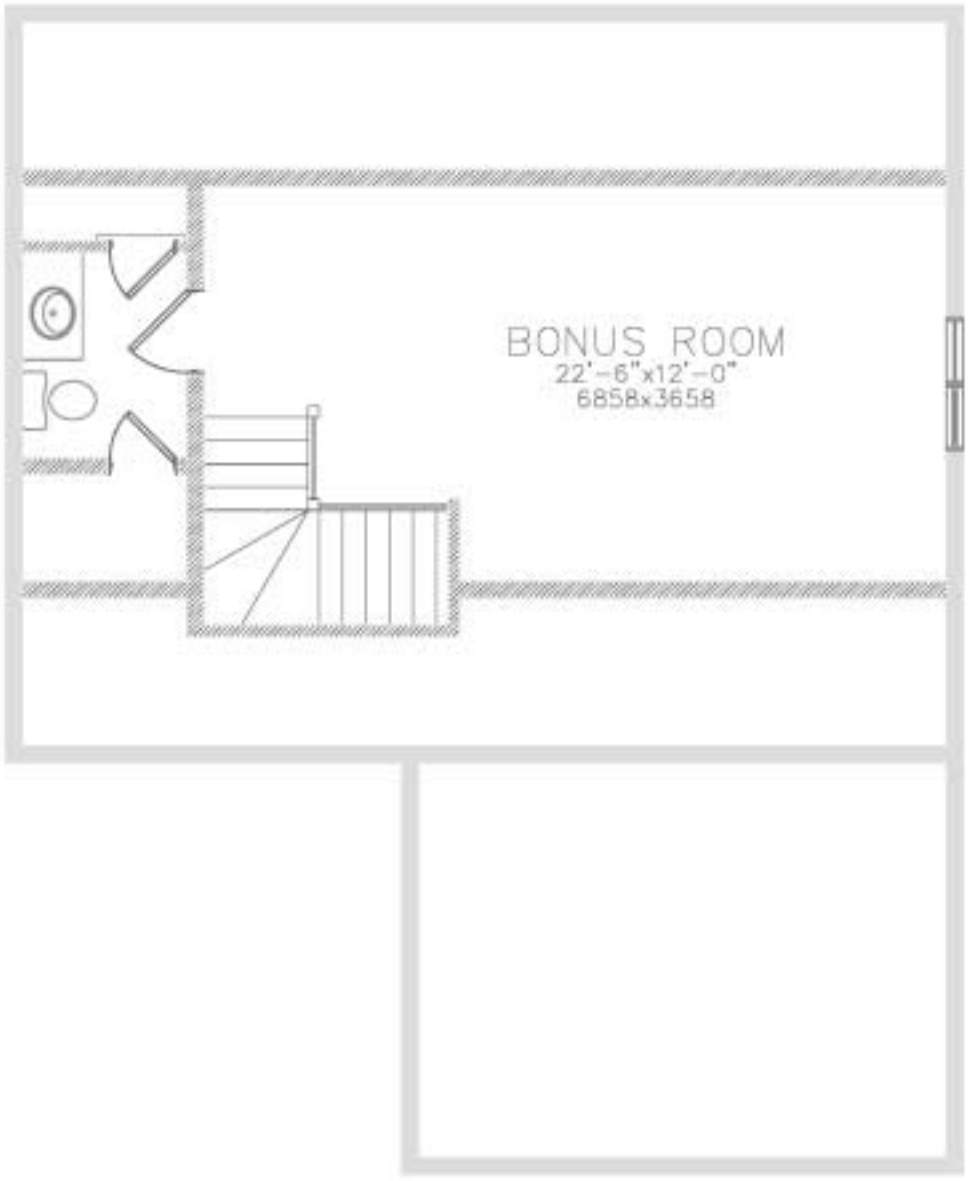
Main Floor Plan - Full Flex House - 1,004 sq. ft. (93.3 m^2)



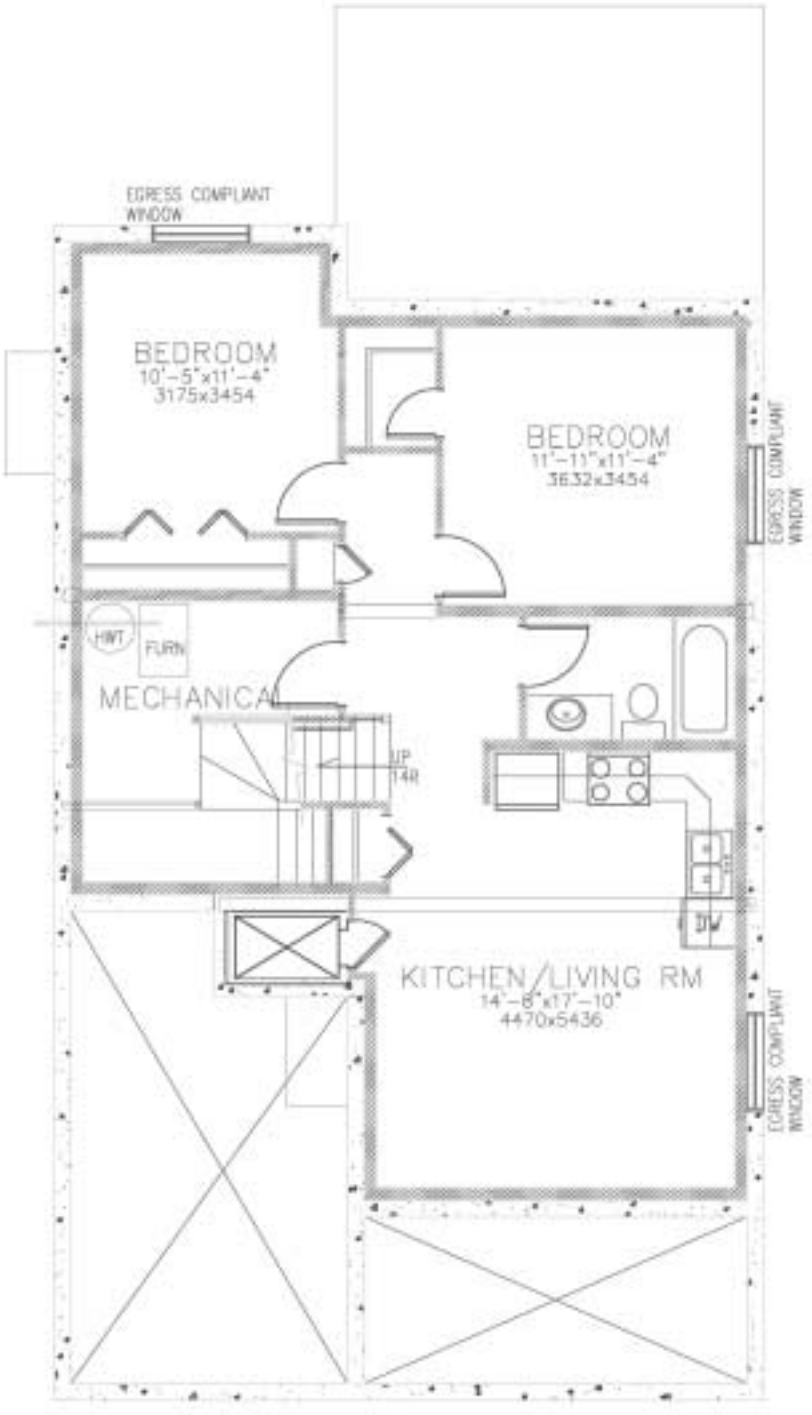
