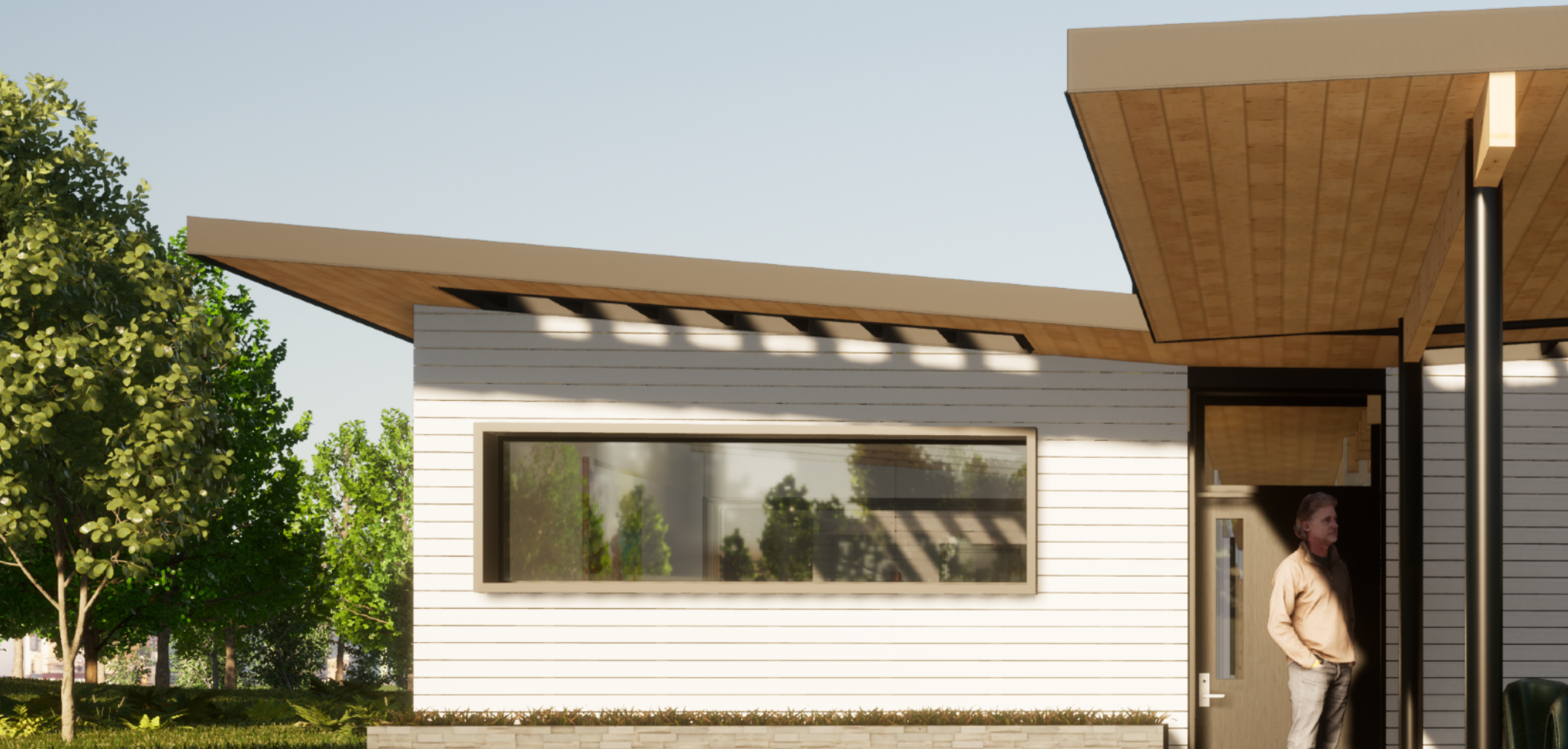


75 YEARS OF SMALL HOUSE DESIGNS FOR CANADIANS

1947 - 2022

A PROJECT OF THOMSON ARCHITECTURE & ENZYME APD.

enzyme



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ABOUT THE PROGRAM

by Thomson Architecture, Inc. + Enzyme APD

BARRIE, ONTARIO | HONG KONG, CHINA

CMHC ran an entire program of competitions and calls for small home designs that went out to Canadian Architects, from 1947 to 1977, that resulted in the 'Pattern Books' - a series of plan books with hundreds of designs generally under 1,500sf, complete with sketch renderings, all numbered by year and model, and complemented by complete sets of construction documents that were available to purchase separately from CMHC for a mere \$10 CAD.

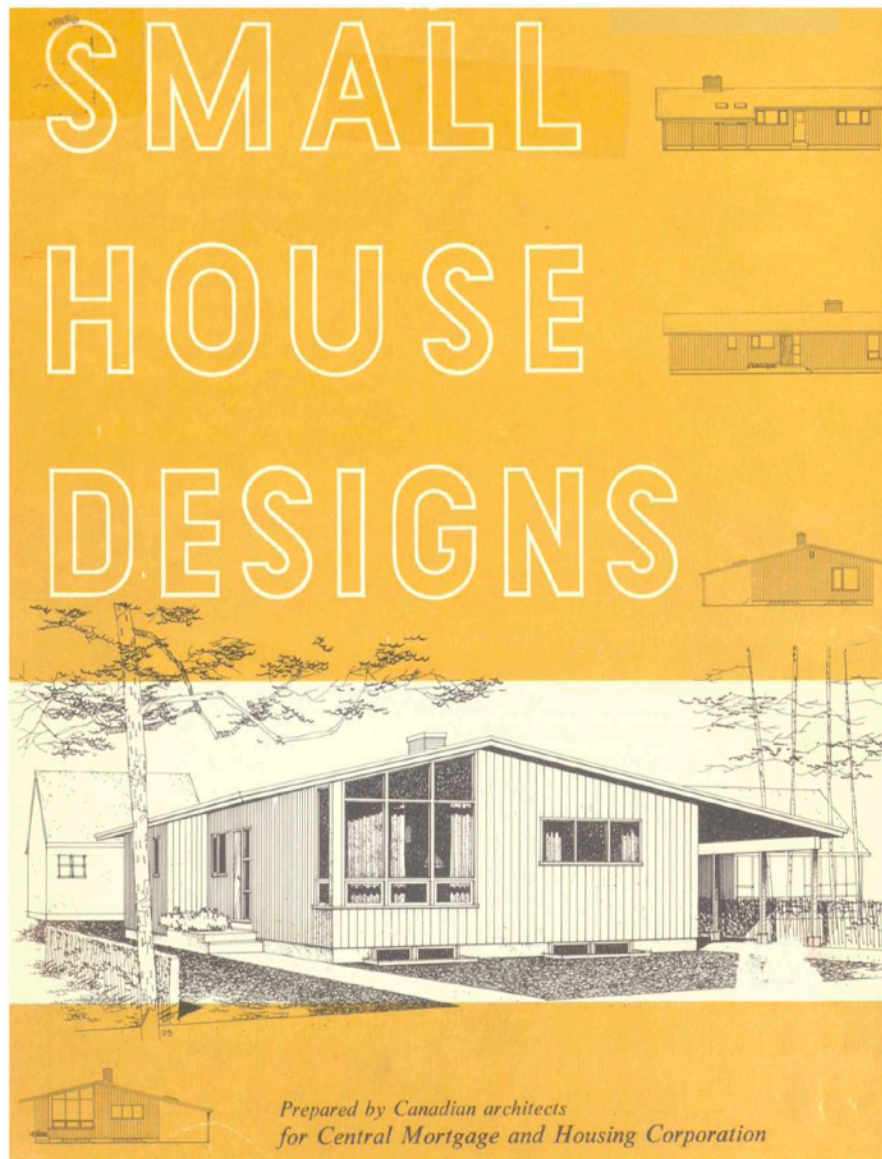
2022 marks the 75th Anniversary year of the first Pattern Book **67 Homes for Canadians**. We are offering a flat rate architectural fee of [\\$7999.00 CAD + HST](#) to update any single model from these pattern book plans to current *Ontario Building Code* requirements with contemporary detailing and complementary Energy Analysis and 3D Rendered visualizations. You can select any design model from the Pattern Books series, links to the series available [here](#) or you can [email us](#) for a zipped archive - and we'll produce the update for you with renderings! The flat rate for this design is a limited time offer (*until June 2022*) as we are aiming to execute a handful of these designs to commemorate the 75-year anniversary of the program. We also aim to demonstrate that an affordable, comfortable and well appointed home can be designed well under 1,500sf – which also results in optimal construction economy, thermal efficiency and a reduced environmental and carbon footprint. The resulting design package equates to our standard service package at the [Bronze Level](#), noted in our rates table on our website.

WHY ARE WE DOING THIS?

Good design is timeless, and the designs found in the series of Pattern Books represents a period in residential architecture that represents the sensible commodity of a home, rather than the [financialized](#) notion of ever expanding 'real estate assets' that we have today. It also signifies a time in Canadian history when CMHC and the associations of Architect across the country were committed to providing timely and relevant advice on building one's own home, and how to consider a style that is at once current, but also relates to climatic considerations, materials and methods unique to Canada, and while the Styles may be similar to the American homes of A. Quincy Jones and Eichler, these CMHC designs are relatively modest in scale and relatively compact in form, a function of our colder climate.

As we struggle as a society with Housing Affordability, we can see that prices everywhere are up, housing supply is down, yet at the same time millions of Canadians are currently 'over-housed'. According to the [OAA Report on Housing Affordability](#), "...nearly two-thirds of Ontario urban households are 'over-housed' = 5.0 million empty bedrooms across Ontario, including 2.2 million in Toronto Neighbourhoods."

What this tells us is that we have been building houses that are simply too large. Any architect or planner can tell you that there is immense pressure to maximize the 'As of Right' zoning envelope of any building lot, which often results in larger homes for a given budget, which imposes a downward pressure on build quality. It should be noted that mere compliance with the Building Code is only compliance to a *minimum standard*, which is why we see a very wide gap between the high-performance and durable buildings we design, when compared with OBC minimum builds. Smaller homes use less construction materials and less energy to heat, light and air-condition, not to mention cost less! In order to meet the urgent demands of these multiple related issues, together with addressing the Climate Crisis, a new embrace of modest homes sizes can only help steer us towards solutions. To this end, we have sought to unpack, review, and in some cases redesign the CMHC Pattern Book Homes for our time, where we are targeting Passive House levels of performance, with an organic and affordable approach to materials and finishes for reduced embodied carbon and improved indoor air quality. We hope our colleagues in the Architecture and construction sector will consider trying a few for themselves!



Small House Designs, 1957, By our beloved Central (now Canada) Homes and Mortgage Corporation

MID-CENTURY MATTERS

by **Andy Thomson**

ARCHITECT AND LOVER OF MIDCENTURY DESIGN

Spanning from the postwar enthusiasm of 1947 to the prospect of a new century in the late 1970's, CMHC's Pattern Books read like an Architectural Epic, and we're about to honour them here with a reboot. Mid-Century Modern (aka. MCM) design has always appealed to us. The low pitch butterfly roofs, big fir beams that shoot through floor-to-ceiling glass, consistent ceiling to soffit transitions, natural materials, quirky cantilevers, open concept Kitchen-Living-Dining areas - what's not to love? For houses that were designed in this style from the 1940's through to the 1970's, the 'Atomic Ranch' aesthetic has proven itself to be timeless *because it's good*. The

spaces connect indoors with the outdoors, where some of the best West Coast modern homes and Palm Springs MCM villas feature as much landscaped outdoor living areas and courtyards as indoor spaces. About 5 years ago, after many months of searching for a new home in Barrie, Ontario – we discovered a pocket of MCM homes in an older neighbourhood and jumped on one (closely resembling CMHC Design #701). The 1954 construction was solid and remained dry-as-a-bone. With big Douglas Fir beams and some remaining original details like the feature wall, skylights and floating brick chimney, the simple, shoebox design with a low-slung roof extending into a carport presented a compact volume that could easily be renovated into a Passive House someday. When it comes time to replace the roofing, windows, deck and other aspects that have weathered beyond the structural core of the house, it will be a simple job that will let us bring this mid-century gem up to a zero emission standard.

HISTORY EXPRESSED , IN FLOOR PLANS AND STYLES

When one of my architectural colleagues gifted me a pattern book from CMHC dated 1950, I was switched on to the idea that there might be more to learn about MCM design in Canada. Well it turns out CMHC ran an entire program of competitions and calls for designs that went out to Canadian Architects, from 1947 to the 1977, that resulted in ‘Pattern Books’ with over one-thousand floor plans and sketch renderings. The corollary advice in the introductory paragraphs included such pearls of wisdom as, “how to plan for the complete budget, including landscaping and service costs”, as well as how to “not be taken for a ride by a contractor” – as relevant today as it was in the 1950’s.

On review of the complete archive of Pattern Books and Construction Plans, we got to thinking... When we bring on a new client, often we spend several weeks reviewing their program. What if we had a way to fast track that process? What if we had a way to bring our clients an accelerated overview of residential architectural layouts so they might consider novel ways to consolidate circulation and reduce square footage? In early Schematic Design we review and order lists of rooms and spaces and explore material qualities while developing an overall look and feel as well as timeline, budget and build quality. This process of generating floor plan options for an owner to choose from takes time and money (our professional fees) to do it right. At the same time we are attempting to fit all of these elements on to the building site, incorporating views and considering environmental aspects such as orientation to the Sun, prevailing winds, etc. But in almost every

case we iterate *multiple versions* of the floor plans, sometimes dozens of times until the layout clicks with the client and they are ready for us to move into the next phase, from Schematic Design to Design Development.

In other instances owners come to us with floor plan sketches they themselves have drawn up, or other times they will arrive at our office with plans they have pulled from the internet. In most cases these serve just fine as a starting place, but seldom are these pre-baked plans aligned 100% with all of the other competing goals or program elements that an owner may have. In other cases the plans may be ill-suited to achieving performance goals or budgets, or it remains the copyright of another designer. Ultimately, however a project is initiated, once we arrive at a general layout that works we all too often require to trim a considerable amount of ‘fat’ from floor plans that tends to accumulate during the development of the plans (aka. scope creep), in order to reconcile aspirational design elements with what are often fixed construction budgets. In other words, we need to be constrain the plans to fit the budget, a process we describe [here in depth](#). Having an owner review a comprehensive set of well-thought-out plans in advance, and then select one that is *close* to meeting their needs, could save thousands of dollars of our fee, and accelerate the process, aligning goals with plans, sites and budgets all at once.

Like a pendulum reflecting the zeitgeist, the CMHC Pattern Books express a range of aesthetic moods and sensibilities in residential Architecture, swinging from a kind of explosive and euphoric post-war enthusiasm in the first issue in 1947, to a more sombre, restrained neo-traditionalist look in the mid-1950’s, and then a full swing of the pendulum back to a kind of manic Utopia of the [West Coast Modern](#) book from prepared by Zoltan Kiss and Fred Lassere of UBC’s School of Architecture (my Alma Mater) that were published from 1950 through 1959. The series gradually migrates to a number of groovy [bilingual MCM](#) books with brown and yellow covers and dithered, xeroxed plans with the same graphic design, look and feel of the 1967 World Expo in Montreal. We can also see a time when domestic chores were starkly gendered, with laundry tubs in the kitchen – no machines, where the ‘lady of the house’ would scrub and wring the laundry while a roast baked, and a rear kitchen door to the yard (presumably to hang clothes in pre-dryer days) and stairs to the basement also from within the kitchen to stoke coal fired heating equipment – all circulation designed to facilitate myriad chores central to this station. Eventually rooms for machines that served these purposes changed the layouts, and kitchens became elevated to a kind of social hub, complete with bars and islands for entertaining and conversing with

house guests. It seems exceptionally odd now for anonymized plans to have bedrooms labelled, 'Boy', 'Girl' and 'Parents'. Flipping through the Pattern Books is like a kind of time-travel, and one can see conventions overturned through innovations in successive turns of the pages. Ideas more relevant to our own time are met with "aha!" – and "that makes total sense, now I see why we don't do that anymore!" For example, few architects today design cold rooms beneath entry niches (maybe we should?), or carefully placed linen closets, or the basement workshops featured in so many CMHC designs, but from today's design trends, clearly not every bedroom needs a bathroom and surely kids could share bedrooms again (we did!). The ubiquitous 'mega-foyer' of the 1980's with chandelier is thankfully, nowhere to be seen.

We have often wondered out loud where we could find such a collection of well considered, compact and completely executed designs to present to our clients that would fit their budgets and programs without investing in a substantial schematic design exploration. The CMHC collection satisfies exactly this requirement since there are over 1,000 (by our count) of royalty-free floor plans an owner can flip through and select a plan that has been taken all the way through to structural design, including thermal details (however dated), and even built-in furniture and millwork.

The compactness of the hand drawn sets are often works of art that consider nothing extraneous and each drawings is essential to the project's total vision. Drawing by hand demanded an efficiency of linework and notes that carefully parsed a design into its relevant sections and elevations with critical details and plans meant organizing information on to the least number of pages possible. The result is a density of information and economy of space that is generations removed from endless PDF scrolls of less meaningful BIM data. While our firm operates at the bleeding edge of BIM and we are far from architectural traditionalists, there is something to be learned from a study of these plans by clients and architects alike.

The CMHC designs range from bungalows to 1.5 and 2-storey projects while the 1970's books feature several duplex models. Plans often feature up to 3 bedrooms and spacious common areas, usually optimized to be less than 1,000sf above grade, with smartly consolidated circulation areas, all professionally designed by licensed architects. Such a resource can save our prospective clients a considerable amount of our fees and their own time, but it also gives us the opportunity to focus on modifying an already excellent designs for unique sites, current building code requirements,

zoning by-laws and other wishlist items while at the same time honouring a tradition of design excellence that is uniquely Canadian.

We have obtained licensing from CMHC that will allow us to modify (to bring up to current codes and beyond) and professionally seal these drawings for use by owners and contractors, provided we attribute CMHC and also credit the original architects. We estimate that starting with one of these CMHC plans could save owners anywhere from \$5k to \$50k in Schematic Design fees that we can simply *bypass* by having started with a well-considered MCM plan from the first day a project starts in our office.

It should be noted that in some cases these designs and plans are older than 70 years, and so structural and thermal aspects of the designs require licensed professionals to bring them up to current standards, but they are a great starting place for anyone interested in MCM design for a range of Canadian climates that is aiming to build the best possible design for the smartest possible budget!

For the full archive of Pattern Books, CMHC has requested that we provide these links:

- 1. CMHC PATTERN BOOKS
- 2. CMHC CONSTRUCTION PLANS



We are grateful to [CMHC](#) for the support they have given us in providing these resources to our firm and the public, but we should mention that any work we do with these files **is not** a CMHC sponsored project. For more information on CMHC please visit their website by click the link above.

PEARLS OF WISDOM FROM 1947:

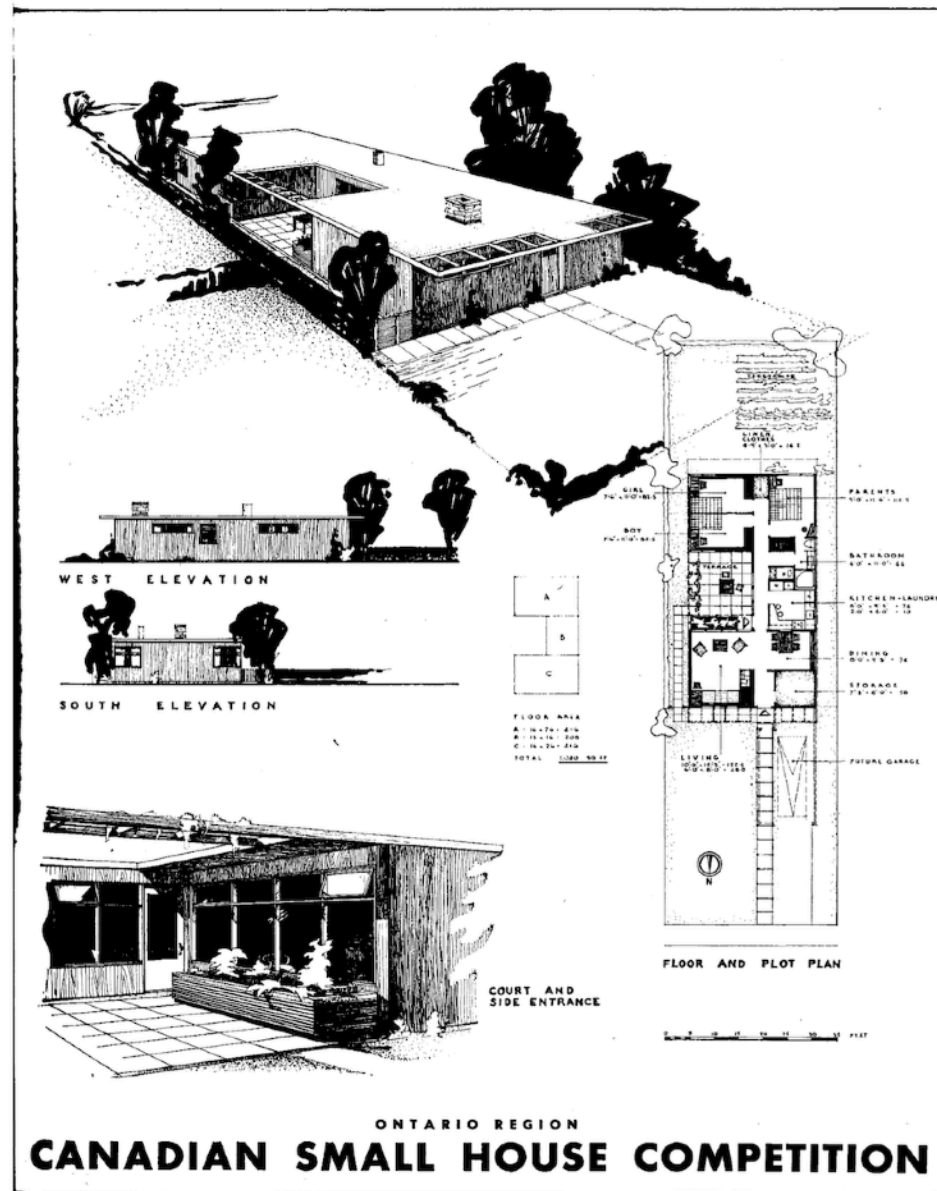
"At all costs avoid 'applied decoration': you date your house and from that moment obsolescence becomes effective.