Second Floor Plan - Full Flex House - 898 sq. ft. (83.4 m²)



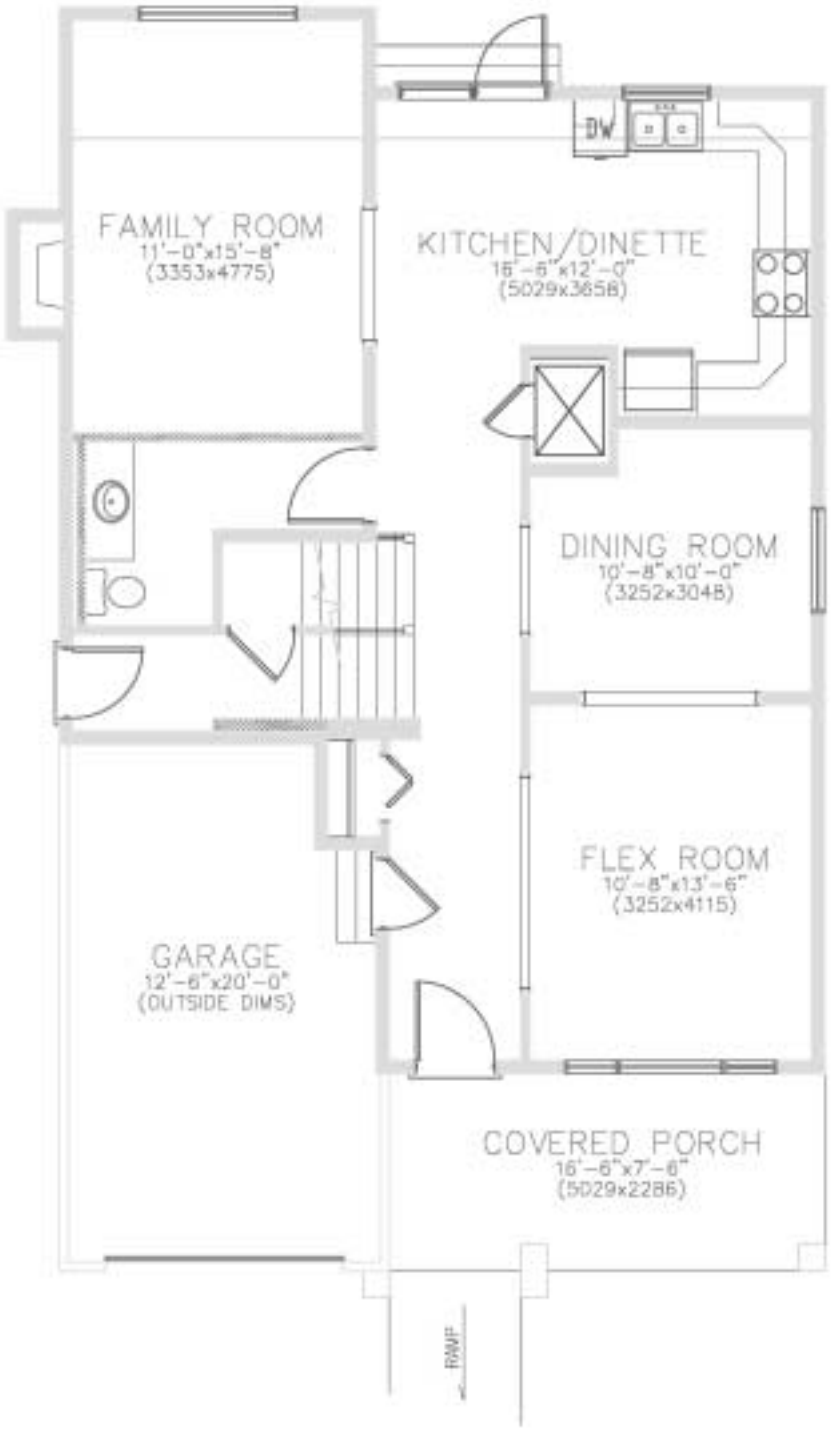
Attic Floor Plan - Full Flex House - 348 sq. ft. (32.3 m²)