"To avoid excessive maintenance costs, care should be taken in the selection of building materials. Do not attempt to cover up sound structural materials that will resist wear and weather. If necessary, decorate construction but do not construct decoration.

"Beware of the builder or contractor who is of limited responsibility and gives a very low bid. Perhaps he will fail to pay some accounts and leave the job in an unfinished condition with liens for you, as the owner, to pay."



West Elevation of CMHC 1947 No. 57, Model by Thomson Architecture, Inc. Rendering by Enzyme APD.



Charles R. Worsley,
48 Foxbar Road,
Toronto, Ont.

Design No. 47-57
(Fifth Honourable Mention)

PAGE ONE HUNDRED AND ELEVEN

Charles R. Worsley, OAA

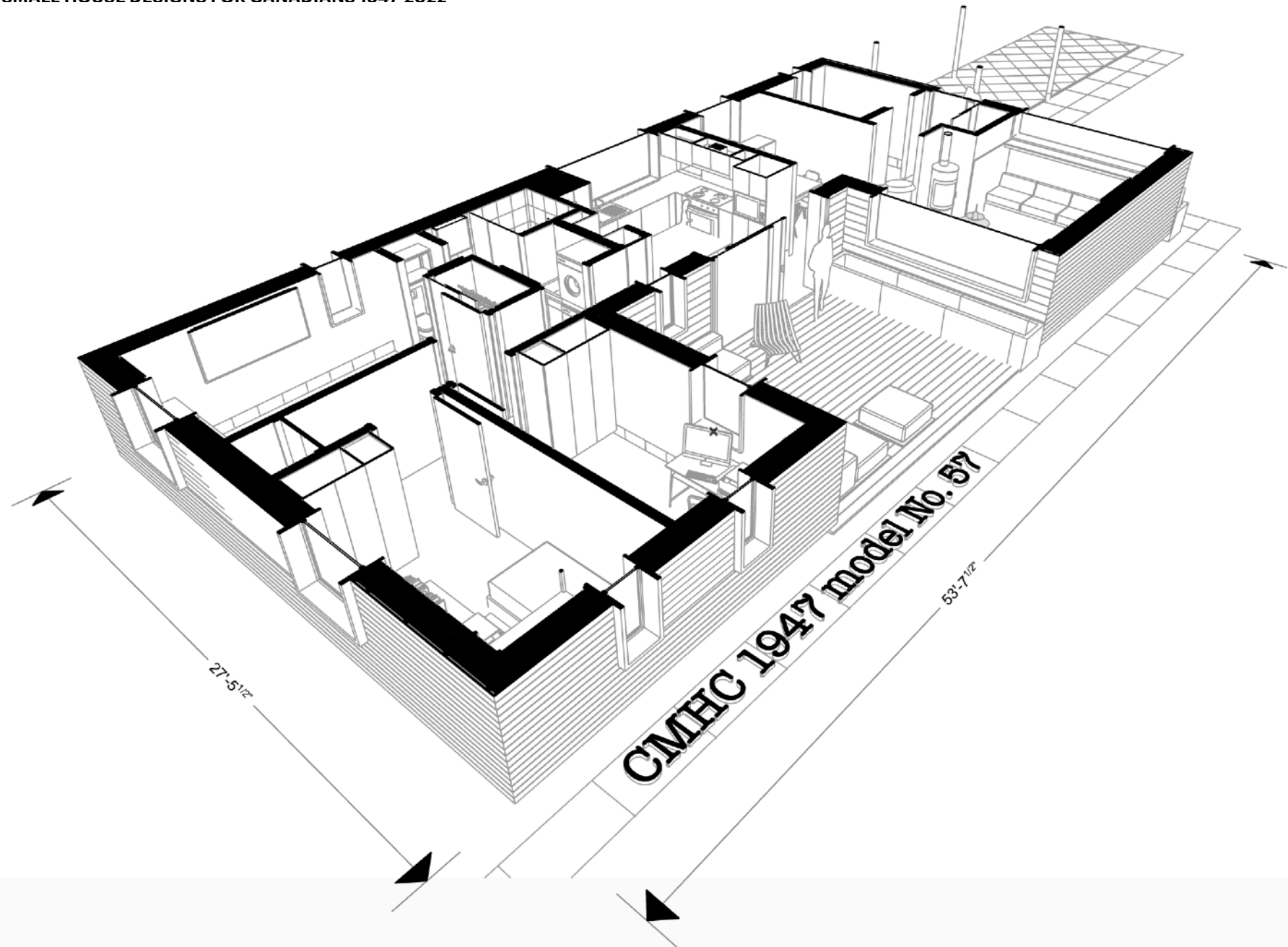
TORONTO, ONTARIO

1947 No. 57

Charles L. Worsley was awarded Fifth Honourable Mention, featured in the inaugural 1947 edition of **67 Homes for Canadians**.

At 1,040 sf, this single-storey, slab-on grade home featured a side court with projecting roof overhangs and integral, albeit notional, brise soleils. While some of the elevation details need to be inferred, it would appear from the sketches that either a flat panelized material (plywood) was the intended exterior cladding, with a masonry chimney clad in fieldstone and precast unit paver patios and walkways.

As we started to model this plan, we made a few changes to reflect our office standards, such as by adding a mild slope to the roof structure for positive drainage, increasing the lamellae for a more functional brise soleil, increasing the kitchen area for a bit more counter space, and cladding the building in a clean and simple lap siding.



3D-cutaway view of 1947 No. 57 by Thomson Architecture, with chimney removed and slightly longer kitchen



View from within the living room, which features a high transom window to the street elevation (for privacy) but a large fixed window to the interior courtyard. To save costs we've replaced the central chimney with an airtight RAIS woodstove. Insulation is on top of the structural 2x6 ceiling, which doubles as a finish. Limited built-in furniture completes the midcentury vibe.

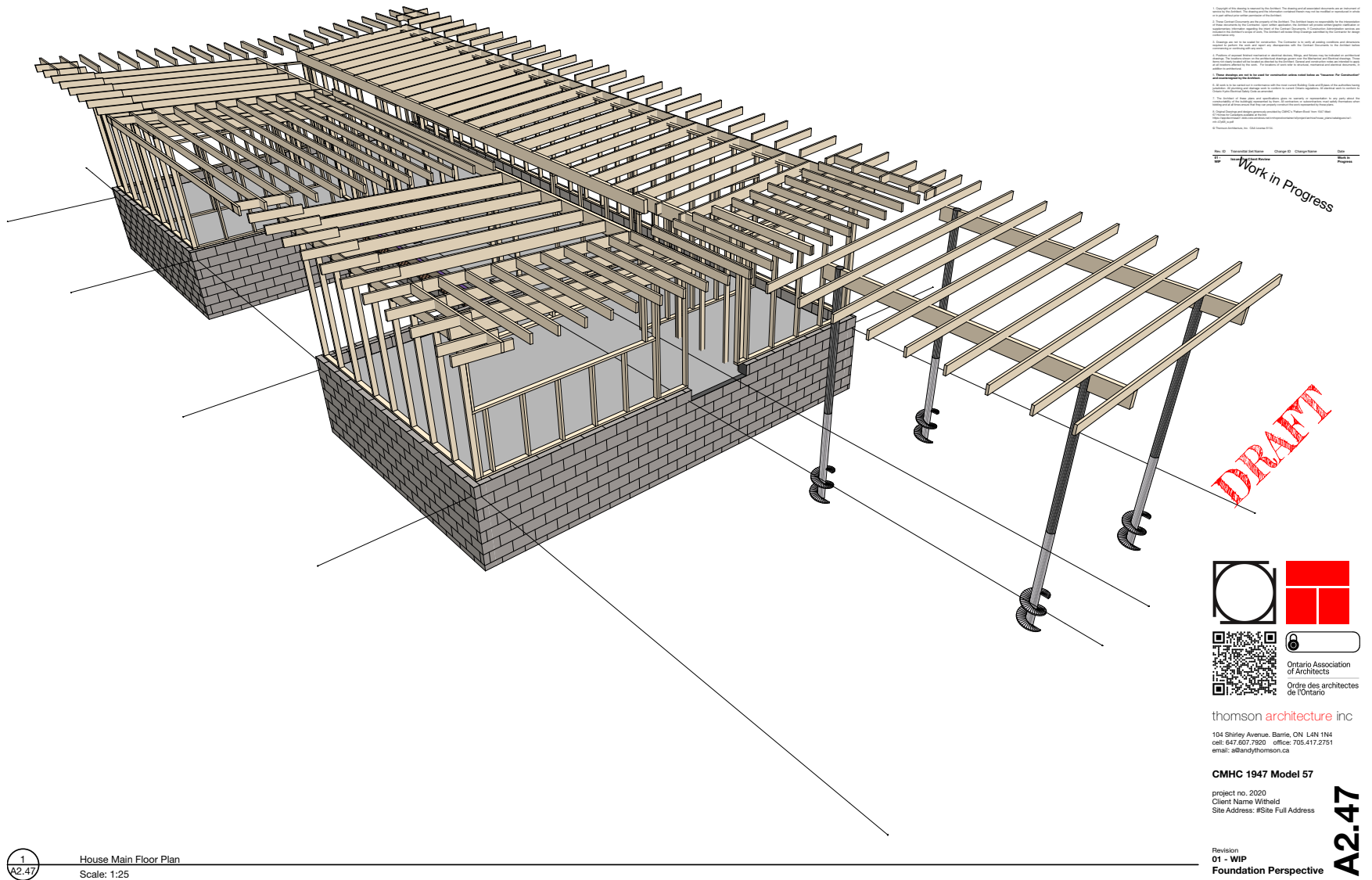


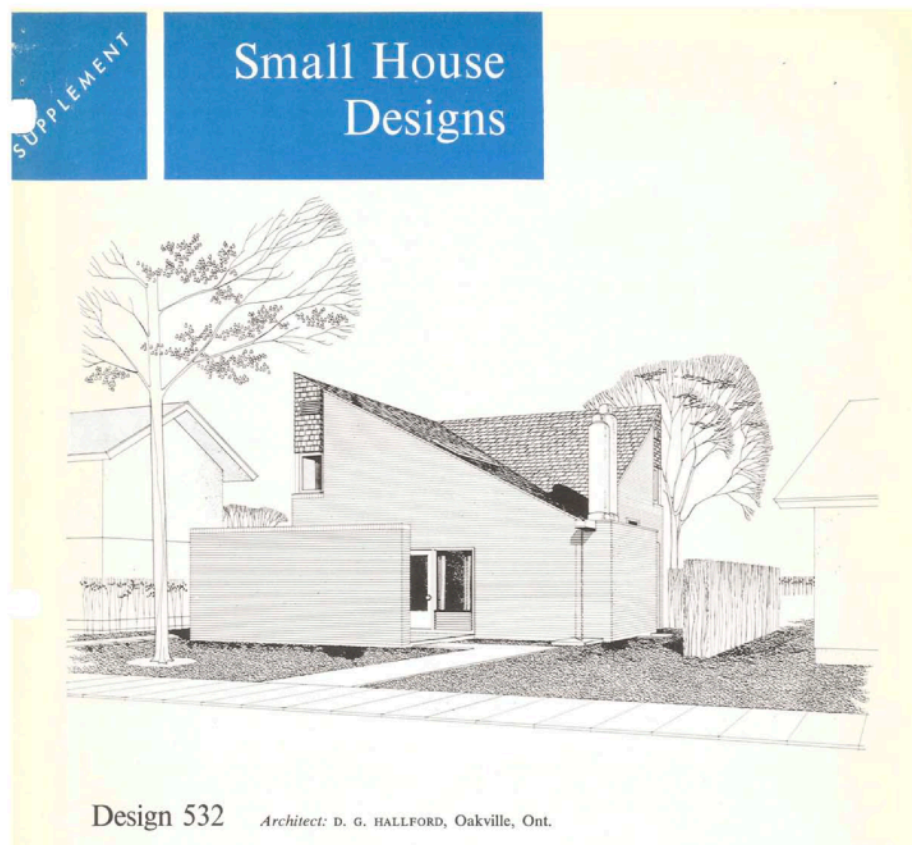


As the kitchen has really become the centre of the home, we've taken the central position of the original kitchen island and lengthened it to allow for more functional counter-space.



While the original designs from 1947 features a high degree of privacy through extensive use of transom windows (Loose Lips Sink Ships), perhaps we are less paranoid as a culture now? So we have added a full 4' x 4' tilt-turn window in the dining room and a full-width picture window in the kitchen (overleaf)





Donald Gordon Halford, OAA OAKVILLE, ONTARIO (1927-2020)

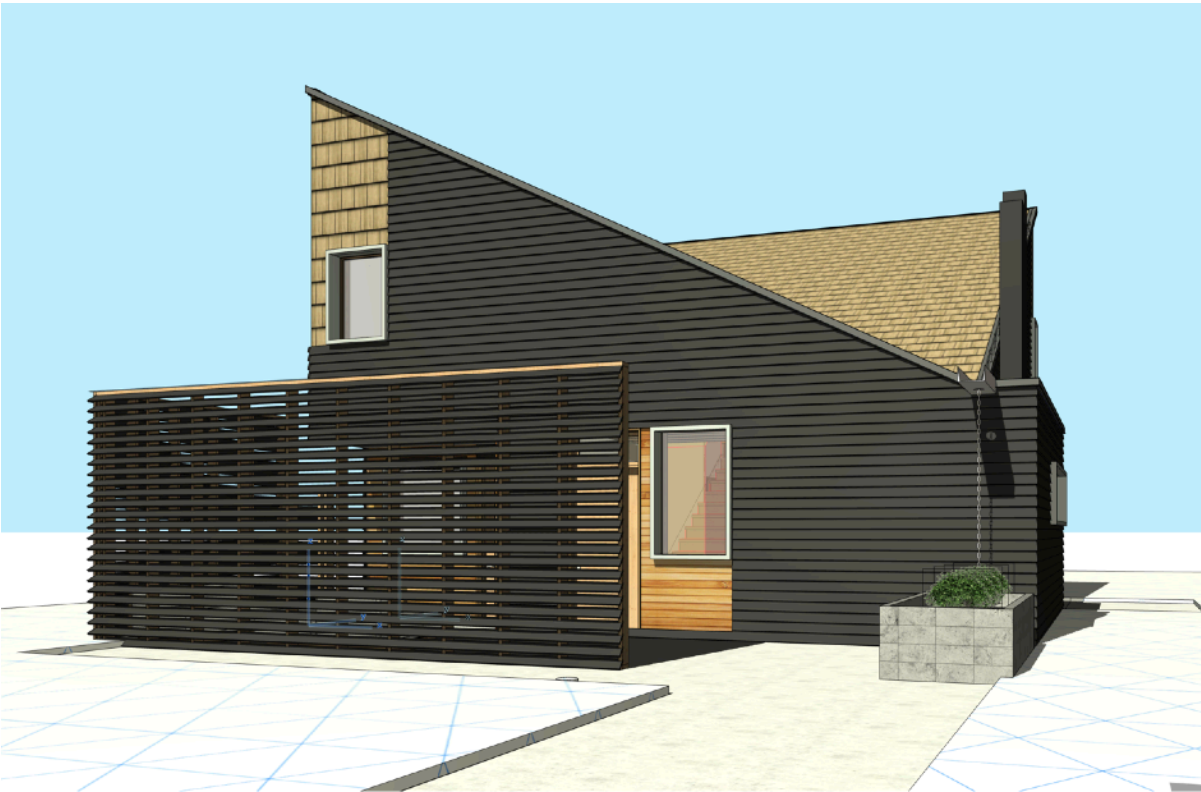
1965 No. 532

Donald G. Halford's designs No. 532 and 533 were featured in the 1965 Small House Designs as well as Supplements (image left) or smaller editions of the same and repeat publications in later years. Despite the popularity of this striking design, it does not appear to have been built, until now. We have a construction permit to build this model in Barrie, Ontario this Summer (2022), and have made only a few alterations to comply with zoning. Design No. 532 features a square plan with

voids taken out of opposing corners only on the first storey, and a diagonal beam supporting steep roof planes, resulting in a roof valley that terminates at a corner fireplace. As most of our plans are targeting zero emission heating systems, we propose to use a chimney-like structure in the same location to provide the supply and exhaust outlets for our proposed Energy Recover Ventilator - facilitating some passive or stack ventilation on the exhaust side. As this is the first of our CMHC Reboot projects to be issued a building permit, we needed to demonstrate compliance with SB10 of the OBC, which encouraged us to complete a detailed Building Energy Model (BEM) right inside of our Building Information Modelling platform (BIM). This allowed us to optimize window shading - which we later discovered was already hinted at by the original architect as sliding shade panels were sketched into the elevations that do not have roof overhangs.