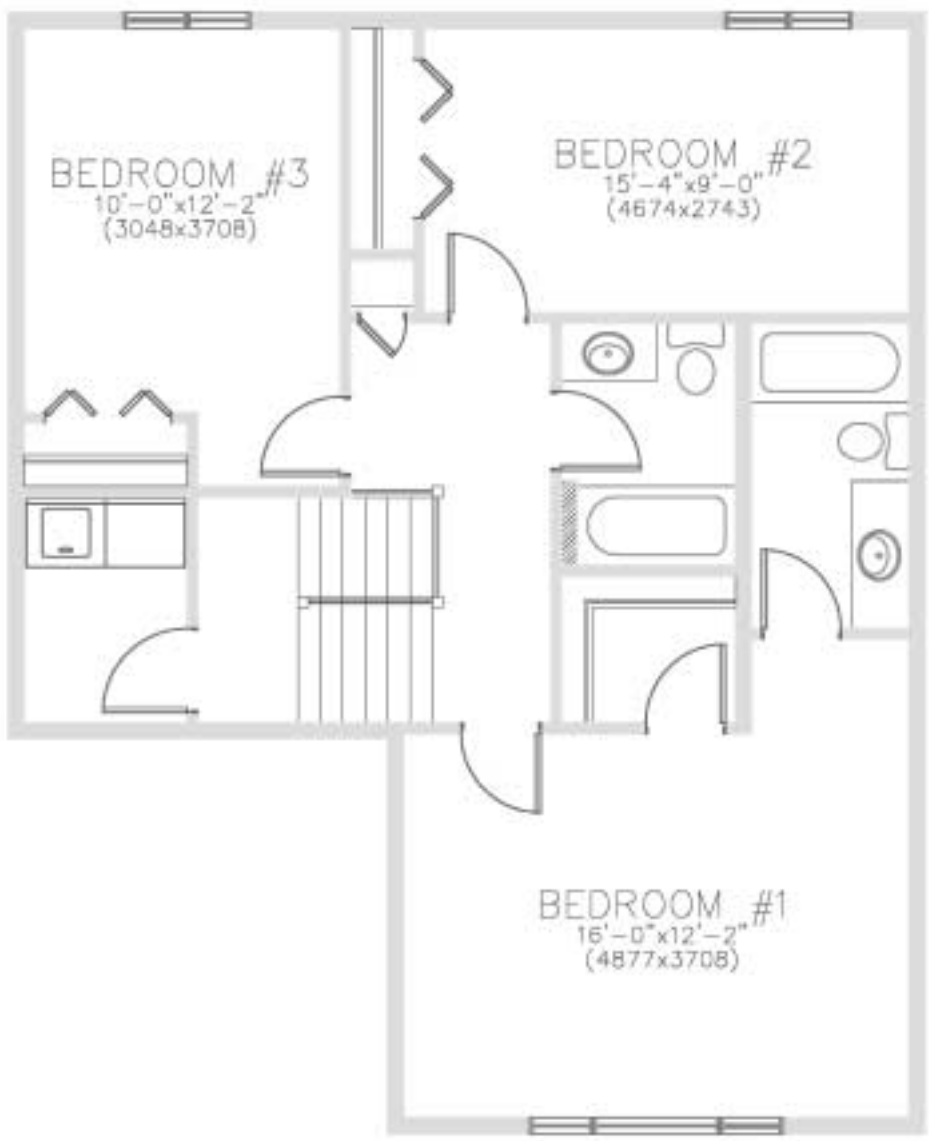
Basement Suite - Full Flex House - 748 sq. ft. (69.5 m²)



Main Floor Plan - Bench mark House - Renovated Full Flex House 1 - 983 sq. ft. (91.3 m^2)



Second Floor Plan - Bench mark House - Renovated Full Flex House - 880 sq. ft. (81.75 m^2)



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