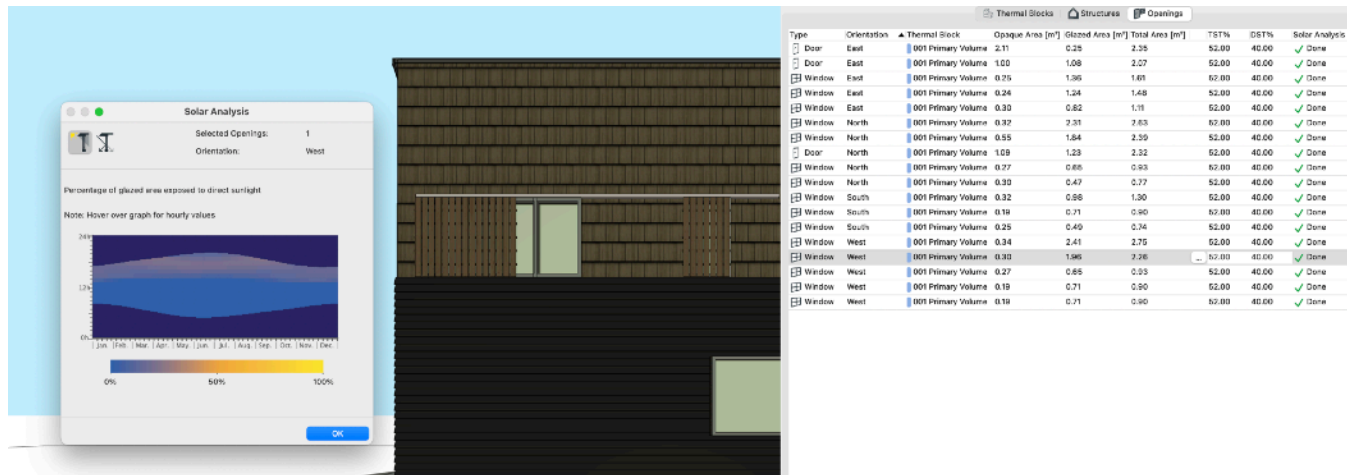
Sustainability Facts		
Occupants per Building 3		
Building Size 130 m²		
Amount per Building		
Carbon * 0.69		
% National Average**		
Energy Consumption 32 GJ/yr 34%		
Metred Electricity Use 8,982 kWh/yr (simulation)		
Metred Natural Gas Use 0 ekWh/yr		
Measured Oil Use 0 ekWh/yr		
Total Energy Use Intensity (TEUI) 69.09 kWh/m²/yr 34%		
CO2e Emissions 0.69 MT CO2e/yr 10%		
Greenhouse Gas Intensity 5.32 kg CO2e/m²/yr 2%		
Embodied Carbon 50 MT 64%		
Embodied Carbon Intensity 384.62 kg/m² 128%		
Onsite Energy Production 0 kWh/yr -		
Photovoltaics 0 kWh/yr		
Geothermal 0 kWh/yr		
Wind 0 kWh/yr		
Offsite Renewable (REC) 0 ekWh/yr 0%		
WWS Electricity 0 ekWh/yr		
Green Natural Gas 0 ekWh/yr		
Annual Water Usage 200,000 litres/yr 46%		
Indoor Air Quality Poor		
Radon (annual avg.) 100 Bq/m³ 67%		
CO2 (annual avg.) 600 ppm 100%		
TVOC (annual avg.) 80 ppm 100%		
Rel. Humidity (annual avg.) 40 % 100%		
Atmospheric Offsets 0 MT/yr CO2e 0%		
% OBC Requirement***		
Building U-Value Avg. 0.22 W/m2·K 88%		
Cooling Degree Days 401 (Barrie 2021-2050 - www.climateatlas.ca)		
Heating Degree Days 4380 (Barrie)		
Walls Below Grade (RSI,eff.) 4.22 K·m²/W 113%		
Walls Above Grade (RSI,eff.) 6.69 K·m²/W 159%		
Floor Exposed (RSI,eff.) 6.70 K·m²/W 119%		
Floor Slab - Heated (RSI,eff.) 4.22 K·m²/W 215%		
Window:Wall Ratio 7.00 % 32%		
Roof (R,eff.) 6.60 K·m²/W 413%		
Doors (Max. U-value) 0.90 W/m2·K 178%		
Windows: Triple, low-E, Argon Fill 0.90 W/m2·K 178%		
ASHP Efficiency 14.00 HSPF 197%		
DWHR Efficiency 46.00 % 110%		
HRV/ERV Efficiency 80.00 % 107%		
* Operational Carbon Emissions in MT CO2e/yr		
** Based on National Research Council of Canada Data: http://bee.nrcan.gc.ca/corporate/statistics/neudrpa/showTable.cfm?type=CP&section=ra&juris=ca&m=1&page=0		
*** Based on the Ontario Building Code SB10 and SB12 Compliance tables		
The concept of a 'Sustainability Facts' label has been floating around schools of architecture for decades, but was popularized by architect Michele Kaufmann. Graphic is based on Health Canada Nutritional Facts labelling.		
All listed values taken from utility bills post occupancy		

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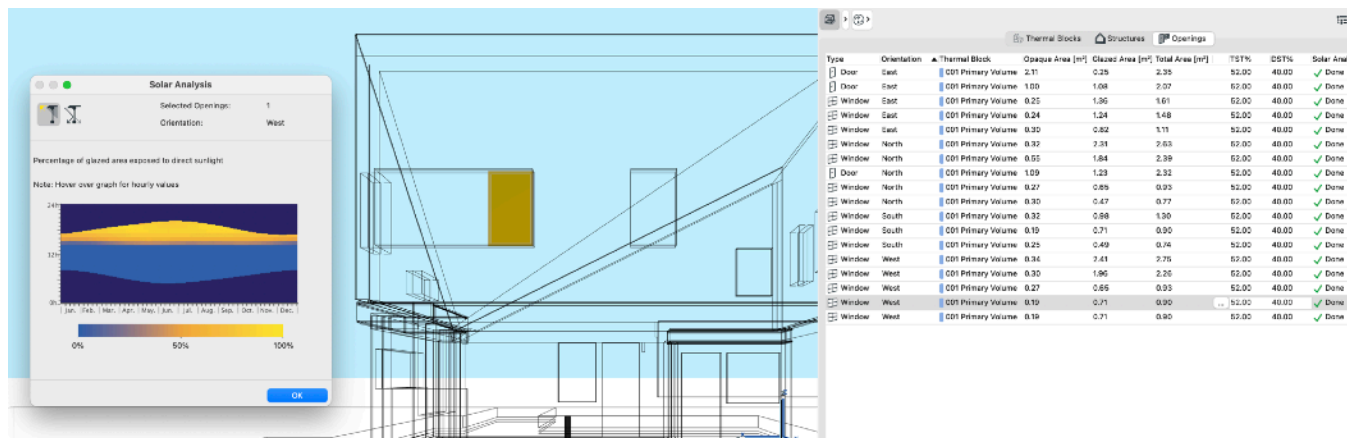


Our BIM model features flat black lap prefinished wood siding with natural cedar shingle roofing and upper wall cladding, and cedar siding accent panels, where the original was proposed as brick cladding.

Part of the benefit of using BIM is that we can readily quantify the density of all of the materials used in the project, which in turn can be used to calculate the embodied energy, carbon and water of the project alongside its predicted energy use. We are using the OBS/BERS Sustainability Facts label (image left) to summarize all of the most relevant energy and material data for all of the reboot projects. Another goal of BIM/BEM is to determine how best to control



Shaded window analysis, note almost no heat gain in the Summer (centre of shade mask graph)



Unshaded window analysis, note solar gains added in the shoulder seasons, but peaking in the Summer (centre of shade mask graph)

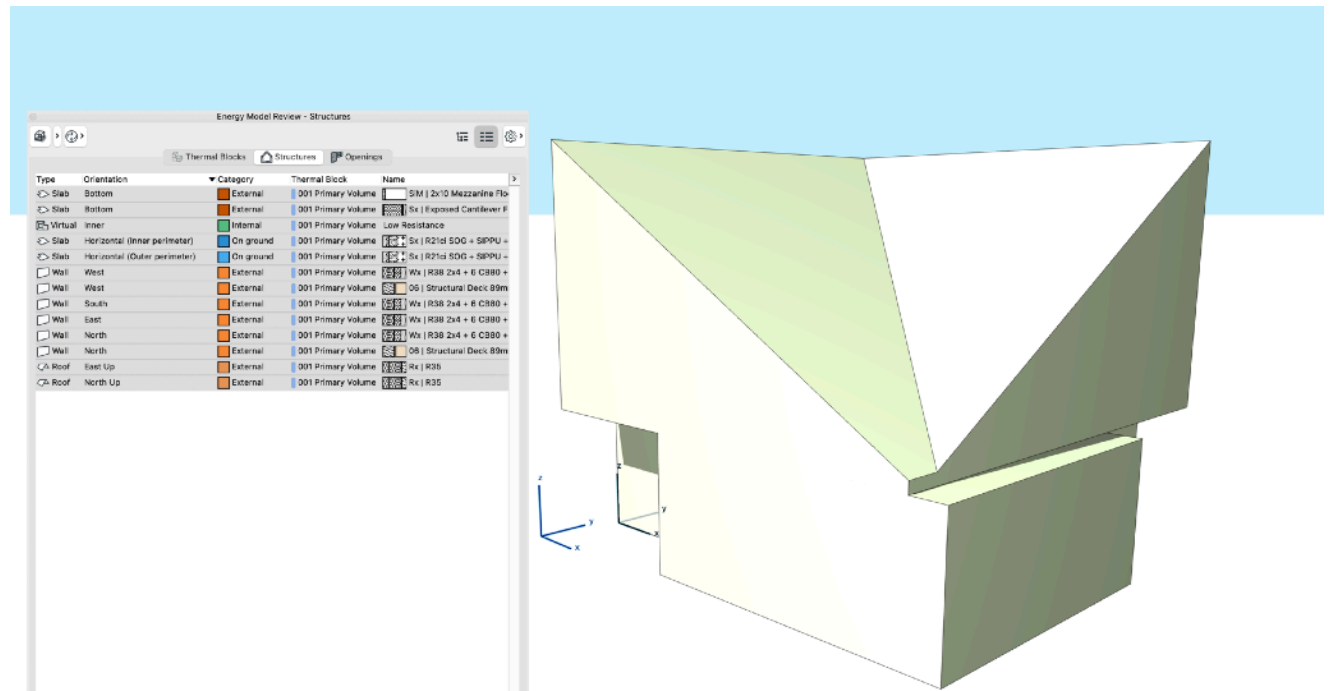
energy gained and lost through windows through the use of orientation, shade structures or overhangs, and to provide measures to limit gains in the Summer and maximize them in the Winter. In the graphs to the left, one can see the effect of energy over the course of every hour in a year (there are 8,765 of them). In the case of Design No. 532, one can see that a band of moveable shading shutters was imagined on what is labelled the 'Left' elevation - Ideally the West elevation, which is the orientation we were able to site the building towards in Barrie. The BEM also allows us to track the energy balance through every surface of the volume, so that we can determine the amount and type of insulation to apply to

each surface, and understanding the volume of the building can also help us understand how to reduce total surface area relative to the volume, aka. the A/V ratio. The higher the A/V ratio - the less heatloss we have, which is typically the goal in a Canadian climate. To read more about energy modelling in BIM, we describe it in much greater detail in this [blog](#).

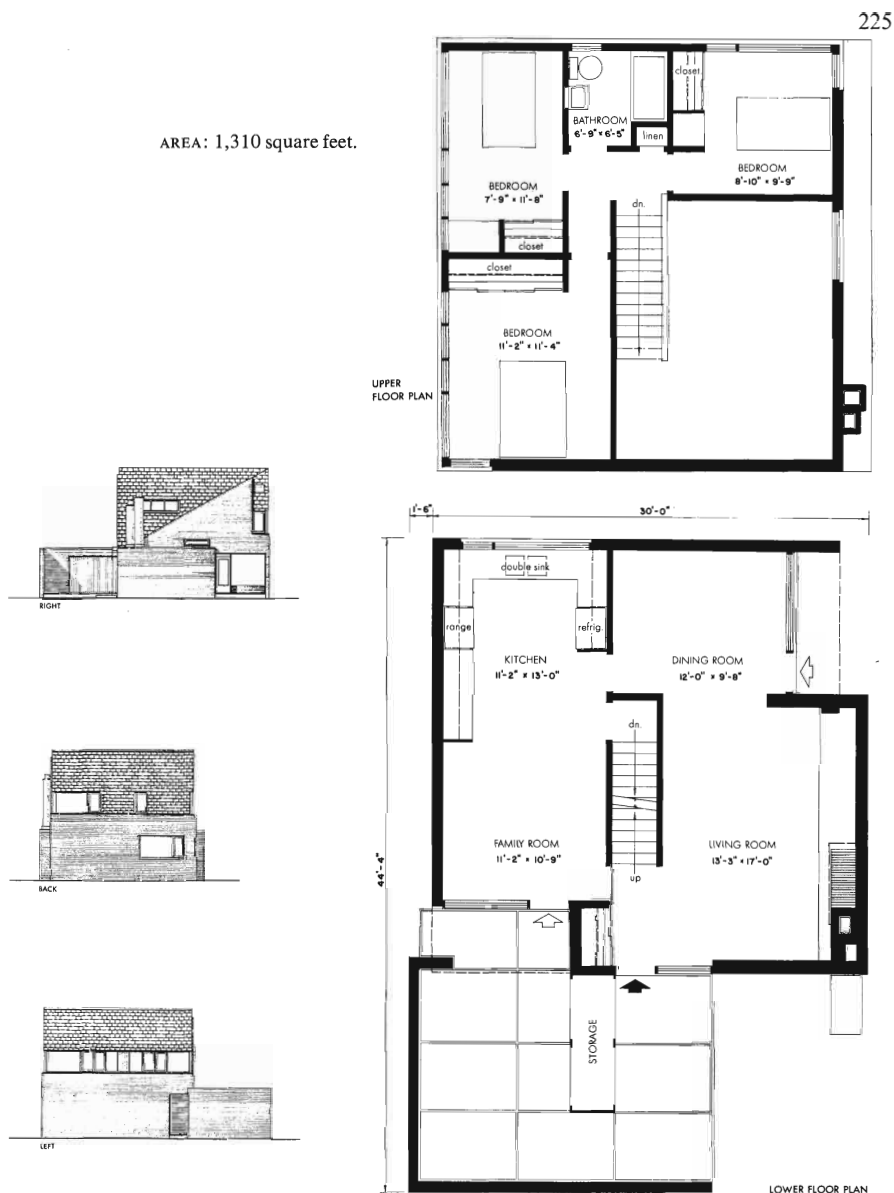


Modelling the designs in BIM allows us to try out different sketch engines in order to best match the original design intent, as well as provide photorealistic rendering through additional engines like Unreal Engine & Twinmotion.

A comparison of both the original floor plans and our own shows marginally thicker walls, but we have tried to maintain the 30' x 30' wide basis of the square plan. We have added a very compact 2PC washroom under the stair (as there is no basement to descend to) and we had to take a greater bite out of the lower dining room to accommodate a 10% lot coverage requirement of the



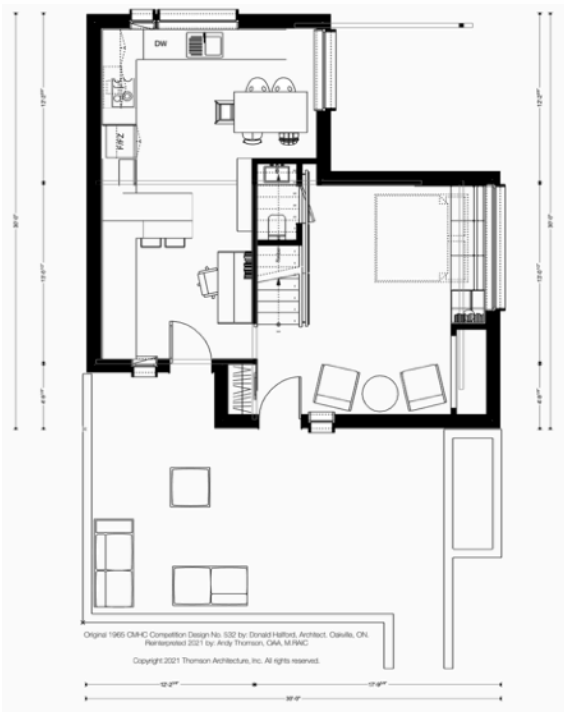
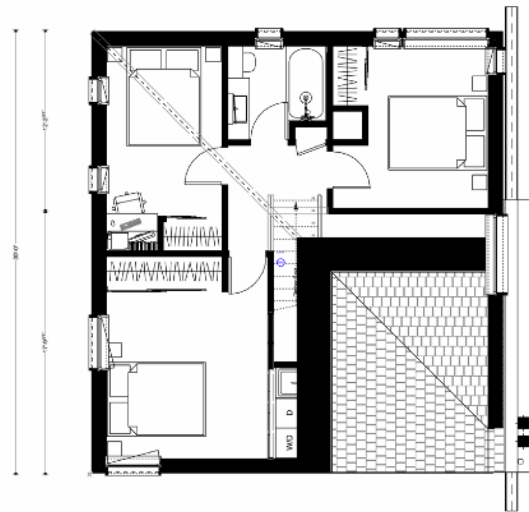
Caption



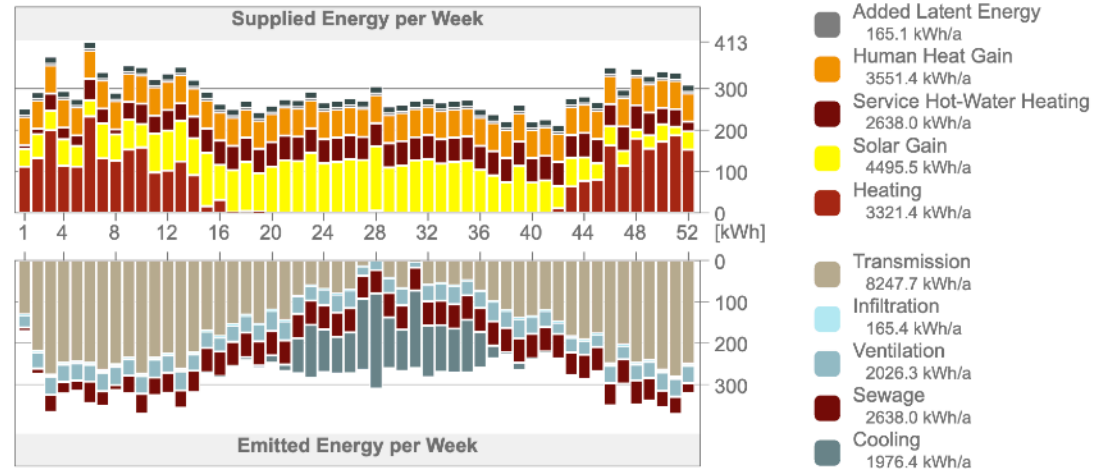
zoning. That said we plan to apply to CofA after the permit is issued to ask to regain that portion, as the foundation and massing will already support the return and because it will more closely align with the original design intent. Another change is due to a zoning compliance requirement, whereby we had to push the building almost 2' into the grade to respect the maximum allowable building height, which incidentally, helps temper the massing and by sinking the adjacent patios slightly, the resulting building has a more grounded feeling, which is an appropriate counterbalance to the soaring peak of the wedged roof forms.

It was an interesting exercise to completely model all of the construction details from the design sketches of Halford's competition entry, because many of the items that would be resolved in the development of Construction Documents is something we needed to consider for the first time.

Only design No. 533 had a matching set of Construction Documents in the CMHC archives, and so while that gave us some clues as to the materiality and detailing of the project, we were on our own to resolve some of the more complex intersections, such as how all of the structure



Project Energy Balance



The Project Energy Balance diagram, for us the principal objective is to flatten the yellow bars in the centre of the graph, the Summer Solar Heat Gains, to limit cooling loads, while maximizing them in the Winter to help reduce heating loads. Additional efficiencies result from optimal orientation and shading, and measures such as improved airtightness and increased insulation reduce transmission losses, shown on the bottom half of the graph.

terminates at the bottom of the roof valley right where all of the bulk water must be conveyed away from the structure.

In total, this home uses only 34% of the energy of the average Canadian home, due in large part to its compact massing, optimized A/V ratio, high insulation and airtightness levels, not to mention that it is only 1,400 sf.



Richard Y. Lee, OAA
OAKVILLE, ONTARIO (1927-2020)

**1969 No.
321**

Richard Y. Lee's 1,477 sf design is first featured in the 1965 edition of **Small House Designs**. The design anticipates some themes that would become popular in designs of the 1970's and

80's, namely broad roof slopes and a distinctive asymmetry of elevations. As described in the pattern book,

"A built-in garage and screened court [to the left] flank two recessed entrances In this unusual 1 1/2-storey house. Two full floors are provided at the rear while, at the front, the ceilings of both the living and dining rooms follow the slope of the roof. The basement contains a large recreation room with a fireplace and also provides a generous amount of space for storage and laundry facilities."

Our partner Jorge Gil at Enzyme APD selected this model as the perfect model to apply a large PV array to, where we estimate approx. 25kWh could more than offset annual energy use for the home and EV charging on a model of this size. Fortunately this set came complete with a set of Construction Documents, which facilitated our conversion to a complete BIM/BEM file for modelling and rendering.



Whether Tesla Solar Roof Tiles or Conventional PV bolted to Standing Seam roofing, this model facilitates an array of upwards of 25kWh of power, where total building energy loads are estimated to be almost half of that. The excess can be either sold to the grid, or used to charge an electric car, storage batteries or bikes in the attached garage.

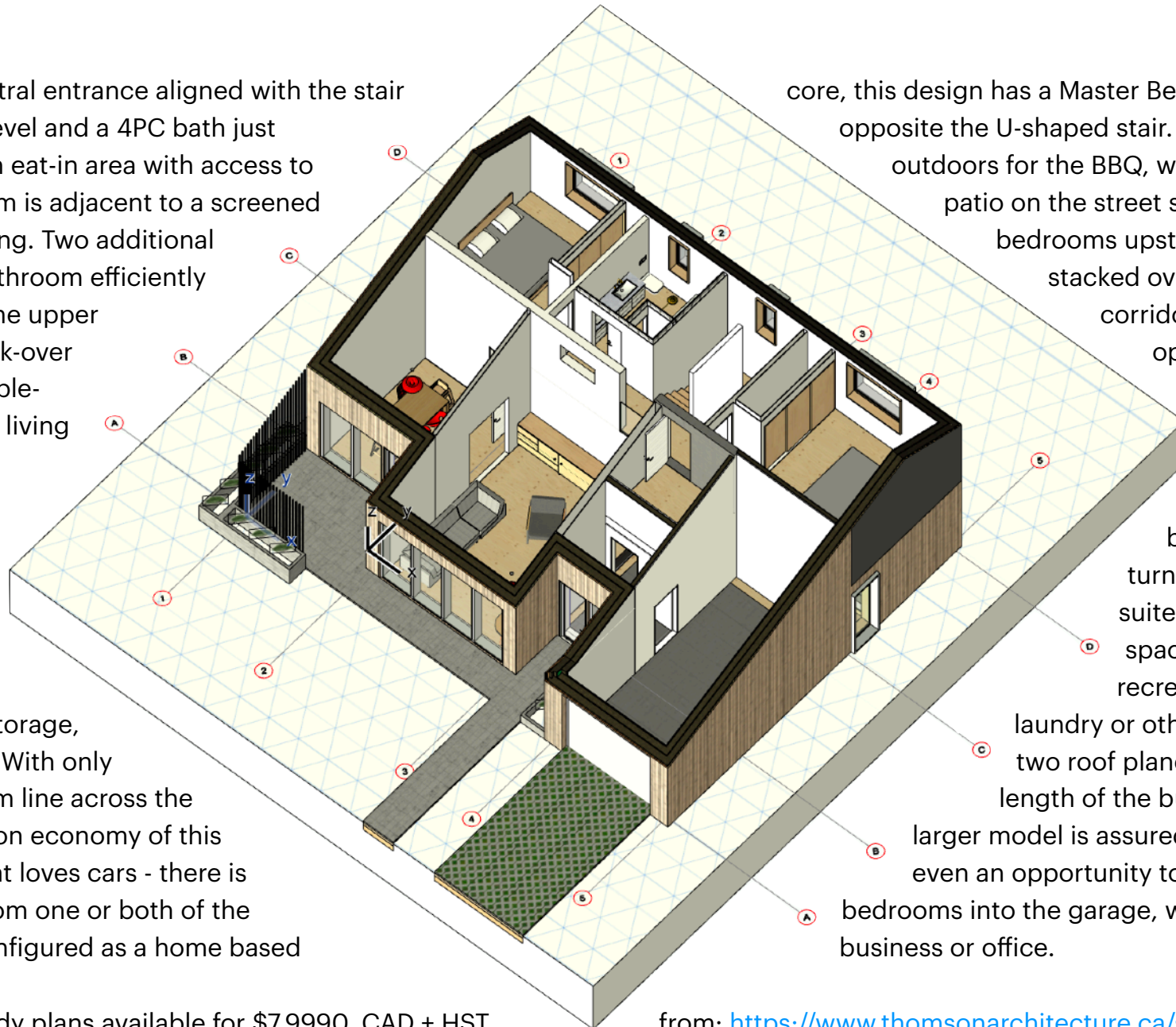
With a central entrance aligned with the stair the main level and a 4PC bath just features an eat-in area with access to dining room is adjacent to a screened *fresco* dining. Two additional second bathroom efficiently one, and the upper several look-over to the double-dining and living its central full

can be granny generous for a seasonal storage, amenities. With only major beam line across the construction economy of this anyone that loves cars - there is window from one or both of the also be configured as a home based

core, this design has a Master Bedroom on opposite the U-shaped stair. The kitchen outdoors for the BBQ, while the patio on the street side for all bedrooms upstairs share a stacked over the lower corridor provides opportunities height area with hearth. A

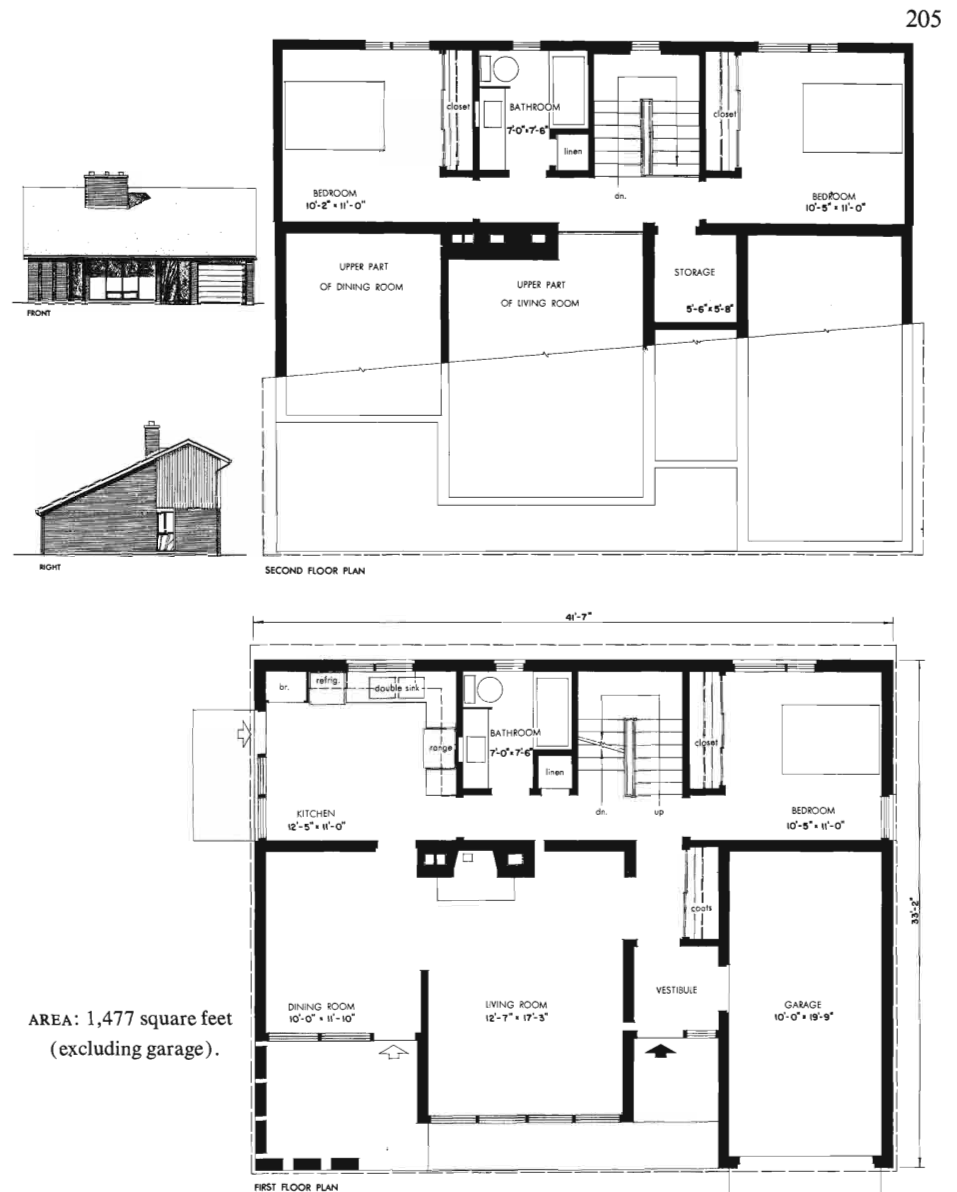
basement turned into a suite, with spaces left over recreation room,

laundry or other two roof planes and one length of the building, the larger model is assured, and for even an opportunity to provide a bedrooms into the garage, which could business or office.



Permit-ready plans available for \$7,9990. CAD + HST

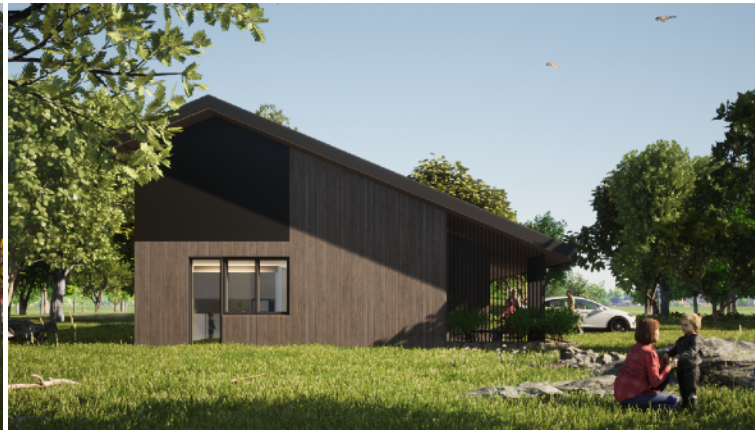
from: <https://www.thomsonarchitecture.ca/shop/>



From Small House Designs, page 205, showing the original floor plans, which we have faithfully reproduced, only with thicker walls.



East Elevation in Winter showing the second walkout entrance from the lower level.

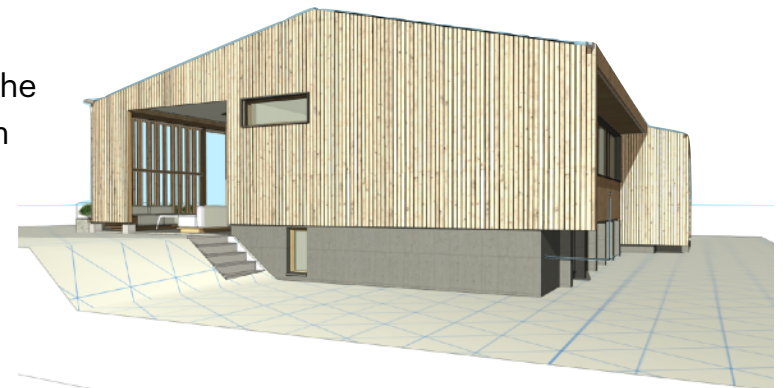
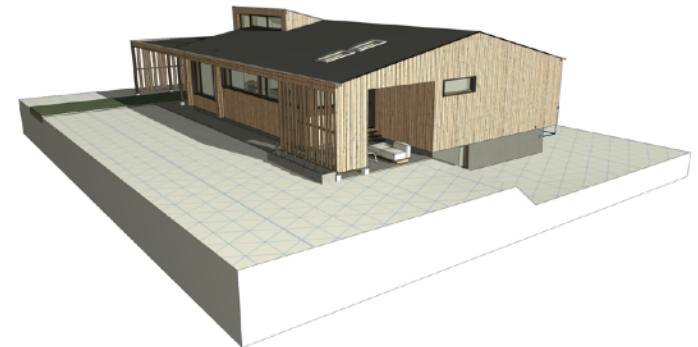
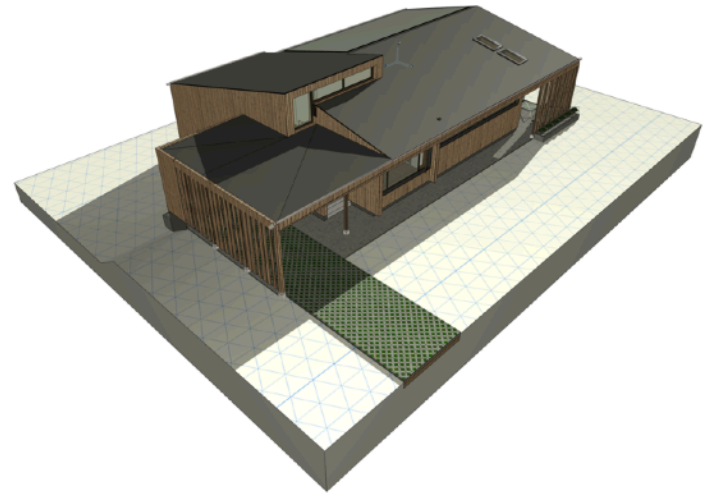


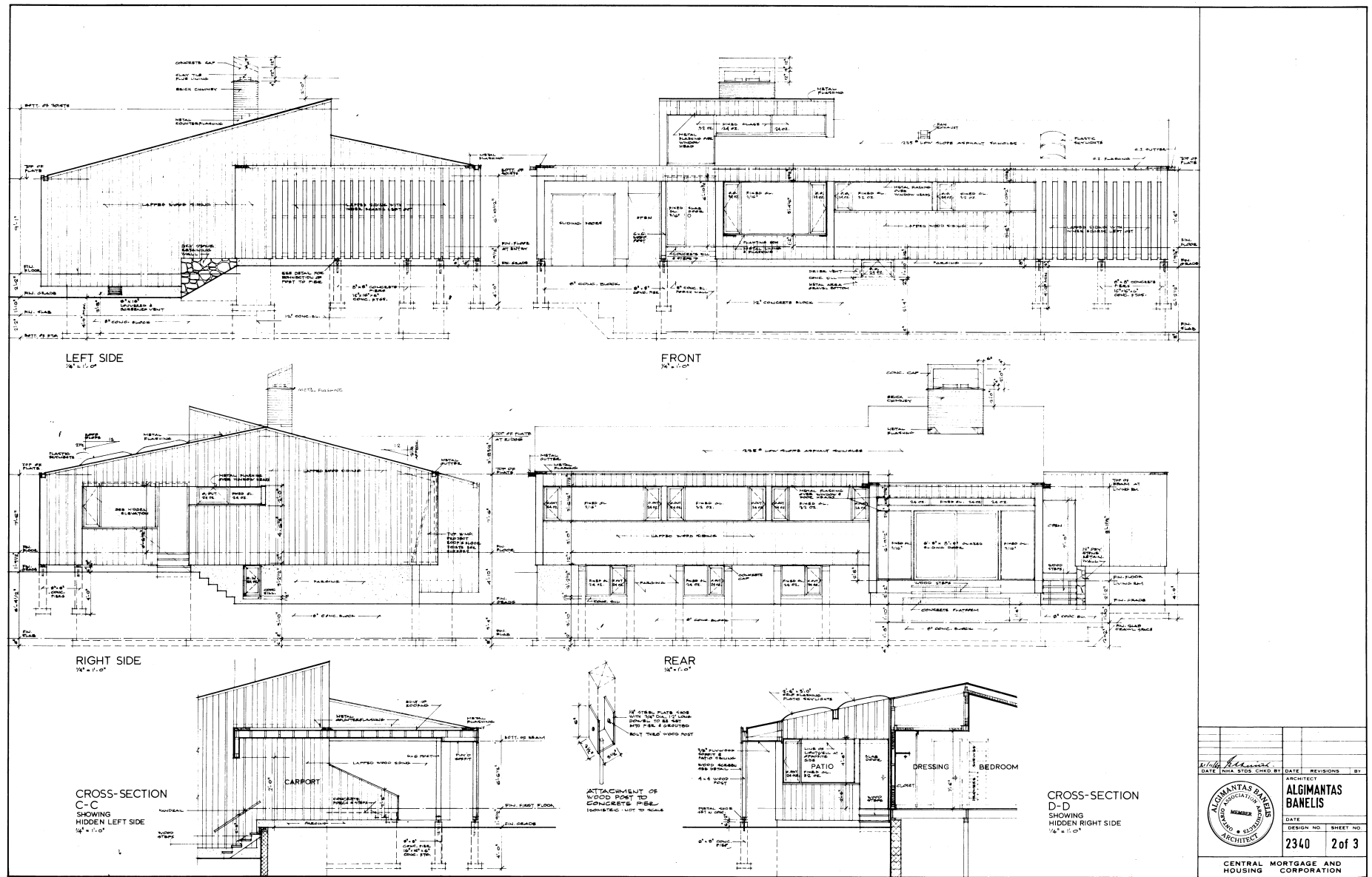
Algimantas Banelis, OAA

TORONTO, ONTARIO (1927-2020)

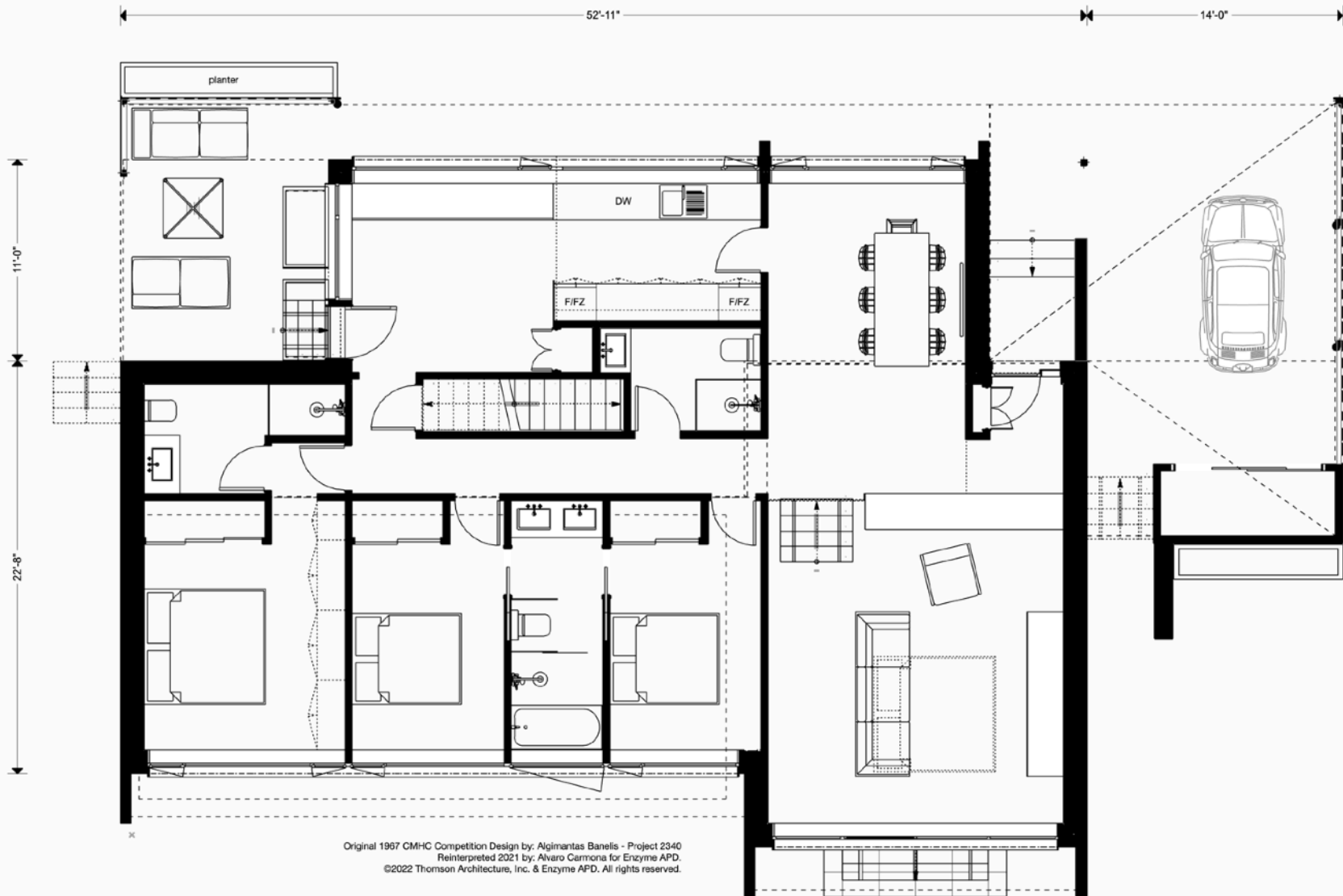
1969 No. 2340

Algimantas Banelis' relatively sprawling 2,515 sf 3-Bedroom, 3-Bathroom design is not in any of the plan books that we could find, but his design No. 612 is featured in the 1962 edition of **Small House Designs** and design No. 769 in the 1965 edition of the same name, and while this model shares similarities with No. 2336 by QC Architect Jacques Vincent. Alvaro Carmona from our Madrid office created the BIM model from a set of plans found in the CMHC Archive. The rectangular plan is essentially a very wide back-split, with a walk-up entrance to a street-facing kitchen and dining area with counter-to-ceiling windows all the way along the frontage. A carport on one side is balanced by a patio on the other, both screened for privacy with an articulated wood feature wall. Above the dining room is a unique clerestory window/light monitor which slopes down into the sunken living room in the rear of the back split - forming a wedge-like bass that rises above and breaks from the standard low-pitch gable roof line. For such a large house, the BEM predicted a surprisingly good TEUI (Total Energy Use Intensity) between 57 and 79 kWh/m²/yr - depending on the building's cardinal orientation. The GHGI (Greenhouse Gas Intensity - Operational) is around ~0.29kg/m²/yr when fitted with an air-source





A typical sheet from the Construction Documents (CD's) corollary of the CMHC Patterns. There are several instances of complete sets of CD's with no matching reference model in the Pattern Books.



Floor Plan drawing directly from our 3D model, Street elevation towards top of page, rear yard towards bottom.



Interestingly, this plan is most efficient (TEUI of 57kWh/m²/yr) when aligned with a North-South running street, otherwise the large amounts of glazing result in excessive heat gain (South) and losses (North) - with greater cooling loads and a TEUI of 79. When the glazing faces East and West (and is shaded by its own overhangs) Winter gains increase and Summer gains are reduced.

heat pump and airtight construction with an overall building U-Value of 0.32 W/m²•K.